

Information Communication Technologies (ICT) as an Enhancing Tool in Quality Education for Transformation of Individual and the Nation

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Abstract

This paper discussed the essentials of ICT in enhancing quality education in Nigeria for transformation of individual that contribute to the development of the Nation value. It equally established the benefits of ICT in quality education. The paper further highlights the hindrances associated with the use of ICT in quality education such as Insufficient ICT facilities, unsophisticated accessories, epileptic electricity power supply, teachers' lack of ICT knowledge/skills, difficult to integrate ICT to instruction, scheduling computer time, insufficient peripherals, not enough copies of software, insufficient teacher time, not enough simultaneous access, not enough supervision staff and lack of technical assistance. The paper then recommend that, the government of Nigeria should pass a bill at the National assembly on the use of sophisticated ICT facilities in the educational system by provision of adequate fund, securing of ICT experts in institutions and schools and ensuring that these facilities are monitored from time to time.

Introduction

Quality Education

Education is seen as a key for transformation of individual for National development. A nation is said to be valued when a sizeable number of the citizens have quality education. Quality education includes:

- Learners who are healthy, well-nourished and ready to participate and learn and supported in learning by their families and communities;
- Environments that are healthy, safe, protective and gender-sensitive, and provide adequate resources and facilities;

- Content that is reflected in relevant curricula and materials for the acquisition of basic skills, especially in the areas of literacy, numeracy and skills for life, and knowledge in such areas as gender, health, nutrition, HIV/AIDS prevention and peace;
- Processes through which trained teachers use child-centred teaching approaches in well-managed classrooms and schools and skilful assessment to facilitate learning and reduce disparities;
- Outcomes that encompass knowledge, skills and attitudes, and are linked to national goals for education and positive participation in society (UNICEF, 2000). In recent years there has been a groundswell of interest in how computers and the Internet can best be harnessed to improve the efficiency and effectiveness of education at all levels and in both formal and non-formal settings (Cuban, 1986). If Nigeria as a Nation needs to improve her quality in education the essentials of information and communication technology in her educational system needs urgent attention. Educational systems around the world are under increasing pressure to use the new information and communication technologies (ICTs) (UNESCO, 2002 as cited by Yuen, Lee, Law & Chan (2008). Similarly, Nwosu and Ugbomo (2012) opined that, the field of education has certainly been affected by the penetrating influence of ICT worldwide and in particular developed countries. ICT has made an impact on the quality and quantity of teaching, learning and research in the tradition and/or distance education institutions using it (Kwacha, 2007). The need for re-orient and re-engineer of its formal education patterns for transformation of its citizens is vital. Nwosu and Ugbomo (2012) assert that, ICTs greatly facilitate the acquisition and absorption of knowledge, offering developing countries unprecedented opportunities to enhance educational systems, improve policy formulation and execution, and widen the range of opportunities for business and the poor. UNESCO (2003:5) points out that “this vision of education emphasizes a holistic, interdisciplinary approach to developing the knowledge and skills needed for a sustainable future as well as changes in values, behaviour, and lifestyles .However, Law, Pelgrum and Plomp (2008) opined that, acquisition of information and communication technology skills include the ability to become lifelong learners within a context of collaborative inquiry and the ability to work and learn from experts and peers in a connected global community . According to Ololube, Ubogu and Ossai (2007), the introduction of ICT usage, integration and diffusion has initiated a new age in educational methodologies, thus it has radically changed traditional method of information delivery and usage patterns in the domain as well as offering contemporary learning experience for both instructors and students. For developing countries, ICTs have the potential for increasing access to and improving the relevance and quality of education (Nwosu and Ugbomo, 2012). Nwosu and Ugbomo further stated that, when used appropriately, different ICTs helps to expand access to education, strengthen the relevance of education to the workplace, and raise educational quality by creating an active process connected to real life.

The paper discusses the topic under the following outlines:

1. Types of ICT used in education

2. Benefits of ICT in enhancing quality education
3. Hindrance of ICT in enhancing quality education
4. The way forward

Types of ICT tools used in education

ICT is a term used to refer to technologies that are used in creating, accumulating, storing, editing and disseminating of information in various forms. ICT as described by Bandele (2006), is a revolution that involves the use of computers, internet and other telecommunication technology in every aspect of human endeavour. These include: Internet access, electronic mail, CD-ROMS, telephone, on line databases, library services and fax machines Nwosu and Ugbomo (2012). Reddi (2012) grouped ICT used in education into two categories namely synchronous and asynchronous media. Synchronous media require all participants to be together at the same time even though in different location , examples of synchronous are audio graphics, audio conferencing as in a telephone conference, broadcast radio and television, teleconferencing, computer conferencing such as chat and internet telephony . Asynchronous ICT allow for participants in the learning process to be at different times and different places, examples of asynchronous include audio and video tapes CDs, email, computer files transfers, virtual conferences, multimedia products, offline, web based learning formats. Teleconferencing is used in both formal and non-formal learning contexts to facilitate teacher-learner and learner-learner discussions, as well as to access experts and other resource persons remotely. In open and distance learning, teleconferencing is a useful tool for providing direct instruction and learner support, minimizing learner isolation.(Tinio (2002) According to Taghioff (2001) the Kothmale Community Radio Internet uses both radio broadcasts and computer and Internet technologies to facilitate the sharing of information and provide educational opportunities in a rural community in Sri Lanka. Tinio (2002) further noted that the Indira Gandhi National Open University in India combines the use of print, recorded audio and video, broadcast radio and television, and audio conferencing technologies. Tinio (2002) further noted that ICT can expand access to education in the following ways:

- Anytime, anywhere: One defining feature of ICTs is their ability to transcend time and space. ICTs make possible asynchronous learning, or learning characterized by a time lag between the delivery of instruction and its reception by learners. Online course materials, for example, may be accessed 24 hours a day, 7 days a week. ICT-based educational delivery (e.g., educational programming broadcast over radio or television) also dispenses with the need for all learners and the instructor to be in one physical location. Additionally, certain types of ICTs, such as teleconferencing technologies, enable instruction to be received simultaneously by multiple, geographically dispersed learners (i.e., synchronous learning).
- Access to remote learning resources: Teachers and learners no longer have to rely solely on printed books and other materials in physical media housed in libraries and available in limited quantities for their educational needs. With the Internet and the World Wide Web, a wealth of learning materials in almost every subject and in a variety of media can now be accessed from anywhere at any time of the day and by an unlimited number

of people. This is particularly significant for many schools in developing countries, and even some in developed countries, that have limited and outdated library resources. ICTs also facilitate access to resource persons- mentors, experts, researchers, professionals, business leaders, and peers all over the world.

- Improving the quality of education and training is a critical issue, particularly at a time of educational expansion: ICTs can enhance the quality of education in several ways; by increasing learner motivation and engagement, by facilitating the acquisition of basic skills, and by enhancing teacher training (Haddad & Jurich, 2002). ICTs are also transformational tools which, when used appropriately, can promote the shift to a learner-centred environment.
- Motivating to learn: ICTs such as videos, television and multimedia computer software that combine text, sound, and colourful, moving images can be used to provide challenging and authentic content that will engage the student in the learning process. Interactive radio likewise makes use of sound effects, songs, dramatizations, comic skits, and other performance conventions to compel the students to listen and become involved in the lessons being delivered. More so than any other type of ICT, net- worked computers with Internet connectivity can increase learner motivation as it combines the media richness and interactivity of other ICTs with the opportunity to connect with real people and to participate in real world events.
- Enhancing teacher training: ICTs have also been used to improve access to and the quality of teacher training. For example, in China, large-scale radio- and television-based teacher education has for many years been conducted by the China Central Radio and TV University, the Shanghai Radio and TV University and many other RTVUs in the country (Carnoy, et al, 2002).

Benefits of ICT in enhancing quality education

There are numerous benefits derived from the use of ICT tool in enhancing quality ICT education such as the ability for learner to choose when to learn irrespective of geographical location without stress. Secondly, ICT also enable learners to discover and explore new ideas or innovations from experts around the global world through the use of the common ICT available facilities. Thirdly, the existence of ICT into education system, will enable delivery of lectures to students, monitoring of learner progress and assessment can be done timely. However, Nwosu and Ugbomo (2012) listed the following as the benefits derived from the use of ICT in education:

- Active learning: ICT-enhanced learning mobilizes tools for examination, calculation and analysis of information, thus providing a platform for student inquiry, analysis and construction of new information. Learners therefore learn as they do and, whenever appropriate, work on real-life problems in-depth, making learning less abstract and more relevant to the learner's life situation. In this way, and in contrast to memorization-based or rote learning, ICT enhanced learning promotes increased learner engagement. ICT-enhanced learning is also "just-in-time" learning in which learners can choose what to learn when they need to learn it.

- Collaborative learning: ICT-supported learning encourages interaction and cooperation among students, teachers, and experts regardless of where they are. Apart from modeling real-world interactions, ICT-supported learning provides learners the opportunity to work with people from different cultures, thereby helping to enhance learners' teaming and communicative skills as well as their global awareness. It models learning done throughout the learner's lifetime by expanding the learning space to include not just peers but also mentors and experts from different fields.
- Creative Learning: ICT-supported learning promotes the manipulation of existing information and the creation of real-world products rather than the regurgitation of received information.
- Integrative learning: ICT-enhanced learning promotes a thematic, integrative approach to teaching and learning. This approach eliminates the artificial separation between the different disciplines and between theory and practice that characterizes the traditional classroom approach.
- Evaluative learning: ICT-enhanced learning is student-directed and diagnostic. Unlike static, text- or print-based educational technologies, ICT-enhanced learning recognizes that there are many different learning pathways and many different articulations of knowledge. ICTs allow learners to explore and discover rather than merely listen and remember.

Factors that hinder ICT in quality education

The hindrances affecting ICT in quality education are numerous but some include issues such as :

- Insufficient ICT facilities and unsophisticated accessories
- Epileptic electricity power supply

Insufficient ICT facilities and unsophisticated accessories

In Nigeria, most ICT facilities are not sufficient to enhance quality education to learners and teachers, even where it exist there are not sophisticated enough to stand the taste of time like the ones acquired in developed countries. Nwosu and Ugbomo (2012) stated that, Problems of quality and lack of resources are compounded by the new realities faced by higher education institutions battle to cope with every increasing student's numbers.

Epileptic electricity power supply

In Nigeria, electricity power supply is irregular this affect most of the ICT operations in her higher institutions and at homes thus causing frequent damages of the existing ICT equipment which hinder ICT uses in enhancing quality education. According to Ndukwe (2007) all ICT equipment, infrastructure and terminals depend on electricity to energize, unless this vital source is always available and reliable, Nigerians will not be able to fully enjoy the benefits that the digital revolution offers and that overcoming the energy crises is a major pre-requisite for Nigeria to achieve its Vision 20-2020 of national transformation.

However, others scholars listed the following as hindrances to ICT in quality education; Kwacha (2007) noted that, the most common problems associated with the effective implementation of ICT are lack of qualified ICT personnel, cost of equipment, management attitudes, inconsistent electric power supply, inadequate telephone lines, particularly in rural areas and non inclusion of ICT programmes in teacher’s training curricula and at the basic levels of education. Pelgrum (2001) stated that, obstacles for ICT implementation include the following: Insufficient number of computers, teachers’ lack of ICT knowledge/skills, difficult to integrate ICT to instruction, scheduling computer time, insufficient peripherals, not enough copies of software, insufficient teacher time, not enough simultaneous access, not enough supervision staff and lack of technical assistance. In addition, Lewis and Smith (2002) summarized these barriers as limited equipment, inadequate skills, minimal support, time constraints and the teacher’s own lack of interest or knowledge about computer.

Method of Data Collection and Analysis of Data

A total of sixty questionnaires were administered. A sample of twenty staff in each of the three institutions Delta State university, Abraka, Petroleum Training Institute Effurun and college of Education, Warri, Delta State were used. The sixty Questionnaires were equally retrieved immediately from the respondents.

TABLE 1: Institution involved in the Research

Name of institution	Number of questionnaire retrieved and use
Delta state university Abraka	20
Petroleum training institute Effurun	20
College of education Warri	20

The Table I revealed that twenty questionnaires were distributed in each of the institution, all were retrieved and were for the study.

TABLE II: Institution and ICT tools used by Staff

ICT tools used	Delsu Abraka	PTI effurun	College of education warri	Total	%
Internet	20	20	20	60	100
Email	20	20	20	60	100
CD-Rom	20	20	20	60	100
Telephone	20	20	20	60	100
Online database	4	2	4	10	16.6
Fax machine	3	2	2	7	11.6
Photocopier	10	10	6	26	43.3
Scanner	8	5	8	21	35
Computer	20	20	20	60	100
Teleconferences	0	0	0	0	00

Table II: ICT tools used

The study reserved the three higher instructions surveyed in this research showed that in all the instructors they used the following ICT tools .in the course of research on study these include internet, email, CD-ROM, telephone ,database, machine, photocopier, scanner, computer. None of the staff of the three institutions have been involved in teleconferencing. The study spelt out across the three institutions delta state university Abraka, petroleum training institute Effurun and College of Education, Warri each of the twenty staff sampled for study showed the entire 60 staff have used the internet, email, CD-ROM, telephone, computer few of the staff have used online database, fax machine, photocopier scanner .the study as shown in Table II revealed that 10(16.6) staff have used databases 7(11.6%) have used fax machine. Similarly 26(43.3%) of the staff of the three tertiary institution have used photocopier and 21(35%) have used scanner while none of the staff out of the sixty randomly sampled for the study have not been involved in the conferencing.

TABLE III: Benefits derived from the use of ICT facilities

Benefits	Delsu Abraka	PTI Effurun	College of Education Warri	Total
Access to what I need anytime	20	11	16	47(78)%
Access to remote resources i want anytime	16	7	14	37(61.6)%
Else of research done quick and easy access to remote resources	16	10	15	41(68.3)%
Improvement in the quality of education	17	14	13	44(73.3)%
Quality of research improvement	15	12	15	42(70)%
Quick access to research expert abroad	14	4	12	30(50)%
Teaching and learning enhancement through the use of quality information resources	16	5	14	35(58.3)%
Active learning enhancement	16	12	14	42(70)%
Encourages collaborative and interactive learning	15	8	11	34(56.6)%
Encouraging creative learning	15	12	13	40(66.6)%
Encouraging interactive approach to learning	16	9	11	36(60)%

Table III : the table on the benefits derived from the used of the ICT tools the study revealed that the three tertiary institutions used have benefited greatly from the ICT facilities through what is needed at any point in time. They attested that 47(78%) have access to what they need anytime.

37(61.6%) of the 60 staff used, reported that they have access to resources they want any were they are from any part of the world through the internet. In the same development 41(68.3%) opined that they derived benefits from the use of ICT facilities through case of research provided by the internet due to quick and easy access to remote resources while 44(73.3%) derived improvement through quality research education they receive as they study much through the Internet. Similarly 42(70%) derived improvement through quality research then conduct as they have access to materials published by others globally online. In the same manner 30(50%) staff benefit from ICT tools through quick access to research experts abroad.35 (58.3%) of the staff reported that ICT as a tool helps them to enhance their teaching and learning skills through the use of quality information resources. the study also revealed that ICT tools enhance creative learning, encourages collaboration, and integrative appraisal to learning.

Table IV: Factors that hinder quality ICT education in Nigeria

Factors	Delsu	PTI	College	Total
Insufficient ICT facilities	16	13	13	42(70)%
Insufficient sophisticated accessories	16	7	10	33(95)%
Insufficient fund to replace facility components	15	13	14	42(70)%
Epileptic electricity power supply	18	15	13	46(76.4)%
Unstable electric current that damages ICT components	18	15	13	40(66.9)%
training void of practical demonstration and involvement of trainees in implementation	16	8	8	32(53.3)%
Training year towards skills acquisition but limited to theoretical illustration of approaches	16	8	9	33(55)%

Table IV: Considering the factors that hinder quality ICT education in Nigerian, the study revealed insufficient ICT facilities 42(70%),insufficient sophisticated accessories 33(55%), insufficient fund to replace faulty components 42(70%), epileptic electricity power supply 46(76.6%) are the major factors that hinder quality ict education in Nigeria. In the same manner the staff of the three tertiary institution attested that unstable electric current that damage ICT components 40(66.6%), training void of practical demonstration and involvement of trained in implementation 32(53.3%) and training geared towards skills acquisition but limited to theoretical illustration of approaches 33(55%) are other notable factors in the research that act as hinders to quality ICT education in Nigeria.

Summary Of Findings

The study spelt out that:

1. ICT facilities through the various ICT tools considered are very relevant for quality ICT education in Nigeria.
2. Internet, telephones, database, scanner, photocopiers among others are highly needed in tertiary and other categories of education in order to have quality ICT education in Nigeria.
- 3.The benefits derived from quality ICT tools in the tertiary institutions are numerous among which are access what researcher need anything, access to remote information resources anywhere, use of research due to quick and easy access to remote resources, improvement in the quality of education, research, quick access to research experts loyalty. In the same manner, ICT tools or facilities enhance active learning as well as it encourages collaborative and interactive learning, creative learning and integrative approach to learning.

4. The factors that hinder quality ICT education in Nigeria includes insufficient ICT facilities, sophisticated accessories and insufficient fund. Other factors include epileptic power supply, unstable electric current among others. Electricity is supply at all time to empower the ICT facilities and to prevent erratic current fluctuation thereby enhancing quality ICT education in Nigeria.
5. Government and organisations that organise ICT training should ensure that such training should be practically demonstrated, to acquire the require skills instead of mere contract to make money.
6. Funding and maintenance of the ICT tools should not be neglected or politicised.
7. The institutions management must be interested and fully involves in implementation and maintenance of ICT equipment and the Internet connectivity.
8. ICT training programmes should not be overloaded to encourage proper assimilation.
9. ICT training should be well package to allow adequate understanding, interest, and practicability.
10. Government should help to build hall of residence equipped with ICT facilities. The hostels should be enough to accommodate postgraduate and large number of under graduates' especially first year and final year undergraduates to enhance quality ICT adaptation and research.

Conclusion

It is imperative and equally inevitable to say that quality ICT tools are a prerequisite to quality ICT education. Therefore quality ICT facilities should be made available, accessible and equally made easy for staff and students to obtain in order to have quality ICT education in Nigeria. It is nice to say that ICT is a tool that enhances quality education for transformation of individual which in turn help, to boast national economy. ICT therefore should be implemented fully in the educational system as already allowed by federal government that CISCO is now be empowered to train federal government college students on ICT in Nigeria as the case with developed nations with the best ICT facilities in countries like united of state of America and Europe continent. Therefore, issues and challenges of ICTs in education should be given urgent/adequate attention in the national assembly and bill should be passed on the effective use of sophisticated ICT gadgets with ICT experts monitoring these equipments .These sophisticated ICT gadgets could stand in test of time, be equipment tested and trusted for durability and reliability provided electricity supply is stable and not erratic.

The Way Forward

In order to overcome the hindrances of ICT in quality education, the under listed recommendations should be put in consideration to ensure the effectiveness of ICT in quality education.

- Development and training of ICT experts, specifically for instruction design and development, who will work in partnership with educators and teachers(Kwacha,2007)

- The adoption of ICT international standards and its inclusion in the Nigeria education system. Continuous training and retraining of teachers, others supporting staff and academia on computers and ICT skill acquisition should be provided.
- There is need for the Nigerian government to address seriously the issues of the erratic electricity power supply, Ghana our neighbouring country has stable electricity supply, the Nigerian government has already on the move to give constant light through generating of power and distribution which is can be possible through privatization as speculated while management of educational institutions and school should make provision for generating sets that can supplement Power Holding Company (PHCN) for supply of electricity power.
- Funding: Government at all levels of educational system should make ICT a matter of priority, improve the funds needed in ICT training of teachers, students and supporting staff available at all time.

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