

# APPLICATION OF ICT FACILITIES FOR ACADEMIC ACTIVITIES AMONG ENGINEERING LECTURERS IN UNIVERSITY LIBRARIES

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## **Abstract**

This paper provides some perspectives on the application of ICT facilities for academic activities among engineering lecturers in university libraries. The research therefore highlighted the role of university libraries as the backbone of research due to the wealth of information resources it provides for its clientele that facilitates teaching, learning, research, and related services. Such researches conducted in academic libraries play an important role in facilitating the prosperity of a nation and the well-being of her people. The paper establishes that through research universities and other higher institutions of learning make important contributions to the growth and development of vital sectors of a nation, thereby promoting national and global development. To facilitate this, ICT is a tool that has revolutionized the creation, processing, storage, dissemination, accessibility and use of information in the libraries of today. Many higher educational institutions are now adopting the use of ICT and associated gadgets such as the Computer Based Instructions (CBI), which refers to virtually any kind of computer used in the educational setting for the purpose of instructional delivery. These include facilities such as laptops, electronic white boards, engineering tools, storage devices, video conferencing facilities, engineering software application packages and Learning Management Systems (LMS) such as Moodle and Google Classroom. The provision of relevant ICT facilities such as computers, internet facilities, software packages, engineering input/output devices and other relevant teaching aids will provide an ideal research environment in the academic library for productive research that will positively thrive our nation's development and as well, ease learning and research for the engineering lecturers, students and faculty members. The research concludes that the availability, accessibility and use of ICT facilities is very essential and instrumental in meeting the academic and research needs of engineering lecturers, students and the faculty. It then suggests that university managements should provide necessary ICT facilities required for research, train library personnel and engineering lecturers on operability and, as well, provide alternative power supply and efficient maintenance strategy for continuity.

**Keywords:** Academic activities, Awareness, Accessibility, ICT Use, Engineering lecturers, University libraries.



## Introduction

Universities are established with set objectives which include but not limited to the provision of information resources for undergraduate and postgraduate research as well as faculty members' research and teaching. The libraries are established within the universities to support and implement the overall objectives of the universities. These objectives include provision of information resources for undergraduate and postgraduate researches as well as support teaching and researches of faculty members. Libraries are therefore recognized in academia and the society as a backbone to scholarly input and output.

One singular objective of establishing university libraries is to provide information resources to support teaching and research (academic activities) of faculty members. For this objective to be achieved, university libraries provide a variety of information resources (print and non-print). In this modern age, Information and Communication Technology (ICT) facilities are made available and used not only for information service delivery but are also used for research and teaching students to conduct researches and publications as well as conduct practical lessons.

Research plays an important role in facilitating the prosperity of a nation and the well-being of her people as it provides solutions to industrial, societal, economic, scientific, engineering and social problems through the outcomes or findings. Through research, universities and other higher institutions of learning make important contributions to the growth and development of vital sectors of a nation, thereby promoting national and global development. Most of the research work in Nigeria takes place in the universities. Ifijeh and Ogbomo (2018) defined research as "the process of rigorous, systematic, validating, verifiable, empirical, critical, analysing and interpreting information to answer questions". Research in addition to their findings provokes innovations that brings about problem solving. Research provides also good platform for engineering lecturers and other faculty members to become accomplished scholars. Research outputs come in the form of journal articles, published books, chapters in books, technical reports, conference papers, seminar papers, edited works, workshop papers, thesis, machines, models and other types of outputs. These research outputs enable lecturers to earn recognition in academic circles nationally and internationally. Also, university recognition and advancement of academic staff depend largely on the quantity and quality of research productivity. Research productivity often serves a major role in attaining success in academic circle as it is related to promotion, tenure, salary to mention but a few.

For teaching, research, publication and seminar presentation to be effectively carried out using ICT facilities, faculty members need to be aware of the available and existing ICT facilities such as Internet accessibility, projectors, computers and teleconferencing to mention but a few. Accessibility to ICT facilities is another important variable and they can be accessed through a number of access tools such as catalogue, Online Public Access Catalogue (OPAC), bibliographies, indexes and abstracts to mention but a few both manually and in electronic formats.



This paper therefore highlights the role of ICT in making teaching, learning and research easy in university libraries especially for the engineering lecturers and students. To setup an efficient environment for these roles therefore, the availability of resources is insufficient without awareness incentives in place to bring about accessibility to the ICT facilities which usually translates to the use of the provided facilities for improved productivity or research output. The thesis statement of this paper is that any effort to maximize intellectual and engineering outputs is inconsequential without the application of ICT facilities which remains indispensable for research and academic activities among engineering lecturers in university libraries which, when put in place, will bring about better research output.

### **ICT Awareness**

The awareness of ICT has revolutionized the educational sector and changed the way lecturers impact knowledge and carry out research in the universities. Many higher educational institutions are now adopting the use of ICT and associated gadgets such as the Computer Based Instructions (CBI), which refers to virtually any kind of computer used in the educational setting for the purpose of instructional delivery. These include facilities such as laptops, electronic white boards, storage devices, video conferencing facilities, application packages such as office packages, statistical packages, graphic packages, Google suites (Google docs, Google slides, Google forms, etc.) and Learning Management Systems (LMS) such as Moodle and Google Classroom. Studies have shown that these facilities enhance and facilitate teaching, learning and research, and time and space are no more barriers to education (Yushau & Nannim, 2018). These ICT facilities have offered great flexibility to instructional delivery (Yushau & Nannim, 2018) as opposed to the difficulties of the traditional method of teaching which sees lecturers as knowledge repository passed to students. ICT expands access to education and raises educational quality by transforming teaching and learning into an engaging active process connected to real-life (Behal, 2011). Studies have shown that the accessibility to ICT facilities is no longer the major concern of lecturers in the universities of developed countries, but rather, how best to integrate these facilities in teaching and learning (Tella et al., 2017).

### **Accessibility and Use of ICT Facilities**

Accessibility to ICT facilities refers to locating of facilities such as the computers, Internet facilities, software packages to mention but a few by engineering lecturers and faculty members in the universities for effective teaching, learning and research. Studies are inconclusive on the availability and accessibility of ICT facilities in Nigerian Universities (Yushau & Nannim, 2018). Enakrire and Ocholla (2017) reported that the availability and accessibility to ICT facilities in institutions of higher learning in Nigeria were inadequate. On the other hand, Olelewe and Okwor (2017) reported that ICT facilities are available and accessible. It is noted that the commonly accessible ICT facilities in the Nigerian Universities are computers and Internet services, while



multimedia projector, television, video recorder and online electronic library are inaccessible (Obahiagbon & Osahon, 2014).

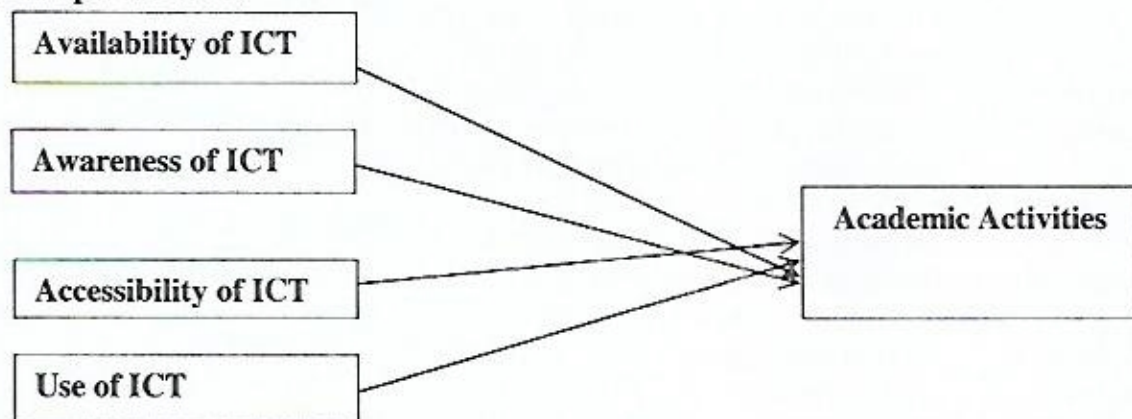
ICT utilisation refers to the process of integrating a wide range of tools such as stand-alone computer instruction, CD ROM and other ICT facilities for the purpose of teaching, learning and research by faculty members and other members of a university community. However, studies have shown that in some universities where these facilities are available, they are not adequately utilised (Amusa & Atinmo, 2016). Opati (2013) revealed that this problem is common to most of the developing countries. However, Agboola et al., (2018) indicated that ICT facilities are available in universities and are used meaningfully.

The desire for effective use of ICT in teaching and research especially among faculty members in Nigerian universities is very essential. Lecturers in this technological age are required not only to access these facilities and use them for lecture preparation or research purposes, but use them in making available their own ideas, teaching materials for undergraduate students, postgraduate students and researchers and made accessible via the Internet. These contents can be uploaded through the use of individual blog, website, or social apps such as WhatsApp and google mail to mention but a few. This will therefore facilitate the research of faculty members in the university libraries.

It could also be said that the integration of ICT in teaching may pose serious challenge to engineering lecturers and faculty members because it requires them to continuously adapt to the changes brought about by the technological revolution. Ohiwerei, Azih and Okoli (2013) revealed lack of qualified personnel as a factor that hampers the utilisation of ICT facilities in teaching. Kennah (2016) opined that despite the fact that stakeholders in education are unanimous about the significance and positive impact of ICT utilisation in education, lecturers do not have clarity about how far technology can be beneficial for the facilitation and enhancement of learning. With respect to this concern, Mikre (2011) opined that the major issue should be on the precise role ICT is expected to play in improving education and how best to ensure that its potential is fully explored. However, many institutions of learning in Nigeria are still struggling with the challenges of utilisation of ICT facilities for teaching and learning (Adavbiele, 2016).

The challenges encountered by engineering lecturers and other faculty members towards the utilisation of ICT facilities for teaching and research purposes might not be unconnected with attitude of lecturers and that of the university management, gender, age and years of experience of the lecturers.



**Conceptual Model**

**Source: Author's Original Construct (2019)**

The arrows in the model show a natural flow among the various component of the model. The influence of the availability of ICT facilities will improve academic activities of engineering lecturers. The influence of the awareness of ICT among engineering lecturers in the university libraries studied leads to its accessibility. The ICT facilities are made accessible to the lecturers and faculty members through accessible tools in the library such as the Online Public Access Catalogue (OPAC), indexes and abstracts to mention but a few. ICT facilities are in turn used by engineering lecturers and other faculty members for their academic activities of teaching both the undergraduate and postgraduate students as well as in their research.

**The Concept of Information and Communication Technology (ICT)**

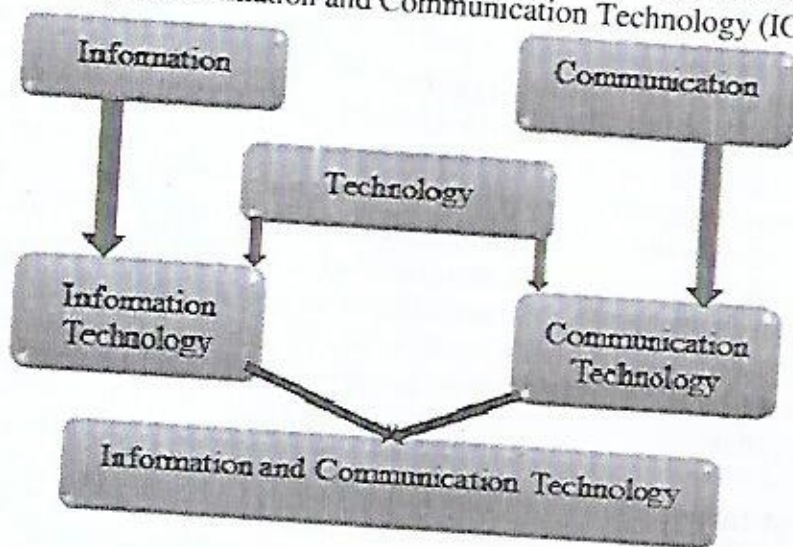
The concept of ICT is built on the three basic components which include: information, communication and technology. Information could be seen as a cause and change within a system. It is conveyed either as the content of a message or through direct or indirect observation of anything. Luciano (2010) opined that information can be encoded (converted or changed) into various forms for transmission and interpretation (for example, information may be encoded into a sequence of signs, or transmitted via a sequence of signals). Luciano (2010) stated further that information is an ordered sequence of symbols that records or transmits message.

Communication on the other hand is the process of transmitting information and common understanding from one person to another (Keyton, 2011). It can also be seen as the act of giving, receiving or exchanging information, ideas and opinions so that the message is completely understood by both the sender and receiver. Cheney (2011) described communication process as the process involving the sender who encodes a message and transmits the message through a medium to a receiver who decodes (recognises and interprets) the message.



In addition, technology can be viewed as comprised of products created by engineers to meet the needs and wants of individuals or society (Wahab, Rose, & Osman, 2012). Technology consists of two primary components which include the physical component which comprises items such as products, tooling, equipment, blueprints, techniques, and processes; and the informational component which consists of know-how in management, marketing, production, quality control, reliability, skilled labour and functional areas.

Information Technology (IT) implies the use of computer technology to collect, design, process and store data as knowledge, while Communication Technology (CT) represents the information super highway or channels for carrying, transporting and delivering the content of information technology from various data networks to the user. The convergence of Information Technology and Communication Technology gave rise to what is now known as Information and Communication Technology (ICT).



### Awareness and Utilization of ICT

The awareness of computer enabled technology in Nigeria and the use of ICT are not only recent but fast spreading. Youth and children have access to computer which is located in several parts of the urban cities. Most of these outfits are observed to render assistance to their users on the use of the new technologies. Therefore, the influence of ICTs on human activity cannot be underestimated; it is highly needed to solve some problems which human beings cannot solve easily most especially in the field of education. Many institutions and organisations have adopted policies favoring the implementation of modern technology. The world generally has become a global village through the advent of ICT and this has influenced all facets of education as well as given rise to rapid advancement in teaching and learning deliveries. The speed at which ICT utilisation is going into the world is such that only nations and countries that are committed to ICT will compete in the present day global market. So also, lecturers need



to use the opportunity presented by ICT in their academic activities to facilitate their research and teaching.

Availability and utilisation of ICTs in tertiary institutions especially the universities plays a significant role in teaching, learning, research as well as administrative activities, even though ICT is not fully embraced by most of the higher institutions of learning in Nigeria today. Information and Communication Technology (ICT) facilities in university libraries could give lecturers and researchers the opportunity to acquire more relevant and effective knowledge and also have full access to a variety of information resources in order to bridge the knowledge and information gap between them and their counterparts in developed countries. The knowledge acquired by lecturers through ICTs can enhance their research activities and imparting of knowledge to their students through the use of personal computers, the Internet to mention but a few. ICTs are seen as tools for information delivery in the new millennium. ICT tools include the following: the Internet, worldwide, web (www), electronic mail (E-mail), bibliographic control tools, online searching, creativity and innovations, and the new information professionals.

ICT facilities which are expected to be readily available in university libraries for a successful teaching, learning, research and administrative activities include computers, Internet, television, radio, cassette player and a radio set, fixed telephone set and mobile phone, video machine and a video tape, real of real projector, slide projector, photocopying machine, duplicating machine, scanner, opaque projector, Email to mention but a few. The introduction of Information and Communication Technologies (ICTs) into higher institutions of learning clearly changed the way education is conducted. It paved the way for a new pedagogical approach, where lecturers and students are expected to play more active role than before, that is, getting more involved in the learning process, being active participants of knowledge creation and not mere recipients of knowledge. Also academic and non-academic staff are expected to embrace its adoption in their activities (Hamilton-Ekeke, & Mbachu, 2015). Thus, ICTs in higher education are being used for developing course material; delivering content and sharing content; communication between learners, teachers and the outside world; creation and delivery of presentation and lectures; academic research; administrative support; student enrolment to mention but a few.

### **Accessibility to ICT Facilities for Academic Activities**

Accessibility can be viewed as the ability to access the functionality and possible benefit of some system or entity. ICT accessibility is about making sure services and information can be used by a wide range of people particularly among lecturers and students in the education system. It is also about adjusting computer equipment to enable users to be more productive. The mere provision of schools with hardware, software and in-service training is not enough. Any in-service training needs follow-up support, peer coaching, and peer dialogue to ensure successful utilization of new technologies. Gender defines what is expected, permitted and esteemed in women or men in a particular



context. Gender is the variety of features relating to, and distinguishing between, male and female. In Nigeria, gender differences in ICT use are linked to patterns of discrimination in the society and with patterns of power relations within the home concerning ownership and use of ICT gadgets.

The ICT users in Nigerian universities, on the other hand, include males and females with different social, economic and psychological backgrounds. So the researchers presumed that variations in universities lecturers' attitudes towards the use of ICT could be influenced by some factors or variables which may include social, economic and psychological factors such as gender, years of experience, the area of specialization, ICT competence, and ICT access. These variables were considered in this study to ensure maximum control of extraneous variables. The necessity for the development of ICT is a worldwide resolution and has been a subject of great worth to all mankind. ICT has become an essential part of the majority of organizations that seek a competitive edge.

Information and Communication Technology is the science of production and utilization of computer equipment, subsystems, software and firmware for the automatic analysis, acquisition, storage, manipulation, management, movement, transformation, control, display, interchange, transmission and retrieval of data (quantitative and qualitative information) to most appropriately meet human needs. Higher education institutions should be highly computerized, and all lecturers should be able to use ICT facilities to enhance their working methods.

In higher institutions of this century, learning is expected to be blended in nature where a student can access the institutions and other libraries at the comfort of their homes. For this to be done, the lecturers and other personnel of our institutions should be upgrading and updated their computer skills. In developing countries, Nigeria specifically, preface investigations prove that only a few organizations in the economy have adopted the ICT, but there has not been a formal study to determine the level of diffusion and the factors affecting its efficiency on organizations.

The various ICT and their access is a factor that could influence use of e-resources in university libraries. ICT accessibility, according to Ismail and Zainab (2011), refers to the 'how' and 'where' users retrieve e-resources. The 'how' refers to the gateways used to access e-resources and the 'where' refers to the location where the service could be used. University libraries in Nigeria are gradually having ICT facilities which include computers, the Internet, videos, radio, telephone, printers, etc. The provision of ICT access points in university libraries will allow use of e-resources. Access to ICT for engineering lecturers will simplify their word processing activities, making their editing work easy and improving the presentation of their assignment and research reports.

Institutions in Nigeria lack adequate ICT infrastructure to effectively tap into the opportunities offered by the cyberspace. Personal computers (PCS) are available in most higher institutions, but they are not readily accessible to students because of the low computer (PC): student ratio which is averagely put at about 1 to 40 (National Population



Commission, 2014). In most cases, the basic software applications needed for practical works are not obtainable, and where they are available, they are not accessible because of the low ratio. There is also a lack of computer aided interaction and other specific software to support some areas of teaching and research. It is true that Internet connectivity is available in some intuitions in Nigeria, but in most cases, the bandwidth subscribed which determines the speed of access is too small to support any meaningful academic activity.

### **Challenges Associated with the Use of ICT Facilities for Academic Activities**

ICT has become an enviable tool in many sectors all over the world particularly in the university education systems. The integration of ICT facilities in the universities especially for dissemination of instruction (teaching purposes) by lecturers to their undergraduate and postgraduate students is the demand of time. However, studies have shown that the integration of ICT into Nigerian education system is hampered by a lot of challenges. Some of the identified challenges from literature include: inadequate funding, management attitudes, poor Internet connectivity, poor power supply, inadequate/lack of ICT facilities and digital divide.

Studies have identified that there is a low level funding of schools as a result of inadequate budgetary allocation (Ani et al., 2016). This affects the procurement, maintenance and utilisation of ICT teaching facilities. These facilities whether software or hardware is often very costly; hence, lecturers and their students cannot all afford them because of inadequate financial support.

The low Internet connectivity towards the use of ICT in the Nigerian tertiary institution poses a serious challenge as identified in many studies (Tella et al., 2017). It is discovered that this problem discourages lecturers from assessing or using Internet because of the long waiting time for a page to open or to get a document downloaded in the case of poor Internet connection. Hence, they perceived it as a waste of time using the facility.

Energy related problems are common in Nigeria. However, all ICT tools depend mostly on steady power supply for their continuous availability, accessibility and utilisation. Nkoyo and Egbe (2016) confirmed that the problem of poor power supply is one of the major challenges to utilisation of ICT in Nigerian tertiary institutions. With uncertainty on availability of electricity, there is a no way ICT will be effectively utilised in the institutions of learning in Nigeria. Lack of computer skill is identified as one of the problems affecting the utilisation of ICT resources. Archibong et al. (2010) identified the absence of opportunity for training and lack of time for practice as the major challenges affecting the use of ICT facilities.

Unavailability or inadequacy of ICT facilities has been identified as a major impediment to lecturers' use of ICT in teaching and learning (Adavebeile, 2016). It is regretted that despite the important role ICT plays in our education, and effort being made by government in equipping schools with ICT facilities, many institutions of learning in Nigeria are still struggling with the challenges of non-availability of ICT



infrastructures and use of Information Communication Technology (ICT) in terms of e-learning processes.

### Conclusion

It could be concluded that the availability, accessibility and use of ICT facilities is very essential and instrumental in meeting the academic and research needs of engineering lecturers. There should be provision of modern ICT facilities and engineering lecturers including library personnel should be trained and re-trained on the use of ICT facilities to facilitate their research activities. The awareness, accessibility and use of ICT facilities by engineering lecturers in university libraries is faced with a lot of challenges such as inadequate ICT facilities, obsolete ICT facilities, ICT illiteracy, funding issue and erratic power supply. As such, urgent attention needs to be given on the aforementioned to enable engineering lecturers perform better in their academic activities.

### Suggestions

The following suggestions are hereby made:

1. The management of universities should make provision for funding to acquire more ICT facilities that will support the academic activities of engineering lecturers and library personnel in university libraries in Nigeria.
2. The management of the university libraries should provide training programmes for library personnel and engineering lecturers to keep them abreast of the use of ICT facilities for their academic activities.
3. The management of the university libraries should provide alternative sources of power supply to enable the use of ICT facilities by engineering lecturers in carrying out their research.

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