

UNIVERSITY OF CAPE COAST

ASSESSING THE EFFECTIVENESS OF THE TEACHING AND  
LEARNING OF INFORMATION AND COMMUNICATION  
TECHNOLOGY IN THE GHANAIAN PUBLIC JUNIOR HIGH  
SCHOOLS

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By

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JULY 2010

## DECLARATION

### Candidate's Declaration

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

Candidate's Signature:.....

Date: 10<sup>th</sup> July 2010

Name: PHILIP NARH DONKOR

### Supervisor's Declaration

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

Supervisor's Signature:.....

Date: 10<sup>th</sup> July 2010

Name: DR. JONATHAN A. FLETCHER

## ABSTRACT

The study was undertaken in the Akuapem South Municipality. The purpose of the work was to assess the effectiveness of the teaching and learning of ICT in the public Junior High School. Pupils, head teachers, teachers, School Management Committee (SMC) and Parent-Teacher Association (PTA) executives were the target population of the study. Two main instruments, questionnaire and interview guide were used to collect data for the study.

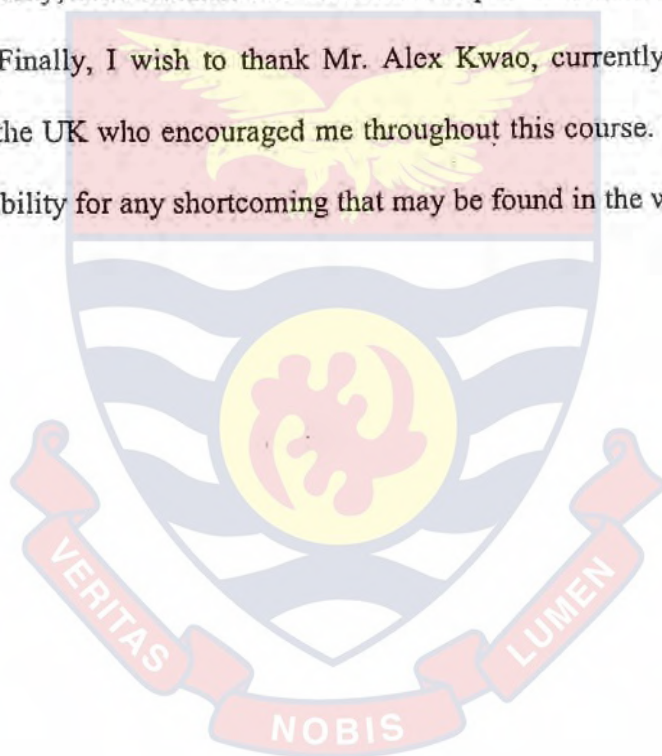
Among the findings were that the teaching and learning of ICT is basically theoretical; that in-service training was not organized for ICT teachers to help upgrade their skills and knowledge; and that the duration for the study of ICT at the teacher training colleges is not uniform. The government did not involve all stakeholders of education in decision making before the introduction of the subject into the school curriculum. Furthermore, most schools don't have computer laboratories.

The main recommendation is that the authorities of Ghana Education Service and the teacher training colleges should extend the duration for the study of ICT in teacher training colleges and that Government, through the Ghana Education Service should organize regular in-service programmes to update the knowledge and skills of the ICT teachers.

## ACKNOWLEDGEMENTS

I wish to acknowledge the help of several individuals who helped in diverse ways to make this piece of work a success. First and foremost, I owe a debt of gratitude to my sole supervisor, Dr Jonathan Fletcher of the Department of Science and Mathematics Education, University of Cape Coast, who supervised the work, and without whose invaluable help this work could not have been completed. I would also like to thank the staff of the Ghana Education Service, both at the headquarters and in Akuapem South Municipality, head teachers and teachers who provided data for the study.

Finally, I wish to thank Mr. Alex Kwao, currently studying for his PhD in the UK who encouraged me throughout this course. I, however, claim responsibility for any shortcoming that may be found in the work.



## DEDICATION

To my dear wife, Gifty Yevu Dziwornu whose toil and support has made my education a reality.



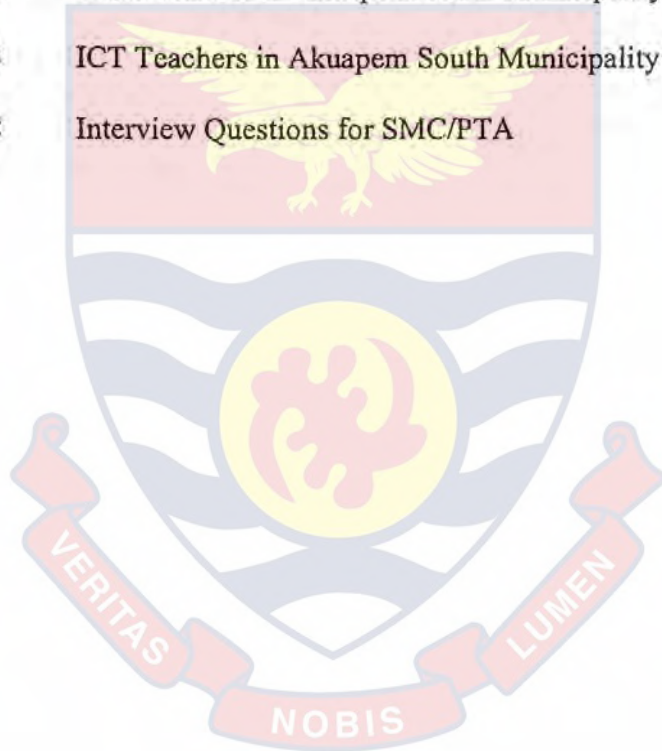
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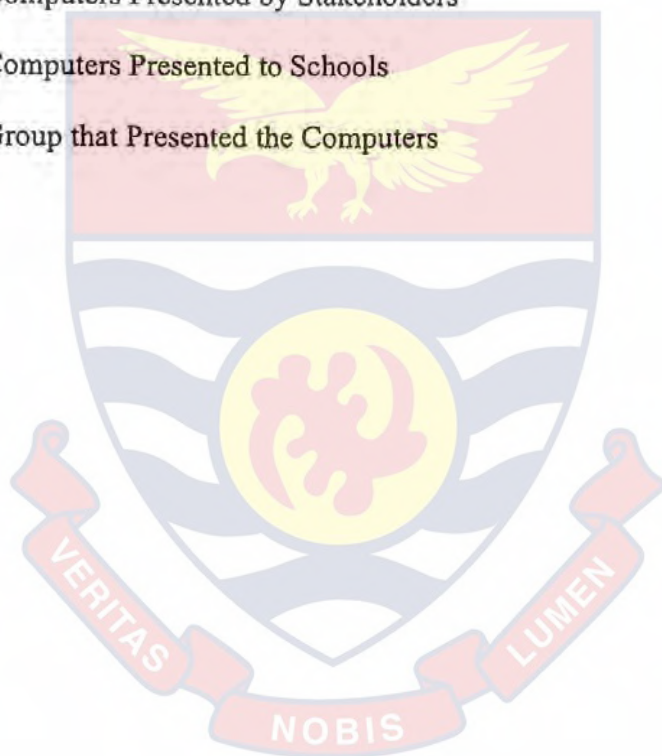




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## CHAPTER ONE

### INTRODUCTION

#### Background to the Study

According to Harrison (1987) information and Communication Technology (ICT) is the use of information in order to meet human needs or purposes including references to the use of contemporary devices such as the internet, video-phones, mobile computing and many others. ICTs are basically information handling tools – a varied set of goods, applications and services that are used to produce, store, and process, distribute and exchange information. They include the ‘old’ ICTs of radio, television and telephone, and the ‘new’ ICT of computers, satellite and wireless technology and the Internet with their attendant tools. With appropriate content and applications, these tools are now able to work together, and combine to form a ‘networked world’ – a massive infrastructure of interconnected telephone services, standardized computing hardware, the Internet, radio and television – which reaches into every corner of the globe”.

Information technology means all equipment, processes, procedures and systems used to provide and support information systems (both computerized and manual) within an organisation and those reaching out to customers and suppliers. The term information and communication technology, ICT, was coined to reflect the seamless convergence of digital processing and

telecommunications. ICTs include hardware, processes and systems that are used for storing, managing, communicating and sharing information.

The origin of ICT could be traced far back in the 1950s when integration of telecommunication and computer technologies enabled the production and networking of computers to each other and to terminals. This development necessitated the combination of electronic circuit on very high tiny surface of silicon popularly referred to as “chips”. The outcome of this was the innovative transformation in ICT’s and the complete revision of the forces and modes of production (Haine, 1997).

Consequently, there was a dynamic change from a ‘world’ economy to ‘global’ economy. Indeed, globalization and technological change processes that have accelerated in tandem over the years have created a new global economy powered by technology, fuelled by information and driven by knowledge (Tinio, 2003). The emergence of this new global economy has serious implications for the nature and purpose of societal development. It is for this reason that policy makers are integrating the use of ICT in various sectors of the economy. Today ICT has been integrated into trade and commerce, health, agriculture, education to mention a few.

In trade and commerce, the use of electronic banking is very prevalent in the financial institutions. This system of banking has changed the way banks operate. Major banks all over the world use ICT in a variety of ways to make their business successful (Karim, 2006).

For health practitioners, ICT presents a significant tool for sharing information within various constituencies. It also presents the opportunity for the health professionals in developing countries to access a wide range of

medicinal journals online. Delivery of medical assistance via ICT's makes access by the public a key issue (Mutala, 2005).

The application of ICT in the agricultural sector is increasing importantly. There is an emerging field of e-agric which involves conceptualization, design, development, evaluation and application of innovative ways to use ICT in the rural domain, with primary focus on agriculture (Wikimedia Foundation Inc). That is, organisations of all types in the private, public and nonprofit sectors are constantly being urged to improve their performance by adopting the tools of ICT with no exception to education.

ICT in education started in the late 1970s and early 1980s where drill and practice multimedia programmes were designed for learning. By the year 2000, internet based training was introduced (Lennon, et al, 2003). Today ICT is gradually being integrated into teaching and learning. Policy makers are incorporating ICT into the school curriculum. According to United Nations Educational Scientific and Cultural Organization (UNESCO, 2007), some countries such as Australia, South Korea and Singapore have reached advanced stages in integrating ICT into their educational system. In such countries almost all classrooms have been equipped with computers and other ICTs; have a low student/computer ratio; and have a high level of internet access to all schools. South Korean schools, for example, have universal access to internet. In terms of ICT policy, their Ministries of Education have formulated a national ICT policy in education, as well as a master plan to implement policies with provision of adequate budgets to ensure effectiveness. As far as the use of ICT in teaching and learning is concerned, all of these countries have revised their

curriculum to ensure that ICT becomes integral nationwide.

(<http://www.unescobkk.org/education/ict/project>)

Another example is that the Hong Kong Special Administrative Region government launched a five year ICT Strategy in schools in the late 1980's. This paper reports the findings of the analysis on models of changing 18 schools striving to integrate the use of ICT in teaching and learning (Allan et al, 2003).

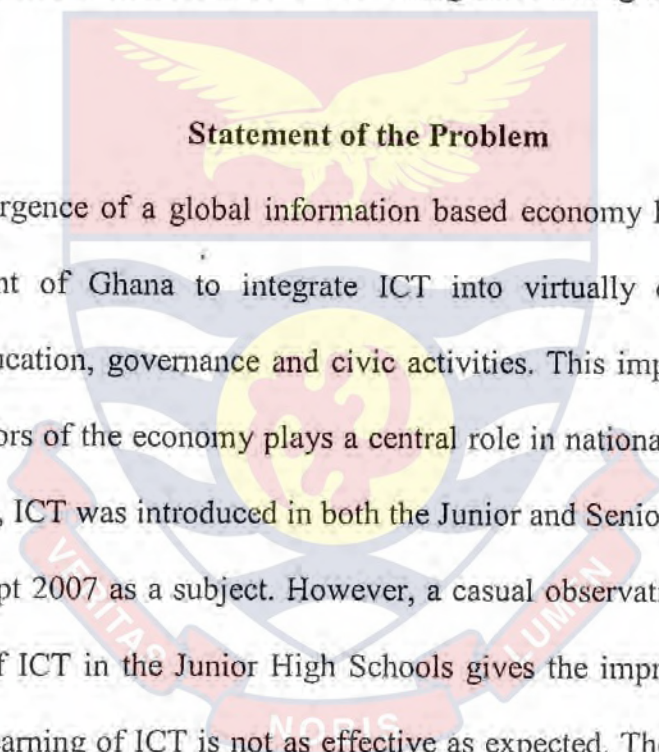
Again, in Mozambique a piece of research was undertaken to document the process of introducing and using ICT in the secondary schools in the last three years (Shafika, 2004)

Thus, the application of Information and Communication Technology (ICT) in schools is perceived as a means for transforming teaching and learning processes, and has been met with significant enthusiasm.

In Ghana, to accelerate ICT development in education, policy makers have revised the curriculum for schools. Basic design and Technology and ICT were introduced into the Junior High School curriculum (Mensah, 2003). At the Senior High School ICT has been added to the core subjects and the duration of the course has been extended to four years. The aim was to ensure that by the year 2015 The New Partnership for Africa's Development (NEPAD) schools initiative will develop all African schools into NEPAD Schools which will transform the entire educational arena in Africa to bridge the digital divide. Mensah (2003) stated further that education policymakers in Ghana have hailed the introduction of Information and Communication Technology (ICT) in schools as a remarkable step that will contribute to knowledge production, communication and information sharing among students and teachers in the

school system. This perception stems from assertions in the literature about the benefits that come with ICT literacy in schools (Mucherah, 2003; ETS, 2001; Hakkarainen et al, 2000). Hakkarainen et al (2000), for example, points out that ICT is a transformative tool and its full integration into the school systems is necessary to prepare students for the information society they will inherit.

Currently, ICT is being taught and learnt at the Junior High Schools as a subject. Since the implementation of the policy took teachers unaware, the current study aimed to find out about the teaching and learning of the subject.



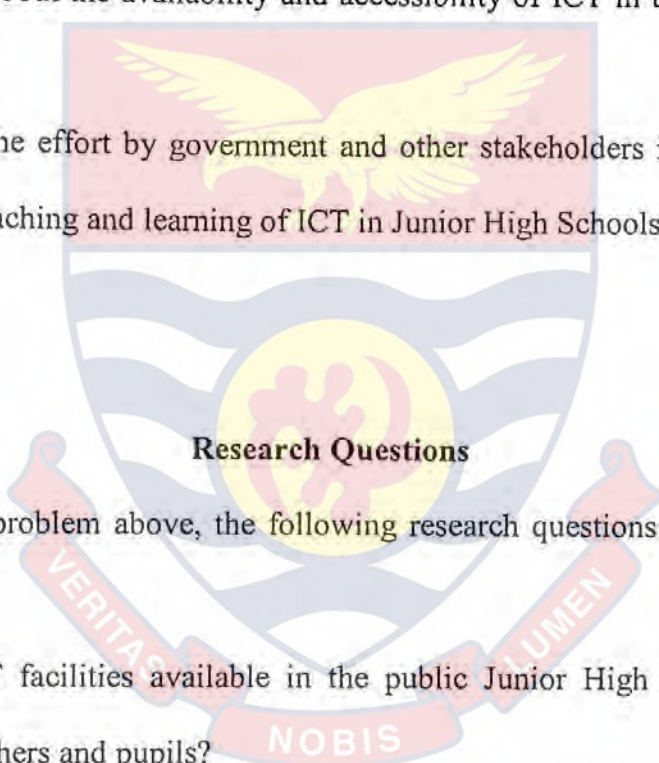
### **Statement of the Problem**

The emergence of a global information based economy has pressurized the government of Ghana to integrate ICT into virtually every facet of commerce, education, governance and civic activities. This implies the use of ICT in all sectors of the economy plays a central role in national development. For this reason, ICT was introduced in both the Junior and Senior High Schools curricula in Sept 2007 as a subject. However, a casual observation of teaching and learning of ICT in the Junior High Schools gives the impression that the teaching and learning of ICT is not as effective as expected. There is therefore the need to delve into the issue to find out how effective the teaching and learning of the subject is. In this study, therefore wants to investigate how effective the teaching and learning of ICT in the public Junior High Schools is. Considering the circumstances surrounding the implementation of this policy, a simple question that could be asked is that, are the Junior High Schools having the available material and human resources to ensure the success of this programme?

## **Purpose of the Study**

The general objective of this study is to examine the effectiveness of the teaching and learning of ICT in Junior High Schools. More specifically, the study seeks to:

1. Find out how ICT is being taught and learnt in the Junior High Schools.
2. Find actual constraints affecting the teaching and learning of the subject effectively.
3. Find out about the availability and accessibility of ICT in the Junior High Schools.
4. Look at the effort by government and other stakeholders in education to enhance the teaching and learning of ICT in Junior High Schools.

The logo of the University of Cape Coast is a watermark in the background. It features a shield with a yellow eagle with wings spread at the top, a yellow sun with rays in the center, and a red banner at the bottom with the Latin motto "VERITAS LIBERABIT VOS".

### **Research Questions**

Based on the problem above, the following research questions will guide the study.

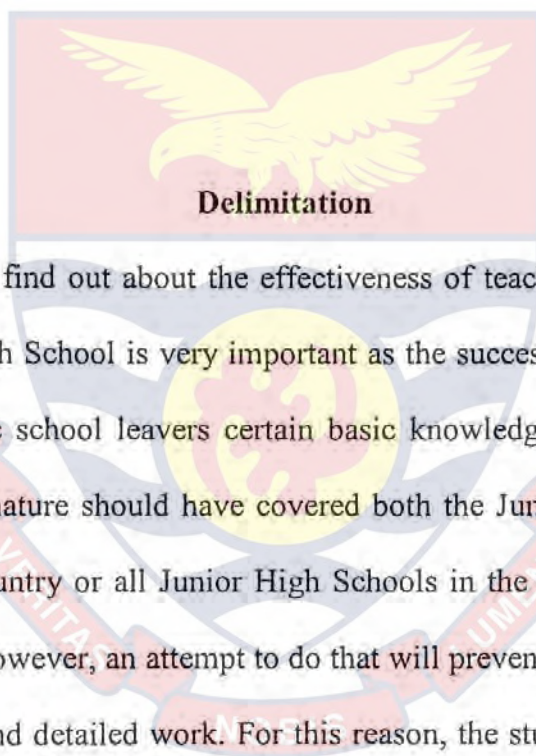
1. Are ICT facilities available in the public Junior High Schools to be accessed by teachers and pupils?
2. How is ICT being taught and learnt in the Junior High Schools?
3. What problems do teachers and learners face in the teaching and learning of ICT?
4. What is the role of the Ministry of Education (MOE), NGOs and other stakeholders in assisting public junior high schools to have access to ICT facilities?



### **Significance of the Study**

The study will help to assess the quality of teaching and learning of ICT in the Public Junior High Schools. It will also provide information to Ghana Education Service (G.E.S) on ICT resource available in the Junior High Schools. The findings will also provide information to policy makers to improve the teaching and learning of the subject.

Furthermore, the study will also serve as literature for future researchers in the area of education.

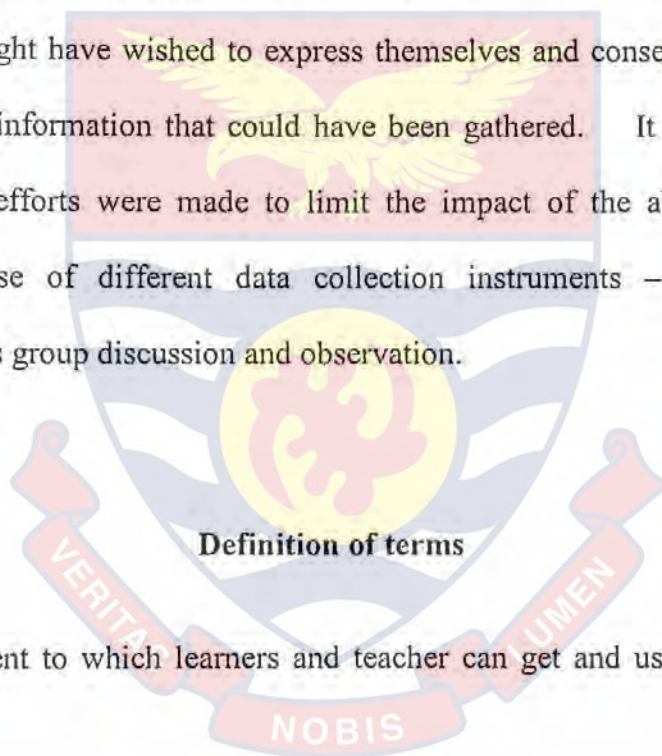


**Delimitation**

Any study to find out about the effectiveness of teaching and learning of ICT in Junior High School is very important as the success of this programme will provide basic school leavers certain basic knowledge and skills in ICT. Research of this nature should have covered both the Junior and Senior High Schools in the country or all Junior High Schools in the country to allow for generalization. However, an attempt to do that will prevent the researcher from doing any good and detailed work. For this reason, the study was delimited to only Junior High Schools in the Akuapem South District.

### **Limitation**

The main limitation of the study is that some of the respondents failed to respond to the questionnaires or return them and this may have affected the validity of some of the conclusions. Furthermore, in using interview to ask people about their view, it was very difficult to be sure whether their views were true and this could somewhat undermine the accuracy of any generalization. Also the questionnaire and interview guide were closed and made use of the Likert- scale format for data collection. This limited the extent to which respondents might have wished to express themselves and consequently limited the amount of information that could have been gathered. It must be noted, however, that efforts were made to limit the impact of the above limitation through the use of different data collection instruments – questionnaire, interview, focus group discussion and observation.



**Access**-the extent to which learners and teacher can get and use ICT facilities and services.

**ICT**- Information and Communication Technology

**Integration** – embedding ICT in the school curriculum

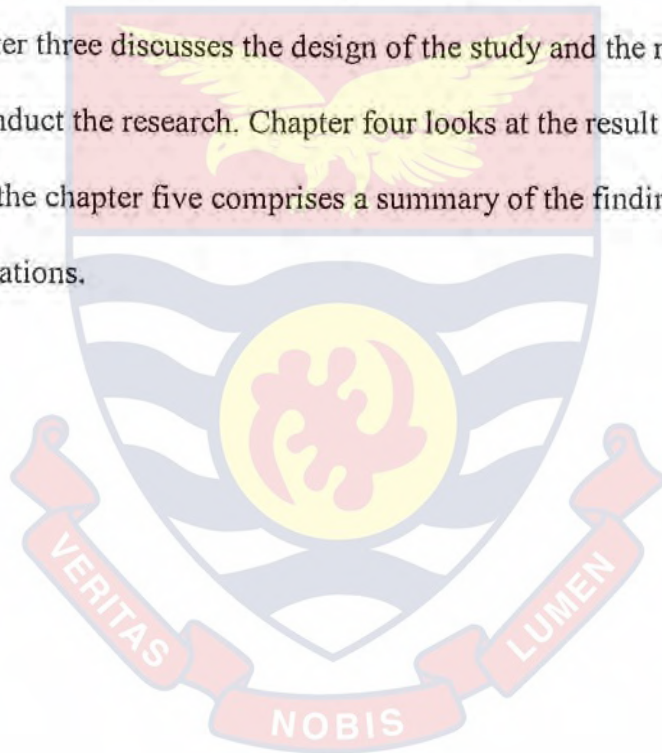
**Effectiveness**-This refers to how well teacher are implementing the ICT integration programme by finding out whether ICT having any effect on teaching and learning.

**NGO** – Non Governmental Organization. This refers to a voluntary organization which supports project development.

**WSD** - Whole School Development – the concept of improving teaching and learning as well as the administration of a school.

### **Organization of the Rest of the Study**

This work is organized in five chapters. The chapter one consists of background to the study, research question, purpose of the study, significance of the study, delimitation and limitation. Chapter two comprises review of related literature. Chapter three discusses the design of the study and the methodology employed to conduct the research. Chapter four looks at the result and discussions of data. Finally the chapter five comprises a summary of the finding, conclusions and recommendations.



## CHAPTER TWO

### REVIEW OF RELATED LITERATURE

#### Introduction

The literature review is aimed at looking at studies which have assessed the effectiveness of teaching and learning of Information and Communication Technology (ICT). The following areas will be reviewed in the literature:

1. The Nature of Basic Schools in Ghana
2. Government Policies in the introduction of ICT to schools
3. Availability of ICT facilities for the basic schools
4. Availability of trained personnel to handle these special facilities
5. The Relevance of integrating ICT into Basic School Curriculum

#### The Nature of Basic Schools in Ghana

Formal education in Ghana dates back to the mercantile era preceding colonization. European merchants and missionaries set up the first schools and Christian missionaries are said to have introduced western-style education into Ghana as early as 1765 (Graham, 1971). In the period 1919-1927, the Governor of the Gold Coast, Sir Gordon Guggisberg improved the management of the basic schools. In the year 1951, the Accelerated Development Plan (ADP) for education was launched. This gained legal backing through the introduction of the 1961 Educational Act, which sought to provide free, universal and compulsory basic education (of 6 years duration) for all children

from 6 years of age. The 1961 Education Act empowered Local Authority Councils to be in control of educational management whilst parents and guardians were expected to make some contribution to the running of schools in their areas. Primary education underwent a rapid and steady growth and the number of schools rose from 1,081 in 1951 to 3,372 in 1952. Enrolment doubled in a period of five years and Ghana was acclaimed as having the most developed education system in Africa (Foster,1965) Ghana Human Development Report,1998 ; Scadding,1989).In 1961, the entire basic education system (primary and middle school education) was made free and compulsory, although uniforms and books were not free. One major achievement was that enrolment in schools increased, causing the number of schools to increase.

However, there was a drawback that could not enhance the success of this programme - inability to provide schools with trained teachers. With the increased number of schools, more teachers were needed and so many 'pupil teachers' (untrained teachers) had to be employed to teach, resulting in poor teaching and learning in schools during this period.

Again, this reform did not diversify the formal academic courses to include practical courses such as technical and vocational. Therefore Ghana's formal education system remained Western and predominantly academic and elitist. The result of this was the production a lot of school leavers who had no marketable skills; neither did they have the skills to go into self-employment ventures. According to (Dzisah, 2006) technical education geared towards innovation and creative purposes was not on the colonial agenda.

Following this, the second significant source of policy development arose through the Dzobo Committee of 1973 and The New Structure and Content of

Education policy of 1974. This reform is generally referred to as 'The New Structure and Content of Education' (NSCE) which reduced the length of pre-tertiary education from 17 years to 13 years. The 6 years of primary education remained the same. The four years of junior schools was reduced to three years. The five years of senior secondary, upper level remained the same. The aim of this policy was:

1. To make it possible for school leavers to leave at any point of exit from the system with skills that would enable them to be employable. For this reason vocational and technical courses were introduced into the curricula.

2. To raise standards at the various levels so that educational standards would not be compromised as a result of the decrease in number of years spent in pre-tertiary education.

3. To reduce educational expenditure.

However, despite its laudable intention, the NSCE did not have any sustainable impact on the general education system of the country. These were still unqualified teachers in the education system, inadequate resources to support teaching and learning in schools, and challenges for teachers within the context and content demands of the curriculum. According to Abdullah (1986), there had been a virtual collapse of physical infrastructure in the provision of buildings, equipment, materials, teaching aids etc. This has resulted in poor teaching by the mid 1980s.

Again the type of vocational and technical courses that were introduced were catering, life skills, carpentry, tailoring etc. Information and Communication Technology (ICT) was then not part of the courses being studied in the schools. The introduction of ICT into higher school level of the public

educational system by the Ministry of Education started in 2003 (Ghana Education Trust Fund 2006).

In 1987 The New Educational Reform Programme (NERP) was introduced with a focus on the total restructuring of the entire pre-tertiary education system and on improving access through the provision of infrastructure whilst making the curriculum more relevant to social and economic needs. According to the Ministry of Education Report (MOE, 1988), the NERP sought to salvage the educational system and make it more meaningful to the individual and the nation as a whole. It is therefore worthy of mention that, even though similar to the NSCE reform, in terms of structure and content, there was a marked improvement on the latter with a revised curriculum which reflected radical changes at the basic education level.

A major thrust of the NERP reform was the diversification of the formal academic courses offered in pre-university institutions by the inclusion of practical courses. These changes were intended to correct the perceived elitist education that downgraded technical, vocational and agriculture education. Basic education was made compulsory for all children and was defined as the first nine years of schooling (6 year primary and 3 years JSS), JSS 3 pupils sat the Basic Education examination to determine their admission into the Senior Secondary School (SSS). The goal of the 1987 NERP as summed up in the sector adjustment policy document of the World Bank (World Bank 1986) includes the following:

1. To expand access to education
2. To improve the quality of education

3. To make education more relevant in meeting the needs and aspirations of the individuals and socio- economic conditions of the country
4. To re-structure pre-university education to 12 years (6-3-3); and to ensure cost- effectiveness and cost-recovery.

This reform was supported by a World Bank Sector Adjustment Credit as well as grants from UNDP, Switzerland, the United Kingdom, Norway, Canada and concessional loans from the OPEC fund (World Bank source, cited by Ministry of Education,1988.). However, there was an obvious indication that this program could not change the educational system completely due to a number of reasons.

Firstly, the policymakers appeared not to take into consideration the attitudes and behaviors of teachers who were to implement the change. In the Ghanaian situation in particular the policy ignored the need for change in teachers' practices and rather looked at simply a change in their curriculum materials. Secondly, science and Technology was not inculcated into the school curriculum to create an opportunity for pupils to acquire basic ICT knowledge and skills that could be developed in the future. Thirdly, it was stated that, the Whole School Development Coordinator, 3 Ghanaian primary teacher educators and 4 training supporters from the UK were to train the National Training Group but unfortunately, the training of 3,600 teachers nationally which was expected to take off early in 1999 did not happen as planned as a result of lack of funds. (Akumfi Ameyaw, 2000).

An attempt to salvage the educational system with the 1987 educational policy could not yield so much hence the review of this policy in 2007.



President John Agyekum Kufour launched a new education reform programme that proposes eleven years of free compulsory universal basic education (FCUBE) and four year of Senior High School (SHS) formally Senior Secondary School (SSS).(GNA, 2007).

The new system, which was implemented from September 1, 2007, starts with two years of kindergarten for pupils at age four; six years of primary school at which the pupils attains age 12; to be followed by three years of Junior High Schools (JHS) till the pupil is 15 years. After the JHS, the student may choose to go into different streams of the four years of Senior High School which would offer General Education with electives in General Arts, Technical, Vocational, Visual Art and Agriculture Education options for entry into tertiary institution or the job market. The aims of this policy are as follows:

1. To prepare the appropriate human resources in the form of skilled, technology-advance and discipline work force with the right ethics to service the growing economy.

2. It placed emphasis on mathematics, science and technology. This was to advance the literacy rate to 100 percent by 2015, pay special attention to girls' education to make them better mothers and heighten awareness of the environment to preserve national resources.

3. To master Information and Communication Technology (ICT) as a priority and that as skills in ICT had become crucial for survival of the global world, government would extend the national broadband backbone connectivity throughout the country to facilitate the development of ICT infrastructure in schools.

To achieve this aim, President John Agyekum stressed on the following strategies:

1. The government was committed to improving the conditions of service of teachers to motivate them to give of their best.
2. Upgrade and refurbish all the 38 teacher training Colleges in the country and that 15 of them were being specially equipped for science, mathematics and technology which constituted the new focus of the educational delivery programme.
3. Government was establishing a National Teacher Council to regulate the professional teachers and that a Distance Education programme to upgrade teachers while still at post was ongoing to ensure that they were abreast with the best practices of their profession to serve all schools irrespective of their location in the country. (GNA, 2007).

### **Government Policy in the Introduction of ICT in Schools**

According to Mangesi (2007), the government of Ghana has placed a strong emphasis on the role of ICT in contributing to the country's economy. The country's medium-term development plan captured in the Ghana Poverty Reduction Strategy Paper (GPRS I&II) and the Education Strategic Plan 2003-2015 all suggest the use of ICT as a means of reaching out to the poor in Ghana. In 2004, Parliament passed into law Ghana's ICT for Accelerated Development (ICT4AD) policy, which is currently at various stages of implementation. This policy represents the vision of Ghana in the information age and addresses 14 priority focus areas. Some of them are:

1. Accelerated human resource development
2. Promoting ICTs in education-the development and exploitation of ICTs in education.
3. Facilitating government administration and service delivery.
4. Facilitating the development of the private sector
5. Developing an export-oriented ICT products and services industry
6. Modernising agriculture and developing an agro-business industry.

The ICT in education policy for Ghana had a long gestation period. An attempt at policy development for the sector predates the national ICT policy. A committee set up by the Ministry of Education, Youth and Sports outlined an ICT in education policy framework and produced a document that remained untouched for a long time. The objectives of the policy were to:

1. Ensure that students have ICT Literacy skills before coming out of each level education of.
2. Provide guidelines for integrating ICT tools in all levels of education
3. Provide means of standardizing ICT resources for all schools.
4. Facilitate training of teachers and students in ICT.
5. Determine the type and level of ICT needed by schools for teaching and administration purposes.
6. Promote ICT as a learning tool in the school curriculum at all levels.

Through the help of various agencies, including Global e-Schools and Communities Initiatives (GeSCI), a final ICT in education policy document has been finalized which was released by the end of the first quarter of 2007.

GeSCI was founded in 2004 with the objective of working with developing country governments to harness the potential of ICT's to improve the quality of teaching and learning. They provide strategic advice to Ministry of Education in developing countries on the effective use of Information and Communication Technologies (ICT's) for education and communities of learning. Adopting a demand driven, collaborative and comprehensive approach, they aim to improve the quality of teaching and learning through the strategic and effective use of ICT's, thereby transforming education, empowering communities and promoting development. (<http://www.unescobkk.org/education/ict/project>)

Below are some of the projects undertaken by the Government to support the accomplishment of ICT initiatives in education?

**Project:** GeSCI – to expand the deployment of ICTs in schools in Ghana and to promote the effective use of these ICTs to achieve Ghana's educational and community development objectives.

- *Organisation(s):* Ministry of Education, Youth and Sports
- *Funding sources:* UNICT Task Force
- *Contact:*

[www.gesci.org/gesci/publisher/index.jsp?aID=229&nID=111&pID=107](http://www.gesci.org/gesci/publisher/index.jsp?aID=229&nID=111&pID=107)

**Project:** Nepad E-Schools – supporting six schools in six regions with ICT infrastructure

- *Organisation(s):* Ministry of Education
- *Funding sources:* HP, Microsoft, Oracle, and Cisco
- *Contact:*

[www.hp.com/hpinfo/newsroom/press\\_kits/2005/wsis/ov\\_nepad.pdf](http://www.hp.com/hpinfo/newsroom/press_kits/2005/wsis/ov_nepad.pdf)

**Project:** APSnet) – has twinned with many schools abroad, including Denmark, Great Britain, Mexico, and the US, facilitating exchanges among teachers and students

- *Organisation(s):* UNESCO
- *Funding sources:* UNESCO
- *Contact:* [http://portal.unesco.org/ci/en/ev.php-](http://portal.unesco.org/ci/en/ev.php-URL_ID=20753&URL_DO=DO_TOPIC&URL_SECTION=201.html)

[URL\\_ID=20753&URL\\_DO=DO\\_TOPIC&URL\\_SECTION=201.html](http://portal.unesco.org/ci/en/ev.php-URL_ID=20753&URL_DO=DO_TOPIC&URL_SECTION=201.html)

**Project:** Expanding Education Networking – involves 50 schools in Accra, Kumasi, Cape Coast, Tema and other areas.

- *Organisation(s):* iEARN /SchoolNet Ghana
- *Funding sources:* SchoolNet Africa
- *Contact:* [www.iearn.org/globe/globe\\_Africa.html](http://www.iearn.org/globe/globe_Africa.html)

**Project:** Innovative Best Teacher Award – awarding teachers who excel in using ICTs in Education

- *Organisation(s):* Ghana Education Service
- *Funding sources:* Government of Ghana
- *Contact:* Ministry of Education

**Project:** Global Teenage Project – using the Internet and especially e-mail as a catalyst to structure exchanges between schools and teachers

- *Organisation(s):* Rescue Mission Ghana
- *Funding sources:* School Net South Africa and International Institute for Communication and Development (IICD)
- *Contact:* [www.globalteenager.org.gh/](http://www.globalteenager.org.gh/)

Some of the main issues challenging the development of this initiative is the problem of achieving equity in implementation. Schools in the rural areas

should not be neglected. For example Project 5 which is being implemented by SchoolNet, a foundation based in Switzerland, was stressing on schools in the urban areas such as Accra Kumasi and Tema. The foundation chose fourteen schools in Ghana in which to implement ICT programs. Of these schools, five are located in Accra, three in Kumasi, four in Cape Coast, one in Tema, and one in Aburi. Of these fourteen schools, eleven belong to those schools categorized as premier schools. Apart from Aburi, the rest of the locations are all cities. Aburi, is however located about twenty miles from Accra. Now that the distribution of ICT in schools is also progressively skewing in favor of the urban schools, as it has been with other educational services since Western-type formal schools started in the country, policy makers face the challenge of promoting equitable ICT implementation. Mensah (2003).

Also the capacity of teachers and educators to deliver policy still remains low with many averse to adopting ICTs in the classroom or with inadequate skills. Co-ordination among the various implementing agencies has not been as good and consolidation of activity is needed. Despite the above challenges, education policy makers are quite enthusiastic about the introduction of ICT in Ghanaian basic schools (Ministry of Education, 2002).

### **Availability of ICT Facilities and Resources in Schools.**

Educational policy makers, non-governmental organizations (NGO), bilateral and multilateral donor organizations and school administrators are making the collective efforts to promote ICT in Ghanaian basic schools. Because of the efforts of NGOs and donor organizations in particular, ICT

facilities have extended to some of these secondary schools, mostly in urban communities (Dankwa, 1997; Parthemore, 2003).

According to National ICT for Accelerated Development Policy, Government of Ghana (2003), the availability of appropriate infrastructure is key to facilitating the deployment of ICT at each level. ICT equipment should be deployed according to internationally acceptable standards. Students' user access to up-to-date computer-based tools can facilitate their making significant contributions to the knowledge economy. Equity of access must be an overriding consideration in any ICT programme being implemented.

However, according to Parthemore (2003), computer literacy education in Ghana has been concentrated in major urban areas. A recent visit to the basic Schools in the Akuapem South Municipality testified that schools were provided with only syllabi and that there are currently no computers in the schools. Some few schools have television set provided by the Municipal Assembly. Resource centre such as computer laboratories are not provided. It is only a single basic school that has computer laboratory which is owned by a private person. Even the few secondary schools that have computer laboratory have fewer computers as a result of small size of their laboratories. The high population of basic students will not permit the use of these labs in secondary schools. However the government emphasized its commitment to promoting equitable ICT in the school system so that all students will equally benefit from ICT regardless of their levels and geographical location. The successful implementation of such a policy would be a great achievement in the educational system. But the existing inequality, poor infrastructure and the nation's present economic situation (as a highly indebted country) is likely to

pose a challenge to implementing equitable ICT in the school system.(GNA April 2007).

In a recent Ghanaian case study (Ismail, 2002), it became apparent that the high costs for providing electricity (where there is none) and connectivity to telephone services are major setbacks to providing ICT in most schools in Ghana. The history of Ghana's educational development and recent case studies all point to the fact that the distribution of educational resources especially, material inputs, teaching personnel, and well-equipped facilities, have always been skewed in favor of some section of the society. (Folson, 1995; Glewwe and Jacoby, 1994; Graham, 1971; McWilliams and Kwamena-Poh, 1975; Mfum-Mensah 2003). These educational resources pointed out above have direct effect on students' acquisition of knowledge and learning, and hinder equal implementation of ICT policies. The provision of technical support for ICT has been a challenge for its effective implementation (Ismail, 2002). The provision of technical support for ICT has been a challenge for its effective implementation (Ismail, 2002). The World Bank impact assessments reveal that through ICT, students in Ghanaian schools have gained knowledge and skills. The case study also points out that through ICT, students have gained positive attitudes toward school, and collaborative learning projects have been implemented in schools.

Similarly, the tool has contributed to teacher's professional satisfaction. These revelations show how some schools (urban secondary schools) and students have taken the lead in the acquisition of ICT skills and knowledge even before its inclusion in the school curriculum. The literature and other emerging Ghanaian case studies on ICT implementation reveal that technical



support is a challenge to ICT implementation (Amenyo, 2003; Ismail, 2002; Ministry of Education, 2002). This body of literature points out that the major challenge for schools that have ICT is lack of resources and proper implementation by trained personnel. As can be seen through previous policy implementation processes and case studies, due to the scarcity of educational resources in rural areas, there is the probability that the distribution of educational resources such as ICT resources will skew in favor of secondary schools in urban centres. (Folson, 1995; Glewwe and Jacoby, 1994; Mfum-Mensah, 2003). It is most likely that a situation will be created where Schools that have the technical support will get comparative learning advantages over those without, therefore creating a digital divide in the school system.

#### **Availability of Trained Personnel to handle the facilities**

McClelland (2002), define training, as an activity that changes people's behavior. It is a learning process that involves the acquisition of knowledge, sharpening of skills, concepts, rules, or changing of attitudes and behaviors to enhance the performance of employees. Increased productivity is often said to be the most important reasons for training. Training is essential not only to increased productivity but also to motivate and inspire workers by letting them know how important their jobs are and giving them all the information they need to perform those jobs (Anonymous, 1998). McNamara, J. (2007) lists the following as some of the benefits from employee training.

1. Increased job satisfaction and moral
2. Increased motivation
3. Increased efficiencies in processes, resulting in financial gain

4. Increased capacity to adopt new technologies and methods
5. Increased innovation in strategies and products
6. Reduced employee turnover.

ICTs can be used to transform the teaching and learning systems to meet the challenges of the knowledge economy. An Informal investigation conducted with some head teachers and teachers of the public Junior High Schools in the Akuapem South Municipality indicates that no ICT training was provided for the teachers who were on the field before the implementation of the policy in 2007. Hence these teachers lack the necessary knowledge and skills needed to enable them teach the subject effectively.

According to Ghana Education Service (G.E.S), the number of trained teachers equipped with ICT knowledge and skills in 2007 was 8,587. This number represents the number of trained teachers who passed out from the teacher training college in that year. These teachers benefited from ICT teaching and learning at their respective colleges. In the year 2008, teachers who passed out from the teacher training colleges is 8,117. Out of this number, only 4122 were posted to the public Junior High School with the rest recruited by private schools, Kindergarten, Nursery, and Crèche. This number as against 7423 public Junior High Schools in the country presently gives an obvious impression that some public J.H.S did not receive some of these newly trained teachers. Another challenging issue is that, how many of these teachers accepted posting to the remote districts?

From the Directorate of the Ghana Education Service (G.E.S), Akuapem South Municipality, 87 newly trained teachers were posted to the district in 2007. Out of this number, the district posted 38 to the primary and kindergarten and 49

were posted to the Junior High Schools. In 2008, they received 123 newly trained teachers. 53 were posted to primary and kindergarten while 70 were posted to the public Junior High Schools. This gives the indication that each Junior High School in the district should have at least one of these newly trained teachers. However the questions to digest are that: To what extent do they studied ICT that have equipped them to teach the subject? Again, have these teachers accepted posting to the remote areas where social infrastructures are not available, the places are not accessible by lorry road? Also some schools have exceeded the staff enrollment from the past years and there is the possibility that such schools will not receive some of these newly trained teachers. An aggressive well planned program is needed to solve the acute shortage of highly qualified ICT & Computer Science teachers in the country's educational institutions. The introduction of ICT in the Education Sector necessitates the training of all persons involved in the educational service delivery (management / staff, teachers including teacher trainees, technicians, etc.). A corps of highly trained personnel is required to ensure the sustainability and growth of ICT implementation. Continued professional development is a key element towards supporting teachers who are confident and creative users of ICTs. Training and ICT skills development of teachers can be used to enhance the teaching and learning of subjects in the curriculum.

## Relevance of Integrating ICT into Basic School Curriculum

According to UNESCO ICT's have become a driving force of educational reform and they are an integrative part of national education policies and plan. (<http://www.unescobkk.org/education/ict/project>)

Also play, performance and practice are three foci of learning that can be enhanced through use of ICT that addresses the interests of early years and middle year's students (Downes 1995). Play provides a blending of ICT as a toy as well as a tool, bringing home developed skills and recognizing them in the classroom. ICT is a tool to support and enhance a repertoire of teaching approaches that teachers can mobilize to address individual difference.

ICT can in such ways be used to promote the basic principles of Indigenous pedagogy (Blitner *et al.* 2000:28-49) through its capacity to:

1. Focus on student / teacher relationships;
2. Maintain continuous teaching, learning and assessment;
3. Create a community of learners recognizing elders as knowledgeable and respected teachers;
4. Develop independence and mutual respect between Indigenous teachers and children.

Various strategies are being developed internationally and within Australia that seek to improve access to marginalized groups. Universal access to the Internet and computers is increasingly being seen by governments to be a precondition for more inclusive use of ICT that has individual and collective social and economic benefits in knowledge based society (Funston and Morrison 2002)

## CHAPTER THREE

### METHODOLOGY

#### Introduction

This study was conducted in the Akuapem South Municipality of the Eastern Region. The selection of Akuapem South Municipality was due to the fact that, its performance in the B.E.C.E is average.

This chapter of the study focuses on the research design, population and sampling, instruments, data collection procedure and data analysis.

The chapter also looks at some of the major problems that were encountered during the administration of the questionnaire and the interview guide.

#### Research Design

The research design for the study was survey research. The rationale for this type of design for the study is that, according to Ekuri (1997), descriptive survey involves the collection of data to accurately and objectively describe the current status of an existing phenomenon. Fraenkel and Wallen (1993) also state that obtaining answers from a large group of people to a set of carefully designed and administered questions, lies at the heart of survey research. It determines and reports the way things are.

Descriptive survey design is directed towards determining the nature of a situation as it exists at the time of the study. Polit and Hungler (1995) have also

indicated that descriptive survey aims predominantly at describing, observing and documenting aspects of a situation as it naturally occurs rather than explaining them.

The design has an advantage of describing a status of an existing phenomenon accurately and objectively. It is able to produce a good amount of responses from a wide range of people. It involves asking the same set of questions to a large number of individuals either by mail, telephone or in person. It also provides a more accurate picture of events and seeks to explain people's perceptions and behaviors on the basis of data gathered at a point in time. It is therefore appropriate when a researcher attempts to describe some aspects of a population by selecting unbiased samples of individuals who are asked to complete questionnaires, interviews or test (Fraenkel & Wallen, 1993). The design has the potential to provide a lot of information obtained from quite a large sample of individuals. Based on the above strengths of the design, it is considered the most appropriate design for assessing the effectiveness of teaching and learning of ICT in the Junior High Schools.

### **Population**

A target population is the population of interest to the researcher. It is the population for whom a researcher would like to answer the research questions. The target population for this study was the public Junior High School students and teachers in the Akuapem South Municipality of the Eastern Region of Ghana. The accessible population was Junior High School Forms 1 and 2 students and their ICT teachers.

## **Sample and Sampling Procedure**

In all 300, Junior High School students were selected from 12 JHS for the study. In each school 25 students were selected for the study. Random sampling procedures were used to select schools to give equal chance to all the schools in the Municipality. Furthermore random sampling was also used to select the students. With regard to the selection of the schools, all the 12 schools in the Municipality were numbered and a table of random numbers was used to select the schools. Concerning the selection of the students in the sampled schools, the random sampling procedure used in the selected schools to select the students was systematic sampling. In a class of about 50 students with 5 columns and 10 rows, 3 students were selected. This was done by picking the third student in each column by counting from the first in each column. In classes of about 30 students with 5 columns, and 6 rows, 2 students were selected. This was done by picking the second students again counting from the first student in each column. Purposive sampling was used for selecting 20 ICT teachers. This is because it is not every teacher who teaches ICT.

## **Instruments**

A semi-structured (and self administered) questionnaire and an interview guide were used as a secondary data collection procedures. They were the main method used to collect data in the present study. Other methods that were used

for the study include secondary sources (documentation, online data), interviews, focus group discussions and observations.

Questionnaires are one of the best impersonal observation techniques used for eliciting data (Leedy 1993). Respondents are more likely to respond honestly because of anonymity. Questionnaires were used more especially because it was not possible for the researcher to interview all three hundred students and teachers. A further reason for using self-administered questionnaires is that, since the schools are scattered all over the Municipality, financial, logistical and time constraints did not allow for interviews only to be used as the main data collection technique for this research.

#### **Format of Questionnaire and the Interview Guide**

The questionnaires and the interview guide used for this study were semi-structured, consisting of a mixture of closed and open-ended questions. De Vaus (1991) provides a number of advantages of closed or forced-choice questions. This is in spite of the problems associated with closed questions, such as providing an adequate range of alternatives to respondents. Another problem is that when a questionnaire is long, motivation to answer could be low. De Vaus (1991) states that closed question questionnaires are easier to code and recommends exhaustive alternative responses as a remedy to the problems. Open-ended questions were included in the questionnaire in the present study to determine the general feelings of teachers and students on issues and the reasons for their opinions. The questions used in the questionnaires were fairly simple. The researcher therefore assumed that teachers and junior high school students would easily fill in the questionnaires.



Considerable attention was given to developing simple, clear and unambiguous questions. The generic name *computer system*, for example, was used in the questionnaire instead of *information and communication technology*. The researcher feels that not every student or teacher would know the term *information and communication technologies*, or the different types of computers and their names.

### Data Collection Procedure

Two questionnaires were designed for data collection. One of the questionnaires was used for the ICT teachers. The other questionnaire was used for school pupils and an interview guide was used to interview the stakeholders. The two questionnaires and the interview guide were used by the researcher to collect the data personally.

Schools were visited and both pupils and teachers completed the questionnaires which were collected on the same day. Small focus group discussions were conducted with pupils on the same day and ten of them were interviewed based on their contributions to the discussions. The follow up interviews for teachers (and members of the School Management Committee/PTA) were done a week later to get more clarification of the responses provided by the teachers. Some teachers were also observed in action during the interview period.

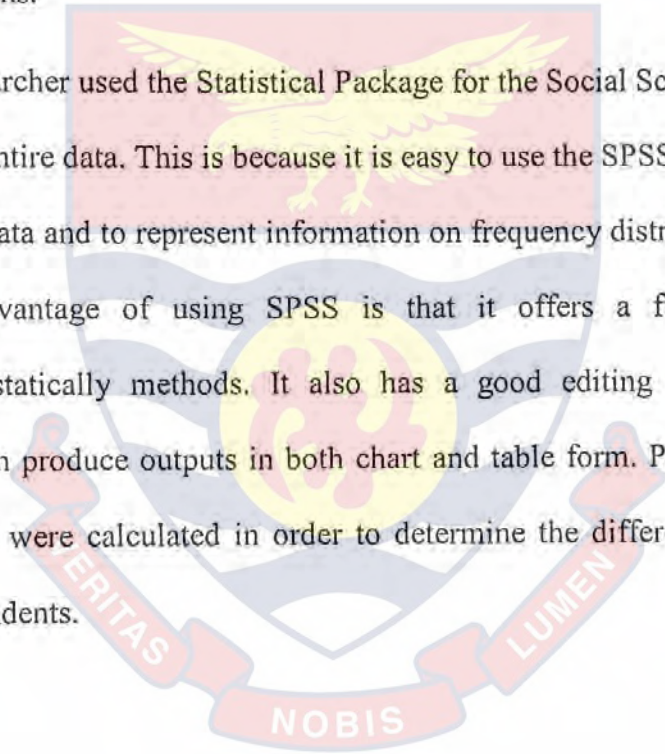
The researcher agrees with Katundu (1998), who said that the use of more than one data gathering instrument – the triangulation method – is considered vital in an under-researched problem such as that in the present study.

## Data Analysis

The scale used for the analysis was the ordinal scale. There were 4-scale steps categories of options for respondents to provide an ordinal level of the agreement to each questionnaire item.

The Likert scale format of questionnaire adopted has the characteristics to indicate the ranking of respondents' responses according to the extent of their agreement to the statements in the question. Data was analyzed based on the research questions.

The researcher used the Statistical Package for the Social Science (SPSS) to analyze the entire data. This is because it is easy to use the SPSS Windows to analyze every data and to represent information on frequency distribution table. One major advantage of using SPSS is that it offers a full range of contemporary statically methods. It also has a good editing and labeling abilities and can produce outputs in both chart and table form. Percentages of the frequencies were calculated in order to determine the different responses given by respondents.



## CHAPTER FOUR

### RESULTS AND DISCUSSION

#### Introduction

This chapter is organized under two main heading. The first section covers the results of the analysis of the background information of the respondents involved in the study. The second part presents and discusses the results of the study in relation to the specific objectives.

#### Background Information

The study involved three (3) categories of respondents; consisting of 300 students from 12 junior high schools, 26 ICT teachers from 26 junior high schools, and 14 members from both School Management Committee (SMC) and Parents and Teachers Association (PTA) all from the Akuapem South Municipality in the Eastern Region of Ghana. Out of the 300 questionnaires which were administered to the junior high school students, 265 were properly completed and collected. For the 26 questionnaires administered to the ICT teachers, all were completed and collected. Members of P.T.A and SMC were interviewed. Details of personal information of student respondents and teacher respondents are presented in tables below. Table 1 shows the gender of students.

Table 1:

**Gender of Students**

Gender	Frequency	Percent
Male	146	55.1
Female	119	44.9
Total	265	100.0

Table 1 shows that out of a total of 265 who indicated their gender in the study, 55.1% were male while 44.9% were female. This means that the male student respondents were more than the female respondents. The age of the student respondents were sought and are shown in Table 2.

Table 2:

**Age of Students**

Age	Frequency	Percent
10 – 15	210	79
16 – 20	55	21
Total	265	100.0

The age distribution of the students indicated that most of them are within the age range for Junior high school students. This is noticed by 210 (79 %) who ticked 10 – 15 yrs. Personal information of teacher respondents were also presented in two tables below. Table 3 shows the gender of teachers.

Table 3:

**Gender of Teachers**

Gender	Frequency	Percent
Male	14	53.8
Female	12	46.2
Total	26	100.0

Table 3 shows that slightly more male teachers than female teachers took part on the study. This means that as far as the present study is concerned male and female teachers were nearly equally represented. This is helpful because opinions from these teachers could throw some light on any gender issues in ICT education. The age distribution of teacher respondents for the study is shown in table 4 below.

Table 4:

**Age of Teachers**

Age	Frequency	Percent
11 – 20	1	3.8
21 – 30	14	53.8
31 – 40	10	38.5
Above 40	1	3.8
Total	26	100.0

As shown in table 4, the majority of the teachers who teach ICT falls within the age range of 21 – 30 (53.8%) and 31 – 40 (38.5%), considering that nearly all the teachers are below 40, the implication is that these teachers are strong and energetic and that they will not be lazy in doing their work. Also considering that modern teaching methods were introduced into education when these teachers

were probably students in teacher training colleges and universities, the age profile suggests that they may be abreast of current methodology of teaching to enhance students understanding and may also have fair knowledge on current subjects being introduced into the school curriculum. The academic qualification of teachers sampled for the study is presented in Table 5.

Table 5:

**Academic Qualification of Teachers**

Qualification	Frequency	Percent
SSS Certificate	3	11.5
Teacher Certificate	4	15.4
Diploma	11	42.3
Degree	8	30.8
Total	26	100.0

As shown in table 5, most of the ICT teachers have strong educational backgrounds. This is evidenced by 11 teachers who represent 42.3% and hold diplomas and 8 other teachers who represent 30.8% and have degrees. The diplomats for example benefited from the diploma course at the teacher training college, which came with integrating ICT into their curriculum. It therefore implies that they may have acquired some knowledge in ICT when they were in college. It is also possible that the graduates have studied some ICT as parts of their course while they were in the university or they studied ICT privately since they accepted to teach the subject. The breakdown of the respondents teaching experience is presented in Table 6.

**Teaching Experience of Teachers.**

Teaching experience	Frequency	Percent
1 – 5	19	73.1
6 – 10	2	7.7
11 – 15	2	7.7
16 – 20	2	7.7
21 – 25	1	3.8
Totals	26	100.0

Table 6 indicates that most of the teachers teaching ICT don't have much experience. This is shown by the 19 teachers who represent 73.1% who have 1 – 5 years teaching experience. Thus most of these teachers are newly trained teachers and therefore there is the possibility that they may have benefitted from the new programme at the teacher training college which were implemented about three years ago. However, with such limited experience, these teachers may lack presentation skills and this may affect the quality of their lessons even though they may have the knowledge and students studying under such teacher may lose interest in the subject. This may adversely affect students' interest in the subjects.

**ANALYSIS OF MAIN DATA**

**RESPONSES TO THE RESEARCH QUESTIONS**

**Research Question 1.**

Are ICT facilities available in the public junior high schools to be accessed by teachers and students?

The research question sought to find out whether students and teachers have ICT facilities to enhance teaching and learning. Responses from students and teachers questionnaire were used to address this question. They include statement such as; the school has computer resource centres, knowledge about computers, ownership of personal computers and power supply. Table 7 presents the result on power supply.

Table 7:

**Power Supply**

Power Supply	Frequency	Percent
Yes	66	24.9
No	199	75.1
Total	265	100.0

As shown in Table 7, most schools don't have power supply or electricity. This is shown by 75.1% who responded "NO" to indicate that their schools don't have power supply. This response gives the impression that in most schools ICT is being taught without practicals. According to Mfum-Mensah (2003) many rural communities are yet to be connected to electricity grid and that even secondary schools in such communities do not have access to electricity and telephone lines. The researcher wanted also to find out whether the schools have computer resource centres. Table 8 presents the results.



Table 8:

<b>Computer Resource Centre</b>		
Computer Resource Centre	Frequency	Percent
Yes	65	24.6
No	200	75.4
Total	265	100.0

As shown in Table 8, the total percentage of those who did not have access to a computer centre was 75.4%. The total percentage of those who had access to computer centres was 24.6%. Thus those who had no access to computer centres far outnumbered those who did have access. . This analysis therefore leads to the conclusion that most basic junior high schools in the Municipality don't have computer resource centres. The researcher further asked respondents whether they had knowledge of computers. The result is presented in Table 9.

Table 9:

**Knowledge of computers**

Knowledge of computers	Frequency	Percent
Yes	210	79.2
No	55	20.8
Total	265	100.0

Table 9 indicates that most students had some knowledge about computers. This is shown by 210 (79.2%) who responded 'Yes'. Even though most of them indicated that they have knowledge about computers, it is obvious that they acquired the knowledge from the few internet café's that operate in town. This is

deduced from the fact established from Table 8 which revealed that most school do not have computers resource centres.

### Analysis of Teachers' Responses to Research Question 1

Responses made by teachers in an attempt to answer Research Question 1 are in Table 10 below. Respondents were asked to state whether or not they have (adequate) access to computer resource centres.

Table 10:

#### Computer Resource Centre

Computer Resource Centre	Frequency	Percent
None	19	73.1
Not Adequate	7	26.9
Total	26	100.0

The distribution shown in Table 10, gives a clear impression that most schools don't have computer resource centres. This is shown by 19 (73.1%) who ticked 'None' and 7 (26.9%) who said they did not have adequate access to computer resource centres. The analysis from both student and teacher respondents concluded that almost all the schools do not have adequate access to computer resource centre, although the ministry of education had pledged that they were going to furnish all schools with computer resource centres. This pledge had clearly not been honoured. The researcher also asked respondents whether they had personal computers. Their responses are shown in Table 11.

Table 11:

**Ownership of Personal Computer**

Ownership of Personal Computer	Frequency	Percent
Yes	15	57.7
No	11	42.3
Total	26	100.0

Table 11 shows that 15 (57.7%) of the teachers who are teaching ICT in the junior high school have their personal computers. One can conclude that they may have some advance preparation. 11(42.3%) of the teachers do not have personal computers. These teachers may lack advance preparation. They may tend to skip the teaching of the practical aspect or teach poorly. The conclusion one can draw is that all students will not benefit from the teaching of ICT the same way. Students whose teachers have personal computers will benefit more than those whose teachers do not own computers.

The general conclusion that can be drawn in response to Research Question 1 is that ICT facilities such as computers resource centres are woefully inadequate in the junior high school of Akuapem South Municipality. This is evidenced by 83.8% of the students and 73.1% of teachers who did not have access to computer resource centres.

Another revelation is that most schools don't have electricity. This is also evidenced by 75.1% of the respondents who said that their schools don't have power supply. It was realized from the data that although most of the teachers had their personal computers, and most students have knowledge of computers, this did not mean the students had access to computers. Lack of ICT facilities

leads to lack of practical work. Yet Murphy (1991) has reported that practical work can play a crucial role in combating learning difficulties. The lack of practical work is one of the major findings of this study, coupled with the complete absence of textbooks facilities for accessing information needed for learning. The conclusion is that students studying ICT in the Akuapem South Municipality have very limited access to ICT facilities.

### **Research Question 2.**

The research question under discussion was: “how is ICT being taught and learnt in the Junior High Schools? The researcher wanted to find out how teachers were teaching the subject and how students were coping with the learning of the subject. Specifically respondents were asked if they were coping with the teaching and learning of the subject.

Responses from students and teachers questionnaire were used to answer this question. Questions from students and teachers’ questionnaire that addressed Research Question 2 included, whether students had heard of ICT, learnt ICT in school, enjoyed learning ICT, studying ICT in any institution, the number of semesters being studied, previous knowledge in ICT.

Other statements related to , benefit from learning ICT, how teaching and learning is organized, knowledge in; personal computers, basic typing skills, word processing, internet, file and folder management, spread sheet, Email, and keyboard symbol. Responses made by students are illustrated in Table 12.

Table 12:

**Awareness of ICT**

Awareness of ICT	Frequency	Percent
Yes	256	97.4
No	7	2.6
Total	265	100.0

As shown in Table 12, 97.4% responded 'Yes' to express their view that they are aware of ICT while 2.6% answered 'No' to indicate that they have not heard of ICT. From this, it is somewhat safe to conclude that all students are aware of ICT. The researcher wanted to find out whether they learn ICT as a subject in school. Answers to this question are summarized in Table 13.

Table 13:

**Learning ICT in School**

Learning ICT in School	Frequency	Percent
Yes	261	98.5
No	4	1.5
Total	265	100.0

The distribution in Table 13 gives a clear indication that the students are learning ICT in their respective schools. This is shown by 98.5% who responded 'Yes'. The conclusion therefore is that nearly all basic schools in the sampled Municipality were studying ICT. The researcher also asked the respondents, about the number of periods they studied ICT in a week. Responses to this question are shown in Table 14.

**Periods of Studying ICT**

Periods of Studying ICT	Frequency	Percent
1 Period	8	3.0
2 Periods	51	19.2
3 Periods	153	57.7
4 Periods	45	17.0
5 Periods	3	1.1
6 Periods	5	1.9
<b>Total</b>	<b>265</b>	<b>100.0</b>

As shown in Table 14, the periods of study that has the highest frequency is 3. This is indicated 153 (57.7%). From the distribution, it is obvious that all schools have different period for studying ICT. There was also an item on the level of enjoyment of ICT lessons. The respondents were asked if they enjoyed learning ICT. Responses to this question are shown in Table 15.

Table 15:

**Students Enjoy Learning ICT**

Enjoy Learning ICT	Frequency	Percent
Yes	190	71.7
No	75	28.3
<b>Total</b>	<b>265</b>	<b>100.0</b>

From the distribution in Table 15, one can infer that most students enjoy learning ICT even though the teaching and learning is mainly theoretical. This is

shown by 190 respondents which represent 71.7% who responded 'Yes' to express their views. The researcher sought to find out whether learners thought they benefited from learning ICT as this would explain their level of enjoyment of the learning of ICT. The researcher had identified a number of benefits students would gain from learning the subject. These benefits include the following:

1. It will develop their computer skills
2. It will provide job for them
3. Will help them to interact with the rest of the world
4. It will support them in studies since the computer is a source of information

Respondents were asked (in Table 16) if they agreed with the benefits listed above.

Table 16:

**Perception of general benefit from learning ICT**

General benefit from learning ICT	Frequency	Percent
Positive about benefits	249	94.0
Negative about benefits	16	6.0
Total	265	100.0

As reflected in Table 16, the total number of students who were positive about the benefits constituted 94 percent of the sample, suggesting that students perceived the learning of ICT as beneficial even if it was not taught well in their schools. The respondents were asked whether ICT teaching and learning was well organized in class or not. The result is presented in Table 17.

Table 17:

**ICT Teaching and Learning**

ICT Teaching and Learning	Frequency	Percent
Negative about ICT teaching	59	22.3
Positive about ICT teaching	206	77.7
Total	265	100.0

As shown in the Table 17, 59 respondents were negative about teaching of ICT in their schools and 206 were not. By considering the number of respondents who were positive about teaching of ICT in their schools, the finding is that the students saw ICT teaching in good light. This implies that ICT teachers are perceived to organize their lessons properly and teach well even if there were no teaching and learning materials.

**Analysis of Teachers' Responses to Research Question 2**

Responses made by teachers in attempt to answer Research Question 2 are also presented as follows. The researcher asked respondents whether they studied ICT in any institution of learning. The result is presented in Table 18.

Table 18:

**Formal Training in ICT**

Formal Training in ICT	Frequency	Percent
Yes	19	73.1
No	7	26.9
Total	26	100.0



As shown in Table 18, 73.1% ticked 'Yes' to show that they studied ICT formally in an institution whilst 7 who represent 26.9% ticked 'No' to indicate that they never had the opportunity to study ICT in any institution. This implies 7 out of 26 teachers learnt the subject on their own or anywhere apart from college and or universities. With this in mind one can infer that, teachers may be teaching without the requisite knowledge in ICT. Furthermore, such teachers may not be necessarily having studied programmes that will enable them to competently teach ICT. Even for some of the 19 teachers who studied ICT in institutions and had formal ICT training, may have studied topics which are different from the topics they are currently teaching in the junior high schools. Since this group involves the graduate from the universities, whose curricula are different from the curriculum they are required to deliver, they may have studied different ICT programmes therefore be teaching topics of their own choice. However the training college syllabus is designed to enable diplomates to deliver the junior high school ICT course content, therefore there is every indication that the diplomates are likely to use what they learnt at college when posted to the junior high school. The implication is that not all the 26 teachers sampled had the requisite knowledge and skills to teach ICT successfully in the junior high schools. Furthermore, the researcher asked respondents the number of semesters they studied ICT. The results are presented in Table 19.

Table 19:

**No. of semesters ICT was studied**

No. of semesters ICT was studied	Frequency	Percent
1 Semester	3	11.5
2 Semesters	13	50.0
3 Semesters	3	11.5
Total	26	100.0

Table 19 indicates that most of the teachers who studied ICT in an institution did so for two semesters which is shown by 50.0% of the sample. Two respondents (11.5%) each represented those who studied ICT for one and three semesters respectively. From the table, one can deduce that the time frame used to study ICT is not adequate and that teachers may not be able to learn so much to prepare them adequately to teach ICT for three years at the junior high school.

The researcher asked respondents who had not had any formal training in ICT whether they had previous knowledge in ICT. Table 20 presents the result.

Table 20:

**Previous Knowledge in ICT**

Previous Knowledge in ICT	Frequency	Percent
Yes	7	26.9
No	19	73.1
Total	26	100.0

As shown in table 20, the 7 teachers who represent 26.9% who had earlier said they did not have any formal training in ICT responded 'Yes' to indicate that they have some knowledge in the subject. The other 19 who represent 73.1% are

those who learnt ICT in an organized institution and therefore had knowledge of ICT. Thus all the 7 who had not attended any institution to study ICT formally, had previous experience in ICT. The implication here is that although all the respondents had some knowledge in ICT (which is why they are teaching the subject in the first place) there is no guarantee that their knowledge was sufficient to make them good teachers of ICT. If what any teacher learnt is not in line with the school syllabus they may not be able to teach the programme in the school syllabus well and students under such teachers may not benefit so much. To help with the analyses of the teachers knowledge of specific programs, the researcher asked respondents to indicate some programs used.

The result is presented in Table 21.

Table 21:

**List of topics/programs learnt by untrained ICT Teachers.**

List of Topics	Frequency	Percent
No topic learnt	1	3.8
MS Office, Internet & communication	1	3.8
MS Office, Typing & Windows	2	7.7
MS Office & Database	3	11.5
Not applicable	19	73.1
Total	26	100.0

Table 21 displays the programs learnt by those who were not trained formally on ICT or its teaching and may have learnt ICT outside an organized institution. It clearly shows that almost all of them studied Microsoft office applications such as word, excel, PowerPoint etc. It means they can teach such applications. Besides, some studied other applications that form part of the junior

high school syllabus such as typing and internet. However, database, windows and communication are not part of the school syllabus so those who studied only these applications may not be adequately prepared to teach at the junior high schools.

Respondents were asked to do a self-report on their knowledge regarding various computer programmes. These computer programmes are introduction to personal computers, typing skills, word processing, internet application, spread sheet, Emails, accessing information, file and folder management and keyboard symbols. The result of this measure of respondents' knowledge in the various programmes is shown in Table 22.

Table 22:  
Computer Programmes

Programmes	Very high		High		Moderate		Low		No Knowledge	
	5		4		3		2		1	
	F	%	F	%	F	%	F	%	F	%
Introduction to Personal Computer	7	26.9	13	50.0	5	19.2	1	3.8	0	0.0
Basic Typing Skills development	2	7.7	5	19.2	8	30.8	11	42.3	0	0.0
Word Processing	7	26.9	5	19.2	11	42.3	3	11.45	0	0.0
Internet Application	1	3.8	3	11.5	12	46.2	8	30.8	2	7.7
File and Folder Management	3	11.5	7	26.9	14	53.8	2	7.7	0	0.0
Accessing Information	2	7.7	5	19.2	4	15.4	14	53.8	1	3.8

Table 22: Continued

Spread Sheet Application	1	3.8	12	46.2	9	34.9	4	15.4	0	0.0
Email	1	3.8	6	23.1	4	15.4	9	34.6	6	23.1
Keyboard Symbols	7	26.9	10	38.5	9	34.6	0	0.0	0	0.0

Note: F = Frequency, % = Percent

As shown in Table 22, 50% of the respondents indicated that they have high knowledge in introduction to computers. From this, one can conclude that most ICT teachers have some average knowledge in introduction to computers. Also 11 (42.3%) teachers have ticked 'low' to express that they have low knowledge in basic typing skills. Only 7.7% have very high and 19.2% have high and 30.8% have moderate knowledge. This gives the impression that teaching of basic typing may not be good since those who have high and very high knowledge (i.e. 19.2% + 7.7%) is far below 50%. Result on Ms Word processing revealed that almost all the teachers are conversant or well equipped with the knowledge of that software. It is obvious that students will gain so much knowledge from the teachers of this software. Again, from the Table 22, it is noticed that 46.2% have moderate knowledge in internet, 11.5% have very high knowledge and 3.8% have high knowledge. This implies that knowledge of internet acquisition will be skewed in favour of students whose teachers are equipped with sufficient knowledge in the software. It's also obvious from the table that most of the respondents have fair knowledge in managing file and folders. Therefore one can deduce that almost all teachers can teach this program but not very effective since they only have average knowledge. From the same table it is also reported that 14 respondents who represented 53.8% have low

knowledge in accessing information. With over 50% having low knowledge, it is obvious that most teachers don't access information at all by the use of computers. Again it is reported that, 46.2% have high knowledge in spread sheet, 3.8% of the respondents have very high knowledge and 34.9% have average knowledge. This gives the impression that almost all teachers can teach spread sheet and that most students are likely to know this program. From table 22, it is also reported that teachers' level of knowledge in emailing and sharing of information is below average. This is because, 34.6% of them have 'low' knowledge, while 23.1% have 'No' knowledge. It is obvious that teaching of the program would be neglected by most teachers.

Finally, the table also depicts that all teachers can teach students how to manipulate the key boards. This is because the result in the table shows that 38.5% have high knowledge, 26.9% have very high knowledge and 34.6% have average knowledge. This gives impression that all students will know how to manipulate the keyboard very well.

The general conclusion that can be drawn from Research Question 2 is that teaching and learning of ICT is arguably ineffective although students seem to be happy about teaching and learning. This is because of the teachers' low levels of knowledge in ICT as well as their low levels of training. Even those who studied ICT formally in institutions studied different programs that do not conform to the junior high syllabus, because some of them studied it at the universities while others at the training colleges which have different curricula. Furthermore, the period for studying the subject was not uniform in all schools and teachers studied the subject for only 2 semesters..

Olger and Garner (1996) define teacher competency as the skills, knowledge and understanding that are required to ensure that teaching is effective for the full range of pupils taught by that teacher. This implies that teachers are expected to employ a range of skills in their professional practice in order to achieve the goals of education. In other words, to a larger extent, professional performance of the ICT teacher or resource personnel of other professions for that matter depends on the competency and level of qualification of the staff. A number of studies have shown that if a teacher is well trained, he or she can help learners better. One of these studies (Hurd, 2007) even suggests that the number of teacher trainees in a school-based teacher training programme improves students' achievement.

The finding of the present study regarding training therefore lends weight to the argument that ICT was not being taught well in the sampled schools.

### **Research Question 3**

The main question was: "What problem do teachers and learners face in the teaching and learning of ICT?" Research Question 3 sought to find the exact problems that both teachers and learners encounter in teaching and learning of the subject. Responses from the students' questionnaire as well as that of their teachers' questionnaire were employed to address this question. They encompassed statements on whether the school needs more ICT teachers, the school needs computers, and we learn ICT by the use of computers, Teaching and learning materials, Periods of studying ICT in school. Others are questions such as have you had any in-service training in ICT? How many times have you had training

program? And finally, how adequate was the training in preparing you to teach the subject effectively?

Results of responses made by students to the question are illustrated in tables, Table 23 shows the results on whether the school needs more ICT teachers. The respondents were required to state whether they agreed or disagreed with a statement that schools have adequate numbers of teachers of ICT.

Table 23:

### ICT Teachers

ICT Teachers	Frequency	Percent
Strongly Agree	51	19.2
Agree	31	11.7
Neither Agree nor Disagree	8	3.0
Disagree	94	35.5
Strongly Disagree	81	30.6
Totals	265	100.0

The data in Table 23 gives the impression that most schools have ICT teachers with the exception of some few schools that need teachers. This is shown on the table by 66.1 % ( i.e. 35.5% +30.6%) that disagreed that they needed ICT teachers. With 30.9% agreeing with the statement it implies that there are some basic junior high schools that don't have ICT teachers at all. The implication is that such schools might not be learning ICT at all or they may not be able to cover the syllabus as the teachers are either not there or are simply not enough. Respondents were asked whether their schools needed computers. Table 24 presents the illustration followed by the analysis.



Table 24:

**Availability of computers**

Availability of Computers	Frequency	Percent
Strongly Agree	195	73.6
Agree	38	14.3
Neither Agree nor Disagree	2	0.8
Disagree	9	3.4
Strongly disagree	21	7.9
Totals	265	100.0

As shown in Table 24, 195 who represent 73.6% strongly agreed that their schools needed computers. Also, 38 who represent 14.3% agreed to the statement. However, 9 respondents who represent 3.4% disagreed that they needed computers and 21 respondents who represent 7.9% strongly disagreed. From the analysis one can conclude that most schools need computers to assist the teaching and learning of ICT. This is deduced from the fact that the addition of percentage of agreed and strongly agreed (i.e.  $73.6+14.3=87.9\%$ ) is far greater than that of disagreed and strongly disagreed ( $3.4+7.9=11.3\%$ ).

The researcher assumed that students learnt ICT using computers and therefore asked respondents to indicate whether they learn ICT by the use of computers by responding to a statement supporting the assumption. The result of response to the question is presented in Table 25.

Table 25:

**Learning ICT with Computers**

Learning ICT with computers	Frequency	Percent
Strongly Agree	48	18.1
Agree	25	9.4
Neither Agree nor Disagree	14	5.3
Disagree	88	33.2
Strongly Disagree	90	34.0
Totals	256	100.0

It is observed from Table 25, that 48 respondents who represent 18.1% strongly agreed to the assertion that they learn ICT by the help of computers. Twenty-five (i.e. 9.4%) respondents also agreed to the same assertion. Conversely, 88 respondents who represent 33.2% disagreed to the assertion that they learn ICT by the help of computers. Also 90 respondents which is 34.0% strongly disagreed to the statement. By comparing those agreeing and those disagreeing it is logical to conclude that most basic junior high schools learn ICT without the help of computers. The implication of this deduction is that the teaching and learning of ICT in majority of our basic junior high schools is done theoretically and that computers are not used to enhance understanding.

This is in sharp contrast with the statement made by the then Minister of Education, the late Kwadwo Baah Wuredu, when he attended the Association for the Development of Education in Africa (ADEA) conference

in Nigeria that almost all basic schools in all district capitals have ICT facilities. (Abuja, July 30, 2004, GNA).

### Analysis of Teachers Responses to Research Question 3

Responses made by teachers in attempt to answers research question 3 are also presented and analyzed. The researcher asked respondents if they had any in-service training in ICT since they left school. The results are presented in Table 26.

#### In-service training in ICT

In-Service Training in ICT	Frequency	Percent
Yes	2	7.7
No	24	92.3
Total	26	100.0

As shown in Table 26, only 2 teachers who represent 7.7% ticked “Yes” to indicate that they had had some in-service training in ICT while 24 teachers who represent 92.3% ticked “No” to express that they had never had any in-service training in ICT. From the percentage difference, it is clear to conclude that ICT teachers who took part in the study had not adequate in-service training. This implies that the stakeholders of education especially the Ministry of education and Ghana Education Service have not played their role with regard to providing in-service training to the teachers. From the literature review, it was noticed that pre-teaching training (or induction) was not provided to teachers before they started teaching at the junior high schools. From this it is obvious that the government in collaboration with Ministry of

Education had not strategized the ICT integration programme well before its implementation.

According to Mfum-Mensah (2003), the government of Ghana does not have any coherent ICT in education policy framework in place. It therefore means that teachers are teaching what they are capable of because the government is not supporting them to improve their skills and knowledge through in-service training.

Respondents' were asked about the number of times they had had in-service training. The responses to the question are shown in Table 27.

Table 27:

**Number of in-service training events attended.**

Number of in-service events attended	Frequency	Percent
Once	2	7.7
Not Applicable	24	92.3
Total	26	100.0

As shown in table 27, 2 teachers who represent 7.7% expressed that they had had in-service training once since the implementation of the ICT integration programme. Again, considering the number of those who had not had any training and that the 2 teachers had the in-service training elsewhere but not in training organized by the Ghana Education Service, one can conclude that by not having regular in-service training, even the 19 teachers who had formal ICT training cannot update their skills and may therefore not be in position to deliver the ICT curriculum effectively.

The researcher further asked respondents' how adequate the training was in preparing them to teach ICT effectively. Table 28 presents the illustrations.

Table 28:

**Adequacy of training**

Adequacy of Training	Frequency	Percent
Not Adequate	2	7.6
Not Applicable	24	92.4
Total	26	100.0

From Table 28, 2 teachers who had the in-service stated that even though they had had some training it was not adequate. Again the message is the same: teachers sampled in the study were not adequately prepared for the tasked for delivering the junior high school curriculum effectively.

Respondents' were then asked whether they had teaching and learning materials in their respective schools. The result of the responses to the question are presented in Table 29

Table 29:

**Teaching and learning material**

Teaching and Learning Material	Frequency	Percent
None	4	15.4
Not Adequate	19	73.1
Adequate	2	7.7
Very Adequate	1	3.8
Total	26	100.0

Table 29 shows the availability of teaching and learning material in the various junior high schools. The distribution indicates that in most schools, teaching and learning materials are not adequate and some few schools not

having them at all. From the table this is noted by 19 teachers who represent 73.1% that ticked “Not Adequate” and 4 teachers who represent 15.4% who expressed that they don’t have teaching and learning materials. However a few of the teachers indicated that they have sufficient teaching and learning materials. From this information one can clearly say that most schools in the Municipality do not have enough teaching and learning materials and that most teachers are doing abstract teaching.

The implication is that the government in collaboration with the Ministry of education has not been able to provide all basic schools with teaching and learning material to facilitate the teaching of the ICT. This supports the assertion that the provision of ICT facilities has been skewed in favour of premier secondary schools in the urban areas (Aseidu Akrofi 1992).

The researcher finally asked respondents’ the number of periods allotted to the teaching and learning of ICT in their respective schools. Responses to the question are shown in table 30.

Table 30:

**Teaching Periods**

Teaching Periods	Frequency	Percent
One Period	1	3.8
Two Periods	3	11.5
Three Periods	15	57.7
Four Periods	5	19.2
Five Periods	2	7.7
<b>Totals</b>	<b>26</b>	<b>100.0</b>

As shown in Table 30, most of the teachers ticked three periods to show that they use those periods to teach the subject. Others use two, four and five periods. One can infer that since all schools are not using the same periods, some teachers will do more work than others and consequently their students will learn more than others with fewer periods.

The general conclusion that can be drawn from attempts to answer Research Question 3 is that almost all schools do not have adequate resources and facilities. It is also revealed that in-service training has not been provided to the teachers; 24 (92.3%) respondents indication supports this assertion. In a way, this finding is in line with Research Question 2 and the discussion under Research question 2 is relevant here too. The Research Question 2 revealed that the teaching and learning of ICT is arguably ineffective although students seem to be happy about teaching and learning. This is because of the teachers' low levels of knowledge in ICT as well as their low levels of training.

#### **Research Questions 4**

Research Question 4 was: "What is the role of the Ministry of Education (MOE), NGO's and other stake holders in assisting the public junior high schools to have access to ICT facilities?"

Research question 4 sought to find out whether Ministry of Education, NGO's, PTAs, and SMC members and other stake holders are providing some assistance to the public junior high school to enhance effective teaching and learning of the subject. Responses from students and teachers questionnaires were employed to answer the question.

PTA or SMC visited the school to give you talk on the subjects? Have any government official, PTA or SMC presented any computer to the school?

Table 31 shows the results on whether a government official, PTA or SMC had visited the schools to give students talk on the subject.

Table 31:

**Talk on ICT**

Talk on ICT	Frequency	Percent
Yes	0.0	0.0
No	265	100.0
Total	265	100.0

As shown in Table 31, all the 265 (100.0%) of the students indicated 'No' to express their view that no government official or any member from the municipal education office or the community has visit them to give them a brief information about the subject. This gives the impression that no orientation was given to students when the integration programme was implemented. The respondents were further asked to indicate whether they had received any computer from any government official, PTA, SMC or Individuals? The result is presented in table 32.

Table 32:  
**Computers Presented by Stakeholders**

Computers Presented	Frequency	Percentage
Yes	85	32.1
No	180	67.9
Total	265	100.0



As shown in Table 32, 180 (67.9%) of the students ticked 'No' which indicate that their schools had not received any computer from any government official, PTA or SMC. However, 85 (32.1%) ticked 'Yes' to indicate that they have received some computers.

#### Analysis of Teachers' Responses to Research Question 4

Responses made by teachers in an attempt to address research question 4 are presented in the following section.

The researcher asked respondents whether they had had computers presented by any government official, PTA SMC or Individual ? The result is presented in Table 33.

Table 33:

##### Computers Presented to School

Computers Presented	Frequency	Percentage
Yes	2	7.7
No	24	92.3
Total	26	100.0

As indicated in the table 33, 2 (7.7%) respondents ticked 'Yes' which gives the idea that their schools received some computers. 24 (92.3%) respondents' ticked 'No' to indicate that they have not received any computer. The researcher further asked respondents the group that presented the computers. The result is presented in table 34.

**Group that presented Computers**

Group that presented Computers	Frequency	Percent
Individuals	2	7.7
Non Applicable	24	92.3
Total	26	100.0

As shown in Table 34, 2 (7.7%) teachers indicated that they had received computers and that those computers were presented by the individuals. The 24 (92.3%) who ticked 'None applicable' are those who already made a comment that they had not received any computer from the previous analysis. From this finding, one can conclude that ministry of education; the NGOs etc are not supporting the schools in any means to facilitate effective teaching and learning.

The general conclusion that can be drawn from attempts to answer Research Question 4 is that, it's only a few individuals that had made some effort to assist some schools by providing them with computers. Other groups such as the Ministry of Education, NGOs, PTA, School Management Committees have done absolutely nothing.

**Interview Data from Students, Teachers, SMC/PTA**

In addition to the questionnaires data, 50 students were interviewed about their views on the use and importance of computers and ICT in general. Some comments provided by the students concerning the teaching and learning of the subjects in their schools are that;

1. There are inadequate teaching and learning materials. 11 students agreed to this assertion.
2. No teaching and learning materials. 25 students passed comment that there are no teaching and learning materials.
3. Eight (8) students also answered that there are no electricity in the schools.
4. Two (2) students were worried about the number of period for studying the subject so they also indicated that the periods for studying the subject are few.
5. Four (4) students also answered that ICT teachers are few.

Most students stressed on non availability of teaching and learning materials. This support the previous result indicated in Tables 8, 10 and 26 that most schools don't have computer resources centres, computers, or textbooks and that some schools do not have teachers. Also four teachers were interviewed about their views on teaching and learning of ICT in general. Most of the teachers accept the idea of introducing ICT into school curriculum. According to them, the globalization has made it necessary for every child to learn much about ICT. However their worry was that implementation of the programme was not properly done. Most of them stressed that they never had any pre- training about the teaching of the subject. Again, they only have the syllabus to be working with. Computers are not provided, resource centres are not available. In short, they lack the necessary teaching and learning materials that will make teaching and learning meaningful. This substantiates the fact that the Ministry of Education and GES have not been able to commit themselves to providing these teaching and learning materials to the basic junior high schools.

and Parents Teachers Association (PTA) were interviewed to ascertain their views about the implementation of the ICT in public junior high schools.

The interviews involved eight( 8) members of School Management Committee(SMC) and six( 6) members of Parent Teachers Association(PTA) . Out of the fourteen (14) members interviewed eight (8) of them had been chairperson for the past seven (7) years. Others had 3 to 4 years experience as members of the association. With such wealth of experience they were conversant with their roles towards the development of the school.

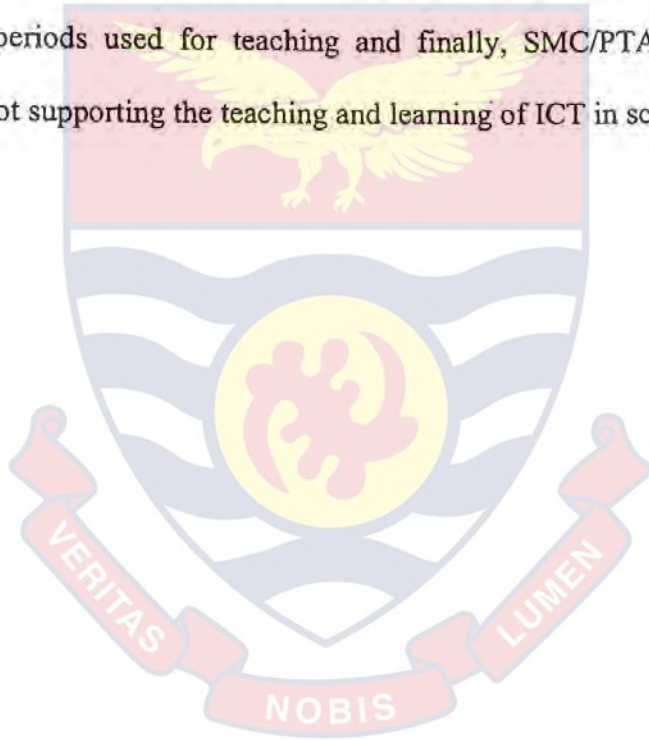
From the interviews, it was noted that only a few of the executive members (three) do visit the school regularly, that is twice a term with the others visiting once a term. To answer the question, whether they had heard of ICT, only 5 of them responded positively .With regard to whether they had some knowledge in ICT, they all emphatically answered “no”. This pre –supposes that these executive members cannot offer any help towards the teaching and learning of ICT in the schools in the sampled Municipality.

With other questions like whether they were aware of the current changes in the school curriculum, all of them responded affirmatively. But on the question of whether they observed ICT teachers in the process of teaching and if they had also receive any complain about ICT teaching and learning from the head teachers, all of them answered “no”.

From this, one can deduce that the SMC and PTA are not playing any sensitive role in the teaching and learning of ICT in their respective schools. This could result from the fact that the government failed to involve all stakeholders of education in decision making about the implementation of the ICT in the

junior high schools. According to the members, they only have the information about the implementation of the ICT in schools when they attended their usual meetings at the beginning of the term and that no government official had invited them to discuss the issue of ICT. It therefore means that the government and other stakeholders of education have not streamlined strategies that will enhance better teaching and learning of ICT in the basic schools.

The general conclusions that is drawn from chapter 4 are that: almost all schools do not have enough computers, in-service training has not been organized for teachers, students do not acquire the same amount of knowledge due to different periods used for teaching and finally, SMC/PTA and other stakeholders are not supporting the teaching and learning of ICT in schools.



## CHAPTER FIVE

### SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

#### Introduction

The main purpose for the study was to assess the effectiveness of teaching and learning of information and communication technology in the Ghanaian public junior high schools. Selected schools in the Akuapem South Municipality of the Eastern Region of Ghana were used for the study.

A descriptive research design which involved simple random sampling was used to select 300 students. However, 265 of the sampled students returned their questionnaires. A purposeful sampling was employed to select 26 teachers for the study. All of the 26 sampled teachers returned their questionnaires. The researcher used the statistical package for the social science (SPSS) to analyze the entire data, using descriptive statistics.

The following research questions guided the study:

1. Are ICT facilities available at the public junior high schools to be accessed by teachers and learners?
2. How is ICT being taught and learnt in the junior high school?
3. What problems do teachers and learners face in the teaching and learning of ICT?
4. What is the role of the Ministry of Education (MOE), NGOs and other stakeholders in assisting public junior high schools to have access to ICT facilities?

## Summary of Main Finding

The major findings of the study were as follows:

1. Are ICT facilities available in the public junior high schools to be accessed by teachers and learners?

The finding from the respondents answered the question on the availability of ICT facilities in the junior high schools in the negative. That is, there are virtually no ICT facilities in the public junior high schools. Nearly eighty-four percent (83.8%) of the teacher respondents indicated that there are no computer resource centres in their respective schools. Also 73.1% of the student respondents also agreed that they don't have computer resource centres in the schools.

Again, all indications from the study revealed that many schools don't have power supply. This is evidenced by 75.1% of the teacher respondents who expressed their view that their schools don't have power supply. Since the schools don't have power supply, it is obvious that there are no computer resource centres in them.

2. How is ICT being taught and learnt at the public junior high schools?

Generally, the respondents perceived that the teaching and learning of the subject is ineffective. This is because almost all teachers have just 'average' knowledge. This results from the fact that only 50% of the teachers studied the subject for 2 semesters in formal institution which is not even adequate to prepare them to teach the subject effectively.

Again what ICT teachers studied cannot be said to be uniform and in line with then junior high school ICT curriculum. . Nearly seventy-three percent (73.3%) of the teachers studied the subject in formal institutions at different

level while 26.9% studied it on their own. This resulted in the teachers studying different programmes which may not be in line with the syllabus. Finally, varied number of periods are being use to teach the subject in various schools, hence development of ICT knowledge and skills among students will vary, with some teaching being below par.

3. What problems do teachers and learners face in the teaching and learning of ICT?

The study discovered that almost all schools don't have computers to enhance effective teaching and learning. This is evidenced by 87.9% of the respondent who agreed that their schools need computers. Again, it was discovered that teachers are not provided with in-service training to equip them for effective teaching. Inadequate number of periods for teaching has been a great problem to the teachers and so has been lack of resources.

4. What is the role of the Ministry of Education (MOE), NGOs and other stakeholders in assisting the public junior high school to have access to ICT facilities?

According to National ICT for Accelerated Development Policy, Government of Ghana (2003), Educational Policy Makers, NGOs, bilateral and multilateral donor organization, are to deploy ICT facilities to all level of education. However,

- the finding from the respondents on these stakeholders' role in supporting public junior high schools to access ICT facilities revealed that none of the stakeholders are playing any role to support the basic schools by providing them any ICT devices. Only a few individuals have taken the initiative to provide some computers to some few schools. From the literature review,



it was noted that some NGO's and donor organizations have made the effort by extending ICT facilities to some secondary schools mostly in the urban communities but this has not extended to the junior high schools. (Dankwa, 1997; Parthermore, 200). SMC and PTA are also not supporting the teaching and learning of ICT in schools.

## CONCLUSIONS

The purpose of the study was to “assess the effectiveness of the teaching and learning of ICT in public junior high schools”. From the study, it is concluded that:

1. Even though ICT is being taught in the public junior high schools, it is only the theoretical aspect and that students do not learn any practical work. Students therefore cannot put what they learn into practice even when they leave school. This has resulted from the fact that most schools don't have computer resource centres and computers.
2. Ghana Education Service (GES) does not organize in-service training for the teachers to help upgrade their knowledge and skills in the subject.
3. Ghana Education Service (GES) does not collaborate with the teacher training colleges to come to a compromise on the duration for the study of the subject in the teacher training colleges.
4. The government does not collaborate with all stakeholders of education in collective decision making regarding the delivery of ICT in junior high schools.

## RECOMMENDATIONS

1. Based on the findings that ICT facilities are unavailable at the public junior high schools, the researcher recommends that the government should encourage Educational Policy Makers, NGOs, and all stakeholders to supply the basic schools with ICT facilities.
2. Based on the finding that in-service training were not provided for the ICT teachers, the researcher recommends that Ghana Education Service (G.E.S) should organize regular in-service training events to update the knowledge and skills of ICT teachers
3. Based on the finding that almost all basic schools don't have electricity, the researcher recommends that, the government should provide basic schools with electricity.
4. Based on the finding that what ICT teachers have learnt is not uniform because they are studying the subject at different institutions with different curricula, the researcher recommends that the Ghana Education Service (G.E.S) should collaborate with teacher training colleges to set uniform periods for studying ICT and its delivery in schools.
5. Finally, based on the finding that ICT teachers have average knowledge in the subject, the researcher recommends that the training colleges should enforce ICT to be learnt throughout the 3 years of study to help teachers have profound knowledge in the subject.

### Suggestions for Further Research

From the findings of this study the following areas are suggested for further research:

1. The present study should be replicated in other regions of Ghana, as this would provide a basis for more generalization of the relevant conclusions
2. A study should be done to determine the status of the ICT curriculum of the basic schools.
3. A study to determine the current status of human and material resources for embedding ICT in the teaching and learning of core subjects like mathematics, science and English.



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## Appendix A

**This questionnaire should be filled out by School Pupils in the JHS.**

The purpose of this questionnaire is to obtain information about the teaching and learning of Information and Communication Technology (ICT) in the public Junior High Schools. It is hoped that the result of the project will help in taking decisions concerning teaching and learning of ICT. Kindly complete it anonymously. Please respond to all items and do it honestly. No attempt will be made to associate your name or institution with the completed instrument.

Please tick (✓) the box corresponding to your choice(s)

Your Gender:

- Male  
 Female

Your Age:

- 1-10    11-20    21-30    Above 30

Section A

1. Have you ever heard of ICT?

- Yes  
 No

2. Have you ever seen a computer before?

- Yes  
 No

3. Do you learn ICT as a subject in school?

- Yes  
 No

4. How many periods do you study ICT in a week

- 1             3             5  
 2             4             6

5. Does the School have power supply?

- Yes  
 No

6. Do you enjoy learning ICT?

- Yes  
 No

7. Has any government official, PTA or SMC member had visited the school to give you talk on ICT?

- Yes  
 No

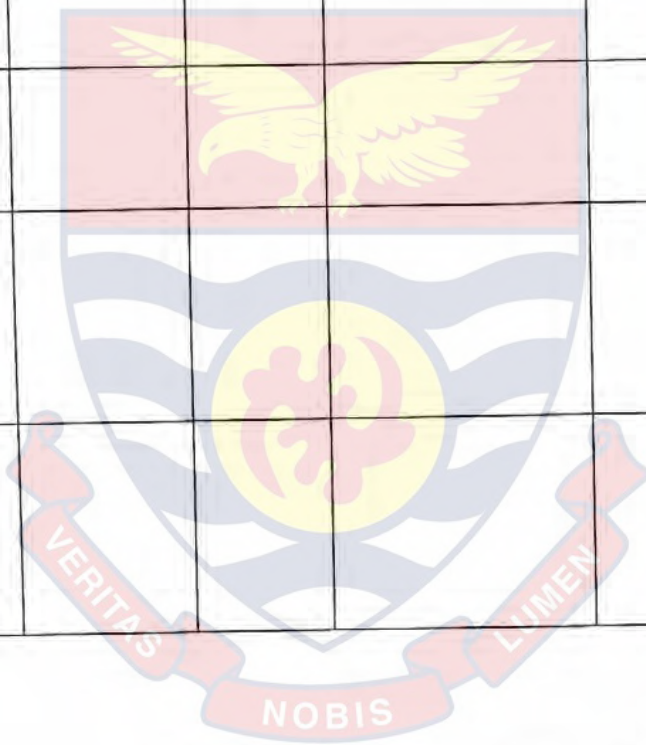
8. Have you received any computer from any Government official, NGO, PTA/SMC OR Individual?

- Yes  
 No

Direction. The following statement has been ranked from 5 to 1. Please kindly tick the box (✓) that is corresponding to your choice(s).

Statements	Strongly	Agree	Neither	Disagree	Strongly
	Agree		Agree Nor		Disagree
	5	4	Disagree 3	2	1
I will benefit from learning ICT					

The teaching and learning of ICT is poorly organized in class					
The school has a computer resource centre					
The school needs ICT teachers					
The school needs computers					
We learn ICT by the use of computers					
I ICT will help me in my daily life					



8. What can you say about the teaching and learning of ICT in your

school? \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

## Appendix B

**This questionnaire should be filled out by the JHS ICT teachers.**

The purpose of this questionnaire is to obtain information about the teaching and learning of ICT in the Public Junior High schools. It is hoped that the result of the project will help in taking decisions concerning the teaching of ICT. Kindly complete it anonymously. Please respond to all items and do it honestly. No attempt will be made to associate your name or institution with the completed instrument.

1 Your gender:

Female

Male

Your age:

1-10

11-20

21-30

31-40

above 40

Section A

Please tick (✓) the box corresponding to your choice(s) or write the requested information concerning each statement below.

1. The highest qualification I hold now is;

SSS certificate

Teachers Certificate 'A'

Diploma

Degree.

2. How many years teaching experience have you had? \_\_\_\_\_

3. (a) Did you study ICT in any institution of learning?

Yes

No

(b) If Yes, was it studied as subject for the number of years you spent in the institution Or it was studied for just a term semester?

---

(c) If No, do you have any previous knowledge in ICT?

Yes

No

(d) If Yes, list some topics you learnt.

---

4. Do you have your personal computer?

Yes

No

5. (a) Have you had any in-service training in ICT since you left school?

Yes

No

(b) If Yes, How many times have you had the training?

---

6. How adequate was the training in preparing you to teach ICT effectively?

Very adequate

Adequate

Fairly adequate

Not adequate

8. Have you received any computer from any Government official, NGO, PTA/SMC OR Individual?

Yes

No

What group presented the computers?

- Individuals
- Non Applicable

18. Directions: Please tick (✓) the cell that indicates your level of knowledge in each of the following areas.

Areas	Very High 5	High 4	Moderate 3	Low 2	No Knowledge 1
Have studied about Introduction to Personal computers					
Knowledge in Basic Typing Skills development					
Knowledge in Word Processing Application					
Knowledge in Internet					
Knowledge in File and Folder Management					

Knowledge in how to Access Information Knowledge in Spreadsheet Application					
Knowledge in Email and Sharing Information					
Knowledge in Keyboard symbols					

9. **Direction.** Please rank the following statement from 4 to 1 by ticking the cell(✓)

Statements	Very Adequate	Adequate	Not Adequate	None
	4	3	2	1
Teaching and Learning Material				
Computer Resource Centre				



10 (a) How many periods have been allotted to the teaching and learning of ICT in your school?

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10 (b). If you have any additional comments concerning teaching of ICT in your school, please note them below.

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### Appendix C

**Structured questions for interviewing members of the School Management Committee (SMC) and Parents Teachers Association (PTA) executive members.**

Questions	Purpose
How long have you become a member of the school management committee?	To find out the experience he/she has, which would lead me to know if he/she knows the responsibilities.
Do you frequently visit the schools?	To know whether he/she is abreast with any current changes in the school
Have you heard of ICT?	To find out if he/she is aware of ICT globally
Have you seen a computer before?	To find out if he/she has set eye on computer before and can even describe it
Do you have some knowledge in ICT?	To find out if he/she has some brief knowledge and what ICT is about.
Are you aware of the current changes in the school curriculum?	To find out whether he/she is aware of the new subjects being taught in the Schools.
Do you observe some of your teachers especially ICT teachers in their teaching process?	To find out if he/she had noticed any difficulty or interesting part in the Process of teaching.
Have the head teacher complain any difficulty or problem to you concerning ICT teaching and learning?	To find out if he/she is aware of any problem confronting ICT teaching and learning in the school.

What advice can you offer especially with the introduction of ICT into JHS curriculum?

