

## INFORMATION AND COMMUNICATION TECHNOLOGY: A PANACEA FOR HUMAN CAPITAL DEVELOPMENT IN NIGERIA

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### **Abstract**

*This paper delved into the importance of information and communication technology to the development of human capital. It covers the introduction; the concept of human capital development; concept of information and communication technology; relevance of Information and Communication Technology in Human Capital Development; the paper recommended that the teaching of information and communication technology should be taken more seriously; more and qualified teachers of ICT should be employed; government should sensitize the people on the importance of ICT regularly; more Information and Communication Technology facilities should be provided and suitable infrastructure should be made available; The relevance of Information and communication Technology in Human Capital Development include: mastery learning, individualization, direct teaching, cooperative learning and education administration; these recommendations when adopted and implemented by the various stakeholders of Information and Communication Technology, it could lead to human capital development in Nigeria.*

### **Introduction**

Technology has made its appearance on a scale that could no longer be ignored and as an entity whose aims were perceptually different from those of art and religion, displaying its new and brash values of “efficiency and power”, than two separate words information, communication coming together as information and communication. Technology can not be over emphasized; therefore, the twenty first century is regarded as the era of information and communication technology. Information and communication technology have the potential to enhance and access quality and effectiveness in an individual. Man’s activities are founded on science, technology, Art and religion. Technology is not merely applied science but it is a cultural field in itself, standing on equality with Art, science and religious ethics as the fourth realm of values (Ekpenyong 2008). Information and communication technology (ICT) assists a lot in dealing with problems in teaching as regards large classes, boredom and lack of interest. Students are exposed and are able to access a wealth of information available on the internet through increased use of technology. The well informed teacher can also achieve more professional test that are more rigorously conducted and relevant to real life situations. Information and communication technology (ICT) has the immense potentials to enhance the teacher’s ability to wade into many problems confronted in learning-teaching environment of the Nigerian education system. More effective management of teaching programme can be achieved through the immense capacity application of information technology in our education system. (Okonta 2009)

Human capital development is the act of increasing the functionality of the human resources by making them competent through the acquisition of knowledge and skills needed for the world of work. Oriazowanlan and Iyekekpolor (2009) define human capital development as the process of increasing the skills and knowledge an employee requires for effective work performance. Every other factors of production depend greatly on human capital development.

### **The Concept of Information and Communication Technology.**

Information and Communication Technology is an instrument for the economic, educational and technological development in the world today as computer is known to serve in different areas of life. The field of education has certainly been affected by the penetrating influence of ICT world wide particularly in developed countries.

Information and Communication Technology seems to have resulted in very profound and remarkable changes on the quality and quantity of teaching, learning and research in the educational institutions, thereby, ensuring quality development of human resources for sustainable society (Okonta 2009). ICT is an acronym for information communication technology, it can be broadly defined as a set of activities that is facilitated by electronic means, the capturing, storage, processing, transmission and display of information. Ekpenyong (2008), stated it is concerned with systems for the creation, processing, storage, retrieval, selection, transformation, dissemination, use of vocal, pictorial, textual and numerical information. Ayo (2001) sees information technology as the use of computer system and telecommunication equipment in information processing. Using the computer, transmission of information using telecommunication equipment and dissemination of information in multimedia. Information and Communication Technology can be seen simply as the acquisition, processing, storage and dissemination of vocal, textual, pictorial and numerical based combination of computer and telecommunication. Information and Communication Technology is the use of electronic computers and computer software to convert, store and process, transmit and retrieve information. It is concerned with systems for creation, processing, storage, retrieval, selection, transformation, dissemination and use of vocal, pictorial, textual and numerical information. According to Okonta (2009), ICT can be seen from three perspectives, firstly, ICT encompasses the software and related industries, computer programming services, pre-packaged software; Wholesale trade of software, retail trade of software, computer integrated system design, computer processing data preparation and information retrieval services; computer service management, computer rental and leasing, as well as computer maintenance and repairs. In terms of hardware, ICT refers to a range of manufacturing and service activities. These include: The manufacture of computers and equipment, magnetic and optical recording, media, electron tubes, print circuit boards, Semi-conductors, passive. electronic components, industrial instruments for measurements, instrument for measuring electricity and laboratory analytical instruments.

According to CTA (2003) Information and communication technologies (ICTs) can be broadly defined as technologies that facilitate communication and the processing and transition of information by electronic means. This encompasses the full range of ICTs from Radio/Television to telephones, computer and the internet. Okoh and Uko-Aviomoh (2008) define information and communication technology (ICTs) as electronic devices for computing, processing, storing and communication information. (ICTs) are further categories into two:

- (i). Digital information-comprises computer hardware, software and Networks and
- (ii). Intermediate technology-based on analogue information waves like radio, television and telephone. They further define (ICTs) as the science of extracting, collating, storing, processing, utilizing and disseminating data.

According to Olumese (2008) Information and communication technology can be define as diverse set of tools and resources use to communicate, create, disseminate, store and manage information. It was furthers stated that the technologies include computers, the internet, broadcasting technologies (radio and television), and telephone. Rahman (2002) describes information and communication technology as the technology of creation, processing, storage, retrieval and transmission of data and information, including telecommunication satellite, computing software, the internet and global systems of mobile communication (GSM). Obi and Oborah (2001), describe information and communication technology as a concept which refers to broad combination of computing and telecommunication technology for information processing. Agomuo and Olufunwa (2012) see information and communication technology as any technique used by people to handle information which involves the creation, storage, manipulation and communication of information.

### **The Use of ICT in Learning**

In order to function in the new world economy, students and their teachers have to learn to navigate large volume of information to analyze and make decisions, to master new knowledge and to accomplish complex tasks collaboratively. Overloaded with information, one key outcome of any learning experience should be for learners to critically challenge the material collected in order to decide whether it can be considered useful input in any educational activity. This is the basis for the construction of knowledge. The use of ICTs as part of the learning process can be subdivided into three different forms: as object, aspect or medium (Okonta 2009).

- As **object**, one refers to learning about ICTs as specific course such as computer education. Learners familiarize themselves with hardware and software including packages such as Microsoft word.
- As **aspect**, one refers to application of ICTs in education similar to what obtains in industry. The use of ICTs in education; such as in computer aided design and computer manufacturing.
- The use of ICTs as a **medium** refers to a situation where ICT is not studied as a course or application to any sector but where it is used to convey, transfer, process, store or retrieve information. The use of ICT as a medium is rare in Africa where the availability of resources is a major obstacle to the wide spread integration of ICTs in education. The computer equipment in the few fortunate schools that have them tends to be under used and lack appropriate education content (Okonta 2009) According to Nwanewezi and Akpomi (2008), Information and Communication technology (ICT) has penetrated all facets of the Nigerian economy and its role in the economic, socio-political and educational development of the country is no longer in question the prevalence and utilization of the business transaction have brought about radical changes in office operations such changes occasioned by improvement in equipment and machines, methods, technologist and procedures of ICT uses in business office have also brought it new challenges and opportunities since most Nigerians use their computers for just word processing, it therefore means that the computer, which has diverse uses is only being put to limited use because of lack of ICT skills.

(Abram 2001). According to Chukwumezie (2002), for any secretary to be relevant in today's technological offices, he or she should be conversant with service and resources provided by the internet. Olumese (2008) says there is increasing interest in how computers and the internet can improve education at all levels in both formal and non-formal setting. Older ICT technology, such as radio and television have for over forty years been for open and distance learning, although prints remain the cheapest, most accessible and therefore most delivery mechanism in both developed and developing countries. Olumese (2008) stating further, says that the use of computers and internet is in its infancy in developing countries due to limited infrastructure and the attendant high cost of access. Stating more, technologies are used in combination rather than as the sole delivery mechanism. Re-affirming the assertion, cited as follows: the kothmale community radio internet uses both radio broadcasts and computer and internet technologist to facilitate the sharing of information and provide educational opportunities in a rural community in Sri Lanka the open university of the United Kingdom established in 1906 as the first education institution in the world wholly dedicated to open and distance learning still relies heavily on printed based materials supplemented by radio, television, and in recent years, online programming.

### **Other Uses of ICT**

The benefits of ICT for civil society and poverty reduction can come from the application of ICT to improving the lives of citizens in general and the less privileged or poorest in particular. These opportunities apply not only to offering new or improved opportunities to earn income, but they also relate to better information about and access to government funded services in education generally. Okonta (2009) identifies three priority areas in which information and communication technology (ICT) potentials could be harnessed for the reduction of poverty. These include; opportunity, empowerment and security. Opportunity makes markets work better for the poor and expends poor peoples assets. Empowerment makes government institutions work better for the poor and removes social barriers. Security helps poor people manage risk. Information and communication technology (ICT) infrastructures such as internet, radio and television enable the delivery of education to isolated rural areas, ICT can also improve health care delivery. Information and communication technology (ICT) is beneficial in the area of production of goods and services. This benefit can extend to the capture of information in a digital form.

According to Ayo (2001), "the paperless or automated office where the computer is employed in carrying out general office work is with us". It is an electronic equivalent of the typical traditional manual office and is characterized by personal computers, fax machines, e-mail and the Internet. Also Itai (2002) remarked that the emergence of many business on the internet offers products to consumers which is facilitated by online payments. However, there is need for competencies in this networking process. He further noted that the financial exchange that takes place online within buyers and sellers without the use of paper documents such as cheque is fast gaining ground among corporate bodies.

### **Human Capital Development**

Human Capital Development is an act of increasing the functionality of the human resources by making them competent through the acquisition of knowledge and skills needed for the world of work.. Oriazowanlan (2009) defined human capital development as the process of increasing the skills and knowledge an employee requires for effective work performance. Every other factor of production depend greatly on human capital development. ICT in Human capital otherwise, human resources is an inevitable issue that needs attention of both the government and spirited individuals. Human capital development is something that must exist or happen for National development to be achieved. Human capital development teaches people how to utilize the power of diverse thinking styles so that they achieve holistic best practical solution. It takes human capital to organize and rationalize the contributions of other factors of production before a result oriented productive goal can be achieved in any industrial setting (Oriazowanlan 2009). It is the factor of production that brings human intellect, skills and competences in the production and provision of goods and services. Human capital development is a process of increasing human knowledge, enhance skills for increase in productivity and stimulate resourcefulness of trainees (Oriazowanlan 2009).

Philosophically, technical and vocational education was built on the production of competent and skilled graduates who would be equipped with all the necessary knowledge and skills that will not only enable them fit into already existing job opportunities in the society but will also empower them with skills and competencies that will enable them establish their own and, if possible create jobs opportunities for others (Okafor, 2008). Technical and vocational Education (TVE) worldwide aims at addressing the issues of youth unemployment, poverty and international competitiveness in skills development towards current and projected opportunities and challenges (MC Grath, 2005). Nigerian government often cushions the effect of poverty on vulnerable groups by establishing vocational schools and training programmes (Nwagwu, 2004). In Nigeria, Technical and Vocational Education has received a lot of attention at both state and federal levels (Garba, 2010). According to Igbiniedion and Ojeaga (2012), different institutions were established to offer technical and vocational education programmes including technical colleges, polytechnics, colleges of technical education, universities and vocational schools. They further state that the main objective of these schools and training programmes is to have competent and skill manpower for the development of the nation.

Obierika (2009) sees entrepreneurial skills as the process in which the expansion or resources, the direction of investment, the orientation of expansion of resources, the direction of investment, the orientation of technological and institutional changes are all in harmony and enhancement of potentials to meet human needs and aspiration. Osuala (1999) asserts that entrepreneurship is the processes of bringing together creative and innovating ideas and combining them with management and organizational skills in order to combine people money and resources to meet an identified need and thereby create wealth. Sequel to the importance of Human capital in a nation, both vocational and technical education and Entrepreneurship education are geared towards human capital development.

### **Relevance of ICT to Human Capital Development.**

The relevance of ICT in Human Capital Development here will be restricted to education. Information and Communication Technology stimulates and propels human capital development process of increasing human knowledge, enhancing skills and competence for increase in productivity and stimulate resourcefulness of trainees. The usefulness of information and communication Technology ICT in human

capital development as it affects Nigerian education could be seen in the following ways: mastery learning, individualization, direct teaching, cooperative learning and education administration.

❖ **Mastery learning:** The system also offers students ways to correct shortcoming and the process of evaluation and correctives until the objectives have been mastered. The basic principles of mastery learning is based on the premise that majority of learners in any group can complete a mastery of the designated objectives. The philosophy behind mastery learning is that the teacher can help the student to learn excellently and quickly (Samuel and Abraham 2005). The students can learn cooperatively in a group in the classroom, the teacher controls the delivery and flow of instruction. The teacher's duty mainly is to specify objectives, motivate the learners and provide instructional materials suitable for learning; to monitor students' progress, diagnose difficulties and provide appropriate remedies. The teacher chooses and specifies instructional objectives in form of observable behaviors, offers instruction and frequent evaluation of student's progress and achievement.

❖ **Individualization:** this is a situation where individual differences of students are taken care of by the teacher allowing the computer to play the pre-requisite skills, which the slow learners can master before moving to mastering new skills. With the use of ICT in this concept, a great problem in the teaching-learning process is being solved on the side of both teachers and learners because it is not an easy task for a teacher to carry the learners with special attention and the fast learners along the same pace (Samuel and Abraham 2005).

❖ **Direct teaching:** more active learning can occur when computers are useful for problem solving and classroom activities are properly focused on thinking skills (Samuel and Abraham 2005). They further stated that when a student is given the task of composing written material on a computer rather than with pen or paper, the computer screen allows the learners to alter phases, check spellings and grammar and correct other errors.

❖ **Cooperative learning:** Samuel and Abraham (2005) also stated that while traditional education practices have encouraged competition among students, co-operative learning offers more productive endeavours by students helping one another. Co-operative learning attempts to modify the instructional settings which will accommodate diversity of learners. The environment is organized in such a way that students possessing a variety of entering ability, knowledge, skills and attitude can learn in a cooperative setting. When students work alone in the classroom, the tendency is to create social isolation which often results in moody state which breeds boredom, loneliness and frustration. Each person has a role to play and he or she, is accountable for that role and must be interested in helping the group to achieve the desired result.

❖ **Educational Administration:** ICT can help in the administration of institutions of learning in the areas of decision making, budget making and implementation, accounting for expenditure, records keeping, tracking students and their records, communication and reduction of paper work and filing. The estimation of human and fiscal resources needed to build staff, equip and manage learning institutions require basic data on population growth, enrolment targets salary structures pension and gratuities and educational resources. ICT helps in identifying educational problems by allowing quick access to current information which will help in decision making Samuel and Abraham (2005).

## **Conclusion**

The development of human capital is imperative for national development. Human resources are seen to be the most important of all resources. Information and communication technology help in the development of human capital. Information and communication technology re-engineers the human capital development, as the human capital is made more functional in the society by ICT. It is difficult to function well in the society without the knowledge of ICT. Different definitions of Information and Communication Technology have been explored to understand in details what ICT is all about. The usefulness of the ICT in developing human capital which includes: educational administration, direct teaching, individualization and mastery learning amongst others have been analyzed. ICT therefore, should be a vital issue in the society and should be welcome by all and sundry.

## Recommendations

Based on the review, the following recommendations were made:

- The teaching of information and communication technology should be taken more serious by the teachers.
- More and qualified teachers of ICT should be employed.
- Government should from time to time sensitize the people on the importance of ICT
- More ICT facilities and suitable infrastructure should be made available.

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