Examination of Ghana's ICT in Education Policy within the Context of Globalization

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Abstract

The Information Communication Technology (ICT) in Education Policy was first drafted in 2003 as part of the general educational reforms in Ghana. The aim of the policy is to improve access, equity and quality education. It is also to ensure that all students acquire basic ICT skills and apply them not only in their studies but also in all aspects of life. Ghana has consistently ranked low in the International ICT development index despite several revisions of the policy. Factors that contribute to this development are not clearly known. The study looks at the current situation as regards the implementation of the policy within the context of globalization. The study seeks to inform debate on how best Ghana can take advantage of globalization and the 21ˢᵗ century information technologies revolution to efficiently implement the policy. It is premised on the ICT Unified Theory of Acceptance and Use of Technology (UTAUT) that is used widely to explain information system usage. The method adopted in the study is meta-analysis. Relevant research articles, policy papers and education sector performance reports are re-examined in the light of global ICT trends to provide a clearer picture of the status of ICT development within the education sector. Evidence found suggests that not only is the implementation of the policy bedeviled with infrastructural and human resource challenges, but also low level of commitment from relevant stakeholders. The study also found that for Ghana to take advantage of opportunities offered by globalization, issues of information and communication technology must be taken seriously. It is therefore recommended that the National Information Technology Agency (NITA) in collaboration with the Government and other relevant stakeholders should

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set up National ICT in Education Commission with specific focus to strengthen the capacity of educational institutions to implement the ICT policy. Ghana must also move away from dependence on foreign assistance by setting up National ICT in Education Fund that will carter for the infrastructural needs of all public institutions. It is also recommended that ICT education must be an integral part of teacher education programs and should form part of requirements for the licensing of professional teachers. There is also the need for a new form of orientation for students and teachers as regards the benefits of ICT education so as to whip up their interest and enthusiasm in ICT education.

Introduction

The Government of Ghana is committed to the provision of quality, equitable and accessible education to its citizens. This commitment is clearly demonstrated in the number of policy initiatives the Ministry of Education has formulated in the past decade. One of such strategic policy initiatives is the ICT in Education Policy. Efforts to formulate the ICT in Education Policy in Ghana started formerly in 2003 as part of the Anamoah-Mensah Educational Reforms. One major recommendation of the committee was to ensure that all students in pre-tertiary institutions in Ghana acquire basic ICT literacy skills (including internet use) and apply these not only in their studies but also in a variety of ways in their everyday life activities (CRDD, 2007a, 2007b, & 2007c). This recommendation led to the first drafting of the Policy documents in 2003. It was subsequently revised in 2006 and 2008. The Ministry of Education promulgated the revised policy document in 2009 for implementation. The policy builds on the Ghana ICT for Accelerated Development (ICT4AD, 2003), that aims to transform Ghana "into an information -rich knowledge-based and technology driven high income economy and society" (MoE, 2015). The policy seeks to utilize ICTs4 in relation to equitable access, quality, science and technology, educational management and labour market needs, especially skills for the 21st century.

The Government of Ghana in a number of initiatives both nationally and internationally has demonstrated commitment as regards the implementation of the ICT in Education Policy (ESPR, 2016; ESPR, 2011; ESPR, 2010; ESPR, 2009). In 2006, Ghana participated in sub-Saharan countries'

education ministries meeting in which a ten-year development plan was adopted to ensure that the teaching and learning of science and technology underwent reforms (African Union, 2006). The plan recommended teaching methods that draw links between science and technology on one hand and the learner's culture and environment on the other (Agyei, 2013). The Ministry of Education also formulated the one lap top per student policy (Education Sector Performance Report, 2010). Under the project, one thousand laptops were made available to thirty primary schools (three in each region) across the country (ESPR, 2010). Sixty thousand (60, 000) laptops were also purchased for 2,500 junior high schools in Ghana (ESPR, 2012).

Despite this level of commitment, available research (Yidana & Buabeng, 2015; Adebi-Caesar, 2012; Boakye and Banini, n.d; Ampofo, et al., 2014) indicates that ICT development in the education sector is still at the rudimentary state. Again, Ghana's participation in the international ICT development index revealed that the country ranked on different measures between 100th and 140th out of 154 countries surveyed (International Telecommunication Union, 2009). In 2016, out of 175 countries, Ghana placed 112th in the global ICT development index (International Telecommunication Union, 2016). This marked a drop from the 2014 figure of 123rd (International Telecommunication Union, 2014). Strangely, this happened after the policy was revised in 2009. It appears that Ghana compared with other countries still lags behind when it comes to the development of information communication technology. This study seeks to examine the current situation of the policy and its implications within the context of globalization. Why does Ghana consistently score low marks on the global ICT development index? What is the current situation of the ICT in education policy in the context of global trends in the field of ICT? How can Ghana turn the current situation into future prospects? By analyzing the current situation, this study seeks to inform debate on how best Ghana can take advantage of globalization and the 21st century information technologies revolution to efficiently implement the ICT in education policy. Most importantly, the study seeks to inform stakeholders and decision makers of what situation exists within educational institutions as they relate to the implementation of the policy. The study adopted the meta-analysis approach to get the results. Research articles, policy papers,

examples from other countries and education sector performance reports were critically analyzed. Suggested possible ways of improving upon the way the ICT policy is being implemented in Ghana are then proffered.

The Theoretical Framework for the Study
Theories or models for examining factors that influence Information and Communication Technology (ICT) Education have been identified by researchers around the world. These theories include the Theory of Reasoned Action, Theory of Planned Behavior, Technology Acceptance Model (TAM) and Unified Theory of Acceptance and Use of Technology.
The Theory of Reasoned Action (TRA) is used in communication discourse as a theory of understanding. It was developed by Martin Fishbein and Icek Ajzen in 1967 and was derived from previous research that began as the theory of attitude. The theory aims to explain the relationship between attitudes and behaviors within human action. TRA is used to predict how individuals will behave based on their pre-existing attitudes and behavioral intentions. An individual's decision to engage in a particular behavior is based on the outcomes the individual expects will come as a result of performing the behavior. The ideas found within the theory of reasoned action have to do with an individual's basic motivation to perform an action. TRA says that a person's intention to perform a behavior is the main predictor of whether or not they actually perform that behaviour. The theory was, however, criticized because not all behaviours are as a result of pre-existing attitudes.

Due to some criticisms against the theory of reasoned action, Icek Ajzen proposed another theory called the Theory of Planned Behaviour to improve on the predictive power of the theory of reasoned action. In this theory, Icek included perceived behavioral control. The theory states that attitude toward behavior, subjective norms, and perceived behavioral control, together shape an individual's behavioral intentions and behavior.
Davis (1989) developed the Technology Acceptance Model which deals more specifically with the prediction of the acceptability of an information system. He contends that the use of an information system is determined by the behavioral intention, but on the other hand, the behavioral intention is determined by the person's attitude towards the use of the system and also by his perception of its utility. The purpose of his model is to predict the

acceptability of a tool and to identify the modifications which must be brought to the system in order to make it acceptable to users. The model suggests that the acceptability of an information system is determined by two main factors: perceived usefulness and perceived ease of use.

Perceived usefulness is defined as being the degree to which a person believes that the use of a system will improve his performance. Perceived ease of use refers to the degree to which a person believes that the use of a system will be effortless. Several factorial analyses demonstrated that perceived usefulness and perceived ease of use can be considered as two different dimensions (Hauser et Shugan, 1980; Larcker et Lessig, 1980; Swanson, 1987).

Agyei (2013) explains that TAM proposed by Davis (1989) seems to be one of the most popular theories that is used widely to explain information system usage due to the advantages it has over the other two theories. According to Davis, the attitude of an individual is not the only factor that determines his use of a system, but is also based on the impact which it may have on his performance. Therefore, even if an employee does not welcome an information system, the probability that he will use it is high if he perceives that the system will improve his performance at work. Besides, the Technology Acceptance Model hypothesizes a direct link between perceived usefulness and perceived ease of use. With two systems offering the same features, a user will find more useful the one that he finds easier to use (Dillon and Morris, on 1996).

In spite of its popularity, many studies (Moon & Kim, 2001; Venkatesh & Davis, 2000) have recommended changes in the originally proposed model due to its limitations. TAM has been widely used to scrutinize individual technology acceptance behavior along only two factors: perceived usefulness and perceived ease of use. Thus, just like most of the other theories, the major limitation of TAM lies in its weakness to include other important factors such as system characteristics, user training, user participation in design, nature of the implementation process, etc. in the model (Agyei, 2013). Groff and Mouza (as cited in Agyei, 2013) added critical factors such as legislative level factors, district and school level factors, factors associated with students and teachers, factors inherent to the

technology itself, and factors associated with the technology-enhanced project. These factors were originally not included in the TAM theoretical analysis.

Based on the criticisms and recommendations, the Unified Theory of Acceptance and Use of Technology (UTAUT) was formulated by Venkatesh (2003) as a solution to the problems inherent in the Technology Acceptance Model. The UTAUT aims to explain user intentions to use an information system and subsequent usage behavior. The theory holds that there are four key constructs: 1) performance expectancy, 2) effort expectancy, 3) social influence, and 4) facilitating conditions.
The first three are direct determinants of usage intention and behavior, and the fourth is a direct determinant of user behavior. Gender, age, experience, and voluntariness of use are posited to moderate the impact of the four key constructs on usage intention and behavior. Subsequent validation by Venkatesh et al. (2003) of UTAUT in a longitudinal study found it to account for an impressive 70% of the variance in Behavioral Intention to Use (BI) and about 50% in actual use.

In this study, the Unified Theory of Acceptance and Use of Technology (UTAUT) is used due to the advantages it has over the other theories. It encompasses all the determinants of usage of technology and also highlights the features of the previous theories. The theory is applied to analyze the current situation as regards the implementation of the ICT in education policy along the following lines:
1. Commitment of relevant stakeholders to the implementation of the policy.
2. Availability of ICT resources, infrastructure, including computer hardware, software, and communication network.
3. Availability of Trained ICT teachers and other supporting staff.

This study also takes into account the factors that affect ICT policy implementation as was proposed by Groff and Mouza (as cited in Agyei, 2013).

Commitment to Implement Educational Policies

Successful implementation of educational policies depends on the commitment of relevant stake holders such as the government, educational authorities, teachers, students and parents. Ahmad, Rauf and Zeb (2012) argue that attitudes and dispositions of public is one of the key factors that affect implementation processes. He, for instance, explains that bureaucratic underpinnings by educational authorities have placed more pressures on the teachers' community in Pakistan. This trend has given rise to feelings of alienation among the teachers. He went on to say that the attitude and disposition of supervisors sometimes promotes a sense of discrimination among the teachers. This leads to demonization of the supervisors and de-motivation of the teachers. In the view of Ahmad (1993), in education system, use of power, developing relationship and keeping expectation depends to a large extent on the disposition of the implementers toward educational policies. Ghaffar (1992) narrates that unless and until there is an efficient bureaucratic structure along strong professional knowledge, the problem of implementation of educational policies will remain unresolved despite having clear communication, resources and positive disposition. He further argues that organization where there is fragmentation hinders effective coordination which is necessary for policy implementation because it may result in wastage of resources, block the pace of smooth change and in overlooking of some of the important actions necessary for policy implementation. Shahid (2003) opines that there are some other chronic factors which have hindered smooth policy implementation of ICT policies in Pakistan. These are not only related to implementation but also related to policy makers and the overall environment where the policies are formulated and implemented. In Pakistan, due to none or less participation of local implementers such as school principals, teachers and students, ownership factor of the policy becomes weak. Jatoi (1995) believes that success of implementation of a policy depends largely on the political will of the policy makers and policy implementers alike.

Availability of Resources

Availability of resources such as infrastructure, including computer hardware, software, and communication network is a key determinant of the success of ICT education. Mankoe (2006) is of the view that successful implementation of educational policies depends on the availability of

resources. He argues that programs designed under policies require resources for their implementation. Such resources include funds and incentives which are usually inadequate- a cause he says often lead to failure of implementation efforts. Indeed, funds are needed to procure tools, equipment and facilities to set up computer laboratories.

Availability of Trained Teachers

Teachers' ICT skills and access to professional development play a significant part in implementation of ICT in schools (Mingaine, 2013). Unfortunately, in many African countries, lack of well-trained teachers and low levels of teacher's ICT skills and knowledge has been recognized as a major obstacle in implementation of ICT in schools (Dzidonu, 2010). For efficient implementation of ICT in schools, there should be adequate personnel that have correct skills. Where such skills are missing, it would be difficult to fully implement the technology in schools.

Research Questions

The purpose of this paper is to provide arguments to better understand the status of implementation of the ICT in education policy within the context of globalization. The study was guided by the following questions:

1. What is the level of commitment of relevant stakeholders in the implementation of the ICT in education policy?
2. What is the level of availability of resources to implement the ICT vin education policy
3. Are trained ICT teachers and other staff available to implement the ICT in education policy?

Data Collection and Analysis

The study adopted the meta-analysis method to collect the data. Meta-analysis means analysis of analyses. It is the examination of a large collection of findings from individual studies for the purpose of integrating the findings. (Glass, 1976) explains that it is a rigorous alternative to the casual, narrative discussions of research studies which typify an attempt to make sense of the rapidly expanding research literature. Although a few researches regarding ICT in education have been conducted in Ghana, it is becoming increasingly difficult to understand what these research results tell us as they accumulate (Agyei, 2013). On the basis of this, the meta-

analysis method was deemed appropriate to provide a focus on contrasting and combining results from the different studies, in the hope of identifying patterns among study results, sources of disagreement among those results, or other interesting relationships that may come to light in the context of multiple studies. The researcher collected data from reputable research studies, policy papers, education sector performance reports and previously published meta-analyses or synthesis of several studies including policy documents and curriculum materials. The analysis focused on studies that addressed issues of the level of commitment on the part of all stakeholders, availability of ICT resources, availability of trained human resources as well as teacher preparedness to implement the policy. The criterion for selecting the meta-data was mainly purposive focusing on ICT in education-related studies conducted in Ghana; however, studies from European countries and the United States were used to support the literature review provided it could be assumed that the arguments were relevant in the Ghanaian context as well.

Results

From the meta-analysis and the literature review discussed in this study, the following issues associated with implementation of the ICT in education policy are re-examined with a focus on achieving a better understanding of the future of ICT attainment in Ghana.

Commitment of Relevant Stakeholders

The Government of Ghana since the promulgation of the policy has demonstrated some level of commitment in the implementation of the policy. To facilitate the implementation of the policy and create a critical mass of interest in ICT as an important subject in Ghana's education curriculum, the treatment of ICT at all levels of the school system became significant. To this end, ICT is being offered as a subject of study in primary, junior high and senior high schools in the country (MoE, 2015): The content of the ICT general courses at all levels and the Information & Communication Technology course at the senior high school is determined by the Curriculum Research and Development Division, in collaboration with the requisite accreditation bodies including the universities and polytechnics to ensure acceptability and admission as the requisite. The Ministry of Education also formulated the one laptop per student policy

(Education Sector Performance Report, 2010). Under the project, one thousand laptops were made available to thirty primary schools (three in each region) across the country (Education Sector Performance Report, 2012). Sixty thousand (60, 000) laptops were also purchased for 2500 junior high schools according to the report. The Education Sector Performance Report (2012) further indicates that at the secondary level, it would appear that Ghanaian second cycle institutions are well equipped with 87% reporting as having a computer laboratory. However, e-readiness assessment by the Ministry of Education suggests that the number of functioning computers in the system was only 56.92%. The student-computer ratio at the national level was at 42:1 with the Northern Region recording the worst (50:1). Of the five- hundred and one (501) second cycle schools, one hundred and eleven (111) had local area networks in place while three hundred and ninety (390) did not. Only eighty-nine (89) representing 19.7% of the total number of schools had internet with eighty of them being urban or semi-urban. Further analysis revealed that only 8.3% of the total number of computers in the system was connected to the system.

A strong teacher development programme was also instituted to create the mass of professionals to handle the programme. The Education Sector Performance Report of 2010 suggests that 97.4% of the schools did have ICT teachers, though the distribution of these was not equitable among the schools, with 2.6% of the schools not having ICT teachers. Furthermore, 68.8% of the schools had professional ICT teachers while the remaining 31.2% did not have professional teachers teaching the subject (ESPR, 2010).

Research findings by Ampofo, Bizimana, Mbuthi Ndayambaje, Ogeta, and Aluko (2014) appear to throw more light on the level of government's commitment to the implementation of the ICT in education policy. Their findings in three countries (Ghana, Kenya and Rwanda) show the existence of political awareness and will to make ICT a transformative and economic tool. They also found that practically on the ground, educational institutions and their stakeholders had already embraced ICT and their actions were portrayed in the progressive efforts to avail required basic ICT infrastructure and future roadmaps of the targets to hit. It was also noted that Rwanda was taking the lead in the achievements in ICT. It was evident that Ghana was

one of the three countries experiencing inadequate funding to put in place the appropriate tools and infrastructure. Low level of ownership and sustainability of ICT projects were also identified as some of the predicaments of ICT education in Ghana. The political will as demonstrated by Government to implement the ICT policy is in line with Jatoi's (1995) suggestion that political will is what is needed to smoothly implement educational policies. This will must, however, be improved upon through sustainable funding to make the policy implementation smoother.

Commitment of other stakeholders, however, appears to be low. Available research studies (Yidana & Buabeng, 2015; Adebi-Caesar, 2012; Boakye & Banini, n.d.) conducted to investigate issues relating to the level of commitment of relevant stake holders reveals that much commitment has not been demonstrated. Yidana and Buabeng (2015), for instance, investigated secondary school students' perceptions' and ICT usage. A total of 3,380 students from 24 public and private schools from four regions in Ghana participated in this study. Descriptive statistics and analysis of variance were used to analyze the findings. The study revealed that students' ICT usage to support learning was low. In a related study, Obiri-Yeboah and Kyere-Djan (2013) investigated factors affecting ICT adoption in tertiary institutions in Ghana. The study showed that perceived usefulness and ease of use is a primary factor driving ICT adoption. The study also revealed that ICT is not fully integrated in teaching, research and learning at KNUST. A major obstacle discovered was that though most users were aware of the potential benefits, they were not ready or willing to fully embrace ICT. Several factors were also identified including inadequate infrastructure and skills to use ICT. The results are consistent with the findings of Yeboah et al. (2013). The authors carried out an analytical study of ICT use in Ghanaian public universities. The findings revealed that in spite of the huge investment in ICT infrastructure by the universities in Ghana and other Internet Service Providers (ISPs) in order to bridge the digital divide, universities in Ghana were still distanced from the global village because they did not have the passion strategies to tap the maximum resources of ICT for the socioeconomic development of the country. Firstly, ICT projects were found not moulded to the local situation in the universities. Secondly, the lack of ownership of technology was the cause of ICT project failure in the universities in Africa. Also, the lack of the right

ICT products which were not designed to meet the needs of the university students and lecturers can become a challenge to access to ICT related products. Furthermore, the lack of adaptation of ICT resources for SEN learners in the Ghanaian universities was also found to be a reason for their absence from ICT revolution. Bonsu, Duodu, Ansere and Djang-Fordjour (2013) investigated the challenges and prospects of ICT in teaching and learning in Sunyani Polytechnic, Ghana. The findings revealed minimal adoption of ICT in teaching and learning at Sunyani Polytechnic. The study makes recommendations that would enhance ICT uptake and adoption when implemented.

It is clear from the results of the analysis that the four key constructs as proposed by Vnekatesh in his Unified Theory of Acceptance and Use of Technology (UTAUT), namely performance expectancy, effort expectancy, social influence, and facilitating conditions all come into play when it comes to the commitment of the relevant stakeholders in the implementation of the ICT policy. Government may show the political will by pumping in the needed resources, but if the conditions in the various institutions such as the readiness of both students and lecturers do not march the efforts of Government, implementation will likely not yield the needed results. Lack of ownership of ICT projects in Africa as found by Obiri-Yeboah & Kyere-Djan (2013) is an important social influence according to Vnekatesh in his Unified Theory of Acceptance and Use of Technology (UTAUT). Great effort must be shown by all relevant stakeholders to embrace change. Again, district assemblies and other development partners need to complement the effort of Government to make the ICT in education objectives a reality.

Availability of Infrastructure
Data from the analysis shows that the country still lags behind in terms of ICT infrastructure. Peprah (2016), for instance, evaluated the challenges associated with the teaching and learning of ICT in basic schools in Atwima Nwabiagya District in Ashanti Region. The study adopted case study design and a mixed method of data collection. In all, a total of 512 were recruited to be part of the study. The study revealed that there was lack of computers, unqualified teachers, limited practical after teaching as well as lack of internet in the schools studied. Peprah's report was corroborated by Owusu-Ansah (2015). The researcher investigated the impact of Government's one

laptop per child policy on teaching and learning. Specifically, 500 students were randomly selected together with 10 information and communication technology (ICT) instructors in the Eastern Region of Ghana. Both questionnaire and in-depth interviews were used for gathering data. The data collected were analyzed using Statistical Package for Social Science (SPSS). The results indicated that lack of infrastructure, power supply and qualified tutors were notable challenges that hindered the attainment of the goals of the policy in the schools investigated. This is sharp contrast to Government's report that one thousand 1000 laptops were made available to thirty primary schools (three in each region) across the country and sixty thousand (60, 000) laptops were also purchased for 2,500 junior high schools in Ghana (Education Sector Performance Report, 2012). In his contribution to the ICT literature, Agyei (2013) carried out analysis of technology integration in teacher education in Ghana. Evidence found suggests non-availability of technological resources to support the implementation of the ICT policy. Adebi-Caesar (2012) assessed whether ICT tools were really used to assist and enhance students' knowledge in the teaching and learning process in four schools in the Lower Manya-Krobo District of the Eastern region. A total sample of 154 teachers took part in the study. The study revealed inadequate ICT infrastructure to support the teaching of ICT in the schools studied.

Davis (1989) in his Technology Acceptance Model suggests that the acceptability of an information system is determined by two main factors: perceived usefulness and perceived ease of use. Perceived usefulness is defined as being the degree to which a person believes that the use of a system will improve his performance. Perceived ease of use refers to the degree to which a person believes that the use of a system will be effortless. ICT is perceived to be useful in Ghana. Nevertheless, as indicated in the findings, the ease with which ICT can be used in the teaching and learning business depends on the availability of power supply, computer soft wares, laboratories and the right caliber of teachers.

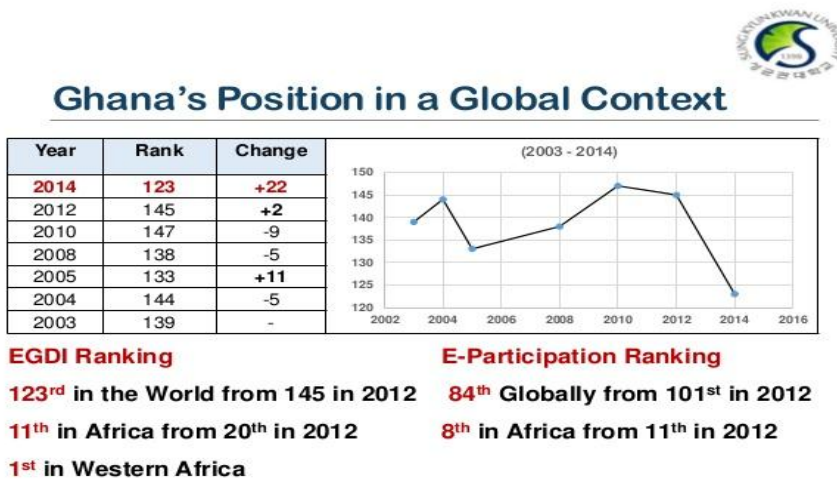**Availability of Trained ICT Teachers**
Teachers are the main implementers of the ICT policy. In order to make an implementation succeed, "the people who will ultimately use the innovation must possess sufficient knowledge and skills to do the job" (Ely, as cited in Agyei, 2013). Findings from research carried out in Ghana indicate that

much has not been done to get professionally trained ICT teachers to implement the policy. Adebi-Caesar's study in the Lower Manya-Krobo District cited above indicated that most of the teachers lack training and knowledge in computer usage. Boakye and Banini (n.d) investigated teachers' readiness for the use of ICT in Ghanaian schools. Their findings came from research that employed the case study approach, with schools and classrooms as cases, in which both quantitative and qualitative data were gathered to understand the use of ICT in the selected schools. From the findings, the researchers concluded that teachers did not seem prepared to integrate ICT in their teaching practices. Again, at the July session of the Northern ICT for development series held in Tamale in July, 2009, Alhaji Mohammed Haroon, a director at the Tamale Metropolitan Education Office identified the lack of ICT- trained teachers as one of the challenges facing the implementation of the introduction of ICT into the Ghanaian school curriculum. Amenyedzi et al. (2011) in their contribution to the literature, conducted a study in Tema metropolis to assess the computer and internet usage as supplementary educational material to enhance quality education; help improve educational management and planning; how students use the computers and internet to facilitate their learning. The stratified sampling method was used to select students and teachers. The results showed that one-fourth of teachers had received some form of training in the use of computers, with quite minimal training in the pedagogical integration of ICT. Agyei (2013) also undertook a meta-analysis of ICT integration in the Ghanaian educational system and reported that the ICT teachers had only basic ICT skills: basic knowledge in application software such as word processing, spreadsheet, internet, and a presentation application, and this is the focus of ICT courses they teach. He lamented that the integration of ICT as a teaching tool for all subject areas was not a common practice because ICT teachers did not have the levels of competence (pedagogical combination with technological skills) to enable them to use ICT tools and equipment in the teaching and learning process. This contention was corroborated by a number of studies (Agyei, 2012; Agyei & Voogt, 2011a; Mereku et al., 2009; MOE, 2009; Ottevanger, van den Akker & de Feiter, 2007).

The above findings seem to suggest that most teachers are either not trained at all or they are ill-trained for a successful implementation of the ICT in

education policy. For Ghana to successfully implement the ICT in education policy, teachers are required to develop knowledge and skills that enable them to teach ICT as a subject with a suitable pedagogical approach or use their ICT knowledge and expertise to improve teaching and learning in the classroom. Ghana's position in the international ICT development index has consistently been low. Table 1 shows the results.

Table 1: Ghana's ICT Development Position in a Global Context

Source: UN E-Government Survey 2014, Lessons for Ghana.

How to turn these challenges into prospects in the globalized economy will depend on the level of commitment of both policy makers and implementing agents.

Implications of Findings in the light of Globalization
The findings indicate that Ghana has made significant strides in the implementation of Information and Community Technology Education Policy. Nevertheless, significant challenges such as infrastructure, human resources and low level of commitment still remain. Meanwhile, globalization is catching up with every aspect of life. What fuels globalization is information and communication technology. One feature of

globalization of particular relevance to education policies relates to the movement of ICT personnel, students and educational services across frontiers. International trade in education services was estimated to be more than US$ 30 billion in 2001(OECD, 2006) of which US $ 11 billion was earned by the USA and UK respectively and the largest per capita earnings was from Australia (US$ 2 billion). Distance learning and even virtual universities have become a reality. Larkai, Asare, Nuamah (2016) discussed Distance Education trends and patterns in enrolments in public universities and private distance learning institutions in Ghana. The analysis covers a seven-year period (2008/2009; 2014/2015) using data collated by the Planning Department of the National Council of Tertiary Education (NCTE). The trends show that University of Education, Winneba (UEW) and University of Cape Coast (UCC) together account for over 70% of all distance enrolment in public universities in Ghana. Distance enrolment has seen a 39.4% increase in the last two years. Graduate enrolment was 5% of total distance enrolment over the last seven years. Kwame Nkrumah University of Science and Technology (KNUST) enrolls 85% of all graduate distance students. Learning is more often taking place in informal and non-formal settings than previously. The efficiency of the learning process can be improved with the integration of ICT into the teaching and learning process. For example, ICT is making it possible to conduct large sets of laboratory experiments in a short period of time which in the past customarily took a very long time. It is also now possible for millions of students to sit at home and take part in lectures taking place in any part of the world. The speed with which knowledge is transmitted and diffused is also vastly increased.

Schools can now use a diverse set of ICT tools to communicate, create, disseminate, store, and manage information. In some contexts, ICT has also become integral to the teaching-learning interaction, through such approaches as replacing chalkboards with interactive digital whiteboards, using students' own smartphones or other devices for learning during class time, and the "flipped classroom" model where students watch lectures at home on the computer and use classroom time for more interactive exercises. When teachers are digitally literate and trained to use ICT, these approaches can lead to higher order thinking skills, provide creative and individualized options for students to express their understandings, and

leave students better prepared to deal with ongoing technological change in society and the workplace.

Proper integration of information and communication technology into the teaching and learning process can attract more foreign students some of whom may want to school through the distance learning approach. These trends have major implications and challenges for the modernization of the Ghanaian educational system through ICTs to improve the quality of education and training so as to attract more foreign students that will earn the country more foreign exchange.

Policy Response in the Light of Current ICT Challenges and Global Trends.

The challenges that bedevil the smooth implementation of the ICT policy in the light of global trends call for policy responses in the following areas:

1. Information Communication Technology is changing the World and Ghana cannot be left behind. All stakeholders, namely Government, development partners, civil society organizations, educational institutions, students and parents must embrace the change process with a high level of commitment. Change is as much an emotional activity as it is practical. If all stakeholders are to 'own' the ICT in education policy they must be 'persuaded' that it is a good idea and they must become 'excited' about it. Some of this involves a cognitive understanding of the policy. Unless people regard the policy as something that they themselves can support, then all implementation efforts will likely be ineffective. Concerted effort must be made to convince all that ICT is the way to go.

2. The Government has done a lot in the implementation of the policy, but there is still more to be done. Government must do more to provide the needed ICT resources to schools to enable them effectively and efficiently implement the program. The one laptop per child policy should be vigorously pursued to enable every child own at least a computer that will enhance their learning of ICT. Schools which do not have computer laboratories should be assisted to get some. Most schools do not have power supply and that is seriously undermining the implementation of the ICT policy. Civil society and our development partners should join hands with the

Government to ensure that there is enough power supply in our educational institutions. Improvised measures such as use of solar and wind to generate power should be pursued as options.

3. Our teacher education policy must undergo serious reforms. Information and communication technology must be made to take prominence in all teacher education programs and must be a requirement for the licensure of all professional teachers. Ghana education service should provide continuous ICT education programs for subject matter teachers possibly through their various subject associations to be able to evaluate and use digital resources in the teaching/learning process.

4. In the wake of the technological revolution, the youth are becoming more glued to the use of phones of all types. Educational institutions can take advantage of this phenomenon to channel this growing interest in the use of phones to positive use. Students should be encouraged and taught how to use smartphones to do research and learning. Educational institutions can emulate the Accra Institute of Technology (AIT) example. AIT has adopted a learning management system called LEMAS that makes learning easier and effective for both its distance and regular students.

A learning management system (LEMAS) is a software application for the administration, documentation, tracking, reporting and delivery of educational courses or training programs (https://en.wikipedia.org/wiki/Learning_management_system).

They help the instructor deliver material to the students, administer tests and other assignments, track student progress, and manage record-keeping. LEMAS is focused on online learning delivery but supports a range of uses, acting as a platform for fully online courses, as well as several hybrid forms, such as blended learning and flipped classrooms. Students at AIT get free unlimited access to their lecture notes; lecture videos and audios for all courses they are registered on at AIT. These resources are provided via LEMAS – the Learning Management System. Registered students also use LEMAS to access past examination papers on all courses. Students are also able to access and upload their course assignments, course assignment grades and their mid-semester and end-of-semester examination grades. They also interact with their lecturers and

classmates through forums and messaging systems and access our extensive e-library resources. Students at AIT are not obliged to take notes in class since they have access to all their lecture notes and hand-outs at the beginning of the semester. No student at AIT purchases a single textbook during their entire studies at AIT; they have free access to all the e-books and other learning resources they need for the entire academic program (AIT Website). Public universities can emulate this example to enhance distance education programs

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