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Application of ICTs in Nigerian Secondary Schools

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Introduction

Information and communication technologies (ICT) are electronic technologies used for information storage and retrieval. Development is partly determined by the ability to establish a synergistic interaction between technological innovation and human values. The rapid rate at which ICTs have evolved since the mid 20th century, the convergence and pervasiveness of ICTs, give them a strong role in development and globalization (Nwagwu, 2006). ICTs have a significant impact on all areas of human activity (Brakel and Chisenga, 2003).

The field of education has been affected by ICTs, which have undoubtedly affected teaching, learning, and research (Yusuf, 2005). A great deal of research has proven the benefits to the quality of education (Al-Ansari, 2006). ICTs have the potential to accelerate, enrich, and deepen skills, to motivate and engage students, to help relate school experience to work practices, create economic viability for tomorrow's workers, as well as strengthening teaching and helping schools change (Davis and Tearle, 1999; Lemke and Coughlin, 1998; cited by Yusuf, 2005).

In a rapidly changing world, basic education is essential for an individual be able to access and apply information. Such ability must find include ICTs in the global village. The Economic Commission for Africa has indicated that the ability to access and use information is no longer a luxury, but a necessity for development. Unfortunately, many developing counties, especially in Africa, are still low in ICT application and use (Aduwa-Ogiegbean and Iyamu, 2005).

This paper focuses on ICT application in Nigerian secondary schools. It particularly dwells on the importance of ICT and the causes of low levels of ICT application in Nigerian secondary schools. Recommendations for improvement are offered.

The Need for ICT Application in Nigerian Secondary Schools

Improved secondary education is essential to the creation of effective human capital in any country (Evoh, 2007). The need for ICT in Nigerian secondary schools cannot be overemphasized. In this technology-driven age, everyone requires ICT competence to survive. Organizations are finding it very necessary to train and re-train their employees to establish or increase their knowledge of computers and other ICT facilities (Adomi and Anie, 2006; Tyler, 1998). This calls for early acquisition of ICT skills by students.

The ability to use computers effectively has become an essential part of everyone's education. Skills such as bookkeeping, clerical and administrative work, stocktaking, and so forth, now constitute a set of computerized practices that form the core IT skills package: spreadsheets, word processors, and databases (Reffell and Whitworth, 2002).

The demand for computer/ICT literacy is increasing in Nigeria, because employees realize that computers and other ICT facilities can enhance efficiency. On the other hand, employees have also realized that computers can be a threat to their jobs, and the only way to enhance job security is to become computer literate. With the high demand for computer literacy, the teaching and learning these skills is a concern among professionals (Oduroye, n.d.). This is also true of other ICT components.

New instructional techniques that use ICTs provide a different modality of instruments. For the student, ICT use allows for increased individualization of learning. In schools where new technologies are used, students have access to tools that adjust to their attention span and provide valuable and immediate feedback for literacy enhancement, which is currently not fully implemented in the Nigerian school system (Emuku and Emuku, 1999 & 2000).

ICT application and use will prove beneficial in improving Nigeria's educational system and giving students a better education. A technologically-advanced workforce will lead to ICT growth in Nigeria, with the potential to improve military technology and telecommunications, media communications, and skilled ICT professionals who will be well-equipped to solve IT problems in Nigeria and other parts of the world (Goshit, 2006).

ICT Application in Nigerian Secondary Schools.

There are developments in the Nigerian education sector which indicate some level of ICT application in the secondary schools. The Federal Government of Nigeria, in the *National Policy on Education* (Federal Republic of Nigeria, 2004), recognizes the prominent role of ICTs in the modern world, and has integrated ICTs into education in Nigeria. To actualize this goal, the document states that government will provide basic infrastructure and training at the primary school. At the junior secondary school, computer education has been made a pre-vocational elective, and is a vocational elective at the senior secondary school. It is also the intention of government to provide necessary infrastructure and training for the integration of ICTs in the secondary school system.

It should be noted that 2004 was not the first attempt the Nigerian government made to introduce computer education in schools. In 1988, the Nigerian government enacted a policy on computer education. The plan was to establish pilot schools and diffuse computer education innovation first to all secondary schools, and then to primary schools. Unfortunately, the project did not really take off beyond the distribution and installation of personal computers (Okebukola, 1997; cited by Aduwa-Ogiegbaen and Iyamu, 2005).

Okebukola (1997), cited by Aduwa-Ogiegbaen and Iyamu (2005), concludes that the computer is not part of classroom technology in more than 90 percent of Nigerian public schools. This implies that the chalkboard and textbook continue to dominate classroom activities in most Nigerian secondary schools.

The Federal Ministry of Education has launched an ICT-driven project know as School Net (www.snnng.org) (Federal Republic of Nigeria, 2006; Adomi 2005; Okebukola, 2004), which was intended to equip all schools in Nigeria with computers and communications technologies. In June 2003, at the African Summit of the World Economic Forum held in Durban, South Africa, the New Partnership for African Development (NEPAD) launched the e-Schools Initiative, intended to equip all African high schools with ICT equipment including computers, radio and television sets, phones and fax machines, communication equipment, scanners, digital cameras, and copiers, among other things. It is also meant to connect African students to the Internet. The NEPAD capacity-building initiative will be executed over a

ten-year period, with the high school component being completed in the first five years. Three phases are envisaged, with fifteen to twenty countries in each phase. The phases are to be staggered, and an estimated 600,100 schools are expected to benefit. The aim of the initiative is to impart ICT skills to young Africans in primary and secondary schools, and to harness ICT to improve, enrich, and expand education in African countries (Aginam, 2006).

The Nigerian Federal Government has commissioned a mobile Internet unit (MIU) operated by the Nigerian National Information Technology Development Agency (NITDA). The MIU is a locally-made bus that has been converted into a mobile training and cyber centre. Its interior has ten workstations, all networked and connected to the Internet. The MIU is also equipped with printers, photocopiers, and a number of multimedia facilities. Internet is provided via VSAT with a 1.2m dish mounted on the roof of the bus. It is also equipped with a small electric generator to ensure regular power supply. The MIU takes the Internet to places areas and various primary and high schools (Ajayi, 2003). The number of buses is so small, however, that most rural areas and schools have not yet been covered.

Although efforts have been made to ensure that ICTs are available and used in Nigerian secondary schools, the level of uptake is still low. It has been observed by Goshit (2006) that most schools, both private and government, do not offer ICT training programmes.

NEPAD has scored the level of African continent students' experience with ICTs and their proficiency in using them very low. Fifty-five percent of students within the continent, including Nigeria, Algeria, Burkina Faso, Cameroon, Republic of Congo, Egypt, Gabon, Lesotho, Mali, Mauritius, Mozambique, Rwanda, Senegal, South Africa, and Uganda (who are participating in the first phase of the NEPAD e-Schools initiative), stated they had no experience at all in using computers. Other findings included that the typical African school environment provides neither opportunity nor training in using ICTS, and that 75 percent of responding teachers have no or very limited experience and expertise regarding ICT educational applications.

Okwudishu (2005) discovered that the unavailability of some ICT components in schools hampers teachers' use of ICTs. Lack of adequate search skills and of access points in the schools were reported as factors inhibiting the use of the Internet by secondary school teachers (Kaku, 2005). The absence of ICT equipment in most Nigerian secondary schools leads students to resort to cybercafés for Internet access. Most cybercafé clients in Nigeria are students (Adomi, Okiy and Ruteyan, 2003; Adomi, Forthcoming a)

Causes of Low ICT Application in Nigerian Secondary Schools.

The low rate of ICT adoption and application in Nigerian secondary schools is attributable to several factors. The factors can be seen in Table 1, which is based on a survey of factors associated with low ICT application in Nigerian secondary schools, as perceived by 176 people in two states of Nigeria: 9 schools in Edo State with 84 respondents and 6 schools in Delta State with 92 respondents. Of the 176 teachers, 97 were male and 77 female. The study settings and subjects were selected through purposive sampling methods.

Causes of level ICT application	No.	Percent
Limited/poor information infrastructure	112	64
Lack of/inadequate inadequate ICT facilities in schools	108	61
Frequent electricity interruption	101	57
Non integration into the school curriculum	98	56
Poor ICT policy/project implementation strategy	94	63
Inadequate ICT manpower in the schools	91	52
High cost of ICT facilities/components	83	47
Limited school budget	78	44
Lack of/limited ICT skills among teachers	71	40
Lack of/poor perception of ICTs among teachers and administrators	70	40
Inadequate educational software	62	35
Poor management on the parts of school administrators and government	5	3
Lack of maintenance culture	3	2
Lack of interest in ICT application/use on the part of students	1	1

N = 176

Table 1: Causes of low level of ICT application in Nigerian high schools

The table reveals that “Limited/poor information infrastructure” ranks highest with 112 respondents (64 percent). Research confirms that ICT development and application are not well established in Nigeria because of poor information infrastructure (Adomi, 2006, Adomi, 2005, Adomi, Forthcoming b, Adomi, Forthcoming, Aginam, 2006). It has been reported by Southwood (2004) that more than 40 percent of the population of Africa is in areas not covered by telecom services. Schools located in such areas will experience ICT connectivity problems.

“Lack of/inadequate inadequate ICT facilities in schools” ranks second with 108 respondents (61 percent). This finding is corroborated by Ndiku (2003) cited by Wims and Lawler (2007) who discovered that insufficient numbers of computers and peripheral devices inhibit deployment of ICT by teachers and by Plante and Beattie (2004) who observed that inadequate ICTs was a challenge to integration of technologies in Canadian schools. Similarly, Okwudishu (2005) discovered that unavailability of some ICT components in the schools hampered teachers' use of ICTs. This problem may be due to underfunding (Enakrire and Onyenena, 2007)

“Frequent electricity interruption” ranks third with 101 respondents (57 percent). Electricity failure has been a persistent problem militating against ICT application and use in Nigeria (Adomi, 2005a; Adomi, Omodeko, and Otole, 2004; Adomi, Okiy, and Ruteyan, 2003). This makes the few schools with ICT facilities unable to use them regularly.

“Poor ICT policy/project implementation strategy” attracted 94 respondents (63 percent). The Nigerian Federal Government's 1988 policy introduced computer education to the high schools (Okebukola, 1997). The only way this policy was implemented was the distribution of computers to federal government high schools, which were never used for computer education of the students. No effort was made to distribute computer to state government or private schools. Although the government planned to integrate ICTs into the school system and provide schools with infrastructure, concerted efforts have not

been made to provide facilities and trained personnel. Thus, most schools do not yet offer ICT training programmes (Goshit, 2006). The NEPAD e-Schools Project is expected to take care of an estimated 600,000 African schools. This means that not all schools will benefit from this initiative. Most countries participating in the NEPAD e-Schools Project have an ICT development policy or are creating one, but very few have clear implementation plans (Aginam, 2006). Evoh (2007) observes that despite the recognized role of ICTs in improving education, ICTs remain a low financial priority in most educational systems in Africa. He further observes that most countries in the region lack resources for a sustainable integration of ICTs in education, and that African countries face numerous competing development priorities. These range from budgetary constraints, management challenges, and shortage of teachers and other educational resources, to the dreadful impacts of HIV/AIDS on education. These are issues that vie for the attention of local policy makers. While all countries in the region acknowledge the strategic role of ICTs in development, only a few have established a comprehensive policy. When such policies exist, they tend to remain unclear and make little reference to implementation (James, 2001, cited by Evoh, 2007).

“Inadequate ICT manpower in the schools” was indicated by 91 respondents (52 percent). The main problem facing Nigeria and its ICT programme is workforce training (Goshit, 2006). Teaching as a profession in Nigeria is considered to be for poor people, therefore the few professional that are available prefer to work in companies and industries where they can earn better salaries. With this deplorable condition, teachers are not motivated to go the extra mile in assisting the students to acquire computer education (Oduroye, n.d).

“High Cost of ICT Facilities” attracted 83 respondents (47 percent). Cost has been reported as one of the factors which influence provision and use of ICT services (Adomi, 2006). The cost of computers is too high for many to afford. Monthly Internet rates are exorbitant and the charges for satellite television are unaffordable for most people in Africa (Brakel and Chiseuga, 2003). This has made it difficult for Nigerian secondary schools to acquire and install ICT facilities for the use of teachers and students.

A total of 70 respondents (40 percent) indicated “Lack of/poor perception of ICTs among teachers and administrators” There is widespread ignorance and misconception about ICTs amongst Nigerians (Ighoroje and Ajayi, n.d). One of the major inhibitors to Nigeria fully embracing ICTs is the average Nigerian's general lack of exposure to them. For most Nigerians, information technology is still something unfamiliar, distant, and mysterious. Rather than being seen as a tool for personal and national development, information technology is seen as a hurdle (NITDA, 2003). Some Nigerians are not aware of the existence and importance of the Internet (Adomi, Okiy, and Ruteyan, 2003). It has been reported that 75 percent of the teachers in the NEPAD's e-Schools Project have no or very limited experience and expertise regarding ICTs in education.

Conclusion

The adoption and use of ICTs in schools have a positive impact on teaching, learning, and research. Despite the roles ICTs can play in education, secondary schools in Nigeria have yet to extensively adopt them for teaching and learning. Efforts geared towards integration of ICTs into the secondary school system, have not had much impact. Problems such as poor policy and project implementation strategies, and limited or poor information infrastructure militate against these efforts. In order to ensure that ICTs are widely adopted and used in Nigeria's secondary school system, the following efforts should be taken.

- Government should ensure that ICT policy statements are translated into reality. An ICT policy implementation commission should be created. This commission should be funded and given the power to provide ICT facilities in the schools and monitor their use.
- All secondary schools should be made beneficiaries of ICT projects.

- Computer/ICT education should be made compulsory for all secondary school students. At present, the *National Policy on Education*, 4th ed., has made computer education an elective course in high schools. This means only those who elect to take it will have computer education in high school.
- Efforts should be made by Ministry of Education (at Federal and State levels) to post teachers skilled in ICTs to each secondary school to impart ICT skills to the students.
- The Federal Ministry of Mines and Power should work towards stabilizing electricity supply in Nigeria.

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