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Information Communication Technology (ICT) and Teacher Education in the 21st Century Nigeria

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Abstract

The teacher is one of the most important factors in the business of teaching and learning. Before the introduction of information and communication technology, he was regarded the sole dispenser of knowledge. With ICT, both the teachers, and students can access information. ICT also, brought with it new skills and methods of teaching and learning processes. So, for the teacher to remain relevant in this new information age, ICT must be integrated in their training. Therefore, this paper opts for the integration of ICT facilities in teacher training in Nigeria. The paper also identifies ICT

facilities such as computer, internet, World Wide Web, E-mail, video conferencing, teleconferencing and teleprocessing as relevant in teacher education. It also identifies poor curriculum, and inadequate facilities as factors that can impair ICT use in teachers training. It reveals that the 21st century teacher needs his potentials enhanced in ICT to be able to harness the required skills and method of delivery in teaching/learning process. This study therefore, strongly posits for the integration of ICT in the training of teachers for the present Nigerian education system. To do this effectively ICT facilities and personnel should be made available especially at university level.

Introduction

Information and communication have made a tremendous impact in all facets of human activities including education in the 21st century. Apart from reducing the world to a global village, it has made the most tremendous impact in education. It revolutionized education by making all vital information available to the learners. This is why Gates (1995) noted that the most fundamental difference between today and the future is that information will be created, stored, and transmitted in digital formats. With ICTs the learners can access information from different parts of the world and they no longer depend solely on the teacher for information. In fact, learners who have access to ICT facilities such as internet and use these facilities in their learning can be said to be more versatile than their teachers who have no access to these ICT facilities.

For teachers to be relevant in this new information and technology age, teacher education or training must adopt ICT programmes in their training. The incorporation of ICT into teacher education curriculum not only positions the teacher to be more effective and efficient but also, to remain relevant in the new world ruled by information and communication technologies. In view of the importance of ICT to our national development in general and educational advancement in particular, this paper therefore, concentrates on the integration of ICT into the training of the 21st century Nigerian teachers.

The Concept of Information and Communication Technology

The age has been rightly described as the age of information and communication technologies (Akpan, Ndem and Usoro, 2004 and Nwachukwu, 2004). It is an age driven by knowledge based on computer

technology which has a prodigious capability to transmit information in a way never experienced before by the human race. According to Marghalani (1987), Information and Communication Technologies (ICTs) is a term which encompasses the notion of the application of technologies to communication/information handling (generation, storage, processing, retrieval, dissemination, etc). as defined by American Library Association (1983). As cited in Nwachukwu, (2004:110), information and communication technologies is the application of computers and other technologies to the acquisition, organization, storage, retrieval and dissemination of information. Also, Ozoji (2003) defined Information and Communication Technologies (ICTs) as the handling and processing of information which may be in the form of texts, images, graphs, instructions and so on for use by means of electronic and communication devices such as computers, cameras, telephones, etc.

As can be deduced from the definitions above, Information and Communication Technologies (ICTs) offered to learners, teachers and other users the opportunity to access and store more information, retrieve and use the information to improve themselves. Its introduction brought about the use of personal computer, and other wireless devices such as the internet, World Wide Web, electronic mail (E-mail), teleconferencing, etc. Also, other low technologies which ICTs brought into the field of teaching and learning transactions include radio, television, videos, tape recorders, compact discs, floppy diskettes, projectors, etc.

For teachers to remain relevant in this age of information and Communication Technology they must be properly trained on how to use these technologies to make their teaching more effective and how to use them to improve their knowledge base and more efficiently manage the classroom.

Some ICT Facilities Relevant for Teacher Education

Computer: The invention of computer to date remains the most important development in the information and communication technology revolution. The computer is interactive and requires active motor involvement. It has the ability to stimulate complex situations and can explain concepts in a more interesting and understandable manner by means of animate material (Stonier, 1989). According to Offoroma (2004:45) “computers are very good at storing manipulating and retrieving large amounts of information”.

Cook (1995) highlighted four advantages of the computer, which include:

- i. It can analyze what the students do and takes account of this in what the learners do next (feedback).
- ii. It can vary stimuli in a drill and also produce appropriate answers in an interactive conversation (novelty and creativity)
- iii. It is adequate to the needs of the learners (individualization).

The use of computer in the classroom can be viewed in two perspectives; as an object of instruction and as a vehicle for instruction (Anakwe, 1991). The computer when used as an object of instruction means the study of computer itself and data processing, and also when used as a vehicle of instruction, it is concerned with instructional delivery system.

In the delivery of instruction, the computer plays two important roles namely; Computer Assisted Instruction (CAI) and Computer Managed Instruction (CMI) (Anakwe, 1991, and Ajewole, Ogunlusi and Bajaulaiye, 2003).

In CAI, computers are used as learning resources, information is stored in the computer and the learners are allowed to access the information. While in CMI, the computer assists the teacher in storing information about the learners and the information can be retrieved when required.

Internet: The internet is an international network of computer networks that allow access to the publication and transfer of information. According to laudu (2004), the internet is a global computer to the other.

It offers a cheap means of communicating and accessing information that compliments standard telephone. Through the internet, the-would-be teachers, under-going training, can assess information, which can enhance their acquisition of modern teaching skills.

World Wide Web (WWW): The web is not synonymous with the internet but, it is one way to utilize the infrastructure of the internet. This is information website. It is also known as information super high way. The web is a global network which allows every computer on earth to have access to world wide information traffic. It allows every user to view documents in richly formatted texts and pictures. With www, learners have access to an unprecedented amount of authentic information, as well as the possibilities to publish and distribute their own multimedia information for other users' consumption (Robinson, 1994 and Iwu, 2004).

Electronic Mail (E-Mail): E-mail is an internet based electronic substitute for the conventional post office (Iwu, 2004). It is a transfer of message in electronic form from one computer use to another, usually over a network. E-mail allows a meaningful interaction between the teacher and the learner; it provides educational programmes like E-learning, E-tutoring and E-schooling.

Video Conferencing: This is one of the latest technological applications in teaching and learning. According to Townsend (1997:48), “video conferencing is a means of linking up two or more remote computers, all of which have a small camera attached which enables participants to see each other, to speak to each other, and to some extent, to be able to send documents to each other through the linked computers”.

Through video conferencing, teaching and learning take place in real and meaningful contexts (Norman, 1997).

Tele Conferencing: This is a communication technology which offers learners the opportunity to simultaneously get connected by means of closed circuit television in a discussion without the attendants meeting themselves. That is, learners from different locations can participate in a discussion at the same time through the telephone without the chance of meeting themselves.

Tele Processing: As contained in Iwu (2004), teleprocessing refers to a form or online processing in which users at remote workstations are able to access a central computer to store, retrieve, or process data. Learners or students can store, retrieve or process information through teleprocessing.

Data Base: This is the memory or where information of data are stored or kept in a computer. The information stored in the data bases of an internet or computer can be retrieved and used at any time they are required. The database then is a concept for a futuristic efficient operating system.

The true database has replaced database-like filesystem. The current model can perform many feats to an unimaginable extent compared to other operating systems. It is used for storage of complex system of tables and grids for future purposes. The information/data retrieval from the database is done in user-friendly tracker display/manner with less effort and for a short time, that is, it's efficient.

Education in Information and Communication Technology Age

Education in any society does not exist in a vacuum. It must link up the current trends, values and reflect the level of human development. The advancement here is illustrated in the ability to generate, store and when necessary retrieve the information or knowledge from an operating system-database (computer). Education reflects the values of the society to which it belongs (Stonier, 1989). As the society is advancing, it is no longer possible for the teacher alone to provide all the information the learner requires to be relevant in the new age. To this end, ICT has offered the greatest assistance to the teacher (education). For instance, the integration of internet and other ICT services into the classroom increase the independence and autonomy of the learners and changes the role of the teacher to that of a facilitator, who plans, structures, organizes meaningful learning and collaborative opportunities for learners. His function is no more that of transmission of knowledge because ICT makes new things possible in new ways, Selinger, (1999). ICTs brought a lot of changes to the way education is dispensed in the classroom, it introduces individualized instruction which means that the dissemination of instruction depend largely on the characteristics of the learners. It also introduces methods such as E-learning, teleconferencing and others which enable students from different locations and countries to attend the same class at the same time.

Apart from this, it provides data to the learners, which was previously the exclusive function of the teacher. On the part of the teacher, it places him on a new and enviable position of a guide or facilitator and a manager of learning. In their contribution to the importance of ICT to education; Akpan, Ndem & Usoro (2004:58) note that:

As an instrument for instructional strategy ICT can be used to present difficult and abstract topics and concepts through varied pedagogical approaches in an existing and captivating way. ICT will, to some extent help to minimize the problem of teacher scarcity in certain areas of specialization.

Oloruntegbe and Odutoyi (2003) enumerated the benefits of ICT based instruction as making learning exciting and challenging, allowing quick responses and feed back, allowing learners to proceed at their own pace, increasing moderation, enabling students to gain both qualitative and quantitative understanding of the topics studied, and stimulating

experimentation. The introduction of ICT services into education to date remains the most fundamental change in education. With its introduction, the learner no longer depends solely on the teacher as the only source of knowledge. Both the learners and their teachers can access information which before now was almost impossible.

ICT, Teacher Training and Its Effectiveness

The adoption of ICT into the educational system brought with it a lot of challenges to the teacher. This obviously means that as ICT changes the traditional perception of the teacher, it places him not only on the embodiment of knowledge but also places on him the responsibilities of a planner/a guidance or facilitator and effective transmitter of knowledge. These challenges are two-fold. First, there are problems of inadequate funding and facilities, power failure, lack of space for the display of the little available facilities/equipments for use coupled with large student population amongst others. Second, the change from traditional strategies mastered by the teacher to the new ones with sophisticated learning facilities not properly understood. These problems threaten the teacher's intellectual ability and self-confidence, hence his profession. What the teacher needs most in this dispensation is training and effective knowledge update. The teacher would need to acquire new skills to be able to handle these new responsibilities.

Teacher's Effectiveness

The training programmes availed to the would be teachers in the tertiary institutions that offer teacher training programmes presently, cannot lead to the proper acquisition of ICT skills by the teachers. The curriculum as offered today in most of the institutions does not have well structured ICT courses in these institutions. And, where the courses are well structured the qualities of personnel available to take the courses are poorly empowered.

These ICT-teachers should not concentrate on just computer appreciation which is elementary and not adequate for the skills required by the class teachers. The teachers in training need in-depth knowledge and as a result, can use the acquired skills in his teaching profession.

More so, some institutions are not sufficiently equipped with ICT facilities which include computer, internet services, teleconferencing, and others. What they do is to teach the theoretical aspect of ICT whereas, it supposes to be practical for the skills to become part and parcel of the teachers in training.

The attendant effect of these obvious ineffectiveness and inadequate preparation in the training of the would be teachers will lead to lack of adequate knowledge of the teachers on how to harness the potentials of the ICT in teaching their subjects. Similarly, the inadequate knowledge of ICT, will lead to the teachers' ineffectiveness and negative perception of the computer application. The use of computer needs mastering otherwise it can be time consuming and also requiring great adjustment to be able to use in class room transactions. Teachers can only be good in ICT application if they are well groomed in the practical application of ICT facilities during their training.

However, no matter what one thinks about the application of ICT-computer, it makes for an effective and efficient teacher in these following ways:

- tool: The computer assists both teachers and students in calculating and typewriting among other uses.
- n object of instruction: In computer literacy courses students learn about computers while in vocational courses they learn to apply computers on the job for data processing and analysis.
- an instructional device: The Computer Assisted Instruction (CAI) helps learners acquire specific skills. In this case, it can assist students learn mathematics and other subjects without difficulty.
- a direct assistant to the teacher: The classroom teacher uses ICT for grade reporting. It saves time and helps him provide reports of students grades. It is used in tests, quizzes and worksheets.
- a general purpose database management programme: It is useful for teachers to grade and store grades, achievement test scores, parents contacts and other information.

Other uses include:

- in prescriptive learning, assignments would be easier to control with ICT.

- ata would be stored, analysed and academic reports used to structure/restructure the students assignments.
- great deal of manual work will be eliminated and instantaneous information on the students' progress would be retrieved from operating system when necessary.
- CT enables the teacher reach a great number of the students online. It saves the teacher from problem of space for learning.
- s an assistant to the students: The student can obtain information necessary for his/her studies and be able to interact with his/her instructor or teacher anywhere in Nigeria or any part of the world.

For the teacher to be effective in his profession he should be able to apply ICT – based instructional procedure and able to use computer.

Demands from the Teachers' in the 21st Century ICT World

In the new information and communication technology age, no country can be an island. ICT has reduced the world to a global village and Nigeria cannot afford to be an exception. For the country to be able to harness the potentials of ICT through our educational system, a lot of responsibilities are placed on the shoulders of the teachers. The society demands a lot from the teachers in terms of knowledge and application. The 21st century teacher is expected to be an expert in the use of ICT facilities in enhancing their students' acquisition of knowledge. They are not only to acquire ICT skills but to also, consistently renew their skills so as to remain relevant. Information and Communication Technology (ICT) is not only about how to use the computer in the storing and retrieval of data, it also involves the use of World Wide Web (WWW), internet, E-mail, teleconferencing, teleprocessing, etc. For the 21st century teacher to be relevant, he or she must possess the skills to harness ICT facilities in their teaching and learning efforts. The skills which would enable them impact to their students the skills to use ICT facilities in assessing information to widening their scope through interaction with other students either through the internet or other ICT facilities are highly required.

These are the demands from the teachers in the new world of Information and Communication Technology (ICT). In Nigeria, these demands become real when we have fully accepted and installed ICT services in our schools.

Conclusion

The teacher is one of the most important factors in the education industry. In his training, the curriculum should be structured to help develop the teacher to be an embodiment and dispenser of knowledge. He should be groomed in the theoretical and practical dissemination of knowledge. Though the introduction of ICT, places in the hands of the learners the facilities which would enable them access information just like the teacher, the role of the teacher in the new dispensation becomes enormous making him not just a guidance or facilitator of learning, but an efficient and excellent facilitator of learning.

Therefore, this paper demands that the training of our teachers should consider both theoretical and practical approaches and therefore there should be an effective integration of ICT courses into the teacher training programmes, availability of personnel in the tertiary institutions to undertake this and the provision of adequate ICT equipment and facilities. The teacher can only play his expected role effectively and efficiently in this age of Information and Communication Technology with adequate knowledge of ICT and available facilities.

Recommendations

Following the importance of Information and Communication Technology (ICT), most especially, now that the Nigerian government is implementing vision 20-20-20 the need for technological advancement of the country cannot be overemphasized. This cannot be fully realized if teachers are not properly prepared to teach the use of ICT facilities in their schools.

Based on the importance of ICT to the country's advancement, these recommendations are made:

- i. The government in conjunction with the tertiary institutions that train the teachers should work to change the course programme of the trainee teachers to include ICT courses.

- ii. Government should as a matter of urgency employ qualified ICT personnel into the tertiary institutions to help in training the teachers.
- iii. That the government should try to provide ICT facilities to the tertiary institutions and other levels of our education system so that the students can access these facilities.
- iv. A monitoring team should be set up to help in checking how teachers use these facilities in teaching their students.
- v. For those who are already in the teaching profession, regular training should be organized for them on the use of ICT facilities to better their teaching.

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