Application of Information and Communication Technology in Technical Education: Issues and Challenges

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Abstract
The paper takes a critical look at the application of ICT on technical education in Nigeria. It reviewed the up to date level of ICT complaints in Nigeria technical education sector. Although, there were challenges highlighted to ICT deployment, the benefits far outweighed the challenges. The remedial measures to checkmate these problems in order to aid the development and growth of ICT in order to enhance technical education in Nigeria were also uncovered. The paper then asserts that technical education in Nigeria cannot afford to be left behind in the digital race.

Introduction
Information and communication goes hand in hand and although information can always be communicated, yet not everything that is communicated is an information. Communication becomes information only when data derived from it have been organized and interpreted in such a way that they contain meaning beyond the individual facts and can be used in decision making. While technology means the tools people and organization apply to operation to get things done more quickly, more easily or more efficiently. Kanu (1990). ICT is all about recording management, communication enhancement and retrieval of information in an organization using advanced technology such as the computer and other telecommunication and electronic devices. ICT therefore, refers to the use of skill in combining information and communication processes and devices to obtain, analyze, store, recall and transmit accurate information from one place to another at very high speed.
Currently speaking, emphasis has shifted from traditional method of education to ICT based teaching and learning with a view to reposition technical education for the challenges of the millennium and keep pace with global trends in learning standards and practices.

This is why Gates (2004) opined that any field of human Endeavour that does not exploit the vast possibilities inherent in ICT application, will become irrelevant in contemporary time. According to Dabesaki (2005) information and communication technology (ICT) have become key tool and a revolutionary impact of how we see the world and how we live.

Education is the most important instrument of change and the bedrock of industrial take off and socio-economic growth. Education is the greatest investment a nation can make for the quick development of its social, economic, political technological and human resources. Hence, most nations of the world give education high priority in their developmental efforts. Developed countries such as USA, Britain, Japan etc. have embraced and recognized technology as a means of realizing economic independence and self-reliance. This has accelerated maximum development in agriculture, industry, mining technology among others.

Umoru (2004) sees technology education as a basis for economic rehabilitation and self-reliance which induce sustained improvement in the well being of the individual and bestow benefit to all. Nigeria has been laying emphasis on self-reliance and mobilization of domestic resources, the transformation of the structure of rural production, development of small scale industry and the acquisition of technological and scientific skill. These objectives are development oriented and generally suitable, but well conceived, planned and directed policies and programmes are required for their realization. The various measures taken by successive governments to attain economic independence and self reliance did not yield any tangible and meaningful result: hence, this paper intends to look at the availability, applicability as well as challenges of ICT deployment in technical education in Nigeria and critically review the issues and challenges of it’s applicability.

**Conceptual Clarification**

At this junction, it is needful to clarify some concept in the discourse. This concept are as follows:

**Information and Communication Technology (ICT):** This concept is aptly defined by Beebe (2004) as: … a shorthand for the computers, software, networks, satellite links and related system that allow people to access, create, exchange and use data, information and knowledge in ways that, until recently, were almost unimaginable.

ICT has to do with creation, sharing and access to information by many people. ICT includes the use of radio, television, telephone, telex, PABX, e-mail, televideo conferencing, computer hardware and software, multi-media etc.

**Technology:** Can be defined as the way of doing things through the application of knowledge derived from systematic investigation of natural forces and materials, (Akinseinde 1998). He stated that technology leads to the development of processes
and devices that are indispensable to human progress. People who can adjust to technological changes and their social impacts on a rational basis are those who are technological literate. While Beebe (2004) sees; Technology as the practice of any or all of the applied science that have practical value or industrial uses, technical methods in a particular field of industry or art, technical nomenclature, technical means and skills characteristic of a particular civilization, group or period.

**Technical education:** Has been defined as that aspect of education which involves the acquisition of techniques and application of the knowledge of science for the improvement of man’s surrounding dealing with man power training for the professional category such as engineers, technicians, craftman and artisans. In other words, it involves practical work that leads to a particular occupation.

**Availability of ICT in Technical Education**

As rightly observed by Ndukwe (2004) most of the benefits derivable from telecommunication infrastructure (ICT inclusive emphasis mine) deployment have been concentrated in the developed countries of the world”. Low level of availability and access to ICT in developing countries is lamented upon by development gateway when it observed that:

Although there has been global progress in improving access to information and communication technologies, poor countries (Nigeria inclusive-emphasis mined lap behind in making ICT application common place in government, business and technical schools in particular).

In order to solve the above problems of lack of access to and availability of ICT in Nigeria; the Federal Government of Nigeria has taken these measures:

(a) Declaration of ICT as a National Project.
(b) Establishing of the National Information Technology Development Agency (NITDA).
(c) Launching of the Nigeria satellite system programme by the National Space Research and Development Agency (NARSRDA) and the launching in 2007 of the Nigercomsat by China.

There are efforts by, Non Governmental Organizations (NGO) to diffuse ICT in Nigeria like the launching of the Owerri Digital Village, Computer for older person’s programme by Mercy Mission (Dabesaki 2005) etc. In the education sector the PTF project and the report of the technical committee on IT set up by the Federal Ministry of Education has enhanced the availability and access to ICT in secondary schools as well as tertiary institutions.

**Application of ICT in Technical Education**

There is scarcely any aspect of human Endeavour where ICT does not apply in contemporary time.

**E-library:** The internet when compared to encyclopedias and traditional libraries has enabled a sudden and extreme decentralization of information and data. It has further triggered an explosion in knowledge and information such that the traditional libraries seem to appear as near obsolete as sources of current and up-to-date information tends
to enhance the teaching and learning standard of modern technical education. The internet presents so many possibilities for knowledge acquisition and dissemination.

**E-learning:** The logic and possibilities of the internet takes us to a new level of learning called e-learning by means of personal computer, CD-ROMS and the internet. The advantages are seen in that just-in-time learning is possible, courses can be tailored to specific needs and asynchronous learning is enhanced. E-learning may also be used to support distance learning and may also be considered to be a form of flexible learning. The possibility of interacting with many people across the world and accessing critical and up-to-date information presents both a great opportunity and a challenge to technical teachers and learners in Nigeria. Successful integration of internet resources to the learning environment will provide at least two critical benefits to our students. First students will be knowledgeable about interacting with people worldwide who share similar interests, or possess knowledge useful to them, in diverse areas, students will also benefit from data available on the internet tremendously in the pursuit of their various programmes of study and research, just as teachers, writes and researchers in educational institutions. Secondly, students learn to use internet resources effectively, a crucial skill they need for the future. Many resources on the internet can aid learning, USENET, Newspaper, special mailing lists, and databases made available by various entities can deepen students understanding of various subject matter if they wonder how technologies will create opportunities and challenges in the future, they will have to keep abreast with the many technology-oriented newsgroups and mailing lists and converse with the most knowledgeable people in specialized areas throughout the world.

**Internet in the class:** The internet can be used by a teacher as a resource of information to enhance technology teaching and learning. Where the class has an internet connection, the teacher can incorporate content found on the net into a lesson in various ways, supplement references, visual aids (pictures, movies, sound etc), and real life application of content to aid engineering designs as well as complex technical drawings etc. the teacher can use LCD projector to allow the whole class to experience this information in real time, or the teacher can go to the net prior to the lesson access a web site, save the web page (as source), place these files onto the computer, in the class and they can view them using the browser but not actually being on the internet. The possibilities for these are determined by the teacher’s familiarity with the internet and the e-learning infrastructure on ground.

**Project Based Engaged Learning:-** The teacher can assign groups to investigate a particular topic. The teacher can also structure internet check points, sites that the students can check periodically for information. Examples include innovations in engineering, weather forecast in central America etc, after demonstrating the use of a search engine like excite, Altra-vista, Google, Hotbot, Lycos or any other search site like web crawler, Northern light etc. the students can be asked to use key words to search for information once found; they can be asked questions about information, do a report, presentation, debate etc.
Impact of the Use of ICT in Technical Education

The impact of the use of ICT in technical education cannot be overemphasized. The impacts are as follows:

- The emergences of ICT has brought about dynamic changes in the teaching as well as learning of technical education such as electronic classroom presentation through power point, graphic designs via Corel draw application, technical drawing using auto cad etc.

- Emphasis has shifted from traditional printing to electronic methods of information processing and publishing, journal bookstores, libraries, now operate electronically. Students’ academic records are now carried out online as well as student’s Registration and result checking. It is also a well known fact that examination bodes in Nigeria like NECO, WAEC, and JAMB etc as a result of ICT deployment now operate on electronic platform and this has brought a great revolution to teaching and learning techniques too.

Furthermore, ICT has given some technical schools competitive edge over others. Due to access to new ideals, technologies, information etc. the deployment and exploitation of ICT facilities has repositioned the schools for the challenges of the 21st century thereby keeping pace with global trends in learning standards and practices.

Issues and Challenges of Using ICT in the Teaching/Learning Process

Despite all these above mentioned positive impact of ICT, there are some issues and challenges encountered by technical education.

The business world is undergoing changes due to technological innovations. The world of work has become a complex and massive matrix of vocations. Globalization, competition, structural changes in economies, new forms of work organization, and many other social and economic factors are creating a new context for technical education.

New jobs require higher levels of cognitive and analytical skills, which require specialist teachers, new infrastructural facilities and upgraded ICT facilities as well as funding etc. all these present complex new challenges for technical education in an age of rapid, continuing, worldwide technological changes. The questions that quickly come to mind are:

- To what extent are the technical skills being acquired or to be acquired become relevant for rebuilding or uplifting our economy into prosperity to graduates of such schools in this technological era?

- To what extent will the skills so acquired help in improving the quality of lives of the graduates?

Because of these complexities, technical education graduates of today needs different training than those of yesterday and yesteryears. The former educational system in Nigeria has not fully realized its intended aim, which is obvious considering the present ailing economy, which is characterized with many problems. The present National policy on Education revised in 2003, Endeavoured to improve technical education at secondary and tertiary levels. As part of the total educational system, technical education will be responsible for helping to meet the needs brought about by
technological changes and progress to use their skill for employment purposes as well as for self-employment in their particular fields. They should be masters of their own disciplines.

ICT empowered and enhanced technical education for the 21st century must provide skilled workers, improve skill levels continuously, meet the needs of new industrialist and industries as well as production patterns, and help overcome unemployment and social exclusion, cope with the requirements of the service sector and deal with the special problem of transition economies.

For contemporary technical education to achieve its desired objective to meet these challenges, it must be domesticated for it to be effective and its teaching in the institutions of learning, made purposeful and relevant to the countries cultural milieu. In other words, the absorption of technological knowledge or skills based on the experience of others through the method of approach to resolution of problems with the sole purpose of utilizing the resultant acquired knowledge for replication of similar devices and methods in a different location. This implies that, in the teaching of science, local examples should be used particularly at the early stage of introduction.

There is an imminent need to review the curricula of technical education in secondary and tertiary institutions to include programmes that provide students with an active and realistic view of the world of work that includes social and technological problems. These programmes would simulate problems solving activities conducted in the practical work and society, with the technical educator providing the means (the ICT learning environment) and the students finding the ends (solutions). The curricula should also be redesigned to equip the technical education graduates to live effectively in this modern age of science and technology. Sate and Federal Departments of Education will have to acquire considerably more expertise in the newer technologies that exist today in technical schools. The learning should be thorough in contents, in structure and in material. Though that means, technical education graduates will be able to develop their talents, create new teaching ideas etc thereby keeping pace with global trends in learning standards and practice.

**Conclusion**

Revolutions in technical education have been brought by the introduction and application of ICT. Before such introduction, activities have been going on, but with snail speed growth and development. However, with the introduction of ICT there has been tremendous growth and improvement in technical education. Furthermore, with investments by government and non-Governmental organizations in ICT infrastructures in Nigeria, there has been growth never imagined. However, this is not without its attendant challenges. But with better ICT policy and management of ICT infrastructure, provision of enabling environment as well as commitment from all stakeholders in ICT in Nigeria, there are boundless opportunities for technical education in the future. These opportunities need only to be discovered, determined and exploited for development which the nation greatly craves for.
Recommendation

In order to keep pace with global trends in learning standard and practices, the following recommendation are advanced:

- The curricular for technical education should be redesigned to meet contemporary challenges of science and technology.
- Research and development aimed at enhancing ICT empowered technical education in Nigeria should be encouraged.
- Federal and state government should acquire and put in place the necessary ICT resources in order to boost the teaching and learning standard of technical education.

References


Mingfang Li (2005): The internet from basics to educational use www.huey.csun.edu.

