INFORMATION AND COMMUNICATION TECHNOLOGY AND PROGRAMMED INSTRUCTION FOR THE ATTAINMENT OF EDUCATIONAL GOALS IN NIGERIAN SECONDARY SCHOOLS

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ABSTRACT

Education is a useful instrument to ensure that positive changes take place in the society. In view of this Nigeria came up with a document stating her national goals and educational goals. The educational goals are anchored in information and communication Technology (1CT) for their realization and Programmed learning. In this paper the national goals, and the national educational goals will be highlighted. 1CT and programmed learning will be explained briefly. The utilization of the internet facilities and services such as, websites, chatting, electronic mails, gateways of the internet for improving the attainment of educational goals are highlighted. Recommendations for the attainment of the educational goals are also made after the conclusion to work.

Keywords: Information; Communication; Technology; Attainment of Secondary school goals in Nigeria.

INTRODUCTION

Education is a veritable instrument available to many Nation or individual to make a visible and positive change. This change is always measured by the way the individuals or nations wellbeing are maintained. According to Iwu and Ike (2009) Nigeria as a nation came up with a document that stated in clear terms her education mission (goals) statement. This became important because this mission statement will guide the operators and stakeholders in the education sector to enhance the thinking of the nation. This thinking is that educational goals shall be set out in terms of their relevance to the society in line with the global issues.

According to Iwu and Ike (2009), this mission statement which is encapsulated in the National Policy on Education is well known, and need not be re-emphasized. These according to FRN (2004) are;

   a. A free and democratic society
   b. A just and egalitarian society
   c. A united, strong and self-reliant nation
   d. A great and dynamic economy, and
   e. A land full of bright opportunities for all citizens

The above national goals constitute the foundation on which the national Development plan is built upon.

Educational Goals in Nigeria:

The National Policy on Education FRN (2004) succinctly outlines the National educational goals as follows:

   a. The inculcation of national consciousness and unity
   b. The inculcation of the right type of values and attitudes for the survival of the individual and the Nigerian society
   c. The training of the mind in the understanding of the world around
   d. The acquisition of appropriate skills and the development of mental, physical, social abilities and competencies as equipment for the individual to have and contribute to the development of the society

The above goals came as a result of the past national experiences and a determined effort to build a united country in which the citizens are persistently conscious of their identity. People often move along state

and ethnic lines. There is need therefore for deliberate attempt to inculcate in our students national unity, values and attitudes. Equally important are the trainings of the mind in understanding the world as well as acquisition of skills, abilities and competencies to the development of the society. To actualize these goals, the National Policy on Education anchored their realization to definite innovation. Innovation is a new technique, method or approach effectively designed and developed to ensure effectiveness and efficiency in a given setting. One of the innovations adopted to actualize the educational goals is Information and Communication Technology (ICT). The focus of this paper therefore is to know the extent of achieving educational goals through ICT and programmed instructions in tertiary institutions in Nigeria.

Concept of Information and Communication Technology

Information and communication technology could be seen as a set of technological tools, techniques and resources used to generate, communicate, store and manage information (Ezemoyih, 2015). These technologies include computers, the internet, radio, television and telephone. In recent times, there has been an enormous interest on how internet can best be harnessed and applied to improve the efficiency and effectiveness of education at different levels both formal and informal.

According to Ike and Iwu (2009), information and communication technology is a term used to refer to a broad are of human activities. It is the acquisition, processing, storage and dissemination of vocal, practical, textual and numeric information by a micro-electronic based combination of computing and telecommunication (Nwosu, 2000). The National Policy on information and communication technology FRN (2004) defines ICT as computers, ancillary equipment, software and firmware, hardware and similar procedures, services (including support services) and related resources. ICT is any equipment that is used in the automatic acquisition, storage, manipulation, management, movement or reception of data or information.

ICT is the term also used to describe exciting and innovative ways to provide learners with global access to information, learning and support (Iwu, 2009). Sometimes, ICT is also seen as an umbrella term that includes any communication device or application which includes but not limited to radio, television, cellular phones, computer network, hardware, software satellite systems as well as the various services and applications associated with them. These include video conferencing, audio conferencing, distance learning and multimedia utilization.

According to Ugo and Aniche (2011), ICT is a potentially powerful tool for extending educational opportunities both formal and informal to people in areas that are traditionally deprived of education, and those who cannot afford to enroll in campuses. An important definition of information and communication technology is their ability to transcend space and time. Information and communication technology makes possible asynchronous teaching, that is, a situation where there is time lag between the delivery of instruction and its reception. Bowes (2003) opined that information and communication technology is a panacea for all educational problems. Today's technologies are essential tools for teaching. Information and communication technology remains transformational tools which when adequately applied can help the shift to a learner-centered approach in education. Information and communication technology combines text, sound and colourful animated images to provide authentic and challenging content that absolutely engages the students in the teaching process.

For developing countries like Nigeria, information and communication technology has been potential to access and improving quality of education (Ugo&Aniche, 2011). In Nigeria, the digitalization of Universities and College facilities and Departments, the National Open University of Nigeria (NOUN) remains a breakthrough in the delivery of education. With an information and communication technology (ICT-based process from admitting, through registration to examination) there is no doubt that ICT has proved effective in the delivery of education process, and truly embracing it. In this vein, information and communication technology represents a potentially equalizing strategy for developing.

The idea that teaching can successfully take place through the application of electronic communication facilities between teachers and students is one which had generated sometimes, hope and dismay and other times, excitement and fear. Hope that many more learners can be reached at a more commitment pace, dismay in that the infrastructure necessary for developing an effective information and communication technology platform is lacking in low income countries like (Olakulehin, 2007)

However, the use of information technologies in the education process have been divided into two broad categories, information and communication technology for education and information and communication technologies in education. Information and communication technology for education connotes the development of information and communication technologies specifically for teaching purpose, while the information and communication technology in education involves the adoption of general components of information and communication technology in the teaching and learning process (Olakulehin, 2007).

Generally, however the educational relevance of computer and other components of information and communication technology cannot be over-emphasised (Nwosu, 2014). Reference can be made to the period when Skinner applied programmed instructions to teaching machines through Brunner's experience with computers in instruction to the current wave of information transmission and exchange via World Wide Web (www). We have seen different applications of information and communication technologies in enhancing cognitive development (Ezemoyih, 2015).

UNESCO (2014) in their classification divided the application of computer and other technologies in education into three broad based categories. These are pedagogy, training and continuity education.

Pedagogy applicability of the information and communication technologies (ICTs) is concerned essentially with the more effective teaching with the various components. Almost all subjects ranging from mathematics (the most structured) to music (the least structured)can be learnt with the help of computers (Olakulehin, 2007). Olakulehin emphasized that pedagogical application of information and communication technologies involve effective teaching with the aids which play complementary role in teaching situation, rather than supplementary to the teacher. Computer is regarded as aid on rather than a replacing device. The pedagogic uses of the computer necessitate the development among teachers as well as students of skills and attitudes related to effective ue of information and communication technologies. Also, ICT facilitates teaching to subject areas and teaching at home on one's own and these necessitates the use of new models like modeling, simulation, use of data basics, guided discovery, closed-word exploration.

Information and communication technology is often spoken of in a particular context such as information and communication technology in health, governance, education and other areas. In education therefore, it is the communication facilities and features that variously support teaching, learning and a range of activities. It is imperative to observe that the basic principles of programmed instruction are utilized in ICT are also relevant in teaching and learning for the attainment of educational goals.

Programmed Instruction

Programmed instruction is defined as a process of arranging in a series of small steps designed to lead a student through self-instruction from what he knows to unknown of new and more complex knowledge and principles, with a view of achieving specific operational defined objectives (Chauhan in Ike &Iwu, 2009). It is an educational technique characterized by self-placed, self-administered instruction, presented in logical sequence and with much repetition of concepts. The theoretical basis for programming instruction was provided by behavioural psychologists as B.F. Skinner and J.A. MCcieoch (Adamu, 2001).

Nwafor in Iwu and Ike (2009) observed that Skinner developed a list of instructions guiding a learner to learn and he called it programmed instruction. His law of effect later became the founding principle of programmed instruction- immediate reinforcement. He foresaw the innovations in one of his writing in 1912.

If by miracle of mechanical ingenuity, a book could be so arranged that only to him who had done what was directed on [page one would page two becomes visible. Much of that now requires personal instruction could manage by prime books be given out in loose sheets a page or so at a time and books, arranged so that the students only suffer if he misuses them, should be worked in many subjects.

Basic Principles of Programming

The principles of programming are relevant to the teaching learning and attainment of educational goals (Okwo & Ike in Ike &Iwu, 2009). Some of these principles are mandatory. They include

1. **Principles of specific objectives**: The principles of specific objectives emphasized the audience, the behavior in an observable term, the condition under which the members of the audiences are expected to function and the degree or level of acceptance (ABCD of specific objectives).
2. **Principles of sequencing**: The principles of sequencing stressed that the learning experiences for the learner should be arranged in logical order.
3. **Principles of error rate**: The principle of error rate ensures that learning experiences are so organized that learners make less mistakes as he/she climbs the intellectual ladder. According to Ike and Iwu (2009), behavioural psychologists especially Skinner suggested the use of different types of prompting techniques to ensure that students get the right answer. In this process, positive reinforcement is recommended. It is important to observe that Crowther in Ike and Iwu (2009) built his programmes on students' error. He used their errors as indication of areas of weakness and that should be remedied. However, research evidence has shown no significant correlation between performance and the number of errors, yet according to Nwafor in Ike and Iwu (2009) others have proved that making errors can enhance learning.
4. **Entry Behaviour:** The principle of entry behavior suggests that new learning experiences should be built on the experience the learners entering the learning environment with.
5. **Self-placing:** The principle of self-placing allows each learner to proceed at his/her own rate. However, recent development preferred group-placed to self-placed instruction. The group should not be more than ten (10) for it to be meaningful.
6. **Responding:** The principle of responding demands activity. Learning is activated through experiences and what a learner does is what he/she learns.
7. **Principles of immediate feedback:** The principles of immediate feedback reinforce the learner. Learners look forward to it in a well-organized learning environment. However, delayed and intermittent feedback can be accepted.
8. **Principles of empirical and continuous testing:** The principle of empirical and continuous testing is necessary to ensure that the objectives of programmes are maintained. Learners on any type of programme therefore are continuously tested. This provides data for diagnostic purposes.
9. **Principle of small step:** The principle of small step is ensuring that learners do things that are responsible at a particular age or level. The success in each step will be instrumental to the next step. This in a way serves as reinforcement.

Consequence on the above principles of programming, students in Nigerian secondary schools who learn instructional content using principles as enumerated above should be in a position to attain educational goals by:

1. Identifying his or her bearing in any situation in life.
2. Achieving self-reliance and rationalizing issues for the political economy of the nation.
3. Improving on skill acquisition and developing new ones in a challenging environment.
4. Developing mentally and be competent in any social environment
5. Functioning as a good Nigerian in any culture he or she may be found
6. Solving any National unity of the nation.
7. Accepting to render services and free movement to any part of the country.

Utilization of ICT Services for the Attainment of Educational Goals

Some of the ways by which information and communication technology can be utilized to attain national educational goals include:

1.Internet: Internet is an aspect of information and communication technology commonly used by people in all aspects of human teaching, learning and everyday transactions. Internet is developed from two different words – interconnection and network (Ike &Iwu, 2009). According to them, this means that ''Inter'' is a short form of interconnection and ''Net'' a short form of network, which gives the acronym – internet. Internet therefore is a global collection of many types of computer networks. The internet is the largest store house for information. With its effective use, the educational goals can be achieved, it is a fact that millions of Nigerians connect (log on) to the internet daily for several purposes.

The internet has made such a difference in our society that it is difficult to remember when we did not depend on it for communication, instruction and entertainment. This is so much to learn about the uses of the internet in education that many educators find it difficult to know where to begin.

Most people think of the internet as synonymous with the World Wide Web (W.W.W), however the later is really the subject of the former, the internet system. The World Wide Web is an internet service that links sites all over the world through hypertext documents. By bringing up hypertext or web page document in a programme called a web browser, one can click on text or graphics linked to other pages in other sites.

According to Ike and Iwu (2009), connection to internet has become a symbol of technology's power to shape our lives. A major advantage of the internet is the ubiquitous, comprehensive nature of its information and services. Once connected, educators and students can exchange information among themselves and with others anywhere in the country. They can use it to locate information virtually from any aspect of national education goals. A person or site with the desired information need only to be connected to the internet and willing to provide listings of available resources.

Internet Services Available

A.**Availability of information:** lots of reports and information services are available which makes it very easy to read national issues that inculcate national unity. For example the establishment of various websites in the country, students browse often to get results (JAMB, WAEC, NECO) as people of the same nation. Also the development of citizenship education curriculum can be programmed and uploaded in the appropriate website. The programmed instruction would kindle the love, awareness and appreciation of the young people of their motherland, Nigeria in a deliberate rather than in an accidental manner.

B.**National Contact**: National contact can be maintained on accessing the internet. Today unity schools and the National Youth Service Scheme are common exchange of information and educational materials through web is possible. Students or members of NYSC can identify a lot of friends using internet services.

C.**Electronic Mail** (e-mail): Electronic mail can be used to send or receive messages in and from friends in Nigeria to inculcate the right type of value and attitude for the survival of the individual and the Nigerian society. The value system of a people can be said to be the set of approved likes and dislikes, as vocalized or as seen in their behavior, their speaking, action and thought. To show the Nigerian value system. Internet is always available to ensure the attainment of these educational goals. For instance, developing on the situation, an e-mail can be sent to a wife. "A husband is the crown of his wife". "A good name is better than silver and gold". These statements are value oriented. They are able to inform and educate everyone.

D. **Training of the mind in understanding the world:** students can benefit from the gains of the internet information on new techniques, methods of doing new things, as painting, planning, teaching and other fields of life. It is used for commercial and business opportunities. Internet helps to know about whether forecast for planning and to get information about different countries as regards to their history and general information. Students can enroll in international/distance learning.

E.**Acquisition of skills, abilities and competencies**: internet is a centre for research for students and teachers alike. It makes it possible to acquire skills to transfer formatted text and unformatted texts such as graphics, audios and videos that came in different formats, costly and time consuming.

F.Chat Rooms: chat rooms are internet locations that allow live real time communication between two or more users.

Challenges on the use of Information and Communication Technology (ICT) facilities

Our educational institutions are populated by youths. These youths are the adults of tomorrow. Although we have shown the place of internet facilities in attainment of educational goals, today our students have unhindering access to internet. At any given moment, millions of our students are online at least with their cell phones. In Canada nearly half of all youths with cell phones can access the internet with them (Iwu, 2005). Let's consider some of the online activities that many students are attracted to and their potential dangers.

i.**E-mail**: This is a fast and in-expensive way to correspond to any one electronically in a written form. Most often unsolicited messages called span can be found in the box. Sometimes they contain suggestive or obscene contents.

ii.**Websites:** millions of sites are now available in the cyber space for students to do a lot of activities such as to shop, to research, download games and music. However, unscrupulous individuals have uploaded morally unacceptable pages for unwary to stumble upon. In the United States of America, for example, 90 percent of youths surveyed between the ages of 8 and 16 confirmed that they had unintentionally encountered pornography (Awake, 2008). The web is now a training site for team gambling. Some sites teach how to unleash terror, produce bombs and other activities injurious to good human relations.

iii.**Chat Rooms:** these are electronic spaces for live text conservations on a topic of interest. Dangerous individuals frequent chat rooms with the interest to lure students into some unacceptable behavior.

iv.**Instant messages**: this is live text conservation between two or more individuals. Here the users select a cyber-friend from contact list. This activity can be distracting. It may not help serious minded students.

v.**Blogs:** this is online diaries. Blogging give students the chance to write about their thoughts, passions and activities, space for readers to comment are provided. Leaving out information about oneself to the public without asking whether it is unethical. Blogs can harm reputations. Some employers consult applicant's blog when considering appointment to any position.

CONCLUSION

FRN (2004) in the National Policy on Education stated clearly the national educational goals. There is need to map out strategies for ensuring that these lofty goals are achieved, information and communication technology and programmed learning are innovative in the attainment of these educational goals if their potentialities are properly harnessed. The roles which ICT and programmed learning can play to ensure that the educational goals are attained are no longer in doubt. The following recommendations are made to further facilitate the attainment of the educational goals using ICT and programmed learning knowledge and facilities.

RECOMMENDATIONS

1. Teachers are responsible for inculcating these educational goals in the school system. Only experienced professional teachers should be allowed to teach in the school system.
2. Every experienced professional teacher should be computer literate.
3. Programmed learning encourages individualized instruction which in turn instills self-confidence encourages self-reliance which is emphasized by the national educational goal.
4. Every school should have computer rooms specifically designed for instruction.
5. Every school should be connected to the internet as this may enable students/pupils not only to download necessary information but also to chat with their contemporaries in other parts of the world.
6. Computer engineers should be employed in each school to maintain the available computers and other internet facilities.
7. Parents and teachers should monitor the use of the internet facilities by the students. It is now discovered that most students go to the internet not to download the needed concepts but to:
    i. Download pornographic pictures, cultic practices, dangerous actions, films on robbery and killing.
    ii. Chat with foreign friends on irrelevant topics.
    iii. Use the e-mail for sending love letters.

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