



Availability and Accessibility of Digital Technology for Teaching in the Department of Printing and Mass Communication, Kaduna Polytechnic

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Abstract

The study was designed to assess the availability of digital technology facilities in enhancing teaching and learning in Printing Technology and Mass communication departments Kaduna Polytechnic. A survey research method was used with 57 respondents (the academic staff) as the population of the study. The whole population was used as no sample was drawn. Questionnaire was used as the instrument for data collection. Mean as the statistical instrument was implied for the data analysis. The findings revealed that there are adequate ICT facilities available for teaching and learning in Kaduna Polytechnic, however, there is inadequate electronic smart board for teaching and learning in most of the classes of the two departments. The findings also reveal that there are factors deterring the acquisition of the state of art digital facilities amongst which include inadequate funding, poor maintenance culture. Not all lecturers apply ICT skills in teaching. The study recommends that the state of art ICT tools that are available and accessible to students and lecturers in the department of Printing Technology and Mass Communication Kaduna Polytechnic should be maintained. The study also recommends that there is need for digital technology retraining programme for lecturers so that the departments can meet up with the global standard on digital technology for teaching and learning.

Keywords: Digital, Technology, Teaching, Learning, Printing, Communication

Introduction

The use of Digital Technology in education for training has been a priority in most European countries since the last few decades. A study by Organization for Economic Cooperation and Development (OECD 2016) states that in most developed countries such as UK, schools have embedded the use of Digital Technology in teaching and learning into the curriculum and demonstrate high level of effective and appropriate use to support teaching and learning. Furthermore, UNESCO (2022) reiterates that the developed countries have integrated Digital Technology into their educational system because of its profound implications such as enabling teachers and students to construct rich multi-sensory, interactive environments with unlimited teaching and learning potentials. Unwin, (2004) opined that computers and internet are used to increase teachers' basic skills and subject mastery to provide resources that can be used in classroom, and help the teachers to build familiarity with specific instructional approaches. Internet as the main body that process information for communication was defined by Etim, et al (2013) as the inter connection of system or subsystems of equipment that is used in the automatic acquisition, storage, manipulation, management, movement, control, display, switching, interchange, transmission or reception of data or information. The use of internet in education is



now growing in all parts of the world and their application is becoming an integral part of education in many parts of the globe.

In consideration of the above, Information Communication Technology (ICT) was introduced to add value to education, support pedagogy in providing knowledge for learners and enhance communication that promotes learning. In addition, ICT becomes more pervasive, computer-based equipment, is integrated into every aspect of academic operations, thus having an influence on the students' performance. The introduction of Digital Technology into Colleges of Education, Polytechnics and universities in Nigeria clearly mean to change the way education is being conducted. It paves the way for a new pedagogical approach, where students are expected to play more active role than before i.e. getting more involved in the learning process, being active participants of knowledge creation not mere recipients of knowledge. Using information with the known Digital Technology tools in education allow students to communicate, and interact with colleagues and teachers to meet the goals of learning (Oladokun 2012)

The prevalence and rapid development in Digital Technology has transformed human society from the information age to the knowledge age. The use of Digital Technology in education by staff and students is becoming a necessity as it can be used to improve the quality of teaching and learning in the tertiary institutions. This study is an endeavor to assess the application of Digital Technology for Teaching and Learning by the teachers and students of the Printing technology and Mass Communication Departments in Kaduna Polytechnic Nigeria. The concept of mobile learning (m-learning) is facilitated by mobile devices. Dickson (2012) defined mobile learning as the intersection of mobile computing and communication device. E-learning facilitates and support learning through the use of ICT. M-learning (mobile-learning) takes place through wireless devices like mobile phones, I pad, Mp3 player, and personal digital assistance. M-learning plays a great role in activity-based and technology-based learning. Despite the rapid growth in e-learning, most educational institutions do not contain consolidated curricula for training in ICT. The provision of appropriate framework for full integration of ICTs into the educational system of any nation's educational sector is the responsibility of the federal or central government (UNESCO, 2021). To integrate ICTs and related technology into the educational system there is need for a comprehensive policy document to serve as a guide for stakeholders in the educational sector. Factors such as competence, adequate funding, provision of infrastructural facilities, environmental factors, students' attitude, teachers' skills should be considered.

There are studies on the factors influencing the adoption and integration of ICTs for educational purposes (Oladokun, 2012). In spite of the benefits derived from ICT use, Hamilton, Ekeke, and Mbach et al (2015) hallucinate that Nigeria is still struggling over their counterparts in the world. Thus, this study intends to focus on the adoption of Digital Technology in teaching and learning by provision of facilities and application for educational revolution in Tertiary Institutions in Nigeria with specific focus on Kaduna Polytechnic Kaduna. There cannot be effective teaching and learning without the availability of instructional facilities. The goal of the new curriculum which advocates ICT can only be achieved when instructional facilities are available and accessible to both students and lecturers. Availability of educational facilities enhances students' learning by allowing them to be involved in demonstrations and practice which continue to build their skills (Oyinloye & Oluwalola, 2014).



According to Uzuegbu, et al (2013), the term “availability” relates to how much instructional materials are on hand, to which teachers and learners have access. It refers to the condition of being obtainable or accessible at a particular point in time. It expresses how materials can easily be gotten and used for a particular purpose and time. It also states how operable or usable resources are upon demand to perform its designated or required functions. This refers to the quality, quantity, functionality and disposability of such instructional materials to teachers at a time for utilization. As a concept, it is an umbrella term that denotes the serviceability, resilience, reliability and maintainability of a component instrument.

It is vital to note that the development of education in any society irrespective of its level depends largely on availability and adequacy of educational materials Bongotons and Onyenwe, (2010) expressed that, “one of the pillars of a successful implementation of effective teacher education is the availability and adequacy of teaching and learning materials”. These materials are needed to foster skill development to meet standard and to achieve quality in products. The availability or adequacy of teaching and learning materials implies that they are easily, readily, publicly and generally found and enough in quantity and quality for use.

In view of the above, it is clear that ICT heralded a paradigm shift in education in that its use in schools is changing how teachers teach and how students learn, this suggests that teachers require new competencies to be able to integrate the use of ICT in teaching and learning. In assuming their new roles, teachers are expected to upgrade their knowledge and acquire new skills in their pedagogical practices and curriculum development to be able to integrate ICT in teaching and learning effectively.

ICT gives teacher access to information to support them in search of new strategies, thinking, reflecting on practice and engaging with new materials in the science of learning. Teacher needs support in making use of new technologies to enhance their personal work before learning to use them in their teaching. (Gregorie et al, 1996). As part of the significance, the study will promote the use of digital technology for the improvement and advancement of teaching and learning among the students and lecturers alike, it will also assist in informing the management of the institution on the various digital facilities that are currently available with the modern innovation, tools and equipment to help skills improvement and advancement through training and retraining.

The rationale behind this study is to assist institutions to ascertain whether condition for teaching and learning with ICT tools have been fulfilled or not. By so doing, highly skillful and employable graduates from the Nigerian institutions will be produced to be able to function effectively in the graphic, printing and communication sector. The study is scoped on the application of digital technology for teaching and learning in the Printing Technology and Mass Communication departments in Kaduna polytechnic, Kaduna only.

The 21st century educational technology is more modified whereby new technological equipment emerged. This forms the bases of the problem of this study by inspecting the influence of ICT to educational activities to achieve the opportunities offered for teaching and learning in the study area. Categorically, the development in ICT has placed a pressure on educators to consider the transformation institutions made through technology in Nigeria. In line with this, the availability of the facilities and its utilization has become a worrying factor in the department of Printing Technology and Mass Communication, Kaduna Polytechnic for the adoption of Digital



Technology in the educational activities. Observation shows that there is a long queue when it come utilization of digital equipment for practical demonstration with students. This conceivably can affect the students' readiness to use the facilities and thus their performance as well. In view the above, the problem of this study desired to solve is to investigate the availability and utilization of state of the art of educational technology by both teachers and students of the department of Printing Technology and Mass Communication Kaduna Polytechnic to meet the aim of the 21st century educational goal.

Objectives of the study

The aim of the study is to investigate the availability of ICT equipment, its accessibility and willingness of lecturers and students to use them to achieve the expected change in teaching and learning. In view of the aim the following objectives were formulated;

1. To assess the Digital Technology facilities availability for enhancing teaching in the department of Printing Technology and Mass Communication, Kaduna Polytechnic
2. To determine the extent at which lecturers apply Digital Technology skills (ICT) to enhance teaching and learning in Kaduna Polytechnic
3. Assess the degree at which ICT facilities are accessible to teachers and students in enhancing teaching and learning in the department of Printing Technology and Mass Communication Kaduna Polytechnic.
4. To ascertain the factors hindering acquiring the state-of-the-art digital technology materials for teaching and learning in the department of printing technology and mass communication, Kaduna polytechnic

Research Questions

To achieve the goal of the study, the objectives of the study were converted into research questions as follows;

1. What are the digital technology facilities available for enhancing teaching and learning in the department of Printing Technology and Mass Communication, Kaduna Polytechnic?
2. What is the extent to which lecturers in the department of Printing Technology and Mass Communication, Kaduna Polytechnic apply digital technology skills (ICT) in enhancing teaching and learning?
3. What is the degree at which ICT facilities are accessible to teachers and students in enhancing teaching and learning in the department of Printing Technology and Mass Communication, Kaduna Polytechnic?
4. what are the factors hindering acquiring the state-of-the-art digital technology materials for teaching and learning in the department of printing technology and mass communication, Kaduna polytechnic?

Methodology

Survey research design was used for the study, survey research enables the researcher to have direct contact with the respondents in order to gather information through their opinions for the purpose of solving the research problem (Nworgu 1991). Academic staff of Departments of Printing Technology and Mass Communication Kaduna Polytechnic was the population of the study. The populations of the lecturers were found to be 57 in number whereby the whole



population was used for the collection of data. Two major sources were used to collect data for the study, the primary and secondary sources. The secondary source of data was obtained from reference materials from published and unpublished works, journals, and books related to the study. Closed ended Questionnaire was used for the collection of data for the primary source.

Four Likert's scale type of questionnaire was utilized to get respondents' opinion. The items used in the questionnaire were 17 items questionnaire. The instrument was subjected to face and content validity by three experienced academic staff from the rank of senior lecturer and above who are specialists in the field of education and information and communication technology. Simple percentage was used for the score of the participants' responses and the outcome was 68%. The result of the validation was used for making the necessary correction for the data collection. Mean statistic was used as the statistical instrument for the data analysis (with cut-off mean of 2.5) covering research question one to four. The questionnaire was design and administered personally by the researchers with the help of research assistant. The questionnaire was distributed and retrieved in 2 weeks.

The 57 questionnaires distributed, 50 were retrieved and all were found valid for the study. By implication, the questionnaire retrieved (50) is found to be 88 % whereby the ones found to be valid for the study (50) is 100%. This means that the 50 questionnaires returned were correctly filled without errors.

Result

Research Question 1:

What are the digital technologies Facilities available for enhancing teaching and learning in the department of Printing Technology and Mass Communication, Kaduna Polytechnic?

Table 1: The Digital Technology Facilities Available for Enhancing Teaching and Learning in Kaduna Polytechnic (Cut-off mean =2.5)

S/N	Statement	\bar{x}	Remarks
1.	Adequate computers are available for teaching and learning in Kaduna polytechnic	3.20	Agreed
2.	Electronic smart boards are available in Kaduna polytechnic	1.58	Disagreed
3.	Few projectors are available in Kaduna Polytechnic	2.58	Agreed
4.	Students and lecturers are partially satisfied with the available tools and equipment	2.24	Agreed
5.	There is need for digital technology tools upgrade in Kaduna Polytechnic	3.40	Agreed

The table above assesses the availability of Digital Technology tools the department of Printing Technology and Mass Communication Kaduna Polytechnic. The table indicates that item 1, 3, and 4 were responded in the positive way. The mean (\bar{x}) of the responses were higher than the mean threshold (MT), 3.20, 2.58 and 3.40 found to be higher than 2.5. By implication the mean 3.20 in item 1 indicates that the two departments have adequate computers available for teaching and learning in Kaduna polytechnic to the satisfaction of both students and lecturers. The mean 2.58 in item 2 indicates that there are few projectors available for teaching and learning. The result (3.40) in item 3 revealed that there is need for digital technology tools upgrade in Kaduna



Polytechnic for teaching and learning. However, the result in item 2 (1.58) revealed that there is no availability of smart boards. Item 4 with mean 2.24 shows there is inavailability of ICTtools in some aspect. But the grand mean 2.6 reveals that digital technology facilities are available for enhancing teaching and learning in the department of Printing Technology and Mass Communication, Kaduna Polytechnic

Research Question 2:

What is the extent to which lecturers in the department of Printing Technology and Mass Communication, Kaduna Polytechnic apply digital technology skills (ICT) in enhancing teaching and learning?

Table 2: The Extent at which Lecturers Apply Digital Technology Skills (ICT) to Enhance Teaching and Learning (Cut-off mean =2.5)

S/N	Statement	\bar{x}	Remarks
6.	All lecturers apply digital technology skills in enhancing teaching and learning	2.28	Disagreed
7.	Only few lecturers apply ICT skills in enhancing teaching & learning	3.16	Agreed
8.	Lecturers attitude towards ICT practical integration is fair	3.52	Strongly Agreed
9.	Lecturers have limited time to prepare for teaching using ICT tools	2.73	Agreed

The table above assesses the extent at which lecturers apply digital technology skills (ICT) to enhance teaching and learning. The mean of items 7,8, and 9 in the table are higher the mean threshold, item 8 is the highest mean with 3.52 followed by item 7 with 3.16. This indicates that item 7, 8, and 9 were all found to be responded positively that lecturers were readily applying ICT skill in enhancing teaching and learning in Kaduna Polytechnic. The result in item 6 also shows that not all lecturers are applying digital knowledge in teaching and learning in the department of Printing Technology and Mass Communication.

Research Question 3:

What is the degree at which ICT facilities are accessible to teachers and students in enhancing teaching and learning in the department of Printing Technology and Mass Communication, Kaduna Polytechnic?

Table 3: The Degree at Which ICT Tools are Accessible to Students and Teachers in Enhancing Teaching and Learning in Kaduna Polytechnic (Cut-off mean =2.5)

S/N	Statement	\bar{x}	Remarks
10.	ICT tools are placed within the reach of students and lecturers in Kaduna Polytechnic.	2.78	Agreed
11.	Some students do not care to get access to the ICT tools	2.58	Agreed
12.	The lecturer's attitude towards getting access to the ICT practical tools are not encouraging	2.66	Agreed
13.	Poor power supply limits accessibility of ICT tools to students and lecturers	3.26	Agreed



The table above assesses the degree in which ICT tools are accessible to students and teachers in enhancing teaching and learning in Kaduna polytechnic. Despite that, item 13 with mean 3.26 shows that poor power supply limits accessibility of ICT tools to students and lecturers. Item 10 with mean 2.78 revealed that ICT tools are placed within the reach of students and lecturers in Kaduna Polytechnic. The grand mean 2.82 of the table 3 above reveals that the ICT tools are fairly accessible to students and lecturers in Department of Printing Technology and Mass Communication Kaduna Polytechnic.

Research Question 4:

What Are the Factors Hindering acquiring the state-of-the-art Digital Technology Materials in Teaching and Learning in the department of Printing Technology and Mass Communication, Kaduna Polytechnic?

Table 4: Factors Hindering the Acquiring the Digital Technology Materials in Teaching and Learning in the Department of Printing Technology and Mass Communication Kaduna Polytechnic (Cut-off mean =2.5)

S/N	Statement	\bar{x}	Remarks
14.	Inadequate funding for ICT infrastructures limits the availability of ICT tools in Kaduna Polytechnic	3.52	Strongly Agreed
15.	Poor maintenance culture is another limiting factor to availability of ICT materials in Kaduna Polytechnic	3.42	Agreed
16.	Lack of ICT training programmes in the Kaduna Polytechnic affects the availability of ICT materials	3.32	Agreed
17.	Corruption in Education system affects the availability of ICT materials in Kaduna Polytechnic	3.62	Strongly Agreed

The table above assesses the factors hindering the availability of digital technology materials in teaching and learning in Kaduna polytechnic. The result that the mean of item 14 – 17 were higher than the mean threshold. Item 17 with mean 3.62 is higher than 2.5 followed by item 14 with 3.52. The grand mean 3.47 reveals that all the factors' items 14-17 on table 4 above were responsible hindering the of acquisition of the digital technology materials in teaching and learning in the Department of Printing Technology and Mass Communication Kaduna Polytechnic.

Discussion of Findings

The result reveals that digital technology facilities are available for enhancing teaching and learning in the department of Printing Technology and Mass Communication, Kaduna Polytechnic. However, despite the availability of the other digital facilities electronic smart boards are not available in Kaduna polytechnic. This go in line with Okoye (2016), which states that studios, laboratories, resource centers and the total environment where technical education is offered must be available and adequately equipped to reflect the actual working environment. The Okoye further maintained that the institution's laboratories should have the equipment, tools and materials in terms of types, designs and specification with the office where the students will work after training.

Among the pervasive changes in professional practice is emerging of ICT in teaching and learning. Having acquired the ICT facilities may not be enough to make progress in teaching and learning but applying the facilities in to use. In view of that the finding from the study shows that



great number of lecturers in the department of Printing Technology and Mass Communication apply digital technology skills (ICT) in enhancing teaching and learning. The link between technological development and the transformation of teaching and learning can said to be achieved moderately. The role of teachers has changed and continues to change from being an instructor to a facilitator, form coach to a creator of learning environments.

The use of Digital Technology in schools should have a positive impact on students in terms of supporting and providing them with relevant technological literacy for learning. In addition, ICT increases the engagement of students and in most cases increase their independence in learning. Accessibility of the digital technology facilities to lecturers and students is another factor this sought to find out. The findings of the study reveal that the available ICT tools in the department of Printing Technology and Mass Communication are accessible to students and lecturers to enhancing teaching and learning in Kaduna Polytechnic. This means that students are willingly adjust to change in their role from receivers to also providers of information. In many cases, the students' role becomes more independent and responsible. They also become co-operative and collaborative, and finally become directive and negotiates.

Factors hindering the acquisition of the state of art digital facilities were among the questions this study interrogates. The study finds that inadequate funding, poor maintenance culture, lack of ICT training programmes, and corruption in Education system hinders acquiring the digital technology materials in teaching and learning in the Department of Printing Technology and Mass Communication Kaduna Polytechnic.

Conclusion

Based on the findings of this research, the study concludes that there is availability of ICT facilities for integration of digital technology into teaching and learning in the department of Printing Technology and Mass Communication Kaduna Polytechnic with negligible shortcomings in some few areas. Both the students and lecturers are ready to apply the ICT into teaching and learning but are faced with electric power problem.

Recommendations

1. Adequate smart board should be provided for teaching and learning
2. Students and lecturers who are lag behind in the usage of ICT facilities should be encouraged to carry all along.
3. The state of art ICT tools that are available and accessible to students and lecturers in the department of Printing Technology and Mass Communication Kaduna Polytechnic should be maintained
4. There should be retraining program for lecturers so that the departments can meet up with global standard on digital technology. There should be adequate funding for ICT facilities, and maintenance culture should be courage among staff and students.

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