
**MANAGING EDUCATIONAL TECHNOLOGY DRIVEN
HIGHER EDUCATION: IMPLICATION FOR 21ST
CENTURY DEVELOPMENT NEEDS**

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Abstract

Higher education has gone through such remarkable changes and disruptions due to the economy. It is a challenge to predict what the future of higher education will be in the future. Many higher institutions of learning are moving towards new forms of teaching and learning that will definitely impose new classroom configurations and to rearrange learning environments to accommodate active learning for students. This paper focused on managing educational technology driven higher education: implication for 21st century development needs. It highlighted concept of educational technology, educational technology in the classroom and the 21st century, managing educational technology in higher institutions in the 21st century and challenges to use of educational technology in higher institutions. The paper concludes that, higher education is considering the move towards performance based measures of students such as student access and successful completion and innovative technology.

Recommendations were also made which include: Government should organize intensive training on in- service and pre- service for teachers on the use of modern technologies, improve on the technological facilities in schools and upgrading to more modern versions and school administrators should provide learning technologies for both teachers and students.

Keywords: Managing, education, technology, higher education, 21st century, development.

Introduction

Higher education has profoundly changed over the past decades and had evolved within the academic enterprise. Academic institutions have faced pressures of increasing numbers of students and demographic changes, accountability demands, new technologies, and data analytics on a global scale. There are still many students across the globes that do not have the opportunity to benefit from higher education. Higher education had gone through such remarkable changes and disruptions due to the economy. It is a challenge to predict what the future of higher education will be in the future. The higher education system is faced with the ever increasing demands as to how to best teach and reach students. Many higher institutions of learning are moving towards new forms of teaching and learning that will definitely impose new classroom configurations and to rearrange learning environments to accommodate active learning for students. Currently, there is a greater shift in higher education to encompass a deeper learning approach with students, which allows them to be engaged in critical thinking, problem solving, and competency based/project learning (Emeke, 2018).

Educational researchers are leveraging tools to guide planning and management to assignments that give real life applications. This approach aids students in taking control of their own learning, engagement and gives them the tools necessary for solutions to global problems. A primary goal for higher education is to be able to equip all students with the skills they need to be successful in the workforce and to have an impact on the world. However, changes in the educational model of how to teach students requires a variety of strategies and techniques for academic success for students (Cope & Ward, 2022). The driving force obliges institutions to assemble, confront, and transform the higher level skills and technological knowledge to ensure that future generations experience and provide graduates the skills needed to be effective in a global and competitive economy for 21st century Development Needs.

The digital age has increasingly ushered in the growing need for Information and Communication Technology (ICT) application in all facets of life. In fact, technology is now the in-thing and it is penetrating every nook and cranny of human existence. No wonder Akabogu (2016) stated that the computer technology will remain a key component to almost everything one does in this 21st century. The use of modern technology is not left out in classroom instruction. In the classroom, the usual instructor-learner based approach (face-to-face) is gradually changing with the advent of ICT to collaborative learning or e-learning environment where learners interact with learning materials, their instructors and other learners from various locations at different times using network technologies in an online environment. An innovation in the Information age of the 21st century is the use of Educational Technologies in the classroom for instructional delivery. This involves the use of appropriate educational technologies like smart boards, computers, and projectors and other projected materials to facilitate learning and improve performance. These

technologies are used in education to assist students learn more effectively by providing teachers with access to a wide range of new pedagogy. The use of Educational Technologies according to Adaka (2014), provides assistive technology and bring to mind high-technology (hi-tech) devices which its application in the classroom enhance meeting the needs of all categories of learners by stimulating their interest, arousing their curiosity, and raising standards to improve attainment by using self-paced individualized and interactive material to increase retention.

Some of the major goals of University Education according to the National Policy on Education (2013) are intensifying and diversifying its programmes for the development of high level manpower within the context of the needs of the nation, and inculcating physical and intellectual skills on the learners to enable them be self-reliant and useful members of the society. However, the use of Educational Communication Technology (ECT) in instructional delivery in higher institutions is hoped to generate a professional workforce and fulfilled citizens endowed with skills in the use of modern technologies in the 21st century to be self-reliant. It is also believed that the use of Educational Technology (ECT) in hard ware and soft ware like: computers, instructional Aids projectors, video clips and models will provide positive effect on learners' achievement and makes teaching and learning more effective (Cope & Ward, 2022). In managing technology driven higher education in the 21st century, information and media literacy is a key pointer to ensure that students possess the ability to recognize when information is needed, be able to locate, evaluate, and use information effectively, critically explore the media which is a major information source and also being able to efficiently and creatively produce representations in a variety of media (Emeke, 2018). However, students groomed in an environment of technology driven higher education in the 21st century should be able to engage with global issues, learn and work collaboratively with individuals from diverse cultures, communities, religions, ideologies and lifestyles in an environment of openness and mutual respect.

Concept of Educational Technology

Educational Technology is the application of technological media to facilitate teaching and learning. It is also considered as the use of technological tools for exploring knowledge, support learning by construction to improve the effectiveness of teaching and learning (Januszewski, 2015). The Association for Educational Communication and Technology (AECT) describe Educational Technologies as complex, integrated process involving people, procedures, idea, devices and organization, for analyzing problems, devising, implementing, and evaluating teaching and learning. Consequently, Wodi (2012) stated that, Educational Technology include various techniques of shaping behavior applied to material use on audio records, computers, and video disk which increases the overall impact in teaching and learning that takes place in the classroom. Azi (2016) described Educational Technology as the application of appropriate Information and Communication Technology (ICT) tools, which facilitate learning by stimulating the sensory and cognition to enhance of the learner. It has a multi-faceted nature comprising a cyclical process using a collection of tools (both physical and conceptual) and a multiple-node relationship between learners and facilitators of instruction as well as between learners themselves. This definition according to Aziz (2016) has five components namely: Considered application, appropriate tools,

techniques, or processes, facilitates the application of senses, memory, and cognition, enhance teaching practices, and improve learning outcome.

Educational Technology therefore involves the application of ICT facilities in the teaching and learning which stimulates learners' interest, and promotes self-paced learning. These technologies involve numerous media that deliver text, audio, images animation; streaming video, satellite TV, CD-ROM, and computer-based learning, as well as local intranet/extranet and web-based learning techniques (Wodi, 2012). Examples are: computers, projectors, radio, tape recorders chart, television, films, interactive video, teletex & videotex, web-based technologies, and so on. The rationale in the use of Educational Technology is to provide valuable help in the teaching-learning process for achieving the best possible results in an economic way through the available human and non-human resources. In addition, special needs programs that help learners with disabilities use educational technologies to enhance learning by integrating technology into education were educators engender pedagogical change and address fundamental issues that affect learners with special needs. The use of Educational Technology place high demand on learners who have to be more proactive and disciplined than in the traditional face-to-face education. Furthermore, the use of Educational Technology removes barriers to achievement by providing new creative ways of motivating and engaging learners of all abilities to attain their educational potential with ease. It also enhances access to variety of learning resources, promotes collaborative learning, provides multimedia approach to education, and facilitates distance education (Januszewski, 2015).

Educational Technology in the classroom and the 21st century

The evolution of the mobile technology has put learning in the palm of both teachers and their learners. Mobile technology refers to mobile devices that include Personal Digital Assistance (PDA), tablets, digital cell phones and ipods. They are self-effacing enough that they have become useful in implementing different learning techniques and pedagogies (Arkorful, Oduro & Abaidoo, 2016). Mobile technology learning, otherwise called M-learning is learning achieved through wireless technology devices that can be pocketed and utilized wherever the learner's device can receive unbroken transmission signals (Attewell & Savil-Smith 2005). However, Laxman (2012) cautioned against the adverse effect of parasitic relationship between education and technology in which devices originally intended for the corporate environment is forcibly transplanted into education on the basis of its instructional efficacy, it will be improper and foolhardy to ignore the impact of mobile devices on learning (Dias & Victor, 2017). Mobile technologies have helped to re-conceptualize what actually constitutes the classroom or learning space by engendering a dimension of learning that is free from the constrains of fixed time, space and place. The use of technology in education has provided students and teachers with an unlimited number of options for classroom learning.

Apart from mobile technologies innovativeness, its portability and ease of use has made it more versatile than desktops and laptop computers. It has become a technological tool of choice in the classroom. Teachers could help students re-focus the use of their mobile phones for more rewarding functional use. The popularity of these devices with the students warns the teachers that if they are not exploited for teaching and learning, they will become sources of distraction to students and to their ability to learn in the classroom (Adaka, 2014). Keeping pace with this technology for

classroom use is not only important to teachers and educators but also absolutely unavoidable. Students and teachers can use mobile technologies any where the classroom is located such as in the school field, the garden, in the school farm, in the gym, during field trips, etc. They do not need to wait to get to the computer laboratory to do an assignment, to answer a question or to access important information. Studies to ascertain the academic potentials and benefits of mobile application, have shown that apart from its benefits as a learning tool, learners vocabulary improved, their understanding of content/concepts improved, student/learners were more motivated to do well and prepared for class than their counterparts who did not use them (Wylie, 2016). It is no more sufficient for teachers to use a particular technology or software but students needs constant assess to an evolving array of technological tools and activities that will enable them to engage in problem-solving, decision-making, teamwork/collaboration and innovation.

Managing Educational Technology in Higher Institutions in the 21st Century

Management involves utilization of human and material resource to achieve set goals. Higher institutions of learning are established to provide education to students who have attained Post-Basic education with the aim of inculcating relevant high level manpower training to contribute to national development. The National Policy on Education (2013) described higher education as education given to the learner after secondary education to acquire both physical and intellectual skills which will enable individuals to be self-reliant and useful members of the society. Emeke (2018) described higher education “as that education that forms a critical component of human development worldwide, not just the next level in the learning process, but that which provides high-level training necessary for every sphere of the labour market, be it in the training needed for the skill development of all professionals that drive local economics, support civil societies lead effective government, and make important decisions which affect entire societies. Higher education should be managed effectively through the utilization of human and material resources. These resources must be in the right quality and quantity to given the necessary support needed in the system. The human resource include: the students, personnel (non-academic staff, and academic staff). The material resources include: infrastructural facilities such as classrooms, offices, furniture & fittings), and, Instructional materials or teaching Aids (Carter, 2018).

Higher institutions in the 21st century should be managed for qualitative inclusiveness, having teachers who can use technologies that enhance learning in the implementation of a curriculum that is broad based, diverse, innovative, and creative. Quality higher education in the 21st century will also require excellent teachers (lecturers) who have the academic freedom and the institutional support for professional development in the use of educational technologies in the delivery of instruction. Otonko (2012) noted that, the higher education requires highly skilled lecturers with the resources and opportunity to stay current in their respective field and to develop the most effective method for teaching their subject matter. It is expected that lecturers should be digitally literate and trained to use ICT. This approach can lead to higher order thinking skills, provide creative approach to teaching and leave students better prepared to deal with ongoing technological change in society and the work place. Higher education in the 21st century should incorporate

technology that enhances learning since the internet is already revolutionized teaching and learning in universities and the wider world.

In management of higher education institutions in this 21st century, the pursuit of effectiveness in instructional delivery in the classroom should not neglect the use of Educational Technologies that appeal to the various domain of learning since instructional delivery is the pivot for instilling the requisite skills in the learner to fit into a society that is technologically driven. Agina-Obu and Onwugbuta-Enyi, (2017) noted that, every educational institution must be able to design and deliver instructional experiences in such a way that there is some assurance that learning will occur when learners engage in the activity. The subject matter must be presented in a way that thrills the learners' interest and encourages them to learn through the use of educational technologies. Similarly, the course design and implementation must provide learners with meaningful feedback on their progress in mastering the material. To achieve the expected feet in producing competitive workforce, higher institutions must train and re-train the teachers on ICT to acquire the necessary skills on technological application and must also consider topical issues in the use of educational technologies in the delivery of instruction.

Challenges to use of Educational Technology in Higher Institutions

The peculiar situation of Nigeria today makes adopting innovations difficult. Even with the awareness of the revolutionary effects of technologies in today's world, integrating these technologies into the classroom for learning purposes by students is hindered by such factors as:

1. ***Institutional Factors:*** Institutional factors play key role in determining teachers' acceptance and use of learning technologies in their classrooms (Arkorful, Odour & Abaidoo, 2016). Certain institutional factors such as inadequate attention to technical problems that arise while using technologies, institution's objectives and vision and provision of system support for learning technology users are major hindrances to teachers and students' acceptance and use of technology in learning.
2. ***Inadequate amount of training for teachers in the use of 21st century learning technologies.*** Carter (2018) has expressed the view that for successful integration of technology into the classrooms, teachers need to be properly trained on designing modern lessons suitable for learning through technology, use of learning technology devices, modern communication and accessing, disseminating knowledge via modern technologies and educational benefits of modern technologies. Most teachers lack the necessary skills to innovate in teaching, to build and use blog, to access the internet, to use Google sites, wiki sites and high-tech device such as mobile phones. Poor digital literacy skills due to poor teacher preparation techniques are responsible for teacher ineffectiveness in the application of modern technologies in Nigerian classrooms.
3. ***Unavailability of constant energy supply*** to power technological devices for learning. Irregular power supply has frustrated users of technology from integrating it into the learning system.
4. ***High cost of High Technology devices*** such as advanced computers, ipads, ipods etc and other mobile devices with the necessary applications and web 2.0 tools for learning. Most of these devices are out of the reach of learners and their teachers. Most schools have no internet connectivity for students to use freely.

5. *Fluctuating Transmission signals* makes the use of internet- based technology frustrating to both teachers and learners.
6. *Curriculum structure*: The present structure of the curriculum gives little or no room for innovativeness and creativity on the part of teachers and students. The curriculum is not only time-framed but also highly sequenced and teacher-centered. Curriculum of the 21st century should give room to multi- dimensional learning from diverse activities and devices to meet students' needs.
7. *Continuous reliance on paper and pencil test* as means of assessing learning outcome (cognitive) neglects digital literacy and the learning that emanates from it and denies the educational system the opportunity to avail itself of the rich resource provided by modern learning technologies. Until the Nigerian educational system departs from age long assessment stereotypes and key into learning with new technologies, the use of these technologies for classroom purposes will remain a mirage.

Conclusion

Academic institutions have faced pressures of increasing numbers of students and demographic changes, accountability demands, new technologies, and data analytics on a global scale. There are still many students across the globe that has not had the opportunity to benefit from higher education. Higher education has gone through such remarkable changes and disruptions due to the economy. Higher education is considering the move towards performance based measures of students such as student access and successful completion and innovative technology. Presently, students in our institutions are more digitally literate than previous generations due to the changing demographics, diversity, and the trend of the immersion of technological rich environments. It is important for higher education programs towards the future to have a reality check. There is need to equip students with the digital literacy skills that would allow them to be dynamic in an ever changing work environment.

Recommendations

1. Government should organize workshops on re-training for lecturers on the use of 21st century learning technologies in line with global practices.
2. Government should integrate solar power supply technological devices to higher institutions..
3. Government should make available free internet connectivity to students and lecturers in higher institution.
4. Government should provide laptops to students and lecturers in higher institution.
5. Curriculum planners' on educational technology should give room to multi-dimensional learning from diverse activities and devices to meet students' needs.

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