

Information and Communication Technology as a Means of Enhancing Education in Ghanaian Schools: Benefits, Challenges, and Recommendations



EDUCATION

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ABSTRACT

ICT integration into the school curriculum have become popular in the country's educational institutions. Even before the government of Ghana on the basis of the Anamuah-Mensah committee on education recommended ICT infusion into the educational system, there were extensive ICT integration attempts initiated by Parent/Teacher Associations, Old Students Associations, non-governmental organizations and some ICT related establishments. This indeed is a clear manifestation of how conscious Ghanaians have become about the importance of ICT in institutions of learning. Unfortunately, however, a close observation of the emergence of ICTs in Ghanaian Schools seems to lack definite goals for teaching and learning. The use of ICT in schools to enhance learning could help overcome some of the challenges of improving the efficiency and productivity of both teaching and learning in Ghanaian schools, thereby narrowing the digital divide.

INTRODUCTION

Information and communication Technology (ICT) has become an indispensable tool and has penetrated every facet of our life be it health, politics, social, culture, entertainment, education, etc. Prensky M.(2001) proposed that students in the 21st century are "Digital Natives". Thus it is assumed that students in the 21st century are more technologically inclined than predecessors. He also expressed concern that there is an apparent lack of technological literacy among teachers. He labelled lecturers in higher education as "Digital Immigrants"; and that there is the need to bridge the gap between Digital Natives and Digital Immigrants for a successful integration of ICT in education

The way and manner computer technology has revolutionized-how things are done in this modern world has led to the investment of millions of Ghana cedis at both government and school levels for the integration of computer technology into Ghana's educational curriculum. The power of ICT has brought a tremendous change to various aspects of people's lives. The use of ICTs in education should be more stressed in strategic policies of developing countries to train their youth to contend in this informative, knowledge and technological eras us to close the 'digital divide.' The digital divide is defined as the gap between those individuals who benefit from digital technology and those who do not.

THE CURRENT ICT PROFILE FOR GHANAIAN SCHOOLS

In 2004 Parliament passed into law Ghana's ICT for Accelerated Development (ICT4AD) policy, which is currently at various stages of implementation. This national policy outlines the plans and strategies for the development of Ghana's information society and seeks to provide a framework and plan as to how ICTs can be used to facilitate amongst other objectives the national goal of "transforming Ghana into an information and knowledge-driven ICT literate nation".

Ghana introduced ICT into the school curriculum in September 2007 following the recommendations of the ICT4AD document and the Anamuah Mensah National Education Review Committee Report (2002). Both documents highlight the importance of integrating ICT into the curriculum at all levels. As a result, the government and other institutions have invested huge sums of money in procurements of computers and establishment of computer labs in most schools, but it is still unclear whether these computers are being used effectively by teachers in their instruction.

Additionally, there has been several private sector initiatives to set up Community based ICT Centre's. These however have been largely confined to urban areas with few available examples of how they have been used to support educational objectives. E-READINESS ASSESSMENT by the Ministry of Education sug-

gests that the number of functioning computers in the system is only 56.92% and the student computer ratio at the national level is 42: 1 (i.e. forty two students to one computer). The Northern Region has the highest (worst) which is 50: 1 and Volta Region the lowest at 33: 1. The student computer ratio according to the regions is as follows:

Table 1: Student Computer Ratio

Region	Student: Computer Ratio	Region	Student: Computer Ratio
Northern	50:1	Western	41:1
Ashanti	48:1	Upper East	41:1
Upper West	48:1	Central	39:1
Brong Ahafo	44:1	Eastern	38:1
Greater Accra	43:1	Volta	33:1

From Table 1, it is quite evident that there are some disparities between most of the regions as regards ICTs, and that the Northern Region has the worst ratio in the whole of Ghana. According to the Education Sector Performance Report 2010, the Ministry of Education (MoE) has put in place a Deployment Plan that covers the different levels of the education structure in Ghana. The target is 1000 Community Learning Centres at the Primary Level and 2000 Community Learning Centres at the JHS while at the Second Cycle level the deployment will cover 496 SHS, 26 TVET and; 38 Colleges at the tertiary level.

Despite the increase in ICT tools in Ghanaian schools, most of the schools seem to be teaching ICT literacy instead of a complete integration of the ICT tools in the curriculum to enhance the teaching and learning process. Educational institutions in Ghana, in particular previously disadvantaged schools, face numerous challenges, such as the dwindling nature of power supply, and declining financial support from the government. This means that the introduction and integration of ICTs at different levels and various types of education is the most challenging undertaking. Failure to meet the challenges would mean a further widening of the knowledge gap and deepening of existing economic and social inequalities among the developed and the developing countries.

MEANING OF ICT INTEGRATION IN EDUCATION

ICT as described by Scott (2002) encompasses a range of applications, communications and technologies which aid information retrieval and research communication and administration. These include: Internet access, electronic mail, CD-ROMS, telephone, on line databases, library services and fax machines.

The term "ICT integration" connotes a range of learning environments from a stand-alone computer in a classroom to a situation where the teaching is done by the computer through

pre-packaged “teacher-proof courseware” (Laferrière, 1999, p. 3). To integrate is to seamlessly combine components, parts or elements into a complex but harmonious whole. The notion of seamlessness is implicit in the definition that ICT integration is the degree to which ICT “vanishes into the background” of the classroom (Fluck, 2003).

ICT integration basically refers to use of technology in communication, data processing and data storage to impact the knowledge on learners. ICTs help to achieve the goals of educational programs for several reasons. The benefits of ICT seem suitable for coping with the issue of basic literacy and technological literacy, even among the poorest population sectors. Computer Based Learning (CBL) and teaching makes learning more efficient and more interesting to learners thus improving the quality of education. The knowledge deepening approach has a greater impact on learning. Its policy goal is to increase the ability of learners, to add value to education. ICT offers increased possibilities for codification of knowledge about teaching and for innovation in teaching activities. Successful integration of ICT in education can lead to a number of benefits.

BENEFITS OF ICT USE IN EDUCATION

The integration of ICT into the curriculum of learners is of immense benefit to them. Firstly, exposure to ICT allows learners to develop skills that will give them an edge in an ever-increasingly technology-saturated work environment. Secondly, the introduction of ICT into the school curriculum allows learners to become creators of knowledge in their own right, for example through conducting research for a school project on the internet and then having to produce, say, a PowerPoint presentation. Furthermore, learners who continue to use ICT in doing their assignments and projects begin to cultivate a culture of personal information management, independent learning and working without supervision, communication skills, teamwork and research skills, which are highly valued in today’s global workforce. Some educational institutions do not even require students to be physically present. Virtual classrooms have flourished in tandem with improved internet accessibility. The significant barriers of time and distance are rendered almost obsolete in such virtual classrooms (Stennes 2008).

Tinio, a well-known author in the field of ICT in education, indicates the potential impact of ICT: ‘these ICT [tools] have been touted as potentially powerful enabling tools for educational change and reform’. Tinio points to the fact that ‘research done globally has shown that if ICT-supported education is used and implemented effectively, it can be used as a catalyst to promote and drive the acquisition of knowledge of learners’. This results in learners being empowered for lifelong learning, and the use of ICT helps to promote new ways of teaching and learning among both students and teachers.

Furthermore, the use of ICTs in education also shifts the learning approaches. As put by (Bransford, Brown, and Cocking, 1999) cited in Volman (2005), there is a common belief that the use of ICTs in education contributes to a more constructivist learning and an increase in activity and greater responsibility of students. This limits the role of the teacher to supporting, advising, and coaching students rather than merely transmitting knowledge. The gradual progress in using computers changes from learning about computers, to learning computers, and finally to learning with computers (Volman, 2005).

ICTs are exerting impacts on pedagogical approaches in the classrooms. Their contribution to changes in teaching practices, school innovation, and community services is considerable. A research review by Kozma (2005) suggests three significant concerns of consideration regarding ICTs impact on education. Firstly, student outcomes such as higher scores in school sub-

jects or the learning of entirely new skills needed for a developing economy. Secondly, we should consider teacher and classroom outcomes such as development of teachers’ technology skills and knowledge of new pedagogic approaches as well as improved attitudes toward teaching. Finally, one has to consider other outcomes such as increased innovativeness in schools and access of community members to adult education and literacy.

CHALLENGES TO THE USE OF ICTs IN GHANAIAN SCHOOLS

The integration of ICTs in education systems may face various challenges with respect to policy, planning, infrastructure, learning content and language, capacity building and financing. ICT-enhanced education requires clearly stated objectives, mobilization of resources and political commitment of the concerned bodies. Despite the desperate need for ICT integration in schools, there are a number of challenges that make it impossible to achieve this goal. Some of these challenges are discussed below.

One of the major challenges of ICTs integration in Ghanaian schools is availability of ICT infrastructure. From the Educational Sector Performance Report (2010), it stated clearly that one of the major challenges is the physical space to accommodate computers. The infrastructure challenges that may exist are absence of appropriate buildings and rooms to house the technology, shortage of electric supply and telephone lines, and lack of the different types of ICTs. Because of this, one needs to deal with infrastructure related challenges before the planning of ICTs integration to education systems.

With respect to challenges of capacity building, we have to develop competencies of teachers and school administrators for the successful integration of ICT in the education system. The Educational Sector Performance Report (2010), stated that over 70% of the teachers are computer illiterate. In a related study, Boakye, K.B., & Banini, D.A. (2008) revealed that, most teachers do not seem prepared to integrate ICT in their teaching practices. In fact, one impeding factor of ICTs integration in education systems is the skill gap of people implementing it (Tinio, 2002). For instance, teachers need professional development to gain skills with particular applications of ICT, integration into existing curricula, curricular changes related to its use, changes in teacher role, and on underpinning educational theories such as constructivism/or student-centred learning. Because of this, any attempt of ICT integration in education should parallel with teachers professional development.

The school leadership also plays a key role in the integration of ICT in education. Lack of support from the school administration is also a big challenge. Thus, for the effectiveness of ICT integration, administrators must be competent and have a broad understanding of the technical, curricular, administrative, financial, and social dimensions of ICT use in education.

Furthermore, learning content and language also challenge the integration of ICTs in education. Content development is a critical area that educators overlook. In integrating ICT in education, we have to care for the relevance of the learning content to the target groups. With respect to language, English is the dominant language in many of educational software, while English language proficiency is not high in many of the developing countries, and this is one barrier in the integration of ICT to education.

Another great challenge is the financing. ICTs in education programs require large capital investment and developing countries need to predict the benefit of ICT use to balance the cost relative to the existing alternatives. Potential sources of money and resources for ICT use programs suggested are grants, public subsidies, fund-raising events, in kind support from volunteers, community support, revenues earned from core business, and

revenues earned from ancillary activities (Tinio, 2002). Overcoming the mentioned challenges may help education systems benefit the most from this technology.

RECOMMENDATIONS AND CONCLUSION

This paper makes the following recommendations with regard to enhancing teaching and learning through the introduction or use of ICTs in Ghanaian schools:

The Ministry of Education Science and Sports as well as Curriculum Research Development Division of the Ghana Education Service who provide policy direction to schools should ensure the integration of ICTs into the curriculum of the various subjects that are being taught. They should also ensure the fair distribution of ICT resources for schools, especially those with fewer resources than others, and in the training of teachers, to equip them with the skills required to take advantage of the immense benefits that come with the use of ICT in both teaching and learning.

About enhancing human capacity of teachers, there is the need to provide extensive teacher professional development for teachers. Such capacity building programs can be online teacher professional training, face to face training workshops among others. The professional development includes more than training in equipment operation. The new pedagogical models required in the adoption of constructivist and constructionist learning outcomes call for training of teachers in these skills and knowledge base.

There is the need also to provide technical support to schools in terms of installation and maintenance of ICT infrastructure. There appears to be an underestimation of the magnitude of effort needed for the large-scale installation and maintenance of hardware, software, and networking equipment for an effective integration of ICTs. Computer coordinators alone cannot maintain the system. An extensive network of skilled technicians must be developed to support schools, administrators, teachers, and students.

In conclusion, the introduction of ICTs in education in Ghanaian schools has numerous benefit for the future life of students through the acquisition of both technology and academic skills. If the recommendations enumerated above is taken seriously, there is high probability for the educational system to be able to achieve proper integration of ICTs.

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