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Multidisciplinary Academic Conference

Proceedings on Shaping the Future of African
Workforce Dynamics: Challenges
and Opportunities



FEDERAL UNIVERSITY DUTSE

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27TH TO 28TH
FEBRUARY, 2025



CONFERENCE THEME

EXPLORING THE ROLE OF GLOBAL
INNOVATIONS IN SHAPING FUTURE OF
AFRICAN WORKFORCE DYNAMICS:
CHALLENGES AND OPPORTUNITIES.

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PROGRAMME OF ACTIVITIES

Days	Time	Activities
Day 1: Wednesday, February 26, 2025		Arrival/Pre-conference Meeting
Day 2: Thursday, February 27, 2025	8.00-10.00am	Registration
	10.00-1.00pm	Opening Ceremony
	1.00-2.00pm	Launch/Break
	2.00-3.00pm	Plenary Section
	3.00-6.00pm	Paper presentation
Day 3: Friday, February 28, 2025	8.00-10.00am	Registration
	10.00-1.00pm	Opening Ceremony
	1.00-2.00pm	Launch/Break
	2.00-3.00pm	Plenary Section
	3.00-6.00pm	Paper presentation
	5.00-6.00pm	Certificates Presentation
Day 4: Saturday, March 1, 2025		Departure

REGISTRATION VENUE
FEDERAL UNIVERSITY, DUTSE, JIGAWA STATE, NIGERIA.

THEME
EXPLORING OF THE GLOBAL INNOVATION IN
SHAPING AFRICAN WORKFORCE DYNAMICS:
CHALLENGES AND OPPORTUNITIES.

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ACCESSIBILITY TO DIGITAL TECHNOLOGIES FOR TEACHING AMONG LECTURERS IN FEDERAL POLYTECHNICS IN NORTH-CENTRAL, NIGERIA

SULEIMAN, SAIDU¹, DR. P. O. CHUKS-IBE² AND DR. R. O. SALAMI³
Federal Polytechnic, Bida¹, Federal University of Technology, Minna

Abstract

This paper examined the accessibility digital technologies for teaching among lecturers in federal polytechnics in North-Central, Nigeria. The study was guided by two objectives and two corresponding research questions and one null hypothesis. The total population for the study was 1,540. This comprised 2,455 lecturers drawn from the federal polytechnics in North-central, Nigeria. Krejcie and Morgan table was used to determine the sample size of the study which was 333. Questionnaire and checklist were the research instruments used for data collection. Out of 333 copies of questionnaire administered, 261 copies were filled, returned and used for the analysis representing 78% response rate. Descriptive statistical tools, mean and standard deviation were used to analyse the data. The findings of the study revealed among others that accessibility to digital technologies for teaching among lecturers is low. The respondents revealed that they have access to digital technologies for teaching in the library, institutional repositories, social media sources and mobile applications. The study concluded that the roles of digital technologies in teaching cannot be underestimated because digital technologies is helping to solve many problems in the educational institutions especially the polytechnic system. The study recommended among others that the management of federal polytechnics in North-central, Nigeria should develop programmes through conferences, workshops and seminar organised for lecturers to enhance their teaching activities as well as learning process of students especially with the usage of digital technologies.

Keywords: Accessibility, Digital technologies, Lecturers, Teaching

Introduction

Education is one of the major instruments that develop the abilities and capabilities of an individual by transmitting skills, knowledge and values required for such individual to be self-reliant and contribute to the nation's development. These skills, knowledge and values are transmitted through teaching. When a person imparts information or skills to another, it is common to describe the action as teaching. Imparting may mean

to share experiences or communicating information, for instance, lecture. Teaching is regarded as both an art and science. As an art, it lays stress on the imaginative and artistic abilities of the teacher in creating a worthwhile situation in the classroom to enable students to learn. As a science, it sheds light on the logical, mechanical, or procedural steps to be followed to attain an effective achievement of goals. Different educationists hold different ideas regarding the concept of teaching (Isola, 2019). Various activities are carried out in polytechnics such as learning, research, community development and teaching.

Danlami (2021) defined teaching as a social process which is an integral part of the process of education. It is considered as an art of providing assistance to another in order to make learning happen by imparting knowledge and information, creating appropriate conditions and engaging learners in productive activities. In essence, it is a process in which one person makes something known to another person. Traditionally, teaching involves imparting instruction and knowledge to the learners in a teacher-centered classroom setting where students are considered to be passive listeners. On the contrary to traditional concept of teaching, in the modern view, teaching facilitates and provides situations to make students learn and acquire the desired knowledge, skills and attitude in more constructive ways with active participation of learners.

The various teaching activities carried out by lecturers include lecture delivery, discussions, giving assignments, setting examinations and test questions, grading assignment and examinations and providing feedback to students, supervising student projects, taking students to field trips, organising practical classes among others. Education in the 21st century has experienced a lot of innovative changes ushered in by technology. This changes has affected a wider area of coverage in educational institutions including teaching and learning. Educational institutions all over the world have recognised the important role technology play in the teaching and learning environment. This is why teaching and learning all over the world has experienced a shift from the existing traditional approach to accommodate the digital based learning environment.

The ability of the lecturer to use the computer and other digital technology facilities to lecture students has become imperative considering the digital era. Lecturers can no longer run away from the developments in the educational sector globally. Many lecturers in tertiary institutions are now employing the use of digital technologies in teaching of their students. Idika *et al.* (2021) defined digital technologies as information, communication and administration of technologies and software which ranges from devices such as computers, laptops and tablets that are either connected or not to the Internet and mobile phones equipped with Global Positioning System

(GPS) sensors of different kinds, as well as whiteboards and projectors with or without interactivity.

Digital technology access is the degree to which digital tools are accessible to people who need them. Accessibility can be seen as the ability to access and the actual frequent application of that ability in utilising the functionality and possible benefits of digital technology tools, facilities, systems or entities (Al-bataineh, 2019). Access to digital technology tools in polytechnics is a necessary condition to its use in teaching as well as learning. Effective adoption and integration of digital technologies into teaching/learning in polytechnics and other tertiary educational institutions is indispensable for quality education delivery (Mandeep and Baharom, 2018). Obviously, if lecturers cannot access digital technologies, then they cannot use them in teaching. Therefore, access to digital technologies are key elements to effective utilisation of digital technologies for teaching in polytechnics and other tertiary institutions of learning.

Statement of the Problem

The integration of digital technologies in teaching by lecturers will help in building quality digital graduate that will make meaningful contributions in the digital world. Hence, it was observed by the researcher that most lecturers in federal polytechnics in North-central, Nigeria do not have the required digital knowledge and right attitude to confidently and creatively integrate digital technologies for teaching and instructional delivery. These limit the knowledge of lecturers on digitally based learning environment and also causing negligence in the use of digital tools for effective teaching.

Objectives of the Study

1. determine how lecturers access digital technologies for teaching in federal polytechnics in North-central, Nigeria;
2. identify the challenges confronting access and utilisation of digital technologies for teaching by lecturers in federal polytechnics in North-central, Nigeria.

Hypothesis of the Study

1. There is no significant relationship between access to digital technologies and teaching by lecturers in federal polytechnics in North-central, Nigeria

Literature Reviews

Benefits of Using Digital Technologies for Lecturing and Learning in Tertiary Institutions

Lecturing with the use of technology aimed at achieving two major benefits for lecturers and the students. This implies that a lecturer lectures with less difficulty and

succeed in bringing about learning which could happen when they leverage on appropriate technology. While, on the other hand, the students learn so easily with the support of the available technology at their disposal or that they possess. This therefore, means that lecturing-learning activities happen anywhere and any place which becomes possible with digital technology. Based on this development, Marc (2021) identified the following as the benefits of using digital technology in Nigeria tertiary institutions.

Easy learning: Education has enjoyed many benefits as a result of digital technology. E-learning is now the preferred choice for many parents, teachers and students. Digital video conferencing and online chats provide instant feedback on the course material, answers to questions and private tutoring.

Mass storage of information: Digital technology enables the storage and retrieval of tremendous amounts of data through devices like smartphones and Personal Computers (PCs). It eliminates the need for bookshelves and cabinets. Cloud storage even reduces the need for local storage media. With cloud services, lecturers and students don't need hard disks and flash drives anymore. Lecturers can easily access and share files with their students by sharing the cloud link (Marc, 2021).

Challenges Confronting Access and Utilisation of Digital Technologies for Teaching

In spite of the numerous benefits offered from the use of digital technologies for teaching, there are numerous challenges in their utilisation by lecturers in tertiary institutions particularly in developing countries. These challenges include:

Epileptic power supply

The nature of electricity supply in Nigeria is terribly bad such that most institutions are using alternative source(s) of power supply to power their ICT facilities and associated gadgets. Abani (2015) opined that power supply by the nation's Power Holding Company of Nigeria (PHCN) is scarcely available in most of the urban cities not even for 12 hours at a stretch daily. Abani (2015) further opined that stable power supply is the hub of an ICT classroom since computers, television, radio, projectors, and video recorders are solely dependent on a stable and uninterrupted power supply. Most of the digital technology devices are electronically driven; they rely totally on electricity to function. There can therefore not be proper integration of these technologies for teaching without steady electricity supply.

High cost of digital technology devices

The digital technology devices are mostly produced overseas. The cost of production and importation is very high thereby making it difficult or impossible for many

institutions to purchase. According to Danlami (2021), one of the factors militating against teachers' use of digital technology is the high cost of the technological tools. Abani, (2015) also argued that high cost of equipment is one of the problems of digital technology. This has made most teaching on the use of some of these devices to be theoretical instead of practical. Most lecturers only know the names of the digital technology devices without having seen them before.

Poor funding of education

Funding of Education is still very poor in Nigeria compared to other countries. Sometimes the funds are not even released or are diverted to other sectors or private pockets. Austria, for example, estimated that \$4.3 billion dollars was spent on ICT between 1999 and 2000 (Danlami, 2021). The Education sub sector which is the engine room for the production of tomorrow's leaders is grossly neglected by the Nigerian government and also private participation in funding Education is still very low. This has made it very difficult to purchase digital technology devices that will be used for teaching of students by lecturers. The result is that lecturers that have no competence in the use of digital technology devices for teaching are produced yearly.

Poor lecturers' remuneration

In Nigeria, lecturers' salaries is very poor. This is amplified by frequent strikes in the Educational sector. Many qualified lecturers have left their places of work and many that went on study leave overseas have refused to return home; this has led to brain drain. Due to this poor remuneration, some lecturers that are still working have little or no interest in the job. They lack the needed impetus to bring about innovative instruction (Abani, 2015).

Lack of infrastructure

One of the biggest problems in tertiary institutions and the use of digital technology is the dearth of infrastructures. Most of the institutions lack basic lecture rooms and resource rooms to accommodate the number of students they have. In some institutions a lecture room that is supposed to accommodate only hundred students is being used by 200-300 students. In addition, digital technology gadgets are not available and where they are available, they are not functional which affects both teaching and learning.

Methodology

The study adopted descriptive survey research design in order to gather data for the study. Descriptive research design is a type of design that describes a population,

situation or phenomenon that is being studied. Hess *et al.* (2022) defined survey research as a method used to collect data that is used to gain insight on a specific topic. The population of the study was 2,455 which consisted of lecturers drawn from the federal polytechnics in North-central, Nigeria. The sample size of the population was 333. Krejcie and Morgan 1970 sampling table was used to determine the sample size of the population. Questionnaire was used as instrument for data collection. The research instrument was validated by the researcher's in LIS, Department, Federal University of Technology (FUT) Minna and a lecturer from Science Education for face and content validation. The data from this study were organised and analysed using descriptive statistical tools such as the use of frequency tables, percentages, mean and standard deviation.

Results and Discussion

Table 1: How Lecturers Access Digital Technologies for Teaching

S/N	Statements	SA	A	D	SD	n	FX	\bar{x}	STD	Decision
1	I access digital technologies for teaching from the computer laboratory	4	3	2	1	261	515	1.97	0.53	Disagreed
2	I access digital technologies for teaching from my office	32	51	97	81	261	556	2.13	0.37	Disagreed
3	I access digital technologies for teaching in the library	112	103	32	14	261	835	3.19	0.69	Strongly Agreed
4	I access digital resources for teaching through Institutional Repositories (IRs)	111	89	42	19	261	814	3.12	0.61	Strongly Agreed
5	I access digital technologies for teaching through mobile applications	112	71	50	28	261	789	3.02	0.52	Strongly Agreed
6	I access digital technologies for teaching through social media sources	71	83	64	43	261	704	2.69	0.19	Agreed
7	I distribute course materials using Learning Management	25	46	96	94	261	524	2.01	0.49	Disagreed

	System (LMS) eg Moodle										
8	I give assignment and test using digital technology	101	79	58	23	261	780	2.99	0.49	Agreed	
9	I interact and collaborate with students using digital technology	87	104	49	21	261	779	2.98	0.48	Agreed	
10	I organise classes using digital technology	19	53	105	84	261	529	2.03	0.47	Disagreed	
11	I assess students' knowledge on various subjects using online digital technology	25	83	106	47	261	608	2.32	0.17	Disagreed	
12	I create content using digital technology	82	83	78	18	261	751	2.88	0.37	Agreed	
13	I use digital technology to obtain feedback from students	15	42	113	91	261	503	1.93	0.57	Disagreed	
14	I mark students scripts using digital technology	13	47	110	91	261	504	1.93	0.56	Disagreed	
15	I track students' progress using digital technology	34	56	94	77	261	569	2.18	0.32	Disagreed	
	Weighted mean							2.49			

Key: Strongly Agreed (SA), Agreed (A), Disagreed (D) and Strongly Disagreed (SD), n = Number of Retrieved Copies of Questionnaire, \bar{X} =Mean and (Weighted mean = 2.49)

Table 1 showed how lecturers access digital technologies for teaching. Out of the fifteen items listed, seven items listed produced high mean scores which were above the weighted mean of 2.49. These items include item 3: I access digital technologies for teaching in the library (\bar{x} =3.19; SD=0.69), item 4: I access digital resources for teaching through Institutional Repositories (IRs) (\bar{x} =3.12, SD=0.61), item 5: I access digital technologies for teaching through mobile applications (\bar{x} =3.02, SD=0.52), item 8: I give assignment and test using digital technology (\bar{x} =2.99, SD=0.49), item 9: I interact and collaborate with students using digital technology (\bar{x} =2.98, SD=0.48), item 12: I create content using digital technology (\bar{x} =2.88, SD=0.37) and item 6: I access digital technologies for teaching through social media sources (\bar{x} =2.69,

SD=0.19). On the other hand, eight items produced low mean scores below the weighted mean of 2.49. These items include item 11: I assess students' knowledge on various subjects using online digital technology (\bar{x} =2.32, SD=0.17) item 15: I track students' progress using digital technology (\bar{x} =2.18, SD=0.32), item 2: I access digital technologies for teaching from my office (\bar{x} =2.13, SD=0.37), item 10: I organise classes using digital technology (\bar{x} =2.03, SD=0.47), item 7: I distribute course materials using Learning Management System (LMS) eg Moodle (\bar{x} =2.01, SD=0.49), item 1: I access digital technologies for teaching from the computer laboratory (\bar{x} =1.97, SD=0.53), item 13: I use digital technology to obtain feedback from students (\bar{x} =1.93, SD=0.57) and item 14: I mark students scripts using digital technology (\bar{x} =1.93, SD=0.57). The weighted mean of 2.49 and above is considered as how lecturers access digital technologies for teaching, while the weighted mean below 2.49 were not considered as how lecturers access digital technologies for teaching.

Table 2: Challenges Confronting Access and Utilisation of Digital Technologies for Teaching by Lecturers

S/N	Statements	SA	A	D	SD	n	FX	\bar{x}	STD	Decision
		4	3	2	1	261				
1	Poor funding of polytechnic libraries	127	98	28	8	261	866	3.32	0.82	Agreed
2	Non-availability or inadequate digital technology devices	75	105	60	21	261	756	2.89	0.39	Agreed
3	Poor Internet connectivity/ Internet bandwidth	95	90	47	29	261	773	2.96	0.46	Agreed
4	Irregular power supply	115	103	27	16	261	839	3.21	0.71	Agreed
5	Computer-illiteracy/low computer literacy among lecturers	87	98	38	38	261	756	2.90	0.39	Agreed
6	High cost of Internet data	84	110	41	26	261	774	2.96	0.46	Agreed
7	Usage of digital devices reduces cognitive ability	29	40	120	72	261	548	2.10	0.40	Disagreed
8	Lack of digital skills	91	80	49	41	261	743	2.84	0.34	Agreed
9	Lack of training	84	85	77	15	261	760	2.91	0.41	Agreed
10	The digital technology tools are not user friendly	32	38	87	104	261	520	1.99	0.51	Disagreed
	Weighted mean							2.81		

Key: Strongly Agreed (SA), Agreed (A), Disagreed (D) and Strongly Disagreed (SD), n = Number of Retrieved Copies of Questionnaire, \bar{X} =Mean and (Weighted mean = 2.81)

Table 2 showed the challenges confronting access and utilisation of digital technologies for teaching by lecturers. Out of the ten items listed, eight items listed produced high mean scores which were above the weighted mean of 2.81. These items include item 5: Poor funding of polytechnic libraries (\bar{x} =3.32; SD=0.82), item 4: Irregular power supply (\bar{x} =3.21; SD=0.71), item 3: Poor Internet connectivity/ Internet bandwidth (\bar{x} =2.96; SD=0.46), item 6: High cost of Internet data (\bar{x} =2.96; SD=0.46), item 9: Lack of training (\bar{x} =2.91; SD=0.41), item 5: Computer-illiteracy/low computer literacy among lecturers (\bar{x} =2.90; SD=0.39), item 2: Non-availability or inadequate digital technology devices (\bar{x} =2.89; SD=0.39) and item 8: Lack of digital skills (\bar{x} =2.84; SD=0.34). On the other hand, two items produced low mean scores below the weighted mean of 2.81. These items include item 7: Usage of digital devices reduces cognitive ability (\bar{x} =2.10; SD=0.40) and item 10: The digital technology tools are not user friendly (\bar{x} =1.99; SD=0.51). The weighted mean of 2.81 and above are considered as challenges confronting access and utilisation of digital technologies for teaching by lecturers, while weighted mean below 2.81 are not considered as challenges that confront access and utilisation of digital technologies for teaching by lecturers.

H_{01} There is no significant relationship between access to digital technologies and teaching by lecturers in federal polytechnics in North-central, Nigeria.

Table 3 showed the relationship between access to digital technologies and teaching by lecturers in the studied federal polytechnics.

Table 3: Relationship between Access to Digital Technologies and Teaching by Lecturers in the studied Federal Polytechnics.

		Access to Digital Teaching Technologies	
Access to Digital Technologies	Pearson Correlation	1	.834**
	Sig. (2-tailed)		.000
	N	261	261
Teaching	Pearson Correlation	.834**	1
	Sig. (2-tailed)	.000	
	N	261	261

** . Correlation is significant at the 0.01 level (2-tailed).

Table 3 shows whether there is significant relationship between access to digital technologies and teaching by lecturers in federal polytechnics in North-central, Nigeria. The $r=0.834$, $p\text{-value} = (0.000) < 0.05$, implies that there is significant relationship between access to digital technologies and teaching by lecturers in federal polytechnics in North-central, Nigeria. This implies that increase in access to digital technology among lecturers will enhance their teaching methods or skills. Therefore, the null hypothesis which states that there is no significant relationship between access to digital technologies and teaching by lecturers in federal polytechnics in North-central, Nigeria is rejected.

Discussions

As regards to research question 1, the study revealed that the access to digital technologies for teaching among lecturers is low. The respondents revealed that they access digital technologies for teaching in the library, through institutional repositories, social media sources and mobile applications. In addition, the lecturers indicated that they give assignment and test using digital technology, interact and collaborate with students using digital technology and also create content using digital technology. This could be because libraries generally are well equipped with ICT facilities including digital technologies that enable effective rendering of library services to users.

As such, lecturers can have access to digital technologies in the library that will assist towards enhancing their teaching. Lecturers can no longer run away from the developments in the educational sector globally as many lecturers in tertiary institutions are now employing the use of digital technologies in teaching of their students. This is because digital technologies facilitates better communication channel between lecturers and students. This is in line with the findings of Itoya (2020) who posited that digital technology accessories facilitate the development of better communication channels between a teacher and students during teaching or instructional delivery to improve communication abilities of teachers and participation in a digital based learning environment.

However, most of the respondents disagreed that they access digital technologies for teaching from the computer laboratory and in their offices. In the same vein, the lecturers revealed that they do not distribute course materials using Learning Management System (LMS) eg Moodle, organise classes using digital technology,

assess students' knowledge on various subjects using online digital technology, obtain feedback from students using digital technology, mark students scripts and track their progress using digital technology. This is in contrast with Cambridge International (2017) which suggested that digital technology can be taken to mean digital processing systems that encourage active learning, knowledge construction, inquiry and exploration on the part of the learners which allow for remote communication as well as data sharing to take place between teachers and/or learners in different physical classroom locations.

The findings of the study as regards to research question 2, the study revealed that the respondents agreed that poor funding of polytechnic libraries, non-availability or inadequate digital technology devices, poor Internet connectivity/ Internet bandwidth, irregular power supply, computer-illiteracy/low computer literacy among lecturers, high cost of Internet data, lack of digital skills and lack of training were challenges confronting the access and utilisation of digital technologies for teaching with the exception of items 7 and 10. Most of the digital technology devices are electronically driven; they rely totally on electricity to function. There can therefore not be proper integration of these technologies for teaching without steady electricity supply. This is in line with the findings of Abani (2015) who opined that stable power supply is the hub of an ICT classroom since computers, television, radio, projectors, and video recorders are solely dependent on a stable and uninterrupted power supply. This further corroborates the findings of Danlami (2021) who suggested that one of the factors militating against teachers' use of digital technology is the high cost of the technological tools.

The test of null hypothesis one revealed that there is significant relationship between access to digital technologies and teaching by lecturers in the federal polytechnics studied. This implies that increasing accessibility to digital technologies by federal polytechnics will invariably enhance the teaching of lecturers and quality educational delivery. This is in line with the findings of Mandeep and Baharom (2018) who posited that effective adoption and integration of digital technologies into teaching/learning in polytechnics and other tertiary educational institutions is indispensable for quality education delivery.

Conclusion

In conclusion, the roles of digital technologies in teaching cannot be underestimated because digital technologies is helping to solve many problems in the educational

institutions especially the polytechnic system. However, factors such as poor funding of polytechnic libraries, non-availability or inadequate digital technology devices, poor Internet connectivity/ Internet bandwidth, irregular power supply, computer-illiteracy/low computer literacy among lecturers, high cost of Internet data, lack of digital skills and lack of training were challenges confronting accessibility to digital technologies for teaching. As such, an urgent attention needs to be given on funding, training session on the use digital technologies to enable lecturers carry out their teaching activities effectively and efficiently.

Recommendations

1. The management of federal polytechnics in North-central, Nigeria should ensure that digital technologies are provided in computer laboratories and offices of lecturers. The management should also organise on the job training programmes for the lecturers in order to improve their technical skills on how to distribute course materials using Learning Management System (LMS), organise classes, assess students' knowledge on various subjects, mark and track students' progress and obtain their feedback using digital technology.
2. The management of federal polytechnics in North-central, Nigeria should ensure the provision of adequate funding needed to acquire digital technology devices, training and re-training of lecturers on the use of digital technologies for teaching, provision of more Internet bandwidth and provision of alternative source of power supply. This will enable effective utilisation of digital technologies for teaching and curriculum instruction.
3. The management of federal polytechnics in North-central, Nigeria should create access to digital technologies among lecturers. Ensuring that all lecturers having equitable access to necessary digital technologies regardless of department of faculty will enhance their teaching across various disciplines.

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