BARRIERS TO THE EFFECTIVE INTEGRATION OF ICT TO UNIVERSITY EDUCATION IN NIGERIA

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Abstract

The quest for knowledge has driven the world into a global village. People all over the globe now have the zeal to interact and gain new knowledge from one another. This move has been made possible by the use of the science of Information and Communication Technologies. Distance is no longer a barrier to communication. As such, most organizations and business enterprises have now embraced the use of ICT and are already reaping the benefits. Discover However, the integration of ICT to university education as well as other levels of education in Nigeria has not witnessed much success as other business organizations. As such, this paper has tried to discover certain barriers to the successful integration of ICT to education in Nigeria with particular emphasis on university education. Possible solutions to these barriers have been suggested. Lastly, the paper made some recommendations which if adopted will to a large extent remedy some of these barriers to ICT integration to education in Nigeria

Globally, human societies have gradually become knowledge-based. Acquisition of knowledge has become the great priority of individual persons, corporate organizations as well as national quest. Knowledge indeed has always been equated with power. Thus, in order to have quick access to the fast growing knowledge, there is need for new technologies. Of course, it is not only necessary to acquire knowledge. It is equally important to master the process of knowledge acquisition in line with new technologies.

As in several other human endeavours, ICT is equally needed in education. Thus, Davis cited in Gusen, Olarinnonve and Garba (2005) states that the new technologies of ICT have the potential to support and improve education across the curriculum and also enhance opportunities for effective communication between teachers and students more than ever before. This entails engaging students in ways not previously possible, creating new learning and teaching possibilities, enhancing achievements and extending interactions with local and global communities.

It has been observed by many researchers that the act of integration of ICT to classroom is a complex process and the one that may encounter a number of difficulties. However, recent studies have shown that there are discrepancies between what is required by the national curriculum at various level of education and what is practiced in the classrooms with regards to ICT usage. It is on this premise that this paper is billed to discuss the barriers to effective integration of ICT to university education in Nigeria via these sub-titles;

1. The concept of ICT
2. The importance of ICT integration to education
3. The barriers to ICT integration to university education.
4. Possible solutions to these barriers
5. Recommendations
6. Summary and conclusions.

The Concept of ICT

Scholars have attempted to define ICT in diverse ways. Marghalani cited in Nwachukwu (2004) sees ICT as a term which encompasses the nature of the application of technologies to communication and information handling (generating, storing, processing, retrieval etc). Reference to American Library Association Journal was also made by Nwachukwu (2004) to the fact that information and communication technologies (ICTs) is the application of computers and other technologies like internet, world wide web (www), e-mail, GSM, radio, television etc. to the acquisition, organization, storage, retrieval and dissemination of information. Supporting this view, Mangal and Mangal(2009) see information and communication technologies as the type of technologies employed in the collection, storage, retrieval, use, transmission, manipulation and dissemination of information as accurately and efficiently as possible for the purpose of enriching the knowledge, developing communication, decision-making and problem solving ability of the user.

The Importance of ICT Integration to University Education in Nigeria

Information and Communication Technologies are of immense importance to the education system of Nigeria especially at the university level. In view of the world wave of technological advancement in various business institutions and industries, the Federal Government of Nigeria saw the need in the ICTs integration to education. Thus NPE (2004:17) expressly states that

"*In recognition of the prominent role of Information and Communication Technology in advancing knowledge and skills necessary for effective functioning in the modern world, there is urgent need to integrate information and communication in Nigeria education*".

To this end, Davis, Desforges, Jessel, Somekh, Taylor and Vanghan cited in Gusen, Olarinoye and Garba (2005) opined that ICT can accelerate, facilitate and improve the quality of education through problem solving, information management, work habit motivation, establishing life-long learning habit, concept development etc. These, of course are not achievable by the traditional face-to-face method of teaching and learning.

ICT stimulates the development of intelligence, the ability of solving problems and creativity. It offers strategies for change by helping students in universities to develop more open-minded and flexible attitude. In view of high cost of financing university education, ICT is capable of providing access to learning at reduced cost and increases participations in the learning process. Students who may not be able to purchase costly textbooks in their various fields of studies can easily get current and sufficiently educational information at a much reduced cost.

ICT can assist lecturers and students in planning and programming cognitive development. The interactive capacity of ICT can help in providing students with the opportunities to engage as creators, manipulators in the learning processes and facilitates research in education.

ICT can qualitatively improve cognition by helping lecturers improve on their pedagogical skills, creative skills and knowledge for tailoring learning resources to meet the particular needs of the students at various levels of education. As a tool, ICT can support deductive, collaborative and interactive learning across time and distance, enquiry or interrogation, open or close research.

ICT as a strategic resource and tool, have the capacity to deliver information or communicate with a large group of students in a quite distinctive and individualistic ways, thereby reducing limitations imposed by peer groups learning irrespective of time and distance, thus promoting fundamental changes in educational process of teaching, learning and research.

Today, the Open University System is made possible by the use of ICT, which offered immense opportunities to individuals who ordinarily will have it difficult to obtain university education. We have to note here that the university curriculum has become enriched with the introduction of satellite microwave T.V. cable and Radio broadcast which give access to students to pursue courses not available in their schools.Hence, it serves as an excellent tool for drill and practice, tutorial, demonstration, problem-solving, stimulation and modeling, games, calculation, construction, managing educational resources and information retrieval. This implies that university students do not need to wait for their lecturers as the only source of educational information, and solve educational problems without the aid of their lecturers.

The Barriers to ICT Integration to University Education in Nigeria

The act of integrating ICT to university education is a complex process and one that has so far encountered a number of hitches and difficulties. These difficulties are known as 'barriers' (Schoepp cited in Bangimlas, 2009). According to world net cited in Bangimlas (2009), a barrier is defined as any condition that makes it difficult to make progress or to achieve an objective. Thus, the objective being examined in this paper is the effective integration of ICT to university education.

Studies have shown that many organizations and business enterprises are already reaping the benefits of ICT integration. This however, cannot be claimed for the education sector, particularly, the university education. This can be attributed to the presence of these barriers. The FGN in NPE (2004), Section 8, subsection 69(a) stated concerning tertiary education that "a greater proportion of expenditure on university education shall be devoted to science and technology of which Information and Communication Technology is inclusive. However, it can be noticed that there has been establishment of ICT centres by the government. Yet, inspite of the presence of these ICT centres, ICT has not yet been integrated into teaching and learning. The ICT centres are under-utilized. Students as well as lecturers have not come to understand fully the importance of these ICT centres. This unpleasant situation can be attributed to these barriers, which are of various forms and dimensions.

Studies have also shown that the barriers to the integration of ICT to science classrooms are of two categories: the extrinsic and intrinsic barriers. Ertmer (1999) sees extrinsic which include access, time, support resources and training, and intrinsic barriers as second-order level which may include attitude, beliefs, practices and resistance. Similarly, while extrinsic barriers are associated with organizations, intrinsic barriers are produced by teachers, administrators and individuals.

Furthermore, Balanskat, A., Blamire, R. and Kefala, S. (2006)classified the barriers in the ways they relate to the individual (teacher-level barriers). These include lack of time, lack of confidence, and resistance to change, and institution (school-level barriers) like lack of effective training in solving technical problems and poor access to resources.

They further made distinctions between these barriers as material and non-material conditions. The material conditions may be the insufficient number of computers or copies of software. The non-material barriers include teachers' insufficient ICT knowledge and skills, the difficulty of integrating ICT in instruction, and insufficient teacher time. Also, Sinko (2002) listed the following as the barriers to successful integration of ICT into teaching and learning process;

1. Lack of support for the educational personnel and learners
2. Lack of teacher competencies to use certain softwares.
3. Insufficient financing (of teacher professional development in ICT field, of appropriate computer hardware and soft ware etc.)
4. Lack of cooperation among academic personnel in the same and in another university.

However, Lai cited in Sabaliauskas and Pukelis (2004), while distinguishing barriers to the ICT integration into the teaching/learning process, describes them in a more detached and structured way;

1. Lack of competences
2. Limited accessibility
3. Shortage of time
4. Change process: (Entry, Adoption, Adaptation, Appropriation, Invention).

Lack of Competencies – This implies that ICT integration to education is frustrated as a result of lack of teacher qualification development in the area of the needs of the teachers and lecturers and demands of the system of education.

Limited Accessibility – According to Lawton (1994), accessibility is one of the major problems of ICT integration to education.

Lecturers and students do not have free access to ICT technologies. In most Nigerian universities, lecturers are not allowed to link up with the ICT internet connections. Very few of them who know the need would pay exorbitantly to private companies to get connected. Also, most of these ICT centres are not functional. Staff and students who may see it necessary to use the systems cannot access them due to technical failures of the entire system.

Lack of Support – There is this problem of poor technical support, poor maintenance of computer hardware and internet infrastructure. When these ICT components break down, their repairs may in some cases last for days and weeks.

Shortage of Time – Shortage of time is a major and crucial barrier in the university culture and integrating ICT into the school and teaching process. Lecturers lack time to develop their professional qualification in Information and Communication Technologies.
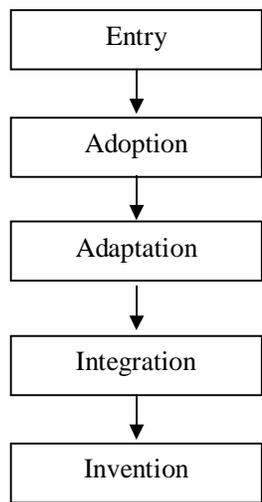
In a study carried out by Vannatta (2000), it was discovered that faculty members identified lack of time to learn new technologies as a leading barrier impeding their technology integration.

Change Process – The highest barriers to ICT integration to education is the process of change. Change is difficult to embrace. As such, ICT integration to education suffers because there has not been a laid down process of change from the traditional method of teaching/learning to this technology method. Thus as suggested by Chief Executive Officer Forum (CEO) (1999), the integration stages should come in five levels:

1. **Entry** – Learners are trained on how to use Information and Communication Technologies.

2. **Adoption –** Teachers use technologies as supplementary aids in the context of traditional teaching/learning methods.
3. **Adaptation –** Technologies are used for expansion/enrichment of the curriculum.
4. **Appropriation –** Technologies are integrated and used due to their exceptional and unique qualities.
5. **Invention –** New areas are invented where the use of technologies is appropriate.

The above is illustrated below;

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┌─────────────────┐
│      Entry      │
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          ▼
┌─────────────────┐
│    Adoption     │
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          │
          ▼
┌─────────────────┐
│   Adaptation    │
└─────────────────┘
          │
          ▼
┌─────────────────┐
│   Integration   │
└─────────────────┘
          │
          ▼
┌─────────────────┐
│    Invention    │
└─────────────────┘
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Furthermore, due to limited accessibility of computers in the lecture halls and classrooms, and the typical 'one user' design of educational softwares, lectures find it difficult to find ways to balance collective and individual needs of students. Even project-based learning that could be easily manned with technology integration, has not yet been adopted by many of today's educators.

Suggested Solutions to the Barriers of ICT Integration

Having overviewed the barriers and difficulties of ICT integration presented by different authors, we will at this point suggest possible ways of overcoming them.

1. **Political Decisions:** Using Information and Communication Technologies in the process of teaching and learning is the most difficult process. This attempt can be fruitless and inefficient unless the Ministry of Education plans and provides schools and universities with proper resources. Lecturers need to recognize the benefits technology could contribute to the teaching and learning process before they would be willing to implement it in their lecture halls.

2. **Professional Development of Lecturers:** This is very essential because as they gain and transfer skills, they find ways to incorporate management strategies to integrate computers into curriculum, pay consideration to grouping strategies, have access to equipment and other things.

3. **Time Issue:** If the universities intend to achieve good results in the area of ICT integration, then at least one week a year should be devoted to lecturers' activities outside the lecture halls. During these events, lecturers should be acquainted with innovations in Information and Communication Technology area, and should be explained in detail how to use these innovations and integrate them into the process of teaching and learning.

4. **Barriers as Opportunities:** The encountered difficulties should be seen as opportunities to develop. It should not be demoralizing, but should be transformed into learning, which could support ICT integration in a mere effective way.

5. The successful ICT integrator must be persistent in the implementation stage

because this stage, more often than not, require a person to be persistent in his/her attempts.

6. The whole learning/teaching and change process of integrating ICT to education has to be flexible, and its efficiency depends on the motivation model developed by the school and preparation of the whole academic staff to implement innovations.

7. Research indicated that successful ICT integration can be achieved if lecturers combine their role with support systems that are available on-site. Lecturers need to reform their conceptions of learning to be able to see how computers could be used as tools for the construction of knowledge, rather than as instruments for classroom management.

8. Support systems consisting of technicians, administrators, and peers need to be made available for successful ICT integration.

9. There is great need to focus on technology integration during pre-service training of teachers/lecturers through modeling instructional use of technology.

10. The problem of resistance to change can be solved by training lectures and teachers in new pedagogical approaches.

Summary/Conclusion

The aim of this paper was to discover the barriers to the effective integration of ICT to education in order to proffer possible solutions to them so that ICT integration to education in Nigeria with particular focus to university education can be successful hence forth.

Since confidence, competence and accessibility have been found to be critical barriers to ICT integration, universities should provide ICT resources including software and hard wares, effective personnel development, sufficient time and technical support for lecturers and students.

Recommendations

Having seen the barriers to effective integration of ICT to education, the following recommendations are hereby made:

(i)   Universities should provide ICT resources including hardware and soft ware.
(ii)   Lecturers should be open-minded towards new ways of teaching.
(iii) Lecturers should take advantages of resources offered by their schools.
(iv)   Universities should conduct training in new pedagogical approaches.
(v)   Sufficient time should be provided for lecturers' development by reducing the number of lecturers' lesson periods.
(vi)   Lecturers should acquire skills of self-organization and time managements.
(vii) Universities should provide training courses in dealing with the new devices and modern technologies.
(viii) Lecturers should prepare themselves by self-training.
(ix)   Lecturers should acquire their laptops and get them connected to the internet.
(x)   Universities should provide continued technical support.
(xi)   Lecturers should rely on themselves to be able to solve problems in their use of ICT.

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