International Journal of Academic and Applied Research (IJAAR)
ISSN: 2643-9603
Vol. 9 Issue 10 October - 2025, Pages: 350-358

Use of Digital Technology in Improving Teaching and Learning Office Technology and Management (OTM) at Kano State Polytechnic, Kano State, Nigeria

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Abstract: *The current study was aimed to investigate the levels of digital skills and technologies in teaching Office Technology and Management (OTM) in Kano State Polytechnic, Kano Sate, Nigeria. Digital Technology (DT) can said to be an individual's ability to find, evaluate, and compose clear information through writing and other media on various digital platforms. However, the extent to which digital technology is used for teaching and learning in office technology and management in Kano state polytechnic is yet to be ascertained. The study comprises of three objectives including; identifying relevant TLS equipments to use (resources), identifying the constraint against the effective use of DT, and identifying the strategies that will be adopted towards full usage of DT for improving the effective delivery of teaching and learning skills (TLS) in Kano State Polytechnic. Thus, six research questions were derived based on the objectives of the study. The population of the study comprised of 28 part time lecturers and 76 part-time OTM students. A Questionnaire was designed and utilized on improving the effective delivery of teaching and learning skills TLS using Digital Technology DT as an instrument in this study, which used a descriptive survey research design. After the instrument was validated, the test-retest method yielded a reliability of 0.8. The mean and standard deviation also were used to examine the data gathered from the questionnaires that were recovered. Thus, the findings of the study revealed that; E- learning as a system of education has brought about tremendous improvement in today's educational system in OTM courses at Kano State Polytechnic, and most importantly the integration of online and distance learning into the educational system of OTM practical skills for effective teaching and learning. However, the study's conclusions showed that some of the limitations affecting the instructional delivery of teaching and learning skills TLS using digital technology DT were the high cost of TLS devices, a lack of smart boards, an epileptic power supply, poor internet access, and inadequate funding for maintaining the few TLS equipments that were available. Therefore, it is advised that teaching resources like computers, smart boards, and internet access be made available and maintained, that internet services and power supplies be reliable, and that computer education be made mandatory for both lecturers, instructors and students in Kano State Polytechnic, Kano-Nigeria.*

Keywords: *Teaching and Learning Skills, Digital Technology, Office Technology and Management, Teaching Effectiveness.*

1. INTRODUCTION

Teaching is essential for imparting knowledge and achieving educational goals and aims, as meaningful learning cannot occur without it. It plays a crucial role in determining students' academic performance. Onyekuru and Ibegbunam (2019) defined teaching as demonstrating intellectual, social, and emotional stability, along with a love for students and a positive attitude towards the profession. Evans (2020) further describes it as the ability to motivate learners of all skill levels while incorporating learning objectives and evaluating effective learning styles. The impact of teaching is particularly significant in Office Technology and Management (OTM), where it surpasses other factors influencing student success. Effective teaching fosters not only academic growth but also personal development, critical thinking, and emotional support for students (Dasaolu, 2025).

According to Oyedele and Fadare (2018), OTM is an effective educational strategy that fosters self-employment, self-reliance, and paid work, leading to selfactualization. OTM focuses on developing the mental and physical skills necessary for individuals to thrive in society. Ajayi (2019) documented that modern OTM instructional delivery involves more interaction and utilizes digital skills and technologies to reach a broader audience beyond traditional classroom settings. Digital skills encompass the ability to use devices like computers and smartphones for communication, information sharing, transactions, problem-solving, and online safety (Olaniyi, 2022). The term "digital skills" was initially focused on computers, the scope has expanded with the rise of the internet and mobile devices. Jenkins (2019) noted that these skills complement traditional literacy, enhancing foundational competencies. Proficiency in digital technology among OTM lecturers significantly improves classroom learning outcomes (Olaniyi, 2022). Digital technologies on the other hand refer to electronic or ICT-based resources that produce, store, or process data for instructional purposes (Crossdale and Nwosu, 2022).

Digital technology literacy does not replace traditional forms of literacy, and instead builds upon and expands the skills that form the foundation of traditional forms of literacy. Digital technology literacy should be considered to be a part of the path to knowledge, as opined by Reedy, (2018). Digital technology literacy is built on the expanding role of social science research in the field of literacy as well as on concepts of visual literacy, computer literacy, and information literacy (Isah, 2010; James, 2014). Teaching and learning is a process that includes many variables. These variables interact as learners work toward their goals and incorporate new knowledge, behaviours, and skills that add to their range of learning experiences (Echezona and Ugwuanyi, 2010).

Over the past century, various perspectives on learning have emerged, among them cognitive (learning as a mental operation); and constructivist (knowledge as a constructed element resulting from the learning process). Rather than considering these theories separately, it is best to think of them together as a range of possibilities that can be integrated into the learning experience (Kwadzo, 2015 and Faletar, 2015; Crossdale & Basil, 2022). During the integration process, it is also important to consider a number of other factors cognitive styles. Learning style, the multiple natures of our intelligences, and learning as it relates to those who have special needs and are from diverse cultural backgrounds. Because theories vary in their quality and rigor, it seems imperative that teachers be well-informed, skeptical consumers of "new" educational ideas or reigning theories (Charles, 2016; Das and Maharana, 2013).

From the foregoing, it is worthy of note that the OTM program must effectively prepare graduates for employment; however, many instructors lack the necessary digital technologies and skills, relying on outdated teaching methods. This situation is compounded by insufficient availability of digital technologies, which further hinders effective teaching and learning delivery and students' readiness for career progressions. Thus, the current study was aimed to investigate the levels of digital skills and technologies and the extent to which they relate to the teaching of OTM in Kano State Polytechnic, Kano State. Nigeria.

2.0 METHODOLOGY

This chapter deals with research design, area and population of the study. Sample and sampling techniques, instrument of data collection, validation, methods of data collection and method of data analysis were also employed in this chapter.

2.1 Research Design

The study employed a descriptive survey research design. A descriptive survey is a method of collecting data using questionnaires or interviews from a sample that has been selected to represent a population to which the findings can be generalized (Gall *et al.*, 2007). The research design was used for the study as it entails using questionnaire to collect data from Lecturers and students of Office Technology and Management OTM in Kano State Polytechnic. Therefore, the present study intended to investigate the lecturers and students of OTM in Kano State polytechnic with a view to find the general information about the uses of Digital Technology in teaching and learning OTM courses at Kano State Polytechnic, Kano-Nigeria, which are justified the effectiveness this research as supported by previous researches.

2.2 Area of Study

Kano State is the second most populous State in Nigeria with an estimated population of over 11 million. The State is highly regarded as the commercial centre of the northern region of the country. There are several higher institutions of higher learning within and around the state. Some of these were set up by the Federal Government, others by the State government and others by private organizations.

2.3 Participants and Sampling Procedure

The population of the study refers to the total elements that the researcher intent to study according to Tony Okeme (2016), in which he defines population as any object (living or non-living) that has the same characteristics or attribute which the researcher intent to study. Therefore, the population of this study was lecturers and students who were involved in teaching and learning OTM program with the aid of digital technology. The population comprises *28 part time lecture* and *76 part-time* OTM students.
The population for this study consisted of 119 full-time and part-time lecturers in OTM at Kano State Polytechnic. Due to the manageable size of the population, the study utilized the entire population without the need for employing sampling procedure.

2.4 Instrument for Data Collection

The instrument for data collection was a two (2) separate structured questionnaire for lecturers and students the title of the questionnaire was questionnaire on the use of digital technology for improving teaching and learning Office Technology and Management (OTM) courses in Continue Education Centre (CEC), Kano State Polytechnic School (KSPS) (QUDTFITLOTMC).

The questionnaire has two sections section A for personal data and section B has 61 items in five (5) point rating scale. Question 1, 5 and 6 have the rating scale of Strongly Agree (SA)=5point, Agree (A)= 4 points, Undecided (UD)= 3points, Disagree (D) =2points, Strongly Disagree (SD)= I point, respectively.

Question 2 has the rating scale of Very Much Available (VMA)=5point, Much Available (MA) = 4 points, Fairly Available (FA)= 3points, Slightly Available (SA) =2points, Not Available (NA)= I point, respectively.

Question 3 has the rating scale of Very highly Adequate (VHA)=5point, Highly Adequate (HA) = 4 points, Moderate Adequate (MA)= 3points, Slightly Adequate (SA)=2points, Inadequate (1)= 1 point, respectively.

Again question 4 has the rating scale of Very Much Frequent (VMF) =5point, Much Frequent (MF) = 4 points, Moderate Frequent (MA)= 3points, Slightly Frequent (SF) =2points, Not Frequent (1)= 1 point, respectively. Therefore, lecturers of OTM rated themselves with on a 4-point rating scale, ranging from 4 = Strongly Agree to 1 = Strongly Disagree.

2.5 Instrument Validity and Reliability

The instrument was subject to validation by lecturers in the department of office technology and management and their correction observation were fully incorporated and hence the questionnaire deemed fit to be administered for use. Therefore, the instrument was subjected to face, construct, criterion and content validity by three experts, two in OTM and one in Measurement and Evaluation. To ensure the internal consistencies of the items in the instruments, a test-retest reliability approach was conducted, yielding coefficient alpha values of 0.80 for Digital Skills Acquisition.

2.6 Analysis of Data

The IBM-SPSS was used to analyze the data collected from the respondents (that is, OTM lecturers and students). The method of data analysis was use of 'mean' to answer the research questions. The decision rule was done based on cut of points 3.00 mean rating for each item and grade mean. Therefore, item with 3.0 and above for questions 1, 5 and 6 are regarded as agree, while below 3 is regarded as disagree. For question 2, item with mean rating of 3.0 and above are considered as Available, while below 3.0 is not available. Question 3, and 4 mean of 3.0 and above are regarded as Available, Adequate and Frequent. Below 3.0 are regarded as inadequate and not frequent. Also the decision criteria are based on when a coefficient probability or r-value is equal to or lesser than 0.05 it implied a significant relationship.

2. RESULTS AND DISCUSSION

3.1 Results

Research Question One: What are the relevant Digital Technology DT resources for teaching Office Technology and Management OTM courses in Kano State Polytechnic, Kano State?

Table 1: Mean Lecturer responses on Digital Technology DT resources for teaching Office Technology and Management OTM courses in Kano State Polytechnic, Kano State.

S/N	Items	Mean	Remarks
1.	Networking equipment	4.29	Agreed
2.	Scanner	4.29	Agreed
3.	Projector	4.40	Agreed
4.	Computer and drives	4.86	Agreed
5.	Software programs	4.60	Agreed
6.	Telecommunications equipment	4.60	Agreed
7.	Sound system	4.70	Agreed
8.	Electronic board	4.70	Agreed
9.	Intranet sites	5.10	Agreed
10.	Internet sites	4.64	Agreed
	Total Avr. Mean	**4.62**	**Agreed**

Source: Field-survey 2025

The Table 1 above shows that all the items ranged from 4.29 to 4.60 mean rating are considered as agreed. The total mean of 4.62 revealed indicated that the respondents agreed with all the items 10 items used. This implies that computers and other related facilities would help in improving the instructional delivery of digital technology resources for teaching office technology and management (OTM) courses in Kano State Polytechnic.

Research Question Two:
To what extent is Digital Technology availability for teaching Office Technology and Management courses at Kano State Polytechnic, Kano State?

Table 2: Mean Lecturer responses on the extent to which Digital Technology availability for teaching OTM courses at Kano State Polytechnic

S/N	Items	Mean	Remarks
1.	Networking equipment	2.9	Not Available
2.	Scanner	2.82	Not Available
3.	Projector	3.21	Available
4.	Computer and drives	2.96	Not Available
5.	Software programs	2.9	Not Available
6.	Telecommunications equipment	2.9	Not Available
7.	Sound system	2.82	Not Available
8.	Electronic board	3.03	Available
9.	Intranet sites	2.82	Not Available
10.	Internet sites	2.96	Not Available
	Total Avr. Mean	**2.93**	**Not Available**

Source: Field-survey 2025

From Table 2 above, the analysis revealed that 8 items were rated as not available by the respondents with mean from 2.96 to 2.82, while 2 items with mean of 3.21 and 3.03 are considered as available by the respondents. Therefore, based on the total mean (2.93), it has indicated that the responses on the items are not available for teaching of OTM course in Kano State Polytechnic.

Research Question Three:
How adequate are Digital Technology for improving teaching Office Technology and Management courses at Kano State Polytechnic?

Table 3: Mean Lecturer responses on the adequacy of Digital Technology for improving teaching Office Technology and Management (OTM) courses at Kano State Polytechnic

S/N	Items	Mean	Remarks
1.	Networking equipment	2.10	Inadequate
2.	Scanner	2.14	Inadequate
3.	Projector	2.59	Inadequate
4.	Computer and drives	3.10	adequate
5.	Software programs	2.36	Inadequate
6.	Telecommunications equipment	2.53	Inadequate
7.	Sound system	2.42	Inadequate
8.	Electronic board	1.07	Inadequate
9.	Intranet sites	1.64	Inadequate
10.	Internet sites	2.82	Inadequate
	Total Avr. Mean	**2.30**	**Inadequate**

Source: Field-survey 2025

From Table 3 above, the analysis shows that 9 items were rated as “in adequate” by the respondents with mean from 2.59 to 1.07, while item 1 with mean of 3.10 was are considered “adequate” by the respondents, and the total mean of 2.30 reveals that the responses on the items are considered inadequate for teaching of OTM course in Kano State Polytechnic.

Research Question Four:
What is the level of usage of Digital Technology for teaching Office Technology and Management courses at Kano State Polytechnic?

Table 4: Mean Lecturer responses on the level of usage of Digital Technology for teaching Office Technology and Management courses at Kano State Polytechnic?

S/N	Items	Mean	Remarks
1.	Networking equipment	3.17	Frequent
2.	Scanner	3.00	Frequent
3.	Projector	2.80	Not Frequent
4.	Computer and drives	3.32	Frequent

5.	Software programs	2.71	Not Frequent
6.	Telecommunications equipment	2.90	Not Frequent
7.	Sound system	2.42	Not Frequent
8.	Electronic board	3.20	Frequent
9.	Intranet sites	2.64	Not Frequent
10.	Internet sites	2.92	Not Frequent
	Total Avr. Mean	**2.91**	**Not Frequent**

Source: Field-survey 2025

From Table 4 above, the analysis shows that 6 items were rated as "not frequent" by the respondents with mean from 2.92 to 2.42. The 4 items with mean of 3.32 and 3.00 are considered as adequate by the respondents. This implies that the total mean (2.91) indicated that the responses on the items are not frequent for teaching OTM course at Kano State Polytechnic.

Research Question Five:
How Digital Technology improves teaching in Office Technology and Management (OTM) courses at Kano State Polytechnic?

Table 5: Mean Lecturer responses on the Digital Technology improvement in teaching Office Technology and Management (OTM) courses at Kano State Polytechnic

S/N	Items	Mean	Remarks
1.	Networking equipment improve teaching and learning	4.60	Agreed
2.	Scanner has no improvement in teaching and learning	1.60	Disagreed
3.	Projector has little impact on teaching and learning	2.46	Disagreed
4.	Computer and drives facilitate teaching and learning	4.42	Agreed
5.	Software programs does not improve teaching and learning	2.71	Disagreed
6.	Telecommunications equipment does not improve teaching and learning	2.71	Disagreed
7.	Sound system facilitate teaching and learning	4.10	Agreed
8.	Electronic board has no impact in teaching and learning	2.64	Disagreed
9.	Intranet services helps in improving teaching and learning	3.90	Agreed
10.	E-library facilitate good teaching and learning	3.92	Agreed
	Total Avr. Mean	**3.30**	**Agreed**

Source: Field-survey 2025

As shown in Table 5 above, the analysis shows that 5 items were rated as agreed by the respondents with mean from 4.60 to 3.90, while the 5 items with mean of 2.71 to 1.60 are considered as disagreed by the respondents. Thus, the total mean for 3.30 reveals that the responses on the items are agreed for teaching of OTM course at Kano State Polytechnic.

Research Question six:
What are the challenges in the use of Digital Technology for teaching Office Technology and Management courses at Kano state polytechnic?

Table 6: Mean lecturer responses on the challenges of Digital Technology for teaching OTM courses at Kano State Polytechnic

S/N	Items	Mean	Remarks
1.	Inaccessibility to username and password to some online digital technology	4.8	Agreed
2.	Inadequate power supply	4.82	Agreed
3.	Lack of communicating and promoting digital technology to users by library management		Agreed
4.	Lack of access to current information on digital technology	4.80	Agreed
5.	Some articles cannot be accessed freely	4.86	Agreed
6.	Insufficient access to relevant journals	4.90	Agreed
7.	Lack of information search literacy skills	4.92	Agreed
8.	Low level of computer skills	5.00	Agreed
9.	Lack of access to internet connectivity from office and homes	4.60	Agreed
10.	Lack of awareness to electronic digital technology	4.30	Agreed
	Total Avr. Mean	**4.3**	**Agreed**

Source: Field-survey 2025

As shown in Table 6 above, all the 10 items that ranged from 5.00 to 4.30 mean rating are considered as agreed. The total mean of 4.30 reveals that the respondents generally agreed which implies that all the items are digital technology resource challenges for teaching Office Technology and Management (OTM) courses at Kano State Polytechnic.

3.2 Discussion of the Findings

Research Question one:
Based on the research, the results regarding the use of Digital Technology resources in improving teaching Office Technology and Management (OTM) courses at Kano State Polytechnic is positive or agreed that the components are used for teaching the courses. George *et al.,* (2013) refers to ICT hardware as the collection of all the physical components of technology that can be touched or felt. Some of the hardware tools may include: The hardware technologies include: computer systems and chips, routers, printers, network card, microphone/speaker/headset and mobile device (Smartphone, iTouch, iPad, MP3 player). Software comprises the entire set of programs, procedures and routines associated with the operation of a computer system. A set of instructions that directs a computer's hardware toper form a task is called a program, or software program. These are software technologies used for teaching and learning. Also software such as: Zoom, Google classroom, Microsoft word, blackboard, Floop, Edmodo, Prezi and Idroo are very helpful in communicating remotely; all lectures and explanations can be conveyed directly without having to meet physically.

Research Question Two:
The research indicated that the availability of Digital Technology resources in improving teaching Office Technology and Management (OTM) courses at Kano state polytechnic are low therefore; the findings showed there is no available DT for teaching improvement. Madukoma (2014) reported that the effective application of digital technologies in teaching will facilitate the realization of the stated objectives of the educational program, by improving innovativeness, curiosity and creativity of the learners. Given the increased use of fast changing digital technologies in the workplace, new skills need have emerged Research.

Research Question Three:
Based on the findings, the use of Digital Technology is not enough for the students to learn through; therefore it is inadequate for teaching OTM courses in Kano State Polytechnic. According to (Charles, 2016), digital technologies have fundamentally changed the way individuals access information and elaborate knowledge. While raising the demand for new skills, they also create new opportunities for education and training. Digital learning is technology-based learning that uses gadgets such as laptops/ netbooks and mobile phones to store information/content of textbooks, activities, exercises, reports, games, illustrations to deliver classroom instruction. Digital Learning is "learning facilitated by technology that gives students some element of control over time, place, path and/or pace. The Internet and the proliferation of Internet access devices have given students the ability to learn anytime, anywhere. Learning is no longer restricted within the walls of a classroom.

Learning is no longer restricted to the pedagogy used by the teacher. Interactive and adaptive software allows students to learn in their own style, making learning personal and engaging. New learning technologies provide real time data that gives teachers the information they need to adjust instruction to meet the unique needs of each student. Learning is no longer restricted to the pace of an entire classroom of students. Interactive and adaptive software allows students to learn at their own pace, spending more or less time on lessons or subjects to achieve the same level of learning.

Research Question Four:
Based on the research, the analysis indicated that the level of usage of digital technology is not frequent for use in teaching OTM courses and thus, agrees with findings of Olaniyi (2022). They relate one of the internal barriers to the lack of encouragement teachers experience from superiors and colleagues. Also a lack of confidence in their own computer competence is brought up as an internal barrier which eventually can lead teachers to avoid the digital technologies. A further internal barrier refers to the lack of incentives and motivations which entails that teacher lack appreciation or rewards for their efforts to use the digital technologies (Olaniyi, 2022).

Research Question Five:
It is also strongly agreed that digital technology improves teaching in OTM courses at Kano State Polytechnic. Learning how things in the world work lies in the nature of the human kind and has been present ever since. Various indicators of the transfer of knowledge, according to Green and Scott (2024), go as far back as to the fifth century B.C in the form of written documents whereas the prior knowledge transfer was pursued solely by oral communication. Subsequently, the use of slate boards can be dated back until the 12th century and were used in India before then blackboards got introduced in western schools in the 18th century. Meanwhile, the development of the printing press in the 15th century enabled also the masses to access knowledge.

Research Question Six:

In this research, the findings showed that lack of enough power supply, financial support and other related factors was the rationale behind the use of digital technology for teaching and learning OTM courses at Kano state polytechnic. James (2014), challenges to its use have been identified to include; availability of equipment, access to resources, training and support, OTM teachers and students are no exception. If there is no access to computers and fast internet connections, then implementing online teaching is not feasible. If teachers have not had sufficient training in technology, then they lack the necessary skills. Working on-line means teachers have to adapt to new pedagogical concepts and mode of delivery of teaching for which they have not been trained (Martins *et al.,* 2023).

Finally, Data from research questionnaire 1 shows that digital technologies availability has a significant relationship between digital technologies and teaching of OTM at Kano State Polytechnic, Kano-Nigeria. Thus, the higher the availability of digital technologies, the higher the effective teaching and learning skills of OTM students at Kano State Polytechnic. This result supports the assertion of Kurt and Doğan (2020) that teachers must have integrate digital technologies into learning-teaching processes. Martins *et al.,* (2023) also found that there are advantages of digital technologies in enhancing teaching learning process of students with Specific Needs, not being so evident with regard to Technologies as a decisive factor in the process of inclusion of these students. Castro and Lucas (2022) opined that there are several advantages associated with the use of digital technologies in teachers' practice: the diversification of learning tools, better management of classes and of the school itself. Some scholars and researchers (e.g. Diaz and Lee, 2020; Castro and Lucas, 2022) empirically found that, for most teachers, digital technologies facilitate teaching and learning skills, make children more motivated and are resources that help pedagogical intervention, in line with several studies.

4.0 CONCLUSION AND RECOMMENDATIONS

4.1 Conclusion

Based on the analysis and presentation of data, it is concluded that E- learning as a system of education has brought about tremendous improvement in today's educational system of Nigeria and more especially to Office Technology and Management (OTM) Education. It was also concluded that digital skills acquisition and digital technologies availability contribute significantly to the effective teaching of OTM. This showed that digital skills acquisition and digital technologies availability have relative and combined influence on the effective teaching of OTM at Kano State Polytechnics, Kano State, Nigeria. However, with the contemporary changes in the mode of instructional delivery, it becomes imperative for teachers' or lecturers' to constantly adopt new methods in the teaching of OTM. Therefore, after investigating digital skills acquisition and digital technologies availability as factors influencing the effective teaching of OTM at Kano State Polytechnics, the study concludes that digital skills acquisition and digital technologies availability are highly relevant in actualizing the goals and objectives of OTM education in Nigeria. Finally, strategies that can help to improve the usage of TLS facilities for improving teacher instructional delivery of teaching skills include compulsory computer education, adequate and stable power supply, and availability of computers, among others.

4.2 RECOMMENDATIONS

The following recommendations were made;

1. The Nigerian Government in collaboration with the NBTE and National Universities Commission (NUC) should endeavor to ensure that digital technologies are regularly provided and constantly available for teaching and learning in OTM programs at National Polytechnics and Public Universities in the country.

2. The Nigerian government should endeavor to partner with private organizations to supply tertiary institutions with advanced ICT facilities like electronic and interactive whiteboards to improve instructional delivery in OTM.

3. Existing ICT facilities and equipments should be effectively used for teaching and research in OTM to maximize the benefits of available resources.

4. OTM lecturers should endeavor to continually update their knowledge and skills in using digital tools to enhance OTM course instruction.

5. Both lecturers and students should endeavor to use available DT gadgets for OTM teaching and learning, with regular assessments to determine essential DT tools needed for OTM education.

ACKNOWLEDGEMENTS

The authors thank and appreciate Tertiary Education Trust Fund TETfund and the Department of Science Laboratory Technology (SLT) Kano State Polytechnic, Nigeria for their endless efforts, guidance and financial support.

AUTHOR CONTRIBUTIONS

All authors contributed toward data analysis, drafting and critical revision of the paper and agreed to be accountable for all aspects of the research study.

CONFLICTS OF INTEREST

No competing interests exist.

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