Challenges And Effects of E-Learning in the Development of Architecture and Engineering in Nigeria's Private Tertiary Institution

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Abstract

The problem of over-population, admission and inflexibility in the conventional universities gave rise to private institutions in Nigeria. Advancement in education is the major factor that has made the difference between economic and social growth of many countries. Architecture and Engineering disciplines have a direct impact on the level of a nation's growth and development. Nigeria today is experiencing a major boost in the educational sector by an increased licensing of private tertiary institutions running Architecture and Engineering courses. It is expected that this drive would lead to the much needed development. Education in private higher institutions can only be reformed by efficient information and communication technology (ICT) support in teaching design and research methods. This paper examined the potential and constraints affecting the teaching of Engineering and Architecture in private higher institution system to educate the students. ICT is having a revolutionary impact on educational methodology globally; however, it must be effective for education service delivery in Private institutions of learning.

Keywords: challenges, education, e-learning, ICT, private institution, teaching

INTRODUCTION

It is unarguable and a known fact that the "vehicle" that transports a nation or people or perhaps a community from the status of third world is technology (Okojie, 2009). The city of Dubai in today's 21st century was brought to limelight through technological advancements that pushed the frontiers in Architecture and the Engineering professions. Nigeria wants to surpass this feat; has taken the right steps by expanding its tertiary institutional base from 53 in 1999 to over 123 in 2013 with the private sector accounting for more than 45 of such citadels of learning (NUC 2013). Globally, professions capable of imparting technological knowledge are Architecture and Engineering which gives rise to economical and developmental transformations that is highly capital intensive both in training and practices (Ekundayo, 2009).

Private Universities in Nigeria except for a few are (religious-based) highly driven by profit generation for their owners and top ranking administrators rather than research and technological advancement. These institutions which are meant to be better than public institutions are worse off due to lack of funds and shrewd business tactics.

 Except the private universities embrace the concept of e-learning capacity development and teaching, especially in its technological courses, they will soon face dwindling enrolment given the recent drive and success by public institutions in the field of e-teaching and learning. One of the factors that have led to the continuous low scoring of private tertiary institutions in Nigeria is the style of educational delivery and lack of Information and Communication Technology (ICT) impartation (Adedoyin, 2009)

Some students complain of inadequate exposure to practical although they are generally satisfied with the quality of education. Employers are also generally satisfied with the performance of graduates on the job and the respond to additional training given. However, they complain of inadequate exposure to practical engineering and architecture; and poor communication skills.

This paper examines the role, challenges and benefits of ICT in relation to e-teaching and learning for the development in the fields of Architecture and Engineering training.

RELATIONSHIP BETWEEN NATIONAL DEVELOPMENT, ARCHITECTURE AND ENGINEERING

The principal role of tertiary institutions is to be the arrowhead in research development, new scientific discoveries and innovations. Nigeria's 2004 National Policy on Education lays emphasis on the point that no educational system can rise above the quality of its teaching. The quality of education and its impact on the society is one of the structures set out in the Millennium Development Goals (MDGs) for measuring a nation's development.

(Daniel, 1996) maintained that tertiary education are not adapting to the extent of diversity of student demand. Private tertiary institutions are expensive and do not turn our graduates with adequate skills that employers and society values, this is because its knowledge dissemination techniques are inflexible, that the notion of the university as an academic community is being eroded and the quality of higher education in today's universities is not assured.

The fact that economic development in the 21st Century is directly tied to Architecture and Engineering knowledge this can be harnessed within a Nation-state. Countries like the Republic of Korea, Japan, China, among others, have resorted to Architecture and Engineering to bridge limitations in the availability of natural resources. Nigeria is faced with specific problems in terms of limited quality teaching resources and infrastructure in Architecture and Engineering teaching. As such policymakers, planners, educators, administrators and other stakeholders are considering the educational policy infrastructure, language, content, capacity development and financing in these fields.

DESCRIPTION OF LEARNING, E-LEARNING, TEACHING, E-TEACHING

Teaching can be defined as an active process in which one person shares information with others to provide them with the information to make behavioural changes. Learning on the other hand is the process of assimilating information with a resultant change in behavior. Teaching-Learning process is a planned interaction that promotes behavioural change that is not a result of maturation or coincidence (Teressa 2000). E-education is an electronic mode of knowledge sharing and transmission, which may not necessarily involve physical contact between teacher and student (Mac-Ikemenjima, D. 2003). The concepts of computer-aided teaching and learning have given birth to computer-aided instruction, which represents a combination of both teaching and learning (Osah-Ogulu, D & Mac-Ikemenjima, D. 2004).

Electronic Learning (e-Learning) is an electronic delivery and administration of learning opportunities and support via computer network and web-based technology (Adu et al, 2013). It covers a wide range of systems, from students using e-mail to accessing course work on-line. E-Learning can be of different types: Web-supplemented, Web-dependent and mixed mode (OECD, 2005). Application and processes of e-Learning include web-bases learning, computer-based learning, virtual classroom, video conferencing and digital collaboration where contents are delivered via the internet, intranet/extranet, audio/video tape, satellite TV, CD-Rom. E-Learning creates a self-centred approach to learning by relaxing time and space, enriches learning content and enhances wider access to information resources.

BENEFITS OF INTEGRATING ICT IN BOTH THE PRACTICE AND TRAINING OF ARCHITECTURE AND ENGINEERING

The in depth learning of Architecture and Engineering requires practical training. ICT has become a global phenomenon of importance and concern among the younger generation, in all aspects of human development spanning across education, entertainment governance, business, agriculture, commerce and others. Nigeria's youth population craves for tertiary education in the fields of Architecture and Engineering but due to insufficient academic workforce to meet this overwhelming demand; training new teaching staff will require time, effort and cost. ICT capacity development presents an opportunity for many potential students and learners to study in these fields within a short period. Furthermore, ICT helps to make available a greater variety of learning resources, allows electronic access to course materials, carry out evaluations and online interaction between faculty and learners thereby fostering communication and cooperation among stakeholders.

Computer Aided software's, interactive White Boards and other devices enhance teaching and learning. The added advantage of e-Learning is the mode of interaction on the internet platform between developer, tutor,

software and student. An instance is the Intranet which is a web-based collaboration among staff and students of same department, faculty or institution maximizing time and other resources in the process.

ICT has the potential to accelerate, enrich and deepen architectural and engineering skills, motivate and engage students in learning, also help to relate school experiences to work place, help to create economic viability for tomorrow's worker in the architectural and engineering fields.

CHALLENGES OF ICT IN TEACHING AND LEARNING ARCHITECTURE AND ENGINEERING

ICT a means of reducing the challenge of capacity, equity and access to education, and an opportunity to educate and train has a growing and undeniably enormous demand in the above named fields. However, these benefits and developments often encounter barriers that challenge their adoption and integration. Some of these challenges include:

Inadequate Human Capacity: Apart from insufficient trained manpower for the development, maintenance and operation, in the context of ICT utilization in schools, (Aduke, 2008) stressed that limited or non-availability of ICT trained teaching staff militate against capacity building in Nigerian universities. Consequently, ICTs have not been fully integrated into their curricula as most of them, even those with relatively good ICT infrastructure are still at a low level of ICT integration into teaching, learning, research, library, information and managerial services due to inadequate skilled hands. Apart from lucrative job opportunities available to ICT professionals outside the academics, the cost of training in ICT is so high that after been trained, no academic client/employer offers commensurate financial reward for the value-added. This leads to a withdrawal of such expertise and whatever is not frequently used is soon forgotten.

Finance: This is a major challenge confronting the acquisition and utilization of ICT in Nigerian tertiary education. Economic factors ranging from the lack of capacity to pay for costly infrastructure to sustaining computer networks introduced through donor funding weighed on the universities as their budgets continued to get slashed (Adam 2003). Since no defined sustainable business framework has yet emerged for adequate provision of ICT in teaching and learning architecture and engineering, institutions are not willing to invest the little fund available.

Infrastructure: Despite increasing evidences that investing in ICT is cost-effective, the total cost of ownership, maintenance, upgrading, skill development, etc of ICT has remained high for African universities (Adam 2003). ICTs costs often include that of computers and peripherals, video equipment, specialized tools like digital microscopes, electrical wiring, internet access, lighting, air-conditioning, space, network equipment and other supplies. Whereas ICT infrastructure like multimedia projectors are available in Nigerian tertiary institutions to support teaching, learning and research, other infrastructure like interactive White Boards and mobile devices are lacking; making supplies of these devices depressingly low in Nigerian universities. In most cases especially in private institutions, where substantial amounts of fund have been spent in procuring these equipments, they are locked up only for the purpose of securing pass marks during accreditation exercises.

ICT and Bandwidth Constraints: Nigeria, like most developing nation faces capacity constraints largely as a result of thin-bandwidth (Ekundayo, 2009). Bandwidth is the scarcest ICT resource in Nigerian universities and this is mainly due to vetoes on academic institutions' accessing advanced circuits and high licensing fees for connecting to advanced circuits for obtaining authorization (Adam 2003). (Ekundayo, 2009) survey showed that almost 60% of African countries have bandwidth that is less than that of a typical institution in the developed world and added that only six countries in Africa have a reasonable outgoing bandwidth. Nigeria is not an exception in this subject. Internet connectivity is usually available in most tertiary institutions in Nigeria, but in most cases the bandwidth subscribed to (which determines speed of access) is too small to support any meaningful academic activity during peak periods. Also, some institutions have CD-ROM collections on specialized fields, but the currency of the information on the CDs cannot be guaranteed as no effort is made to update them. Nigeria lacks broad band network which aids ICT in addition to inferior quality of infrastructure supplied to her market.

Electricity: Nigeria faces epileptic generation and supply of electricity. Recently, Bowen University students rioted, damaged valuables because of lack of electricity and water. This situation hampers the development of the internet as incessant power outages are experienced. Recently, the Power Holding Company of Nigeria (PHCN), the body responsible for electricity in the country, was privatized in the hope to address this national problem. Furthermore, it does not all allow for flexibility in the way classes are run. In some countries where classes are run at various times of the day, classes in Nigeria are run only during the day due to inadequacies of the electrical system.

Institutional Governance: Some private universities suffer poor, inefficient and highly bureaucratic management systems. Poorly trained, poorly qualified personnel; inefficient, ineffective and out-of-date

management and administrative infrastructure; and poorly remunerated staff are the norm. This is the reason why most of the architecture departments and engineering faculties, laboratories of science, and classrooms still have ageing and obsolete equipments. The NUC, the body that oversees the Nigerian university system, is staffed almost entirely by long-serving public servants that appear to operate in relative isolation from international higher education bodies and likewise appear to lack adequate knowledge of how a modern university system should function.

Political Unrest: The civil war, the era of military rule and the general feeling of injustice and insecurity have been literally demoralizing the society. The educational system is not immune to this. The over-dependence of universities on government for every need has limited their ability to collaborate with the private sector to seek alternative funding for capacity development and ICT education initiatives. However, the advent of democracy in 1999 till date has caused a relatively stable environment for effective framework to be established.

CONCLUSION AND RECOMMENDATIONS

The National Policy on Computer Education emphasized the need for the integration of ICT into the Nigerian educational system particularly the need for primary school pupils to be introduced to the basic computer skills. However, three major objectives, among others were reiterated in the Nigerian National policy for Information Technology. These are to empower youths with ICT skills to prepare them for competitiveness in a global environment, integrate ICT into the mainstream of education and training and establishment of multifaceted ICT institutions as centres of excellence of capacity development.

The relevance of Nigeria in the educational development programme in the 21st Century solely depends on the degree of free flow of research works and ideas, findings and innovations in architecture and engineering via ICT. Based on this study the following recommendations are proffered:

- Nigeria is generously endowed with human resources that need to be equipped with literacy and skills to contribute to economic and human development.

- There is also the need for universities to recruit staff to complement ICT, academic staff such as technologists, instructional designers and learning scientists. The Cross-River State government gingered staff interest in ICT by encouraging the acquisition of computers (laptops and desktops) for academic staff by allowing payment in installments.

- The ICT professionals should be encouraged through good remuneration based on improved salaries and conditions of service.

- Local content should be encouraged - there must be local manufacturing of ICT materials and development of in-house software for CAI AND LMS to reduce the cost of acquiring the software and hardware components

- Government should work with the private sector and civil society to ensure affordable and sustainable access to ICT infrastructure.

- IT education should be included in the education curriculum, provision of necessary infrastructural support. However, ICT should always be seen as a tool for teachers to use and not as a substitution for teachers.

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