THE ROLE OF UNITED NATIONS SPECIALIZED AGENCIES IN GHANA: A CASE STUDY OF THE UNITED NATIONS EDUCATIONAL, SCIENTIFIC AND CULTURAL ORGANIZATION (UNESCO)

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LEGON                MARCH 2015
DECLARATION

I hereby declare that this dissertation is the product of an original research that I undertook under the supervision of Dr. Peace Medie. This work has never been submitted partially or wholly elsewhere for any award, that all sources used have been duly acknowledged.

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DATE.......................... DATE..........................
DEDICATION

I dedicate this work to my family.
ACKNOWLEDGEMENTS

I am grateful to the Lord Almighty, for his guidance protection. My heartfelt appreciation goes to my supervisor, Dr. Peace Medie, for her guidance and assistance throughout the study. I am also grateful to the officials of UNESCO Country office – Ghana and all the other personalities who participated in the study. God bless you all.
**ACRONYMS AND ABBREVIATIONS**

<table>
<thead>
<tr>
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<tbody>
<tr>
<td>ASPnet</td>
<td>Associated Schools Project Network</td>
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<tr>
<td>FCUBE</td>
<td>Free Compulsory Universal Basic Education</td>
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<td>GES</td>
<td>Ghana Education Service</td>
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<tr>
<td>ICT</td>
<td>Information Communication Technology</td>
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<tr>
<td>ICT4AD</td>
<td>ICT for Accelerated Development policy</td>
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<td>IIEP</td>
<td>International Institute for Educational Planning</td>
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<tr>
<td>MOEYS</td>
<td>Ministry of Education Youth and Sports</td>
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<td>UN</td>
<td>United Nations</td>
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<td>UNESCO</td>
<td>United Nations Educational, Scientific and Cultural Organization</td>
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<td>UNDP</td>
<td>United Nations Development Programme</td>
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ABSTRACT

Information Communication Technology (ICT) is fast developing and its impact on socio-economic activities cannot be overlooked. It is a fact that the use of ICT has been integrated into virtually every facet of commerce, education, governance and civic activity in developed countries and has become a critical factor in creating wealth worldwide. Despite this, there has been only limited research to investigate the role of institutions such as UNESCO in ICT education in Ghana. This study examined the contribution of UNESCO to ICT education in Ghana. From the responses, some of the major programs of UNESCO are teacher education, E-learning platforms, open educational resources, and lifelong learning opportunities. Respondents indicated that these programmes have positively influenced ICT and education in general through teaching and learning. The study revealed that the ASPNet ICT centre has been very beneficial to major stakeholders such as students/pupils, teachers, and even adults. ASPnet has offered people the needed skills and also stressed on the need for greater emphasis to be put on ICT and Science and Technology as well as train teachers to effectively use the computer. The study also presented the major challenges that militates against the effective implementation of UNESCO’s programmes in Ghana. Some of these challenges are policy and planning, inadequate infrastructure, capacity building, and a lack of government budget support. It concludes that the effective utilisation of computers in schools would help to introduce the desired changes in teaching and learning method. District Assemblies like the Accra Metropolitan Assembly should prioritize the provision of materials and infrastructure expansion for schools in their jurisdictions. They should factor them into their medium term development plans. The central government should increase its budgetary allocation for ICT related programmes in order to give enough facilities to schools, motivation to teachers and attract competent personnel into the teaching profession.
CHAPTER ONE

RESEARCH DESIGN

1.1 Background of the study

Information Communication Technology (ICT) is fast developing and its impact on socio-economic activities cannot be overlooked. The United Nations Development Programme (UNDP) defines ICT as the full range of electronic technologies and techniques used to manage information and knowledge.\textsuperscript{1} It is, therefore, important for Africa to be part of this technological revolution. It is a fact that the use of ICT has been integrated into virtually every facet of commerce, education, governance, and civic activity in developed countries and has become a critical factor in creating wealth worldwide.\textsuperscript{2} Computer illiteracy and lack of access to ICT are widely recognised as increasingly powerful obstacles to the economic, civic, and political development of Africa. According to the UN ICT Task Force, the digital divide is more pronounced in Africa than any other continent. Africa is the most unconnected in an increasing connected world and therefore bold steps needs to be taken.\textsuperscript{3}

UNESCO was created in the aftermath of the atrocities of the Second World War to bring about peace. As widely known, UNESCO’s works for peace was rooted in the minds of men and founded on the intellectual and moral solidarity of mankind.\textsuperscript{4} According to the UNESCO charter, peace is a matter of trust and perseverance, and the organization’s task is to sow the seeds of peace one by one, with time as its ally, over wide areas of responsibility in education, science, culture and communication.\textsuperscript{5}

National education systems that do not incorporate ICT will likely fail to prepare students to participate in, or support the development of, the national innovation infrastructure. But, the incorporation of ICT into national education systems does not necessarily mean that the system transforms to promote innovation. Technology use in formal learning creates opportunities for students to have greater responsibility for their learning.\textsuperscript{6} In the traditional
teaching-learning paradigm, teachers are the “owners” of knowledge; however, when ICT tools are used to their capacity in formal learning, students have increased access to multiple sources of information that they can use to develop their subject-area competence and problem solving skills.\(^7\) This does not delegitimize the role of the teacher in instruction, but it does provide more opportunities for students to independently acquire knowledge and apply their expertise in the creation of new ideas. The development of these three key skills – knowledge acquisition, application, and creation (i.e., knowledge production capacity) – are essential to the growth of innovation systems, which start in the classroom and spread out to the nation, yet are notoriously difficult to operationalize.\(^8\)

ICT is uniquely associated with innovation in many countries because it provides multiple opportunities to communicate across otherwise separated communities (e.g., gender, socioeconomic, and geographic). ICT has the potential to provide an immediate method of acquiring, applying, and creating knowledge, which then can be transferred and disseminated across communities in real time. This process complements the rapid economic and social changes occurring in the country. And, in ideal situations the level or degree of ICT tools and implementation can develop alongside the social, economic, and political infrastructures of each country so that it is continuously improving development capacity at the national level.\(^9\)

Ghana has, since 1951, and especially after independence in 1957, made significant strides in improving its education system. Various governments have adopted several policies and strategies in order to improve upon the educational system. Some of these strategies include the Free Compulsory Universal Basic Education (FCUBE) Programme. Article 38 of the 1992 Constitution of Ghana requires government to provide access to free compulsory universal basic education, and depending on resource availability, to senior secondary, technical, tertiary education, and lifelong learning. Strategies adopted to achieve these policies include the introduction of the capitation grant, which has abolished the payment of school fees
in all public schools at the basic level in Ghana, the expansion of early childhood development services making pre-school development a part of the educational system, the promotion of measures to improve gender parity in primary schools, and the introduction of school feeding programme.

The development of ICT provides numerous opportunities for developing countries such as Ghana. According to the Data Development Group of the World Bank, ICT infrastructure in Ghana is progressing as compared to other low-income countries globally and is above the 1.1% average for Sub Saharan Africa. One of such bold steps is the Kofi Annan ICT Centre of Excellence. The Kofi Annan ICT Centre of Excellence, which is a joint Ghana/India project, was commissioned in December 2003 with the aim of producing the human capacity needed for the emerging ICT industry in Ghana and the Sub-region.

1.2 Statement of the research problem

ICT which greatly penetrates society, brings changes into the structure of work and the ability to master and use computers, and has an increasing importance for national development. ICT education which aims to build up information technology literacy and develop skills, has therefore become the object of the attention of a number of conceptual and programme documents and also lifelong learning system domains. The right to education, described as a fundamental human right, is considered an “upstream” right in the sense that it determines whether other rights can actually be exercised. It will be very difficult for individuals to exercise their political, civil, economic, and social right without receiving a minimum level of education. This is because without education, individuals may not be aware of their rights therefore, their rights can easily be abused. Among economic and social rights, the right to education holds a central place. Due to the critical importance of educational rights, it was affirmed and often at length with a wealth of detail in the constitution of UNESCO and included in the domestic and foreign policy of member states so that it could be developed
in the world.¹⁵ The expansion of education represents major aspects of the thorough-going transformations that are taking place currently and it is a phenomenon whose long-term impact will be considerable. Such progress has not been achieved without mobilizing substantial material, financial, and human resources, and therefore the percentage of Gross National Income spent on education has been increasing yearly. All nations including Ghana together with other stakeholders like UNESCO, UNICEF, USAID, have been making consonant efforts to promote education.¹⁶

Boakye and Banini note that from the early 1990s, education stakeholders in Ghana have been concerned about how teachers and students use computers in schools and how computers support learning.¹⁷ At the beginning of the millennium, educational authorities in Ghana embarked on a number of projects to introduce ICT into the Ghanaian educational system at the basic and secondary school levels. In the middle of the 1990s for example, educational providers realized that Ghanaian professionals could not compete on the global market for jobs, because they were limited in skills, especially in the area of information technology.¹⁸

These challenges called for a concrete policy on ICT. Therefore, in implementing policies for achieving national development in Ghana, the ICT for Accelerated Development policy (ICT4AD) emphasized the need to transform Ghana into an information-rich, knowledge-based, and technology-driven high income economy and society. The ICT4AD policy aims to achieve this mission by transforming the educational system to provide requisite educational and training services and an environment capable of producing the right types of skills and human resources required for developing and driving Ghana’s information and knowledge-based economy and society.

In light of the above therefore, the Ministry of Education Youth and Sports (MOEYS) and the Ghana Education Service (GES) proposed that students have ICT literacy skills before
coming out of each level of education, there should be guidelines for integrating ICT tools at all levels of education; ICT resources should be standardized in all schools in Ghana. As it stands now, there has been only limited research to investigate the role of institutions such as UNESCO in ICT education in Ghana. Mereku, Yidana, Hodzi, Tete-Mensah, Tete-Mensah, and Williams asserted that for Ghana, and Africa as a whole, to be able to fully integrate ICT into teaching and learning there is the need for frequent collection and analysis of data on ICT usage. In their bid to promote ICT education worldwide, UNESCO has initiated and implemented Associated Schools Project Network (ASPnet). ASPnet, which has 120 member schools in Ghana and 7,956 worldwide, is a UNESCO project in which schools interconnect with foreign schools, establish international friendship and the pupils visit other pupils in other cultures with the aim of building international understanding towards building world peace. In addition to promoting ICT education the ASPnet centre would develop to cater for ASPnet not only at the local level but also in the West Africa Sub-Region and consolidate the cooperation with other countries. It is, therefore, important to examine ICT education in Ghana with a focus on UNESCO’s ASPnet programme.

1.3 Research Questions

The following questions are answered:

- What are the major programmes undertaken by UNESCO in promoting ICT education in Ghana?
- What is the significance of the UNESCO’s Associated Schools Project Network (ASPnet) ICT project to the development of education in Ghana?
- What are the major challenges that militate against effective implementation of UNESCO’s ASPnet ICT project in Ghana?
1.4 **Objectives of the study**

The main objective of the study is to examine the role of UNESCO in ICT education in Ghana. Specifically, the following objectives will be achieved:

- To identify the major programmes undertaken by UNESCO in promoting ICT education in Ghana.
- To examine the significance of the UNESCO’s Associated Schools Project Network (ASPnet) ICT project to the development of education in Ghana.
- To understand the major challenges that militates against effective implementation of UNESCO’s ASPnet ICT project in Ghana.

1.5 **Hypothesis**

H₀: UNESCO’S ASPnet ICT project has positively impact the development of education in Ghana.

1.6 **Scope**

This study covers UNESCO’s ASPnet ICT project in Accra. UNESCO ASPnet ICT Centre is located at the Osu Home Junior Secondary School, set up in 2004 with funding from UNESCO. Seven other schools in the area, namely, Estate 1 and 2, Anglican 1 and 2, Manle Dada, African Unity and Tenashie also use the centre. In all, about more than 1,000 pupils are benefiting from basic training in computer skills at the centre.

1.7 **Significance of the study**

Education is recognized all over the world as a fundamental right of every individual. It is a pre-condition for social change which helps in eradicating crime, and conflict. Due to the crucial role of education in society, every nation makes conscious efforts to promote education and make it affordable and accesses to its citizens. Though the government of Ghana has made several efforts to achieve universal quality education for its citizens, the education sector
continues to face numerous problems leading to a low standard of education and an increase in the rate of school drop-outs and illiteracy in the country. The effort of government is, therefore, being complemented by individuals, communities, and international organizations like UNICEF and UNESCO. This study therefore highlights the contributions of organisations such as UNESCO by contributing to literature or knowledge especially from the perspective. As a contribution to policy by exploring the contributions made by UNESCO towards improving ICT education in Ghana. It also contribute to practice by highlighting the bottlenecks in the implementation of UNESCO programmes and suggest possible solutions that may also be of interest to other stakeholders in the education sector. It serves as a source of reference to students and any institution that is conducting research in the area of educational development in Ghana.

1.8 Theoretical framework

Stakeholder theory looks at the relationships between an organization and others in its internal and external environment. It also looks at how these relationships affect how the organization conducts its activities. Stakeholders can come from inside or outside the organization. Examples of stakeholders of an organisation include employees, suppliers, non-profit community organizations, government, and the local community among many others.

Stakeholder theory’s social responsibility element allowed it to blend into social issues in management and, more recently, it has begun to enter the conversation about sustainable development. Stakeholder theory provides no formal process or means of balancing stakeholder interests, but is more in the nature of a political model of the corporation. It elevates non-shareholding interests to the level of shareholder interests in formulating strategy and policy, and seeks an exclusive attention to the concerns of shareholders so that they can focus on a broader set of interests. Stakeholder theory posits that certain outcomes will be obtained if certain behaviors are adopted. Stakeholder theory takes into account the groups or
individuals with a ‘stake’ or a claim on the organization. Stakeholders are groups or individuals who benefit from or are harmed by institutional actions. The United Nations Specialised Agencies are institutions operating within the larger system of the host society and provides the necessary support and infrastructure for the development of nations.

The United Nations through its agencies have contributed immensely to the development of Nations. Therefore as stakeholders in development, some of the Agencies such as UNESCO have been very tremendous. One of the central (normative) tenets of stakeholder theory is that organisations should attend to the interests of all of their stakeholders. This is the central reason why UNESCO contributes to Ghana’s development in several fronts. Education is recognized by UNESCO as a fundamental right of every individual. It is a major factor of economic priority and pre-condition for social change which helps in eradicating crime and conflict. In view of this UNESCO has taken keen interest in the education of people. This theory imposes an obligation on UNESCO to contribute to the development of Ghana.

1.9 Literature Review

The Role of UNESCO in Education

UNESCO's largest sectoral activity, education, is the field for constant but changing endeavor. From originally helping to reconstruct educational systems in war-torn Europe and carrying out isolated, modest projects elsewhere, UNESCO has progressed to large-scale undertakings, such as literacy campaigns, rural development, science teaching, educational planning and administration, and teacher training. UNESCO's major education activities have focused on basic education, the renewal of educational systems, and educational advancement and policy.23

In activities following the 1990 World Conference on Education for All, UNESCO has assisted member states in diagnosing basic learning needs, setting national education-for-all
(EFA) objectives, and devising effective strategies to move towards EFA. In cooperation with UNFPA, UNESCO organized the International Congress on Population Education and Development (Istanbul, April 1993), which adopted the Istanbul Declaration and Action Framework for Population Education on the eve of the twenty-first century. Emergency assistance programs and reconstruction operations in the field of education were carried out in such countries as Afghanistan, Albania, Angola, Bosnia and Herzegovina, Cambodia, Croatia, Iraq, Lebanon, Mozambique, Slovenia, and Somalia. Following the international meeting on “Peace, the day after”, held in Granada, Spain in December 1993, activities aimed at the rebuilding of Palestinian educational and cultural institutions were initiated.  

The Scheme of Humanitarian Assistance for Refugee Education (SHARE) (1993–96) responded specifically to the needs of refugee children. The program went beyond the urgent but short-term goal of providing shelter, food, and medicines, to develop a coherent policy of refugee education in cooperation with local and national authorities. After initial experiences in Cambodia, Somalia, and Afghanistan, SHARE activities were also carried out in Slovenia and Croatia. UNESCO also promotes studies and teaching in the fields of drugs, population, and the environment. In cooperation with WHO, the organization has elaborated a joint prototype curriculum for AIDS education in schools and disseminated documents and guidelines to support AIDS education programs in member states. The UNITWIN/UNESCO Chairs Programme was launched in 1991 to strengthen cooperation between universities through twinning arrangements and to promote the development of inter-university networks in order to facilitate the exchange of knowledge and improve teacher training. As of 30 April 2001, there were 56 UNITWIN networks.

*The World Education Report*, a biennial first published in 1991, presents a broad but concise analysis of major trends and policy issues in education, including many tables, graphs, and a unique set of statistics—“World Education Indicators”—which give a country-by-
country summary of key aspects of education in over 180 countries. In January 1993, UNESCO set up the International Commission on Education for the Twenty-First Century, under the Chairmanship of Jacques Delors, President of the Commission of the European Community, to study and reflect on the challenges facing education in the coming years, and to make recommendations that can serve as an agenda for renewal, innovation, and action for policymakers. The commission focused its reflection on one central question—what kind of education is needed for what kind of society of tomorrow? - in its report at the end of 1995.26

The Associated Schools Project (ASP), an international network set up to experiment with ways and means for enhancing the role of education in preparing young people to live in a world community, was launched in 1953. As of 1999, it included over 5,600 educational institutions in 162 countries, which conduct pilot projects to enhance education for a culture of peace. ASPnet schools focus on any of four main themes of study: World Concerns and the role of the United Nations system; Human Rights, Democracy, and Tolerance; Intercultural Learning; and Environmental Concern. Closely linked with the Associated Schools Project, often carrying out joint projects in crucial fields such as literacy work and the environment, are the 5,000 UNESCO associations, centers and clubs, the first of which was founded in 1947. Found in some 120 countries, with members from all age groups, they are set up in schools, universities, as associations or as permanent centers and, since 1981, are grouped together as part of the World Federation of UNESCO Clubs, Centers and Associations (WFUCA).

In specific educational areas, UNESCO's work is supported by three separate institutes which conduct research and training programs. The International Bureau of Education (IBE), located in Geneva, serves as an international center for studies and publications on comparative education. The International Institute for Educational Planning (IIEP), in Paris, organizes an annual nine-month training program for education planners and administrators, and offers training courses in the planning, financing and management of education. The Institute for
Education (UIE), located in Hamburg, focuses on adult and non-formal education, within the framework of lifelong learning.²⁷

**Relevance of Education**

Education is seen as a form of investment in people to enhance their economic productivity. The development of any society relies on how educated its citizens are and how scarce resources are channeled into improvement of their education. That educated persons have strong linkages with other factors of production (land, capital and entrepreneur) to maximize productivity in society. Based on this, Olaniyan and Okemakinde made the assertion that an educated population is a productive one.²⁸ Supporting the argument further, Psacharopoulos and Woodhall maintain that: “human resources constitute the ultimate basis of wealth of nations. Capital and natural resources are passive factors of production, human beings are the active agencies who accumulate capital, exploit natural resources, build social, economic and political organization, and carry forward national development”.²⁹

Emphasizing the significance of improved education and its quality, Babalola cited in Olaniyan and Okemakinde, indicated that, in every surviving nation or society, accumulated knowledge should be transferred into the new generation who must be taught how it could be applied in developing new products, introducing new processes and production methods as well as producing social services³⁰. In view of this governments world over commit about five to six percent of their Gross Domestic Products (GDP) to formal education for human resource development. The non-governmental organizations as well spend their hard earn scarce resources training and sponsoring workers to upgrade their education and to some extent educating themselves. The assumption is that, through improved and quality education, the labour force of a country is thought better ways of doing old things and acquiring new knowledge to enhance their capacity and capability.
In his contribution to education and human development, Oxaal used human Capital Theory (associated with the work of Gary Becker, Mark Blaug and many others), to re-echo the fact that, quality education provides mental and physical skills to literates who contribute highly to the productivity of a country as compared to the low productivity from their ignorant counterparts. This informs why the advanced countries invest a large chunk of their assets in the development of their population through promotion of science and superior education. Quick advancement of some poor countries could be explained to the importance that they attached to education and sound education policies for human capital development. In view of that development agencies like UNESCO have taken keen interest in the development of education in countries of which Ghana is no exception.

1.10 Research Methodology

The study adopts a qualitative approach. Cresswell posits that the qualitative approach is where the inquirer often makes knowledge claims based primarily on the multiple meanings of individual experiences socially and historically constructed, with an intent of developing a theory or pattern or advocacy/participatory perspectives (i.e., political, issue-oriented, collaborative, or change oriented) or both. As further noted by Cresswell, the qualitative approach uses strategies of inquiry such as narratives, phenomenologies, ethnographies, grounded theory studies, or case studies. In view of that the researcher collected open-ended and the emerging data with the primary intent of developing themes from the data.

The qualitative research is especially effective in obtaining culturally specific information about the values, opinions, behaviors, and social contexts of particular populations. Adopting qualitative approach enabled the researcher to use open-ended and probing questions which gave the participants the opportunity to respond in their own words, rather than forcing them to choose from fixed responses. The open-ended questions aroused responses that are: meaningful and culturally salient to the participants, unanticipated by the researcher, and rich
and explanatory in nature. Another advantage of this approach is the fact that the researcher had the flexibility to probe further some of the responses of the participants such as why, why not, or how.

In all, fifteen respondents were purposively selected for the study, this consists of nine officials under the educational sector, which was be made up of UNESCO officials, teachers, school inspectors as well as heads of educational institutions. The remaining six were students selected from the schools using the facility. I chose Greater Accra because it has the largest number of UNESCO’s programs. The sample technique for this study was purposive sampling, this is based on the basic criterion that, the schools selected are beneficiaries of the project. This criterion was based on the belief that people who benefit from a particular project, are best placed to comment effectively on its quality and effectiveness as well as problems associated with them.

Data for this study was derived from two major sources: these are primary and secondary source. Interviews were used to collect primary while secondary data was gathered from books and articles. Secondary data were collected by reviewing documents obtained from textbooks of international organization published and unpublished, books on the activities of UNESCO Education in Ghana, theses, and articles from journals and magazines. The data gathered were analysed qualitatively. This was interpreted through description based on the issues investigated in the survey. The data gathered from the interviews were analysed using the Miles and Huberman approach to qualitative data analysis. The data were coded so as to identify and describe patterns and themes from the perspective of the participant(s), as well as to understand and explain these patterns and themes. During data analysis, the data were organized categorically and chronologically, reviewed repeatedly, and continually coded.
1.1 **Organization of the Study**

The study is organized into four chapters, chapter one is the introductory chapter, and it consists of introduction and background of the study, statement of research problem, significance of study and the objective or purpose of the study. It also includes theoretical framework, literature review, statement of hypothesis and methodology used in conducting the research. Chapter two examines the formation of UNESCO, the structure, functions, funding, and modes of operation of UNESCO as well as the contribution of UNESCO towards development of education in Ghana. Chapter three discusses the findings with emphasis on ICT education in Ghana and the various challenges in the education sector in Ghana. Chapter four is for summary of the findings recommendations and conclusion of the study.
END NOTES

1 UNDP
3 Ibid.
4 The secretariat of Ghana Commission for UNESCO Ghana and UNESCO, public 1985
5 Ibid.
14 Balton, D. A. Human rights in the classroom. Teaching the convention on the right of the child. Social Education (1992)
15 Ibid.
18 Ibid.
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CHAPTER TWO

THE ROLE OF UNESCO

2.0 Introduction

UNESCO, since 1945, has promoted the advancement of science and its applications to develop knowledge and capacity, which is the key to economic and social progress and the basis for peace and sustainable development. This chapter covers an extensive review of literature on ICT, UNESCO, and the need for ICT in schools.

2.1 Information and Communication Technology

ICT comprises the use of at least a computer and the internet as well as computer hardware and software, networks, and a host of devices that convert information (text, images, sounds, and motion) into general digital formats. Information and communication technology (ICT), represent a new approach for enhancing the dissemination of information, applied, and integrated into learning on the basis of conceptual understanding and methods of informatics. Bork argues that computers should be used to support learning. Initially, computers were used to teach computer programming but the development of the microprocessor in the early 1970s saw the introduction of affordable microcomputers into schools at a rapid rate. Computers and applications of technology became more pervasive in society which led to a concern about the need for computing skills in everyday life.

As public awareness grew, this need for computer literacy became extremely influential and many schools in the developed world purchased computers based on this rationale. The 1990s was the decade of computer communications and information access, particularly with the popularity and accessibility of internet-based services such as electronic mail and the World Wide Web. At the same time, the CD-ROM became the standard for distributing packaged software replacing the floppy disk. This allowed large information-based software packages
such as encyclopedias to be cheaply and easily distributed. As a result, educators became more focused on the use of the technology to improve student learning.

Investment in science, technology and innovation (STI) is an important driver of economic growth and social development. UNESCO works to assist countries to invest in STI, to develop national science policies, to reform their science systems, and to build capacity to monitor and evaluate performance through STI indicators. Many countries have benefited from UNESCO’s assistance, including over twenty countries in Africa. Every five years, the UNESCO Science Report assesses the status of investment in STI around the world. In 2011, UNESCO launched the Science, Technology and Innovation Global Assessment Programme (STIGAP) to widen the scope of standard STI assessment, to take into account country-specific contexts including the social dimension and emerging knowledge on the relationship between technological progress and sustainable development.

2.2 ICT in Developing Countries

According to Hepp, Hinostroza, Laval and Rehbein, developing countries have become anxious about the widening gap between their reality and the aggressive ICT policies of some developed countries. Consequently, there is a more urgent need to improve the quality and equity of education to bridge the gap between developed and developing nations, and ICTs are perceived as necessary tools for this purpose. The Government of Ghana has placed a strong emphasis on the role of ICT in contributing to the country’s economy and for that matter, education. 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 suggest the use of ICT as a means of reaching out to all the people in Ghana, especially the poor.

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 fourteen priority focus
areas. Accelerating human resource development and promoting ICT in education – the
deployment and exploitation of ICT in education is among the fourteen priority focus areas.
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 unimplemented for a long time. The objectives of the
policy were to:

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

The Ghanaian tertiary education sector is the most advanced in the deployment and use
of ICT in the country. All the country’s major universities have their own separate ICT policy,
which includes an ICT levy imposed on students. This enables students to have access to
computer labs with broadband connection. In the basic and secondary education sectors, a
project to set up computer laboratories in all science schools in the country has led to a
significant number of computers being installed across the country. Most of these schools are
in the urban centres, therefore, deepening the digital divide between the urban and rural
dwellers. Again, there is a great disparity between public and private schools in access to ICT.
This makes it difficult for the integration of ICT into the various facets of the educational
sector, particularly into the subjects taught at our schools.
The rapid development in ICTs has made tremendous changes in the twenty-first century, as well as affected the demands of modern societies. Recognizing the impact of new technologies on the workplace and everyday life, today’s educational institutions try to restructure their educational programs and classroom facilities, to minimize the teaching and learning technology gap between developed and the developing countries. This restructuring process requires effective diffusion of technologies into existing contexts in order to provide learners with knowledge of specific subject areas, to promote meaningful learning, and to enhance professional productivity. The use of ICTs in Ghanaian schools and African countries is generally increasing and dramatically growing. However, while there is a great deal of knowledge about how ICTs are being diffused and used in schools in developed countries, there is not much information on how ICTs are being diffused and used by teachers in Ghanaian schools.

2.3 The Need for ICT in Schools

It is necessary to develop a thorough program on ICT before beginning to use computers in schools and classrooms. There is little or no point in providing computers in schools unless there is a rationale behind it. With the increasing availability of computer hardware, it is important that teachers do not become engrossed in the machine but focus rather on their primary role as educators. Teachers need to extend their imaginations with the awareness that as developments in computer technology occur they will be able to achieve more of their goals. Since the 1960's the computer has been heralded, by some, as the solution to many problems in education. Many early computer scientists saw the possibility of the computer replacing teachers in schools. However, these pictures of students sitting behind computer terminals for much of the day have largely not occurred in mainstream schools and most students would not like this to be realised. There are three main rationales for ICT in schools: one concerns the organisational productivity of the school, and the other two focus on the needs of students:
technological literacy and support for their learning. The latter two rationales are supported by the recent Australian report on education.\textsuperscript{13}

The need for ICT competent teachers stems from the need for ICT competent students and for ICT-rich learning environments that enhance students’ learning across the curriculum. Apart from a few exceptional schools, in the 20th century, computers had only a minimal impact on what happens in classrooms.\textsuperscript{14} There has been much debate over the reasons for this discrepancy between the potential and what is realised. The computer is one of a range of technologies now available to teachers and students. In past decades, technologies such as radio, television, and overhead projectors similarly had little lasting impact on the experiences of students and teachers in schools.\textsuperscript{15} In these cases, a large amount of money was spent by governments on these resources which some would argue would have been better spent on other resources. It is important that scarce resources to support learning in schools are not wasted and therefore care needs to be taken in choosing to use computers to support learning.

Historically, technology has been developed to solve problems, improve living standards, and to increase productivity. Therefore, it is reasonable to expect educational technology to be developed with a concrete objective in mind. Within the educational context, these objectives become increased in productivity and in solving of problems in teaching/learning programmes.\textsuperscript{16}

There are several reasons for incorporating technology into education. According to Ittigson and Zewe technology is essential in teaching and learning.\textsuperscript{17} Technology improves the way subjects should be taught and enhances students understanding of basic concepts. It deemphasizes algorithmic skills resulting in an increased emphasize on the development of concept. BECTA however summarised the key benefits of technology in education as follows: firstly technology promotes greater collaboration among students and encourages communication and the sharing of knowledge. Secondly, technology gives rapid and accurate
feedback to students and this contributes towards positive motivation. Finally, the use of technology in mathematics also allows students to focus on strategies and interpretations of answers rather than spending time on tedious computational calculations. Technology also supports constructivist pedagogy, wherein students use technology to explore and reach an understanding of concepts. This approach promotes higher order thinking and better problem solving strategies.

Information and Communication Technology (ICT) can contribute to universal access to education, equity in education, the delivery of quality learning and teaching, teachers’ professional development and more efficient education management, governance and administration. UNESCO takes a holistic and comprehensive approach to promoting ICT in education. Access, inclusion and quality are among the main challenges they can address. The Organization’s Intersectoral Platform for ICT in education focuses on these issues through the joint work of three of its sectors: Communication and Information, Education and Science. Broadly speaking, educators, policy makers and researchers all seem to agree on the potential of ICT to have a significant and positive impact on education.

Studies including Hadley and Sheingold and Hannafin and Saverye have indicated that ICT has the potential for enhancing student learning. On the part of teachers, they use ICT particularly, computers to write lesson plans, prepare materials for teaching, record and calculate student grades, and communicate with students and other teachers. As such, computers have become a routine tool for helping teachers accomplish their professional work. Eulogizing the importance of ICT in the instructional process, Chapin and Messick assert that the role of ICT in teaching and learning is rapidly becoming one of the most important and widely discussed issues in contemporary education policy. To this extent, developed countries in Europe and America have made legislative provisions on the imperative use of ICT in the instructional process.
2.4 UNESCO in Perspective

In 1945, UNESCO was created in order to respond to the firm belief of nations, forged by two world wars in less than a generation that political and economic agreements are not enough to build a lasting peace. Peace must be established on the basis of humanity’s moral and intellectual solidarity. UNESCO strives to build networks among nations that enable this kind of solidarity, by:

- Mobilizing for education: so that every child, boy or girl, has access to quality education as a fundamental human right and as a prerequisite for human development.
- Building intercultural understanding: through protection of heritage and support for cultural diversity. UNESCO created the idea of World Heritage to protect sites of outstanding universal value.
- Pursuing scientific cooperation: such as early warning systems for tsunamis or trans-boundary water management agreements, to strengthen ties between nations and societies.
- Protecting freedom of expression: an essential condition for democracy, development and human dignity.

The focus of UNESCO is on how to create holistic policies that are capable of addressing the social, environmental and economic dimensions of sustainable development. This new thinking on sustainable development reaffirms the founding principles of the Organization and enhances its role:

- In a globalized world with interconnected societies, intercultural dialogue is vital if we are to live together while acknowledging our diversity.
- In an uncertain world, the future of nations depends not only on their economic capital or natural resources, but on their collective ability to understand and anticipate changes
in the environment - through education, scientific research and the sharing of knowledge.

- In an unstable world - marked by fledgling democratic movements, the emergence of new economic powers and societies weakened by multiple stress factors – the educational, scientific and cultural fabric of societies – along with respect for fundamental rights - guarantees their resilience and stability.

- In a connected world - with the emergence of the creative economy and knowledge societies, along with the dominance of the internet, the full participation of everyone in the new global public space is a prerequisite for peace and development.

UNESCO is known as the “intellectual” agency of the United Nations. At a time when the world is looking for new ways to build peace and sustainable development, people must rely on the power of intelligence to innovate, expand their horizons and sustain the hope of a new humanism. UNESCO exists to bring this creative intelligence to life; for it is in the minds of men and women that the defences of peace and the conditions for sustainable development must be built.28

UNESCO’s work is carried out principally in the fields of education, the natural sciences, the social and human sciences, culture, and communication. At the 27th session of the General Conference (1993), a broad consensus emerged on the need to concentrate efforts on two of the objectives common to the United Nations system as a whole—the consolidation of peace and the promotion of sustainable human development. The General Conference also underlined the importance of UNESCO’s role in promoting international intellectual cooperation that is, acting as an international “think tank”.29

The organization's constitution outlines UNESCO’s fundamental mission of promoting access to, and the transfer and sharing of knowledge. UNESCO’s continued role of offering guidance, advice, and assessment when needed calls for strengthening activities in the
following areas: anticipating and preparing innovative strategies, gathering and circulating reliable information on the present situation and probable trends in the organization’s fields of competence, and encouraging political leaders at the highest level to make firm commitments. UNESCO’s recent actions have been largely determined by commitments made at the major intergovernmental conferences it has recently convened - solely or jointly with other UN agencies—or in which it has participated, in particular the World Conference on Education for All, held in Jomtien, Thailand, in March 1990, the United Nations Conference on Environment and Development (UNCED), held in Rio de Janeiro, Brazil, in June 1992, the United Nations Fourth World Conference on Women, held in Beijing, China, in September 1995, and the World Summit on Sustainable Development held in Johannesburg, South Africa, in August and September 2002. The increasingly global nature and growing complexity of the problems in today's world call for a multidisciplinary or transdisciplinary approach in many of UNESCO's activities. A good example is the interdisciplinary project “Environment and Population Education and Information for human development”, conceived following the Rio Conference and aimed at the adoption of an integrated approach in order to achieve a development that is people-centered, equitable, and sustainable.

2.5 UNESCO’s Contribution to Development

UNESCO’s early work in the field of education included the pilot project on fundamental education in the Marbial Valley, Haiti, started in 1947. This project was followed by expert missions to other countries, including, for example, a mission to Afghanistan in 1949. In 1948, UNESCO recommended that Member States should make free primary education compulsory and universal. In 1990 the World Conference on Education for All, in Jomtien, Thailand, launched a global movement to provide basic education for all children, youths and adults. Ten years later, the 2000 World Education Forum held in Dakar, Senegal, led member governments to commit to achieving basic education for all by 2015. UNESCO's
early activities in the field of culture included, for example, the Nubia Campaign, launched in 1960. The purpose of the campaign was to move the Great Temple of Abu Simbel to keep it from being swamped by the Nile after construction of the Aswan Dam.

During the 20-year campaign, 22 monuments and architectural complexes were relocated. This was the first and largest in a series of campaigns including Mohenjo-daro (Pakistan), Fes (Morocco), Kathmandu (Nepal), Borobudur (Indonesia) and the Acropolis (Greece). The organization’s work on heritage led to the adoption, in 1972, of the Convention concerning the Protection of the World Cultural and Natural Heritage. The World Heritage Committee was established in 1976 and the first sites inscribed on the World Heritage List in 1978. Since then important legal instruments on cultural heritage and diversity have been adopted by UNESCO member states in 2003 (Convention for the Safeguarding of the Intangible Cultural Heritage) and 2005 (Convention on the Protection and Promotion of the Diversity of Cultural Expressions).

2.6 UNESCO’s Contribution to ICT Education in Developing Countries

Communication is the central instrument by which UNESCO achieves its mission. Article 1 of the Constitution of UNESCO states that to realise this purpose the organisation will “(a) Collaborate in the work of advancing the mutual knowledge and understanding of peoples, through all means of mass communication and to that end recommend such international agreements as may be necessary to promote the free flow of ideas by word and image”. Given such a general responsibility, it is not surprising that UNESCO has been involved – and occasionally embroiled - in information and communications technology (ICT) and media issues throughout its evolution. Information and Communication Technology (ICT) can contribute to universal access to education, equity in education, the delivery of quality learning and teaching, teachers’ professional development and more efficient education management, governance and administration. UNESCO takes a holistic and comprehensive approach to
promoting ICT in education. Access, inclusion and quality are among the main challenges they can address. The Organization’s Intersectoral Platform for ICT in education focuses on these issues through the joint work of three of its sectors: Communication & Information, Education and Science.\(^\text{36}\)

UNESCO’s global network of offices, institutes and partners provide Member States with resources for elaborating ICT in education policies, strategies and activities. In particular, the UNESCO Institute for Information Technologies in Education (IITE), based in Moscow, specializes in information exchange, research and training on the integration of ICT in education while UNESCO’s Bangkok office is strongly involved in ICT for Education in Asia and the Pacific.\(^\text{37}\) ICT can help strengthen democratic and transparent education planning and management. Communications technologies can expand access to learning, improve quality and ensure inclusion. Where resources are scarce, judicious use of open-source materials through technologies can provide the means to bypass the bottleneck of textbook production, distribution and updating. The need for wide-scale innovations has led UNESCO to focus principally on system-wide improvement and change. The Organization studies the role that ICT can play in shaping policies for education. Its role is both normative and informative, gathering facts, data and examples of ICT in education and making this information widely available.\(^\text{38}\)

UNESCO, in common with all participating organisations, faces a difficult task in implementing these action lines. Some obstacles, such as lack of precision and a very general focus, may be overcome through concerted effort on the part of the multi-stakeholder teams. Others, however, pose more serious challenges.\(^\text{39}\)
Endnotes

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7 ibid
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CHAPTER THREE

ANALYSIS AND DISCUSSION OF FINDINGS

3.0 Introduction

This chapter presents and discusses the findings gathered from the interviews. The findings were compared and contrasted with literature after which relevant conclusions were drawn. The analysis and the discussions focused on the three objectives outlined for the study. The analysis began with insights about the case project.

3.1 The Case Study

The UNESCO Associated Schools Project Network (ASPnet)\(^1\) is a global network of over 7,900 schools and colleges in 176 countries who have come together in order to promote UNESCO’s ideal of peace and contribute to the quality of education. The network was created in 1953 with 33 schools, and is now one of the oldest and largest educational networks in the world. Membership ranges from nursery to secondary and teacher education institutions. The network is coordinated from its headquarters in Paris, and each country also has a National Coordinator for Associated Schools. Interested schools apply to join the network and must commit to following one or all of the following four study themes:

- World concerns and the role of the United Nations
- Education for sustainable development
- Peace and human rights
- Intercultural learning.

ASPnet schools integrate these priorities throughout their curriculum, celebrate internationally-recognized days (like World Water Day), participate in international exchanges, and join UNESCO-affiliated education programs (like Gigapan). Schools ranging from preschools and elementary schools to university education departments are eligible for ASPnet membership. The reason for having the word ‘project’ in the title is that Associated
Schools are invited to create innovative pilot plans, design new teaching materials and methods, and develop exchanges between students and teachers internationally. The aim is for the schools to be a ‘laboratory’ for innovation, so that projects can be shared across the network and so that there is a multiplier effect. In this way, it is hoped that ASPnet schools can influence education reform and improve the quality of education. Schools are invited to participate in the network in different ways. They can launch activities on any one of the themes above, take part in ‘flagship projects’ that are generated from UNESCO Paris (such as the Transatlantic Slave Project, Sandwatch or World Heritage), participate in UNESCO campaigns or observe the International Days and Years celebrated by UNESCO and the UN, and act as experimental centres for testing and validating teaching and learning materials produced by UNESCO or its partners. Advice to schools also includes “having as their foundation democracy and participation in structures and teaching methods” – that is, that being an ASPnet school cuts across all aspects of school life, and is not only about temporary participation in high profile events or international exchange visits.

In Ghana, UNESCO ASPnet ICT Centre at the Osu Home Junior Secondary School, set up in 2004 with funding from UNESCO aimed at providing ICT education in Ghana. Seven other schools in the area, namely, Estate 1 and 2, Anglican 1 and 2, Manle Dada, African Unity and Tenashie also use the centre. Asked whether the centre has been beneficial, Mr. Osei-Akoto Asare stated more than 1,000 pupils are benefiting from basic training in computer skills at the centre. Mr. Osei-Akoto Asare indicated that during H.E. Mr. Koichiro Matsuura’s (past Director-General of UNESCO) first visit to Ghana, ASPnet in Ghana requested an ICT Centre to help promote the use of computers to the Ghanaian student as well as train teachers to effectively use the computer. The Director-General responded positively by providing fifty computers for the centre.
The UNESCO Information for All Program (IFAP) also contributed to the project by purchasing a server and hooking the centre to the worldwide web for one year. IFAP also purchased four computers with accessories to increase the number of computers in the Centre to fifty-four. The National Commission for UNESCO consulted the Accra Metropolitan Assembly and other stakeholders who provided a furnished a building to host the centre. A Management Committee has been set up and headed by the Metropolitan Directorate of Education and other stakeholders of education in the sub-metropolitan area. According to Osei-Akoto Asare, the establishment of the centre is meeting the following objectives which aim at promoting quality education:

- Demystifying the computer to school children in Ghana, especially those in the deprived regions.
- Training teachers who have no skill in ICT to enhance quality delivery
- Serving as a centre where schools in the neighbouring communities can use the facility for computer studies.
- Serving as an on-line registration centre for schools whose candidates have to travel long distances to register on-line for their final examinations.
- Helping Ghana to achieve MDG 2 and
- Enhancing the visibility of UNESCO⁴

All over the world, education is accepted as the process by which individuals acquire knowledge, skills, and attitudes which enable them to develop their faculties in full. It is universally accepted that one of the benefits of good education is that it enable individuals to contribute to the personal development, their communities and the nation as a whole. It is on account of the belief in the benefits of good education that successive governments of Ghana have sought to use education as the vehicle for accelerating the implementation of their development policies and programmes. An official of the UNESCO country office indicated
that, UNESCO implements its activities through the five programme areas of Education, Natural Sciences, Social and Human Sciences, Culture, and Communication and Information.\(^5\)

In the area of education, UNESCO supports research in comparative education and provides expertise and fosters partnerships to strengthen national educational leadership and the capacity of countries to offer quality education for all. This includes the:

- **UNESCO Chairs**, an international network of 644 UNESCO Chairs, involving over 770 institutions in 126 countries
- **Environmental Conservation Organisation**
- **Convention against Discrimination in Education adopted in 1960**
- **Organization of the International Conference on Adult Education (CONFINTEA) in an interval of 12 years**
- **Publication of the Education for All Global Monitoring Report**
- **UNESCO ASPNet**, an international network of 8,000 schools in 170 countries

UNESCO has been actively involved and engaged in education especially through ICT. ICT education, leaning and use will enabled persons and equip them with the needed and the requisite skills to contribute to their respective national economics and sustainable development. The 2007 reforms placed a greater emphasis on ICT, since technology has the potential of poverty reduction, creation of opportunities and employment and in empowering women. This is why ICT has been included in the basic school’s curriculum and it’s now an examinable course in Ghana especially in the BECE basic education certificate examination. The following are the major programmes and projects undertaken by UNESCO in promoting ICT education in Ghana. These are teacher education, mobile learning, e-learning, lifelong learning, open education resource and Education management information system (EMIS).\(^6\) It is important to recognize that there are other intentions in the learning and teaching process in schools in Ghana which have instrumentally increased enrolment. Pre-primary was at
1,604,505 pupils, primary intake stood at 4,105,913, and that of the junior high schools was 1,452,585 and an introduction of ICT at all these levels is critical. The teachers indicated that the ASPnet centre has provided added value in terms of gains in innovative teaching methods, the climate of the school and intercultural understanding. The UNESCO ASPnet ICT Centre in Accra has been of tremendous help to the Ghanaian child and their teachers as well. The centre has offered pupils and teachers the needed skills which can push them to higher levels in their education. It has also placed greater emphasis on ICT and Science and Technology and this has led to the inclusion of ICT in the basic school curricula where the subject is now an examinable one.  

3.2 **Major Programmes Undertaken by UNESCO in Promoting ICT Education in Ghana**

UNESCO pursues its objectives through five major programs, namely education, natural sciences, social and human sciences, culture, and communication and information. Projects sponsored by UNESCO include literacy, technical, and teacher-training programmes; international science programmes; the promotion of independent media and freedom of the press; regional and cultural history projects; the promotion of cultural diversity; translations of world literature; international co-operation agreements to secure the world cultural and natural heritage (World Heritage Sites) and to preserve human rights, and also attempts to bridge the worldwide digital divide. Other priorities of the Organization include attaining quality education for all and lifelong learning, addressing emerging social and ethical challenges, fostering cultural diversity, a culture of peace and building inclusive knowledge societies through information and communication. In view of the diverse activities undertaken by UNESCO, teachers and officials of UNESCO were asked to indicate the major programmes undertaken by UNESCO. Discussed below are some of the major programmes undertaken by UNESCO in Ghana.
**Teacher Education**

The quality and caliber of teachers is very critical to the success of any educational programme, especially ICT which is very technical. Continued professional education and training is essential to the achievement of quality education which has the potential to enable all and sundry to contribute meaningfully to national economic development. Teachers, especially, those in the area of ICT face serious systematic challenges in the delivery of their work. More teachers are needed and must be well-trained while the existing teachers should be upgraded to keep up with the changing times, and with the application of ICT. UNESCO has been addressing these challenges through holistic collaboration which saw the integration of ICT in the educational curriculum in Ghana. An official of UNESCO admitted that this is one of the ways that has genuinely motivated teachers to learn and appreciate it.  

As a teacher in Osu Primary School intimated:

I am a beneficiary of the UNESCO ICT training programs for teacher and I can tell you, it has help tremendously to improve upon my appreciation and delivery of the subject in class. I am able to do research and gather recent issues.

UNESCO ICT competency framework for teacher, portal for teachers to share ideas and information and institutional capacity building are some of the other critical programmes they are embarking upon in Ghana to bring ICT closer to the Ghanaians children through teachers. Another teacher from Manle Dada who uses the centre more often stated that

ICTs can be used to transform the teaching and learning systems to meet the challenges of the knowledge economy.

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.).
E-learning Platforms

According to the National Communication Authority, The Mobile Voice subscriber base in Ghana grew from 29,815,213 in September 2014 to 29,990,581 at the end of October 2014 and Mobile Data subscription and use is currently at 15,643,629 as of October 2014. This shows the power of mobile and the prevalence of use in Ghana. UNESCO has therefore decided to use the mobile phone as a tool to improve ICT education in Ghana. An officer at UNESCO indicated that the use of mobile technology either alone or in conjunction with other communicating technology devices is the current focus especially among adults. A teacher added that:

one of the key advantages of choosing e-learning over classroom learning is convenience. Students can learn whilst they are at home, in the library or on vacation. This prevents teachers from having to stick to a schedule and allows them to carefully manage the pace of their own learning experience at their own convenience.

Access to online resources, lectures and other study material 24 hours a day and 7 days is another major advantage. The mobile reading, mobile learning, promoting gender equality with ICT, are projects that are currently been rolled out in Ghana which however has effectively been implemented in Nigeria, Mexico Pakistan, Senegal and it is expected to boost ICT education in Ghana.

Open Education Resources

Open Educational Resources (OER), are teaching, learning and research materials that are in the public domain permissible to be reused under the intellectual property license that allows re-sue or adaptation. UNESCO has helped many pre-schools in acquiring not only the hardware but genuine software that aid the learning of ICT in schools in Ghana. This is to support those in resource-poor areas especially children in the rural areas in the developing areas of Africa of which Ghana is on no exception. UNESCO has been on the forefront of actively promoting OER. Its communication and information programme allows learners, teachers, administrators,
and governments to freely access, create and share documents. A sizeable number of respondents have a problem with the OER due to their inability to access the service though to system breakdown or interconnectivity problems. Four teachers who often use this resource complained bitterly. This is what one of them had to share:

it is difficult for some of us to access these electronic materials because we have poor network infrastructure even though UNESCO has made the materials available online.

UNESCO has also made OER available for education in the sensitive areas of HIV, AIDS, literacy and education in post conflict and post disasters management context.

**Lifelong Learning**

Adult education and adult literacy is essential for increasing the literacy level especially among the older generation. Education strategies must recognize all places where learning takes place. Advancement in technology could make people that do not have access to be excluded from sharing and benefiting in the new global communication channels. It is part of UNESCO’s programme to make facilities available for persons to use due to the huge potential of ICT for leaning and self-empowerment. Literacy concerns, technical, vocational education and training (TVET), higher education, open and distance education and non-formal education are areas that UNESCO has invested over the years. According to an official of UNESCO:

the lifelong learning programme was designed to enable people, at any stage of their life, to take part in stimulating learning experiences, as well as developing education and training with the aim of helping teachers to be part of the technology revolution.\(^\text{15}\)

According to UNESCO, the achievement of teaching and learning is influenced by the availability of resources to use for the process and how these resources are regulated.\(^\text{16}\) Thus, schools that have no textbooks and learning materials or well-equipped library cannot do effective and efficient work. Adeyemi citing Gibbs (1990) maintains that a well-equipped library provides assortment of material resources like books, journals, and CD ROM.\(^\text{17}\)
**UNESCO ICT Competency Framework for Teachers**

The UNESCO ICT Competency Framework for Teachers (ICT-CFT) is intended to inform educational policy makers, teacher-educators, providers of professional learning and working teachers on the role of ICT in educational reform, as well as to assist member states in developing national ICT competency standards for teachers with an ICT in Education Master Plan approach. According to an officer at the UNESCO country office,

> modern societies are increasingly based on information and knowledge and that is how come Ghana is building workforces which have ICT skills to handle information so as to be reflective, creative and adept at problem-solving.

According to the respondents, this is to generate knowledge; enable citizens to be knowledgeable and resourceful so they are able to manage their own lives effectively, and are able to lead full and satisfying lives; encourage all citizens to participate fully in society and influence the decisions which affect their lives; and foster cross-cultural understanding and the peaceful resolution of conflict.

These social and economic goals are the focus of a country's education system. Teachers need to be equipped to achieve these goals, and UNESCO has created an international benchmark which sets out the skills required to teach effectively with ICT: UNESCO's ICT Competency Framework for Teachers. An official of UNESCO stated that UNESCO's Framework emphasizes that it is not enough for teachers to have ICT skills and be able to teach them to their students. Teachers need to be able to help the students become collaborative, problem-solving, creative learners through using ICT so they will be effective citizens and members of the workforce. The Framework therefore addresses all aspects of a teacher's work: understanding ICT in education, curriculum and assessment, pedagogy, ICT, organisation and administration, and teacher professional learning.

The Framework is arranged in three different approaches to teaching (three successive stages of a teacher's development). The first is Technology Literacy, enabling students to use ICT in order to learn more efficiently. The second is Knowledge Deepening, enabling students to acquire in-depth knowledge of their school subjects and apply it to complex, real-world...
problems. The third is Knowledge Creation, enabling students, citizens and the workforce they become, to create the new knowledge required for more harmonious, fulfilling and prosperous societies.\textsuperscript{19}

3.3 Significance of UNESCO’s Programmes to the Development of Education in Ghana

Information and communication technology has undergone various transformations. The effects of globalization coupled with rapid change in the management and dissemination of information through technology calls for the developing world to put in the necessary measures and close the gap. This sections seeks to examine the significance or benefits of the use of ICT in education in Ghana. These benefits, however, were examined in the area to the child, to the teacher, the society and to government.

\textit{Benefit to the Child}

ICT has positive impact on students’ performances in primary schools particularly in English language, mathematics and science. Schools with higher level adoption and use of ICT in education show a rapid increase in performances in scores compared to those with little or no ICT use.\textsuperscript{20} In addition, schools with sufficient ICT resources achieved better results than those that are not well-equipped. A head teacher indicated that:

\begin{quote}
there is a significant improvement on learners’ performances which can be attributed to the introduction of ICT. ICT education, leaning and use has equipped pupils with the needed skills at the both the basic and junior high school level.\textsuperscript{21}
\end{quote}

The reforms is 2007 placed a greater emphasis on ICT. Technology use in formal learning creates opportunities for students to have greater responsibility in their learning. In the traditional teaching-learning paradigm, teachers are the “owners” of knowledge; however, when ICT tools are used to their capacity in formal learning, students have increased access to
multiple sources of information that they can use to develop their subject-area competence and problem solving skills. A pupil had this to share:

we now have access to computers which was previously not the case.\textsuperscript{22}

One headmaster testified that there is a renewed interest in students learning since the introduction of ICT in his school. In fact he said the caution that those who come to school late would not use the computers have even improve punctuality and discipline amongst the student’s body.\textsuperscript{23}

\textit{Benefit to the Teacher}

Teachers are also beneficiaries of ICT use in education in Ghana. Teachers and students alike are convinced that educational achievements of pupils are due to good ICT use. A teacher stated that

“pupils are more motivated when computers and Internet are being used in class”.

Through UNESCO programs and training seminars organized in this regard, ICT tools stimulate teachers. All teachers interviewed in this research claim to use ICT to do tasks, such as preparing lessons, sequencing classroom activities, etc. Therefore, teachers plan their lessons more efficiently. ICT helped teachers to work in teams and share ideas related to schools curriculum.

According to one of the teachers at Tenashie Junior High School:

since the introduction of ICT, I have stop prepared writing notes, I now do everything on my computer. This has help me prepare for class in a more organized way.\textsuperscript{24}

An interviewee also said that:

“the project has not only been beneficial to students but teachers and headteachers as well. As part of the project an information literacy project for headmasters of schools participating in Ghana’s Associated Schools Project Network (ASPnet) was launched with the support of UNESCO’s Information for All Programme”.

According to the interviewee the project has provided series of ICT training courses for fifty headmasters and teachers from selected ASPnet schools. Indeed the project has also equipped teachers and students with ICT skills to foster effective twinning among ASPnet schools,
promote the quality of education in ASPnet schools through internet access and the use of virtual libraries and train resource persons in ICT for ASPnet schools.\textsuperscript{25}

**Benefit to Society and Government**

The ICT for Accelerated Development policy (ICT4AD) emphasized the need to transform Ghana into an information-rich, knowledge-based, and technology-driven high income economy and society.\textsuperscript{26} The Ministry of Education is responsible for the administration and the coordination of public action regarding education, especially, in its collaboration with UNESCO in ICT education in Ghana. The government and invariably the society mainly civil society organization and the non-governmental organizations are focused on reducing economic, social and political oppression, discrimination, and exclusion in all their forms. As a result there is the need for education in order to eradicate conflict and engagement of individuals though ICT education can help reduce this issues. The social media has been helpful in mobilizing support both for the bad and good things. UNESCO believes that with the right appropriate measure in place, through progressive ICT, the social media can be used for a good course that would improve the development of this country\textsuperscript{27}.

The important role that education plays in the overall personal and intellectual development of the individual cannot be underestimated. On the significance of UNESCO’s programmes, respondents noted a lot of them. For example, it was noted that UNESCO’s programmes are very critical to the educational sector. A UNESCO official had this to say:

> the application of ICT is crucial to the future of Ghana’s knowledge economy and deserves a special focus in education.\textsuperscript{28}

Besides, students must learn with understanding, actively building new knowledge from experience and prior knowledge. In the rapidly changing and technologically dependent society, students are now faced with the need for a solid understanding of skills and concepts.\textsuperscript{29} One of the key components of education is technology, and as technology advances it
inevitably influences what happens in the classroom. Technology plays an essential role in teaching and learning as it influences the subject that is taught and enhances students’ learning.

In addition to the above, interviewees enumerated a number of specific benefits accrued since the establishment of the centre. An interviewee said that:

over 300 basic school teachers have acquired training in computer skills and the use of computers to enhance delivery.\(^{30}\)

In addition, with the introduction of ICT as an examinable subject in the basic schools curriculum in Ghana, the Teachers who were trained in the first centre are now ICT teachers in their schools.\(^ {31}\) A respondent indicated that the ICT centre in Accra is being used by a number of schools in the circuit such as Osu Home Junior Secondary School, Estate 1 and 2, Anglican 1 and 2, Manle Dada, African Unity and Tenashie. It is used to teach over 800 pupils. As noted by a teacher of Osu Home Junior Secondary School:

the Centre also serves teachers and members of the neighbourhood who are not computer literate.\(^ {32}\)

Another respondent indicated that

“It serves as an on-line registration centre where schools register their candidates for the Basic Education Certificate Examination run by the West African Examination Council."\(^ {33}\)

In all over 850 pupils use the facilities in the centre for their lessons in ICT. The total number of lesson periods the centre gives to the schools is 46 per week, where each period is 40 minutes. About 70 teachers in the circuit also use the facility after school hours for research purposes to enhance their delivery. Looking into the future, an interviewee hinted that:

the centre would develop to cater for ASPnet not only at the local level but also in the West Africa Sub-Region and consolidate the cooperation with other countries.\(^ {34}\)

UNESCO in recent times was focusing on expanding and enhancing learning opportunities through the use of ICT such as e-campuses, open and distance learning initiative, facilitating teacher networks and integrating ICT into pedagogy and classroom learning situations.\(^ {35}\)
Technology influences the skills taught and enhances students’ learning. Technology should therefore be used to support the learning. In so doing, NCTM recommends that technology must be embedded in the educational programme, rather than provided as a supplemental element.\textsuperscript{36} Using technology in the classroom provides ample learning opportunities for the students. An interviewee said “technology enables students to learn from feedback. The computer often provides fast and reliable feedback to students. It enables students to produce many examples when exploring typical classroom problems.”\textsuperscript{37} Technology helps students to see patterns and connections. The computer enables formulae, tables of numbers, and graphs to be linked readily. The use of technology allows students to work with dynamic images that cannot be done within traditional teaching. Students can use computers to draw graphs and manipulate diagrams dynamically. Technology enables students to work with real data which can be represented in a variety of ways. This supports interpretation and analysis that lead students to higher order thinking skills.\textsuperscript{38}

A study conducted by Roschelle, Pea, Hoadley, Gordin, and Means supports the use of technology in teaching and learning.\textsuperscript{39} Their finding indicates that computer technology can help support learning, and that it is especially useful in developing the higher-order skills of critical thinking, analysis, and scientific inquiry. The study explores the various ways computer technology can be used to improve how and what children learn in the classroom by helping students understand core concepts. According to them computer-based learning builds confidences and is a great tool for remediating slower learners. Besides, Collinson observed that with the use of technology in the classroom, students are saved from becoming bogged down in the difficult computations.\textsuperscript{40} This allows them to turn their focus to understanding the concepts and how to apply them. Technology also allows open-ended assignments in which the students can learn concepts by “discovery” and are more likely to retain the concepts.\textsuperscript{41} The students can also experiment and view different results and methods of solutions to different
problems. Without the use of technology, students spend majority of their time and energy attempting to memorize rules and procedures while using sample exercises as models for their homework problems.

3.4 Major Challenges that Militates against Effective Implementation of UNESCO’s ICT Programmes in Ghana

In 2010, Ghana’s literacy rate was 71.5%, with a notable gap between men (78.3%) and women (65.3%). This is of serious concern to UNESCO since they believed that improving upon the livelihood capacity of the woman is the surest way to eliminate poverty. Education indicators in Ghana reflect a gender gap and disparities between rural and urban areas, as well as between southern and northern parts of the country. Those disparities drive public action against illiteracy and inequities in access to education. Eliminating illiteracy has been a constant objective of Ghanaian education policies for the last 40 years but its achievement has been very elusive.

Basically, education in Ghana is divided into three phases: basic education (kindergarten, primary school, and lower secondary school), secondary education (upper secondary school, technical and vocational education) and tertiary education (universities, polytechnics and colleges). Education is however compulsory between the ages of four and 15 (basic education) even though we can confirm though this research that many children under 15 were not in school at the time of data collection. Computer illiteracy and the lack of access to ICT are widely recognized as an increasingly powerful obstacle to the economic, civic and political development of Africa. The challenges include policy and planning, infrastructure, capacity building, lack of government budget support, and others.
**Policy and planning**

An official of UNESCO indicated that there is inadequate planning and policy directives by government to the study of ICT education in Ghana. Adequate policy provision were not made for training, time and space within the academic year. An interviewee lamented that the lack of government budget support, too many students, lack of motivation for tutors, non-regular repair works at the computer lab and intermittent power outages are all problems that hinder the use of ICT education in Ghana.32

The objective of the program is not followed through as the emergence of new priorities and issues of equal importance shift attention from the existing ones. ICT use should follow society not lead it. Cutting edge technologies are unavailable to be used, which compound the issue. The responses point to the fact that the policy directives of governments both past and present is woefully inadequate despite the numerous calls.

**Infrastructure**

The infrastructure related challenges are the major challenges confronting the use of ICT in education in Ghana. Appropriate rooms where the computers would be kept, building to house the technology, proper electrical wiring, energy consumption, air conditioners and then regular and affordable internet pose a significant challenge to the implementation of such projects. This was highlighted by a UNESCO official. One student stated that

“we have only one computer which our teacher use to teach us. We have been leaning computers but I have never touched the mouse before because our teacher is highly protective of the computer”.43

This indicates the extent to which students and teachers are worried about the situation. Infrastructural challenges impede the successful implementation of projects. The issue of lack of computers raised by the student implies that there is the need for major stakeholders like government to also provide the needed support to complement the efforts of UNESCO.
**Capacity building**

To enable graduates from Ghanaian educational institutions to confidently and creatively use ICT tools and resources to develop requisite skills and knowledge needed to be active participants in the global knowledge economy, there is the need to build their capacity. Some of the teachers are ill equipped in skills with computer software application. Thus, integrating changes into existing curricula will be a major boost to ICT. A respondent stated that:

> we need to upgrade our knowledge every now and then so as to develop.

Even the ICT fluent teacher needs a continuous education to enable them to teach better as this will help improve upon the capacity building of the teachers including specialist support.

**Inadequate government budget**

It is the government’s desire that through the deployment of ICT in Education, the culture and practice of traditional memory based learning will be transformed to education that stimulates thinking and creativity necessary to meet the challenges of the 21st Century. The government has a non-negotiable primary responsibility to ensure that it provides accessible and quality public education for all Ghanaian youths especially at basic levels. However, the issue of priorities and funding to education, especially, in the area of ICT within the public sector, is a subject of critical analysis. Government must commit more resources to education in Ghana.

**Community participation**

Inadequate participation on the part of the recipient community is another challenge. An interviewee had this to share: “most of the community members did not own the project. In other words, the community members do not see themselves as part of the project”. A study conducted by the World Bank reveals that, involvement of community and the commitment of its resources into schools organization and management to some extent support and influence teaching, learning and quality of education. The community supports the school with TLM,
means of transportation and physical infrastructure such as classrooms and teachers accommodation. Also, parents' investment in children's education while they are in school is considered as one of the most powerful interventions for enhancing learning achievement. Among the potential advantages of closer linkages of school and community is the possibility for more involvement of students, teachers, and parents in data collection, verification, analysis and use organized as an interactive process. This may be seen as part of a local process of inquiry which, in itself, is part of a process of sustaining improvement.

3.5 Conclusion

This chapter has presented the results from the fieldwork carried out collecting data in the Greater Accra region on examining the role of UNESCO in ICT education in Ghana using the ASPnet ICT centre at Osu as a case. The chapter presented data on the major programmes undertaken by UNESCO in promoting ICT education in Ghana, the significance of the UNESCO’s ASPnet ICT project to the development of education in Ghana and the major challenges that militates against effective implementation of UNESCO’s ASPnet ICT project in Ghana.

The chapter identified and discussed the major programmes undertaken by UNESCO in promoting Education in Ghana especially within the enclaves of primary and adult education. From the responses, some of the major programs of UNESCO are teacher education, E-learning platforms, open educational resources, and lifelong learning opportunities. Respondents indicated these programmes have positively influenced ICT and education in general. This was followed by the description of results and analysis of findings regarding the significance of those programmes to the development of education in Ghana. The study revealed that the ASPNet ICT centre has been very beneficial to major stakeholders such as students/pupils, teachers and even adults. This chapter also presented the major challenges that militating against the effective implementation of UNESCO’s ASPnet project. Some of these
challenges are policy and planning, inadequate infrastructure, capacity building, and a lack of government budget support. The ASPnet has offered people the needed skills and also stressed on the need for greater emphasis to be put on ICT and Science and Technology. This has led to the inclusion of ICT in the basic school curricula where the subject is now an examinable one as well as train teachers to effectively use the computer. The UNESCO ASPnet ICT Centre in Accra has been of tremendous help to the Ghanaian child and their teachers as well.

The theoretical framework supports the findings gathered. This implies that UNESCO is a stakeholder in the development of nations and therefore has to contribute to the development efforts of Ghana. As widely known, UNESCO’s works for peace rooted in the minds of men and founded on the intellectual and moral solidarity of mankind. According to the UNESCO charter, peace is a matter of trust and perseverance, and the organization’s task is to sow the seeds of peace one by one, with time as its ally, over wide areas of responsibility in education, the science, culture and communication. In evaluating the hypothesis, it can be said that the findings support the hypothesis and therefore the implementation of UNESCO’s ASPnet ICT project has impacted on the development of ICT education in Ghana.
Endnotes

1 The main work of ASPnet and of their various national organisations can be accessed through the website: www.unesco.org/education/asp. Related websites would be www.ibe.unesco.org and www.timeproject.org.

2 Apollonius Osei-Akoto Asare, National ASPnet Coordinator- interviewed by Chris Gaba, Accra, 20th October, 2014

3 Ibid.

4 Ibid.

5 Mr. E. O. Darko, official of UNESCO - interviewed by Chris Gaba, Accra, 7th November, 2014.

6 Circuit Supervisor- interviewed by Chris Gaba, Accra, 7th November, 2014

7 Ibid


9 Mr. E. O. Darko, official of UNESCO - interviewed by Chris Gaba, Accra, 7th November, 2014.

10 Mr. Kumordzi, Teacher Osu Home Junior High School Primary School - interviewed by Chris Gaba, Osu-Accra, 12th November, 2014

11 Mr. Tepkoti, Teacher Manle Dada Primary School - interviewed by Chris Gaba, Accra, 12th November, 2014.


13 UNESCO official, UNESCO Ghana Office, interviewed by Chris Gaba, Accra, 19th November, 2014

14 Mr. Tepkoti, Teacher Manle Dada Primary School - interviewed by Chris Gaba, Accra, 12th November, 2014.

15 UNESCO official, UNESCO Ghana Office, interviewed by Chris Gaba, Accra, 19th November, 2014

16 Ibid


18 UNESCO official, UNESCO Ghana Office, interviewed by Chris Gaba, Accra, 19th November, 2014

19 Ibid


21 Headmaster, Estate 1 Junior High School, interviewed by Chris Gaba, 17th November, 2014

22 Calistus Akordi, A pupil of Osu Home Junior High School Primary School - interviewed by Chris Gaba, Accra, 17th November, 2014

23 Ibid

24 Mr. Gulliby Mankartta, Teacher, Tenashie Junior High School, interviewed by Chris Gaba, Accra 17th November, 2014.


27 Apollonius Osei-Akoto Asare, National ASPnet Coordinator- interviewed by Chris Gaba, Accra, 20th October, 2014


29 Metropolitan Director of Education, Accra - interviewed by Chris Gaba, Accra, 20th October, 2014

30 Apollonius Osei-Akoto Asare, National ASPnet Coordinator- interviewed by Chris Gaba, Accra, 20th October, 2014

31 Ibid

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33 Mr. Kumordzi, Teacher Osu Home Junior High School Primary School - interviewed by Chris Gaba, Osu-Accra, 12th November, 2014

34 Ibid

35 Apollonius Osei-Akoto Asare, National ASPnet Coordinator- interviewed by Chris Gaba, Accra, 20th October, 2014


37 Headmaster, Estate 1 Junior High School, interviewed by Chris Gaba, Accra, 17th November, 2014


ibid

Metropolitan Director of Education, Accra - interviewed by Chris Gaba, Accra, 20th October, 2014

Patrick Quansah, a pupil of African Unity Primary School, interviewed by Chris Gaba, Accra, 17th November, 2014

Mr. Gulliby Mankartta, Teacher, Tenashie Junior High School, interviewed by Chris Gaba, Accra 17th November, 2014.

Mr. Kumordzi, Teacher Osu Home Junior High School Primary School - interviewed by Chris Gaba, Osu-Accra, 12th November, 2014

CHAPTER FOUR
SUMMARY OF FINDINGS RECOMMENDATIONS AND CONCLUSION

4.0 Introduction

This chapter presents a summary of the key findings as well as the conclusions drawn. In addition, it presents the recommendations suitable to address the challenges discussed.

4.1 Summary of Key Findings

On the major policies and programmes undertaken by UNESCO in promoting education in Ghana, the study revealed that UNESCO has been actively involved and engaged in education especially through ICT. ICT education, leaning, and use will enabled persons and equip them with the needed requisite skills to contribute to their respective national economics and sustainable development. The major programmes and projects undertaken by UNESCO in promoting ICT education in Ghana include teacher education, mobile learning, e-learning, lifelong learning, open education resource, and Education management information system.

With respect to the significance of the project, the study revealed that the ASPNet ICT centre has been very beneficial to major stakeholders such as students/pupils, teachers and even adults. For example headmasters of schools participating in Ghana’s ASPnet benefitted from the information literacy project for headmasters of schools participating in Ghana’s Associated Schools Project Network (ASPnet) which was launched with the support of UNESCO’s Information for All Programme. Again, over 300 basic school teachers have acquired training in computer skills and the use of computers to enhance delivery. In addition, with the introduction of ICT as an examinable subject in the basic schools curriculum in Ghana, the Teachers who were trained in the first centre are now ICT teachers in their schools. The centre is also used to teach over 800 pupils. It also serves as an on-line registration centre where schools register their candidates for the Basic Education Certificate Examination run by the West African Examination Council. Again, teachers indicated that ICT has a positive impact
on students’ performances in primary schools, particularly in English language, mathematics, and science. Schools with higher level adoption and use of ICT in education show a rapid increase in performances in scores compared to those with little or no ICT use. In addition, schools with sufficient ICT resources achieved better results than those that are not well-equipped.

The study revealed a number of challenges which includes policy and planning, inadequate infrastructure, capacity building, and a lack of government budget support. Interviewees indicated that there is inadequate planning and policy directive to the study of ICT education in Ghana. Adequate policy provisions were not made for training, and as such ICT has no time and space on the academic calendar. The infrastructure related challenge was also identified as one of the major challenges confronting the use of ICT in education in Ghana. Inadequate participation on the part of the recipient community is another challenge.

4.2 Conclusion

ICTs have undergone a lot of transformation. The rapid change in technology coupled with the effects of globalization calls for an urgent need for nations lagging behind the change to close the gap. Education in ICT offers people the needed skills to contribute to their respective national economies. It is in light of this that the Education Reform (2007) of Ghana stressed on the need for greater emphasis to be put on ICT and Science and Technology. This led to the inclusion of ICT in the basic school curricula where the subject is now an examinable one. Since the introduction of ICT in the new educational reforms basic school syllabus, pupils in public schools who form the majority find it difficult to assess the computer. Those in the remote areas have not got the opportunity to see and touch the computer.

The study has confirmed that UNESCO has affected the quality education in Ghana through quality teaching and learning, and the provision of teaching and learning aids.
However, the realization of these goals are challenged by a shortage of professional teachers, teaching and learning materials, low motivation of teachers, and lack of intensive supervision and maintenance culture particularly in the circuit where the ASPNet project was implemented. The degree of successes attained in the implementation of the project has impacted students’ performance in external examinations. It can also be concluded that the effective utilisation of computers in schools would help to introduce the desired changes in teaching and learning methods.

4.3 Recommendations

Based on the findings, the following are recommended:

The Government must show a commitment to dealing with the issues that confront ICT education in Ghana. Issues such as policy and planning, ICT infrastructure, capacity building, and budgetary allocation to the sector needs to be addressed by government considering the relevance of ICT education to the economy of Ghana. Government of Ghana should provide grants as well as subsidies to address these challenges. Private donation, community support, and membership fees can also contribute significantly in this direction. Strategies such as investment in capacity building, infrastructure and increase investment would contribute immensely to solving the problem or challenges of ICT education in Ghana.

District Assemblies like the Accra Metropolitan Assembly should prioritize the provision of materials and infrastructure expansion for schools in their jurisdictions. They should factor them into their medium term development plans. The central government should increase its budgetary allocation for ICT related programmes in order to give enough facilities to schools, motivation to teachers and attract competent personnel into the teaching profession.

Parents and Teachers Associations should not overly concentrate on the provision of infrastructure in the schools but rather spend part of their resources in securing textbooks and other ICT related materials.
A. Books


Balton, D. A. Human rights in the classroom. Teaching the convention on the right of the child. Social Education (1992)


B. Journal Articles


**C. Reports/Documents/Papers**


Communications, British Educational Technology Agency (BECTA) (2003)." *ICT Advice*.


D. Interviews
Interview with Apollonius Osei-Akoto Asare, National ASPnet Coordinator, 20th October, 2013.
Interview with Mr. E. O. Darko, 7th November, 2014.
Interview with Mr. Kumordzi, Teacher Osu Home Junior High School Primary School, 12th November, 2014.
Interview with Mr. Tepkoti, Teacher Manle Dada Primary School, 12th November, 2014.
Interview with Headmaster, Estate 1 Junior High School, 17th November, 2014.
Interview with Mr. Gulliby Mankartta, Teacher, Tenashie Junior High School, 17th November, 2014.
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E. Internet
http://unesco.org/education/asp, accessed 10/09/14
http://ibe.unesco.org, accessed 08/12/14
http://timeproject.org, accessed 04/11/14