The Status of Information Communication Technology (ICT) In Technical and Vocational Education for Skill Acquisition towards Sustainable Economic Development

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Abstract
There is hardly any modern organization that operates without the use of information and communication technology (ICT). Technologicaladvancement in Technical and Vocational Education (TVE) may bedescribed as the improvement in machines and equipment, the methods oftheir uses and applications in the classroom, business and industry in orderto increase productivity. Technology in this context means the application ofICT in the inculcation of the required skills that will make the student usefulto themselves and the society in which they live in. Business today depends on ICT. Banks use ICT to up-date customers' account, libraries use it tolocate books, offices use it to process and disseminate information whileeducational institutions use it to store students' personal data and files.However, the training in TVE has been noted to be defective as a result ofnon-acquisition of the skills required to meet the standard of modern dayemployers of labour. This paper thus examined the importance of ICT in TVE for skill Acquisition for a sustainable development. The paper recommendsamong others that government should provide the required ICTinfrastructure in schools; there should be an established vision for the planof ICT in education. A committee involving all stakeholders should be setup for the development of ICT; etc.

Keywords: ICT, TVE, Economic Development

Introduction
ICT is an umbrella term that includes communication devices or application (radio, television, cellular phone, computer hardware and software and networking, and satellite system) and servicesassociated with them. It is a term used to denote a wide range of services, application andtechnologies using various types of equipment and software running over telecommunicationnetworks. ICT can be defined as computer based tools and techniques for gathering and usinginformation. It encompasses the hardware and software, the network and several other devices (video, audio, photographic camera, etc) that can convert information, images, and sound into common digitalform. It includes electronic information in processing technologies such as computer and internet, aswell as fixed-line telecommunication networks.
ICT is a heterogeneous application of computing, communication, telecommunication and satellite technology (Yusuf, 2000). The information accessedthrough digital technologies can

promote innovation, increase productivity and enrich the quality oflives. ICT in education is broad, deep and rapidly growing field of study (Moursund, 2005).ICT utilizes a broad range of technologies that are applied in the process of collecting, storing, editing, retrieving and transfer of information in various forms. One of the major factors oragencies of national development and global competitiveness is Education. Education is a veritabletool for national development. It is through education that a nation achieves her ideal and aspirations.Through education a nation produces the manpower needs that are necessary for national development. It istherefore pertinent for any nation not only to embrace all it takes but to improve the worth of education and much more through ICT even as it concern the technical and vocational education.

This was the reason for the revitalization of Nigeria educational system with the introduction of thenational policy on education to give training and impact the necessary skills to individuals who shallbe self-reliant economically (Federal Republic of Nigeria (FRN), 2004). Supporting this view, Ifedi(1982) stated that one of the main causes of unemployment among school leavers is lack ofemployable skills. Many do not possess the necessary skills and competencies which the moderneconomy demands. Thus, the nation is face with critical shortage of competent applicants' and burdensome surpluses of unemployable manpower. A sure way out of this unemployment andjoblessness is the integration of information and communication (ICT) into technical and vocationaleducation (TVE) programs.Employability in both public and private sectors of the Nigerian economy has growntremendously and this has made the manpower production to be of far in excess to demand. Theproblem faced by employers now is too many well qualified job applicants chasing very few jobvacancies. The increasing complexity of competition in the Nigerian labour market requires greaterefficiency of workforce. TVE has become very relevant to Nigeria of today, where massiveunemployment of both youths and adults is on the increase. One of the objectives of TVE is to prepareindividuals for gainful employment. Whether paid employment or self-employment, the emphasis ison exposure to and acquisition of knowledge, skills and attitudes relevant and adequate foremployment in specific occupations. Thus, the value of any TVE program could be determined inits ability to adequately prepare and equip appropriate individuals in such a manner that they could fitinto specific jobs or establish their own business after graduation.

ICT has affected man in all spheres of life. It has affected the way people live, work and play.People from all walks of life use ICT to accomplish various tasks. The influence of ICT in all humanactivities especially in the development of the nation's economy and its sustainability is imperative and necessary that TVE students should be madeto be aware and make use of ICT facilities to be functional and to add value to the nation's economy. To this end, Adesina(2002) affirm that whatever be your profession or would-be career, it is expected that anyone whohas acquired basic education should be able to perform the following: boot a system; shut down thesystem; operate the basic operating system that run a single users PC. for example, MSDOS andWindows millennium, Window 2000 or Window XP; use the computer to produce simple documentssuch as memo, letters, notes, etc; operate simple printers, to produce hard copy of work done on thesystem; use the e-mail facility to send and receive mails; and browse on the internet.It is clear that the changes occurring due to the introduction of ICT to our world affects theskills required so as to increase the economic position of the nation and this will make employees to be able to bring sustainability to the development of the nation.Learners' attitude can be positively influenced through the use of ICT in the classroom. The use ofICT in the teaching of TVE programs such as wood-processing has given a high support as it isneat, easy correction of errors as such, it is motivating, interesting, entertaining, educationallyinteractive, fun and meaningful.

Today, most assignments in schools have to do with ICTs such as the computer and theinternet and students are expected to use the E-library to source for information. Before this can bedone effectively, the students must have skills in accessing, manipulating and evaluating theelectronic information sources (ICTs). All these can be attained in the TVE classroom, since TVE'sgoals and objectives been identified as the production of manpower with the required skills, knowledge and attitude to function effectively.

The Concept of ICT

In time past man has always been inquisitive to get ideas to serve daily needs. This searchresulted in ICT tools and facilities. The use of ICT in acquisition of TVE skills cannot be underrated.ICT facilities are vital tools for enriching and facilitating observations, enhancing memory retentionand resulting in effective teaching and learning. Much attention is accorded ICT because it can beused to perform a lot of tasks. Ajoku (2000) posited that the use of ICT in teaching enables the learnerto develop problem-solving skills and attitudes as well as to develop knowledge and manipulativeskills. The need for the use of instructional materials in TVE programs has unlimited advantages.ICTs do not only reinforce learning but also supplement teachers' efforts to put knowledge and skillstransfer across. The use of ICT is an innovation which poses challenges to the society due to theincreasing demands of the economy; ICT has made work interesting rather than labourious and stressful. ICT has helped in acquiring of skills which has gone a long way to improve the economy. Researchers have explored the impact of ICT skill requirements. This recognition of ICTcalls for its adoption by every institutions as a compulsory course.

Educational institutions should prepare students to suit the manpower needs of the nation and to equip learners for the new information technology. major concern should be to train allTVE students who could use ICTs in the discharge of their duties, be it writing of programs,preparation of vouchers, payment of wages/salaries, keying in words, transcribing, storing andretrieving of information, communication, etc. An educational institution could be accessed throughits ability to train and prepare students for the challenging needs of the society; its success could beattributed to the identification of the required skills and competencies. This could be attained throughteaching the students how to live in a dynamic world and how to adapt to the changes. Acquisition ofskills in educational institutions should be in three stages. These are theoretical, practical andexposure. The combination of these three stages helps to facilitate the possession of appreciablerelevant production skills, to avoid the production of mediocrity as graduates. To this end, Mischwat (1998) in Oko (2002) asserted that the importance of skill acquisition is the exposure to practicalsituations where these skills are displayed in similar environment.

The Status/placement of Information and Communication Technology in Education

ICT refers to all kinds of electronics that are used for broadcasting, telecommunication and allforms of computer-mediated communication (Akindolu, 2002). Advances in ICT have its fulladvantage in all spheres of life. The use of ICT in education has brought many online packages whichgives the students greater control over what they learn and how they learn. It provides students withvast electronic learning capabilities. Gell and Cochran (1996) in Akindolu (2002) stated that ICT isable to bring students and teachers together for lectures, tutorials and one-to-one interaction acrossgeographical locations. With ICT, the tradition world of paper has become obsolete.Many nations of the world have embraced the use of ICT in their educational system. Thedividend of this step has been so wonderful and amazing. Gell and Cochran (1996) in Akindolu (2002) reported how Britain made use of ICT to promote distance learning. Gell and Cochran stated that the Open University of United Kingdom started offering degree courses through the use oftelevision and they opened a

summer school over the internet. Also, master degrees were obtained in1995 via the use of Integrated Digital Service Network. This afforded opportunities for students' to upgrade their knowledge without undergoing unnecessary hardship.In Austria, a policy known as eFit-Austria is already in place. The Austrian governmentthrough eFit-Austria gave e-Education a key position in order to make educational institutions and allpeople who are involved in Austria educational system fit for the knowledge society and informationtechnology. The objective pursued by eFit-Austria include: enlarging access to education for all;raising the quality of education; enabling lifelong learning, enhancing ICT competencies ofpupils/students, teachers and administrative staff; and raising the efficiency of school administrators.The strategy put in place is worthy of emulation. It covers the whole educational system fromprimary schools to Universities, training centers of teachers, institutions for adult education, scienceand research, sites of culture like museum, libraries and galleries. The Austrian government has beenvery supportive in financing the educational ICT activities. Between the year 2001 and 2003, thegovernment has donated 70 million pounds for ICT activities. Subsequently, provision has been madefor explicit funding with the normal budget.

The use of ICT in education in any nation depends on the computer technological awarenessin that country. According to Akindolu (2002), the first time computer appeared in Nigeria was in1963 when it was used to process the national census data. Some companies started the use ofcomputer from that time. However, it is very obvious that the use of ICT in education is yet to beembraced by Nigerian educational institutions (Aleburu, 2005). Many reasons are responsible for this.

The new innovation of ICT in teaching and learning process in most schools is still a dream yet to berealized. ICT has not been integrated into the curriculum and incorporated into the mainstream ofinstructional programs. Another reason is the non-availability of ICT facilities in our institutions.for instance, apart from computer science department that are equipped with few computers, availablefor the use of their students, most of the other students and lecturers outside the department do nothave access to computers. Similarly, Aduwa-Ogiegbean and Iyamu (2005) reported that Nigerianschools are without internet facilities.The implication of this is that students and teachers will not be able to come together for lectures, tutorials and one-to-one interactions across geographical locations. The traditional world ofpaper is still the order of the day. Students will not be exposed to enriching teaching and learningmaterials on the internet. Another reason is inadequate training of teachers. Most teachers in ourschools have not been trained on the use of ICT facilities. Few of them may be trained only toappreciate the use of which will be inadequate for them to apply in teaching and learning process.

The Essence of ICT in Education
The use of ICT as instructional materials has become a reality. Culp and Lagowski (1971) posited that the use of ICT in science instruction has been seen by its advocates as potentials, a toolwithout peer and as the probable means for providing instructional flexibility and individualizedinstruction; the use of ICT should not be neglected if one has to stress the effectiveness and simplicityof it in terms of teaching and learning. ICT has transformed many sectors of the society especially themanufacturing industries finance and medicine of which it has the capacity of changing orrestructuring the conventional method of learning in schools. ICT is replacing the chalkboard, overhead projector with various types of software, such as tutorial, simulation, drill and practice, telecommunication and internet. The Federal Republic of Nigeria (2004) in her national policy oneducation section 10 stated that most of our textbooks at present are unstable, inadequate orexpensive. Radio and television are products

of ICT designed to improve communication. They arealso used for the development and improvement of education as well as for the expansion ofinstructional techniques.

Afe (1989) asserted that the impact of ICT is unsurpassed by any innovationin the field of science and education.Many nations have already advanced in the use of ICT in education and all humanendeavours. For any developing nation like Nigeria ICT is expected to have a place in education nomatter the demand it places on the teachers and resources of acquiring them are enormous. Danladi(1996) asserted that with the introduction of ICT in education one can now easily find instructionalmaterials which are carefully structured for teaching specific lessons. In Computer-AssistedInstruction, ICT is to be used as a store of information which can answer questions (that is as aprocessor of answers to given questions) and to demonstrate visually or via educational robots, ideasand concepts. Walker (1986) identified the following as strength of ICT in education:

(i)   More active learning;

(ii)   More varied sensory and conceptual modes; and

(iii)   Nearer speed of thought and an aid to abstraction.

According to Graham (1998), ICT stimulates the interest of the learner; and gives the individual a flexible tuition at the learner's own pace and direction. Since the acquisition of appropriate skills will be of tremendous benefit to the individual and the nation at large and Nigeria has accepted education as an instrument per excellence, it is thus imperative for curriculum planners to include ICT education into Nigeria educational system at all levels (primary to tertiary) so that the objectives of education can be achieved.

ICT Literacy in Technical and Vocational Education

The world has become a global village and has moved from the industrial based society to an Information-oriented one as a result of ICT which is the dominant agent of the change. ICT skills, knowledge, and competencies are needed in almost all spheres of human life and its literacy is aprerequisite to effective participation in information-oriented society. For instance, for any individualor student or researcher to succeed, ICT knowledge is a criterion. Assignments, seminars, projects,thesis, and term papers have to do with ICT facilities such as the computer and internet and studentsare expected to use the library to source for information Idowu and Adagunodo (2003) posited thatknowledge, skills and confidence with ICT are now an asset to those entering the competitive labourmarket. Employment will soon be given to only those that possess ICT knowledge and this knowledgewill be used as aparameter over those without ICT knowledge. Bukley (2002) suggested that intoday's world, proficiency in ICT skills is as critical as reading, writing and arithmetic. ICT is nowbeing compared to that of reading and writing literacy and a prerequisite for employment. Buttressingthe above statement, Bukley asserted that today's business world is looking for skilled workers whowant to continue to learn and meet organizational goals. How much skills an individual has is fastbecoming a determining factor to securing a proper job and good pay and in a society such as ours (Nigeria), ICT skills are most required and requested for in any kind of employment. The fact thatICT has moved into the society so rapidly, the need thus arises for everyone to quickly acquire basicICT skills in order to pursue ones career goals and function effectively in the society.Odili (1994) suggested that the increasing need of multi-national companies of persons, knowledgeable in ICT will definitely frustrate the efforts of the government to provide teachers forICT related courses. This support the fact that with ICT knowledge, an individual is obliged tolucrative employment.

In Nigeria, policy makers, public institutions and the grassroots movement are striving for broad ICT access and being able to use ICT facilities is a requirement for democracy to be sustained and developed. A lot of old employees in government ministries and agencies, companies,industries, educational institutions, etc that are not automated live with the fear of

possibleretrenchment for lack of required skills to work in an ICT office environment. Adesina (2002) positedthat it is a complex thing today to secure professional jobs without demonstration of relevant ICTskills. Koko (2001) also asserted that on no account should staff without an up-to-date knowledge of modern office equipment be allowed to practice based on trial and error. No wonder employees inindustries, government ministries and agencies without ICT knowledge and skills feel scared of threats ofretrenchments and unemployment. It is sad but true that these ICT illiterate employees will soon losetheir jobs paving ways for those who are ICT literate. Employment security is what people look outfor and can only be 70 per cent guaranteed if an individual possesses the required knowledge andskills for the job which ICT knowledge is of top priority. ICT literacy cannot be avoided but must beembraced by Technical and Vocational Education students. It should be seen as a tool of making an individual a good scholar, a prerequisite for good employment and a vehicle that can convey anindividual and his/her messages round the world.

Benefits or Advantages of ICT in Technical and Vocational Education

The use of ICT in education and TVE particularly could be highly beneficial to students andthe nation at large in the following way: increases performance when interactivity is prominent;improves attitude and confidence; provides instructional opportunities otherwise not available;increase opportunities for students-constructed learning; increases mastery of technical skills; prepare students for work when emphasized as a problem-solving tool; increases thepreparation of students for most careers and vocations; increase emphasis on individual instruction;ICT will provide flexibility and convenience; it will overcome some traditional barriers such as timeand place; it helps students to study independently; enhances the learning achievement levels of students (Bezt, 1996); enhance problem-solving skills of students (Gokhale, 1996); Fosters peer interaction (Bilan, 1992); a student can take an instructor-led online class, which combines thebenefits of self-study with those of more traditional classroom-based learning (Ryan, 2001).It is evident that information is a key resource which permeates teaching, learning, research andpublishing. To this end, Robinson (1991) in Okeh and Opone (2007) stated that the use of newinformation technology can serve three main functions in the educational system. These are to: (i) deliver all or part of the learning experiences to learners; (ii) supplement and extend content providedin different forms other than printed (hard copy); and (iii) provide a two-way channel ofcommunication for exchange between tutors and students with their peers for feedback or for learning,problem-solving, advice, debate, and reports. According to Ikelegbe (2006) in Okeh and Opone (2007), other ways in which ICT can be used in education include: (i) supporting conventional classroom work; the teacher could ask his/her students to use ICT approach; (ii) helping in the designand development of learning materials. A lot of materials can be downloaded from the Internet. Suchmaterials must however be adapted to suit the specific instructional objectives; (iii) accessingelectronic teaching materials such as books, journals. These can be accessed, stored and analyzed bythe use of ICT; (iv) accessing virtual library "stocks" electronic versions of books and journals; (v)giving or providing access to the world of resources especially in electronic form; (vi) playing a keyrole in educational administration. Students' data, personnel administration, purchasing and supplies,advertisement, etc can be handled with ease using ICT; (vii) facilitating independent study andindividual instruction especially on the open distance-learning program; (viii) making learningmore vivid and engaging; (ix) assisting the teacher in assessment and testing; and (x) bringing apermanent solution to brain drain problems as we now live in a global village. Other benefits as identified by Ohakwe (2001) are:

1. Records can be managed and accounting functions performed using electronic document.

Information is now being processed, stored, retrieved and outputted at a far greater speed thanthe manual method. The secretarial student is able to carry out his/her duties with ease and ata faster rate than it is in the traditional office. Also the technical or industrial students are ableto perform their technical or engineering drawing activities using AUTOCAD faster than inthe usual classroom arrangement.

2. ICT creates opportunities for learners to have access to libraries and databases of otheruniversities, research institutions, or government agencies to consult stored files of TVEpapers, studies or reports. For example, users could subscribe to any of several electronic TVE journals, newsletter and periodicals published on internet

3. It is used for communication between individuals. For example, through video conferencing, audio conferencing, voice mail, etc, technicians can dialogue over various issues withoutbeing in the same location.

Recommendations and Conclusion

The basis for any meaningful national development in Nigeria will largely depend on howmuch the seriousness that is shown to the study of Technical and Vocational Education. A major wayto get through this predicament is the introduction of ICT in the teaching and learning of Technicaland Vocational Education. Technical and Vocational Education students skills are a particularinstructional behaviour or readiness in practical subjects, such as accounting, office education, engineering/architectural drawing and drafting, land surveying, etc. skills in these subjects areas wereacquired through the conventional method of chalkboard, textbooks, manual typewriters, drawings inthe studio or classroom, etc; but today, invention has made the acquisition easier through the use ofICT. Hence, the demands ICT places on teachers and students are very great and challenging. In thelight of the above discussions and conclusion, the following recommendations are made:

1. There should be an established vision for the plan of ICT in education. A committeeinvolving all stakeholders should be set up for the development of ICT.

2. Government should provide the required ICT infrastructure in schools. There should beprovision of computers and internet facilities in schools.

3. Government should make provision for staff development through organizations of seminarsand conferences to Train TVE educators in ICT skills.

4. Government should make funds adequately available for ICT implementation in schools.

5. Government should ensure steady supply of electricity in schools by mobilizing andmonitoring PHCN for effective discharge of their duties.

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