Challenges Undermining the Teaching of ICT as a Core Subject in Senior High Schools in Ghana: A Case Study of Selected Schools in Kumasi Metropolis

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Abstract
The rapidity with which Information Communication Technology (ICT) is emerging and its effect on socio-economic activities cannot be exaggerated. The main objective of the study was to assess challenges undermining the teaching of ICT as a core subject in Senior High Schools in Ghana: a case study of selected schools in Kumasi Metropolis. The study used a case study design approach and sample size for the study was 80 respondents. The study used convenience and purposive sampling techniques to select respondents for the study. Questionnaire was the main instrument used for data collection. The study findings show that all the respondents (100%) strongly agree that the introduction of ICT has created ICT knowledge sharing, facilitated teaching enhancement among students, ICT skills development among students, students produced can compete globally in terms of ICT application and has improved students' access to communication respectively. All the respondents (100%) strongly agree that the introduction of ICT in senior high school is timely and helping students acquire the basic ICT skills and knowledge. All the 80 (100%) respondents strongly agree that inadequate trained ICT teachers, inadequate learning and teaching materials, lack of ICT infrastructure, lack of constant power supply, high cost of internet connectivity and high cost of ICT equipment do affect the effective teaching. The study concluded that knowledge and skills gained from the study of ICT will help students to use ICT, teachers do support the implementation of the introduction of ICT into senior high school curriculum and there are many challenges negatively affecting the teaching of ICT as a core subjects. The study recommended that the Ministry of Education and Curriculum Research Development Division of the Ghana Education Service should come together to address the challenges opposing the teaching of ICT as a core subject in senior high schools.
Keywords: ICT, computer, school curriculum, education, information

Introduction
The fast advancement in Information Communication and Technologies (ICTs) have made remarkable changes in the twenty-first century, as well as affected the demands of contemporary societies. ICT is also a vital avenue for social change and economic development that is seen as an essential tool for developing countries. It is clarified in the book published by World Bank (2006a) that the world's policy makers have acknowledged the importance of ICT which provides principal efforts for economic development, contributes to global integration and also advances the effectiveness and efficiency of public sector. Owing to this, it has become priority for many governments to expand ICT access and quality.

Identifying the influence of new technologies at every sector of economy and everyday life, today's educational institutions are making every effort to streamline their educational programmes and classroom amenities, in order to reduce the teaching and learning technology gap between advanced and the developing countries. Accordingly, a completely innovative set of knowledge, competence and skills is prerequisite in this era of globalization in information and technology (Hawkins, 2002). The function of ICT in educational institutions ought to be more emphasize in strategic polices of developing countries to train their youth to contend in this informative, knowledge and technological age.

The educational usage of ICT is explained in the report by OECS (2002) that ICT can be used to support students play their role fully in society. All Students must be well educated about the present-day and potential applications of ICT and should be possessed with capacity, competence and skills to make use of those applications. The use of Information Communication Technology (ICTs) in Ghanaian schools and African countries is generally increasing and dramatically growing.

For developing countries to meaningfully close down the gaps of knowledge, technology and economy with the developed countries, the development and application of ICT in the continent's higher institutions of learning is very vital. In response to global policy changes in the ICT industry, Ghana was among the first African countries to reform its ICT sector and institute the required legal and regulatory framework to upkeep the growth of the sector. Since 1990, the government of Ghana has liberalized the telecommunications sector

with the aim of enabling the private sector to actively participate in the provision of services to increase access and coverage, introduce value-added services and boost consumer access to the state-of-the-art technology (Frempong & Atubra, 2001).

The government of Ghana introduced its Information and Communication Technology for Accelerated Development (ICT4AD policy) in the latter part of 2003. According to the basic premise of the policy, Ghana's development process can be accelerated through the development, deployment and exploitation of ICTs within the economy and society. The overall aim of ICT4AD was to engineer an ICT-led socioeconomic development process with the potential to transform Ghana into a middle income, information-rich, knowledge-based and technology-driven economy and society (Ghana Government, 2003).

It is worth noting that 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, Science and Sports outlined an ICT in education policy framework and produced a document that remained untouched for a long time. The objectives of the policy were to:

- Ensure that students have ICT literacy skills before coming out at each level of education.
- Provide guidelines for integrating ICT tools at all levels of education.
- Provide means of standardizing 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 administrative purposes.
- Promote ICT as a learning tool in the school curriculum at all levels. (Government of Ghana, Ministerial ICT Policy statements, 2005).

The inclusion of ICT at Senior High School Education Level was aimed at the acquisition of basic ICT literacy, developing, interest and use ICT for learning in other subjects, acquisition of knowledge for application of ICT in education and business, the use of the Internet to communicate effectively and the ability to follow basic ethics in the use of ICT. It is therefore expected that the knowledge and skills gained will help students to use ICT in almost all their courses at school and to access information for further learning.

In spite of the benefits of studying ICT in schools with all these policy objectives in place, very little in ICT has been achieved in Ghanaian Senior High schools. There are numerous challenges which continue to affect effective teaching of ICT in Senior High Schools. Owing to the importance of ICT to national development and the future of education, it is very prudent to identify the challenges undermining the teaching of ICT as a core subject in Senior High Schools in Ghana.

Statement of the Problem

Information and communication technologies (ICT) have become necessary apparatuses in today's information age, making a dramatic impact on the lives of individuals worldwide. This effect is most significant in education. ICT infrastructure is a basic condition for the successful implementation of the ICT programmes. For the last decade, Ghana's education authorities have embarked on a number of projects to introduce (ICTs) into the Ghanaian education set up; specifically at the basic and senior high school levels. The government of Ghana with the collaboration of Non-Governmental Organizations (NGO), philanthropists and Parent-Teacher Associations (PTAs) built ICT resource centres to help the teaching ICT as a core subject which is mandatory for senior high school students to learn.

Although there is large amount of literature on the importance and challenges on use of ICT, after reviewing literature, it was found out that there is less studies that focus on the challenges which exist specifically on the teaching of ICT as a core subject for developing countries. Therefore, this study looks at challenges undermining the teaching of ICT as a core subject in Senior High Schools in Ghana to fill the research gap. Researching into the challenges undermining the teaching of ICT in senior high school in Ghana is very important to the fact that the results could provide practical and realistic ways of enhancing the teaching of ICT and promote the general use of ICT in all endeavours.

Main Objective of the Study

The main objective of the study was to assess challenges undermining the teaching of ICT as a core subject in Senior High Schools in Ghana: a case study of selected schools in Kumasi Metropolis

Specific Objectives

These were the specific objectives to guide the study:
1. To examine the effect of the introduction of ICT into the school curriculum on Senior High School students.
2. To ascertain teachers' perception on implementation of the introduction of ICT into the Ghanaian Senior High School Curriculum
3. To assess the challenges facing the implementation of the introduction of ICT into the Ghanaian Senior

High School Curriculum

Research Questions

1. What are the effect of the introduction of ICT into the school curriculum on senior High School students?
2. How do teachers perceive the implementation of the introduction of ICT into the Ghanaian Senior High School Curriculum?
3. What are the challenges facing the implementation of the introduction of ICT into the Ghanaian Senior High School Curriculum?

Literature Review

ICT is an abbreviation which stands for Information and Communication Technology. Information Communication and Technology (ICT) is a generic term with several meanings. In order to realize a vivid definition of what ICT is, the following definitions provided by UNESCO (2003) can be used as a guide:

- Information technology [IT] is the term used to describe computer hardware and software which are used "*to access and retrieve information, and store, organize, manipulate and present*" it by electronic means. While the items of equipment such as personal computers, scanners and digital cameras are included in the hardware category, database storage and multimedia programs take place in the software category.
- Communication technology [CT] is the term applied to describe telecommunications tools which are employed to seek and access information, such as phones, faxes, modems and computers.
- Information literacy implies the composition of knowledge, understanding, skills, and attitudes that individuals need to have in order to completely contribute as members of society in the information age.

Information and Communication Technologies (ICTs) may refers to systems for producing, storing, sending and retrieving digital files (Bartlett, 2002). These files can contain text, sounds and images, both still and moving. Information and communication technologies, and particularly the Internet, are transforming all human activities dependent on information, including those in rural areas. It includes computers, radio, television, mobile telephony, internet, networking and data processing capabilities and the software for using these technologies.

From the above definitions offered, ICT can be implied as an umbrella term that embraces all technologies for the operation and communication of information; it is the overlap of computer information and telecommunication technologies, and their uses. Therefore, ICT offers more than just computers, but any technology involved in communicating such as software, CD-ROMs, the Internet, television and radio, image capture devices including still and video cameras, sending, data logging and control apparatus, and other equipment, for example even using a video recorder (Alsop & Hicks, 2001). Information and communication technologies are information usage tools that are employed to create, store, and process, distribute and exchange information. These diverse tools are now able to function together, and come together to form networked world which spreads into every angle of the world (UNDP Evaluation Office, 2001).

The use of Information Communication Technology (ICTs) in Ghanaian schools and African countries is commonly increasing and vividly increasing. ICT can be used to build up student's ability to produce solutions in their learning, communication and cooperation .ICT can be used to access global knowledge and interconnect with other persons since it is an electronic based system of information transmission, reception, processing and retrieval, which has considerably transformed the way people think, the way people live and the location in which folks live (Ogunsola, 2005).

According to Haroon, 2009, the introduction of ICT in Senior High School curriculum has brought the following effects on students:

- Increasing computer awareness among students.
- Teaching and Learning has been made much easier with the use of ICT in schools.
- Students with high IQ can now find something to engage them meaningfully instead of indulging themselves in some social vices.
- Educational institutions have economic network with other organizations.
- There is keen and healthy competition among schools in ICT knowledge sharing.
- ICT at the school level sets the basis for further training in the Universities and Post Sec. Institutions

ICT as a core subject in Senior High Schools can bring countless positive effects on the classroom, teaching and learning practice comprising posing prospects for more learner centred teaching. The ICT can be used to improve the competence, approachability and quality of learning process by empowering increased access to knowledge, more collaborative as well as interactive learning methods. Fruitful and positive integration of ICT's in school curriculum will play a crucial role in disseminating skills to broader people, increase quality of curriculum and build progressive effects on the national economy. Information and Communications

Technology when efficiently integrated into teaching and learning ensures interaction between learners and teachers, consequently progressing cognitive skills development.

Most ICT experts have the belief that there should be no interrogation on whether technology should be used in educational institutions but emphasis should be on ensuring that technology is used meritoriously to create new prospects for learning and to promote student learning. Owing to the importance of ICT in Education, the Ghana's Ministry of Education has been facilitating the process of integrating ICT in the educational system because this will facilitate Teaching and learning at all levels of education.

There are many factors identified as challenges to the teaching of ICT as a core subjects in senior High Schools. According to Fugluu, 2009, inadequate trained personnel to handle the facilitation of the subject, inadequate supply of teaching and learning materials, lack of Infrastructure, lack of administrative support, lack of power supply in the rural areas, the lack of internet connectivity in most schools to broaden access to information, high cost of ICT services and components and the brain drain syndrome in the area of ICT professional are the major factors affecting the teaching of ICT in most Senior Schools in Ghana. Teachers' lack of knowledge and skills; insufficient number of computers and ICT infrastructure; and difficulty in integrating ICTs instruction in classrooms.

In related a study, Ely (1993), posited the factors negating the teaching of ICT in schools include among lack of sufficient ICTs infrastructure, access to a consistent supply of electricity is a broad-spectrum problem but is predominantly austere in peri-urban regions because of power crisis the nation is facing currently. There is a common lack of human resource capacity to provide ICT training and equipment servicing, and there is a gap between the availability of ICT infrastructure and the capacity to integrate it in the educational system.

Methodology

The study engaged a case study design which allowed the realization of an in-depth investigation of the study constructs. The population of the study comprised of heads of senior high schools, the teachers teaching ICT in senior high schools in Kumasi Metropolis. The study used convenience and purposive sampling technique to select 80 respondents comprising of 10 headmasters and mistresses, 10 assistant headmasters and mistresses and 60 ICT teachers from 10 selected senior high schools in the Kumasi Metropolis. Questionnaire was the main instrument used purposely for data collection. Structured and unstructured items were included in the questionnaire. The data attained from the field was prepared, edited to guarantee fullness, unambiguousness and reliability, and coded according to research objective for analysis. Both descriptive and inferential statistics were computed by the use of the Statistical Package for the Social Sciences (SPSS) version 19 for windows.

Presentation of Results and Discussion

Eighty respondents were selected to the study and questionnaire was given to them. All the 80 questionnaire were retrieved from respondents thereby recording 100% return rate.

Table1: Demographic characteristics Respondents

Variable	N=80 Frequency	Percentage
Gender		
Male	62	77.5
Female	18	22.5
Respondents' Age		
21-30 years	8	10
31-40 years	32	40
41-50 years	18	22.5
Above 51 years	22	27.5
Marital Status		
Single	20	25
Married	60	75
Educational Qualification		
Degree holders	50	62.5
Master's holders	24	30
Other	6	7.5

Source: Field Survey, 2015

According to Table 1, regarding the gender of the respondents, 62 (77.5%) of the respondents were males whereas 18 (22.5%) of the respondents were female. This result finding support available research that the formal sector of the Ghanaian economy is mainly dominated by male. In term of the respondents' age, those within the ages of 31-40 were 32 representing 40% of the respondents, those above 51 years were 22 representing 27.5, and respondents within the ages of 41-50 years were 18 constituting 22.5% whereas those

within 21-30 years were 8 constituting 10% of the respondents. Regarding the marital status of the respondents, 60 (75%) were married whiles 20 (25%) were single.

On the subject of the educational qualification of the respondents, majority of the respondents representing 62.5% were degree holders, 30% of the respondents were master's degree holders and those with other professional certificate were 7.5%.

Table 2: Effect of the Introduction of ICT into the School curriculum

Variable	Strongly disagree	Disagree	Undecided	Agree	Strongly Agree	Total
Student ability to learn	0 (0)	0(0)	0 (0)	0(0)	80 (100)	80 (100)
Student's interest in ICT	0 (0)	0(0)	0(0)	0(0)	80 (100)	80 (100)
ICT Knowledge Sharing	0 (0)	0 (0)	0 (0)	0 (0)	80 (100)	80 (100)
Teaching Enhancement	0 (0)	0 (0)	0 (0)	0(0)	80 (100)	80 (100)
ICT skills development	0 (0)	0(0)	0 (0)	0(0)	80 (100)	80 (100)
Compete globally	0 (0)	0 (0)	0 (0)	0 (0)	80 (100)	80 (100)
Access to communication	0 (0)	0(0)	0 (0)	0 (0)	80 (100)	80 (100)

The figures in parentheses are the percentages
Source: Field Survey, 2015

Respondents were asked questions concerning the effect of the introduction of ICT into the senior high school curriculum. All the respondents (100%) strongly agree that the introduction of the ICT into school curriculum has promoted the students; ability to learn. All the respondents strongly agree that the introduction of ICT as a core subject has sustained students" interest ICT.

Again all the respondents (100%) strongly agree that the introduction of ICT has created ICT knowledge sharing, facilitated teaching enhancement among students, ICT skills development among students, students produced can compete globally in terms of ICT application and has improved students access to communication respectively. This result findings confirms with what Ogunsola (2005) and Haroon, (2009) postulated that the introduction of ICT in Senior High School curriculum has brought enormous effects to the students.

Table 3: Teachers' Perception on Implementation of the Introduction of ICT

Variable	Strongly disagree	Disagree	Undecided	Agree	Strongly Agree	Total
Support ICT introduction	0 (0)	0(0)	0 (0)	0(0)	80 (100)	80 (100)
Timely Introduction	0 (0)	0(0)	0(0)	0(0)	80 (100)	80 (100)
Learner-teacher interaction	0 (0)	0 (0)	0 (0)	0 (0)	80 (100)	80 (100)
Cognitive skill development	0 (0)	0 (0)	0 (0)	0(0)	80 (100)	80 (100)
Practicability of ICT	0 (0)	0(0)	0 (0)	0(0)	80 (100)	80 (100)

The figures in parentheses are the percentages
Source: Field Survey, 2015

In connection with the teachers' perception on the implementation of the introduction ICT into school curriculum, all the respondents (100%) strongly agree that they supported the ICT introduction in schools curriculum and did strongly agree that the study of ICT was a timely introduction to help the students acquire the basic ICT skills and knowledge. Concerning the study of ICT leading to learner-interaction, cognitive skill development of students and practicability of ICT subject, all the respondents (100%) strongly agree with these questions respectively. Information and Communications. These result findings supported already existed literature on ICT making the assertion that when technology is efficiently integrated into teaching and learning, it ensures interaction between learners and teachers, consequently progressing cognitive skills development

Table 4: Challenges facing the Implementation of the Introduction of ICT into School curriculum

Variable	Strongly disagree	Disagree	Undecided	Agree	Strongly Agree	Total
Inadequate trained ICT teachers	0 (0)	0(0)	0 (0)	0(0)	80 (100)	80 (100)
Inadequate learning and teaching materials	0 (0)	0(0)	0(0)	0(0)	80 (100)	80 (100)
Lack of ICT infrastructure	0 (0)	0 (0)	0 (0)	0 (0)	80 (100)	80 (100)
Lack of constant supply of power	0 (0)	0 (0)	0 (0)	0(0)	80 (100)	80 (100)
High cost of internet connectivity	0 (0)	0(0)	0 (0)	0(0)	80 (100)	80 (100)
High cost of ICT equipment	0 (0)	0(0)	0 (0)	0 (0)	80 (100)	80 (100)

The figures in parentheses are the percentages
Source: Field Survey, 2015

On the subject of challenges facing the implementation of the introduction of ICT into Senior High School curriculum, all the 80 (100%) respondents strongly agree that inadequate trained ICT teachers, inadequate learning and teaching materials, lack of ICT infrastructure, lack of constant power supply, high cost of internet connectivity and high cost of ICT equipment do affect the effective implementation of the introduction of ICT into school curriculum respectively. These results findings further substantiate Fugluu (2009) research finding that there are countless factors challenging the teaching of ICT as a core subjects in senior High Schools.

Conclusion and Recommendations

Based on the study findings, the study concluded that knowledge and skills gained from the study of ICT in senior high schools will help students to use ICT in almost all their undertakings, teachers do support the implementation of the introduction of ICT into senior high school curriculum and there are many challenges negatively affecting the teaching of ICT as a core subjects in senior high schools in Ghana.

Recommendations

- The Ministry of Education and Curriculum Research Development Division of the Ghana Education Service who make available policy direction to schools should come together to address the challenges opposing the teaching of ICT as a core subject in senior high schools.
- There is the need to implement policy direction to deal with it issues such as provision of computer laboratories, staffing the laboratories with permanent technology assistants
- It is very imperative to offer all-embracing teacher professional development for ICT teachers and such capacity building programmes can be fashioned through online teacher professional training and frequent workshops.
- The Government's One Computer Per Child Policy which was formulated in 2006 must be executed fully to increase the interest students in ICTs to completely impact on the lives of students.
- ICT should be seen as an enabler, as a tool to benefit the entire of people and not only the educated elite.
- The quality of ICT into School curriculum should be continuously improved and this is aided by intensive and extensive use of ICT by both teachers and students.
- Parent Teacher Associations in the various senior high schools should support the implementation of the introduction of ICT into School curriculum.

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