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**DIGITAL COMPETENCE AND ACADEMIC PERFORMANCE OF
STUDENTS OFFERING OFFICE TECHNOLOGY AND MANAGEMENT
PROGRAMME IN OYO STATE-OWNED POLYTECHNICS, NIGERIA**

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Abstract

In an era where digital skills are increasingly essential for professional success, understanding the impact of digital competence on academic performance is paramount. Despite several studies on the academic performance of students in the Office Technology and Management programme, factors that predict the variable have not been adequately studied. This study, however, aims to investigate the influence of digital competence on the academic performance of the students offering the Office Technology and Management programme in Oyo State-owned Polytechnics, Nigeria. The study employed a Descriptive Survey Design. One hundred and sixty-two (162) participants were selected from the population of 284 using the 1979 Krejci and Morgan Table, while Proportional Stratified and Random Sampling techniques were used for the selection. A structured Questionnaire was used to collect data consisting of a demographic section as well as an assessment of the most prominent digital resources used for teaching OTM programme, the level of digital competencies of students offering OTM programme, and the implications of these on their academic performance. Two hypotheses were tested using Mean, Standard Deviation and Regression Analysis. The findings revealed that digital competence has a statistically significant positive association with the academic performance of the students offering OTM Programme. The coefficient of 0.039 suggests that an increase in digital competence is associated with higher academic performance of the student. This is supported by the significant t-value of 2.302 at the 0.05 significance level. Based on the findings, it was recommended that the management and lecturers of the polytechnics should provide adequate access to digital educational resources, and integrate technologies into teaching and learning to develop the digital competencies of the students. Also, students should endeavour

to maximize the use of the widespread ICTs to promote and enhance their learning and not for frivolity.

Keywords: Digital Competence, Academic performance, Office Technology Management (OTM) programme

Introduction

Globally, and in Nigeria in particular, improving the quality of education and investing in educational resources, information and communication technology (ICT), and human capital management are recognized as effective factors that pave the way for a country's comprehensive socio-economic development. Improving the school performance of the students is also one of the basic goals of educational planning. Through academic performance, students can fully realize and express their potential, and abilities in line with educational goals.

Academic performance is the degree of success a student achieves in academic pursuits and is often measured by grades and academic achievement tests. Academic performance is generally viewed as evidence of knowledge or skills developed through instructions and processes. It means the knowledge and skills that students have mastered in a subject or a course. It is a measure of how well students have performed in the various assessment items set for them based on some educational criteria determined by professional educators (Florence & Eremie, 2021; Kapur, 2018; Yunlok, 2014). Such activities distinguish some students from others as grade is the deciding factor. It is also viewed as the student's ability to carry out classroom assignments, problem-solving activities, and academic matters (Afzal et al., 2010), as well as the ability to reflect, demonstrate, implement, and share. Moreover, Academic performance is the extent to which a student has achieved short-term educational goals and can also be measured using self-reported data such as students' perceptions of their ability to study, accomplish academic tasks, and achieve their goals. Academic performance is a form of feedback (Azizov, 2022; Mehrvarz et al., 2021).

A broad description of academic performance is any action or process that engages the cognitive, social, affective, and psychomotor domains of students in a sociocultural setting. This suggests that academic performance goes beyond the cognitive process and achievement of grades. It reflects the overall engagement of students in the academic process, as well as showing their performance in examinations, to the point of recognizing and involving the totality of all academic activities in which the student participates whether in school or outside of school (Ngelale, 2019). This description confirms that academic performance is not an end in itself, nor an achievement or result, but a process leading to it. Many factors play a role in the process of academic success, and many studies have uncovered some complexities surrounding academic performance, such as demographic, socioeconomic, school factors, social media, information and communication technologies (ICT), and teacher indices. (Waheed et al., 2020; Sivakumar, 2020; Pavanelli, 2018; Al-Rahmi et al., 2015). Likewise, many theories have been used to

underpin learning and academic performance, academic achievement, and academic success, such as Digital Natives vs. Digital Immigrants (Boyratz & Ocak, 2021); Self-Efficacy Theory (Teo, 2019); Digital Theory Frameworks (Fraillon et al. 2019); the theory of Social Constructivist Learning (Al-Rahmi et al, 2015). This study, however, hinged on the connective theory.

Connectivism is a learning theory for the digital age, developed by George Siemens and Stephen Downes. The theory has its origins in distributed learning (Siemens, 2005). In Connectivism, learning is actionable knowledge. Connectivity theory is a framework that attempts to understand how different elements in a system are connected and how these connections affect system behaviour. In the digital age, connectivity theory is becoming increasingly important for academic performance as students need to navigate complex information networks and digital resources. By understanding how different pieces of information are connected and how they relate to each other, students can better understand complex topics and develop a more nuanced understanding. Connectivism accepts that technology is a major part of the learning process and that constant connectedness gives opportunities to make choices about learning (Herlo, 2017). The ability to use technologies effectively is essential for students to excel in their academic achievements and prepare for the job market. Office Technology and Management (OTM) students are no exception to this trend. The Office Technology and Management programme aims to enable students to use office management and communication technologies effectively to expand the e-business sector and generate the greatest possible output for social and economic development.

Digital competence is the ability to safely and appropriately access, manage, understand, integrate, communicate, evaluate, and create information via digital devices and connect technologies to participate in social and economic life (UNESCO, 2018) and enhance academic performance. It includes skills that are often referred to as computer literacy, ICT literacy, information literacy, and media literacy. Digital competence builds on different learning domains (knowledge, attitudes, and skills) and is divided into several competence areas. The component frameworks analyzed (Ferrari, 2012) are information management, collaboration, communication and sharing, content and knowledge creation, evaluation and problem-solving, and technical operations (Kryukova et al., 2022). This framework is very important in the Office Information and Management programme packages, where the technical areas revolve around information processing and communication.

According to Fan and Wang (2022), learning in the 21st century promises that digital tools will transform traditional education and mobilize the skills needed in the emerging digital world. It has been noted that students are sometimes referred to as "digital natives" because they live in a digital world and use digital technologies in various everyday activities. Students, therefore, are expected to acquire several necessary essential digital skills that are relatively aligned with the achievement of academic goals and not just for frivolity (Soroya et al., 2021; Van Laar et al., 2017).

Fan and Wang (2022) opine that digital skills facilitate access to educational content, information management, and the efficient use of e-learning as an educational medium. Digital literacy is the set of knowledge, skills, and attitudes required today to function in a digital environment.

Despite the tremendous benefits that ICT offer students in navigating the digital world, preliminary research, experience and close observation have shown that some higher education students, particularly those in the Office Technology and Management programme are only familiar with basic skills in Microsoft Office programs such as Word Processing, CorelDraw, Excel, and PowerPoint. However, massive use of Internet browsers, YouTube, basic programming, digital skills to store information in the cloud, edit videos/photos, information retrieval, and analysis skills, content creation skills and media literacy, solving technical problems relating to information management, security issues are the biggest challenges. These challenges are also revealed in the study of Ile and Abi (2021); as well as; Omoregie & Akinrinmade; (2021).

Also, several publications and research have shown that digital competence is positively associated with academic achievement, performance, and employability in the global economy (Adeleke & Awogbami (2022); Apuke & Tunca, 2022; Ben Youssef, Dahmani & Ragni, 2022; Mehrvarz, Heidari, Farrokhnia, & Noroozi, 2021; Ademiluyi, 2021; Elstad & Christophersen, 2017), however, there is a paucity of information on the influence of digital competence and academic performance of students in the polytechnic, particularly, in Office Technology and Management programme which is designed to prepare students to fit right into any computerized organisation and play significant roles for socio-economic development. This creates a gap in the literature. This study, therefore, investigates the influence of digital competence on the academic performance of students in the Office Technology and Management programme in Oyo State-owned Polytechnics, Nigeria. It examines the level of availability of the most prominent digital resources used for teaching and learning, students' disposition to using the tools to complete assignments more efficiently, develop private study, collaborate with colleagues, demonstrate enhanced problem-solving skills within their academic course work, and, the implication of these on the academic performance.

Aim and Objectives of the Study

The main aim of this study is to investigate the influence of digital competence on the academic performance of students in the Office Technology and Management programme in Oyo State-owned Polytechnics, Nigeria. The specific objectives were to:

- examine the most prominent digital resources used for teaching students in Office Technology and Management programme in Oyo State-owned Polytechnics, Nigeria.
- i. determine the level of digital competence of students offering Office Technology and Management programme in Oyo State-owned Polytechnics,

- Nigeria.
- ii. assess the influence of digital competence on the academic performance of students offering the Office Technology and Management programme in Oyo State-owned Polytechnics, Nigeria.

Research Questions

Two research questions are raised in the study as follows.

What are the most prominent digital resources used for teaching the Office Technology and Management programme in Oyo State-owned Polytechnics, Nigeria?

What is the level of digital competence of students offering the Office Technology and Management programme in Oyo State-owned Polytechnics, Nigeria?

Hypotheses

The following hypotheses were tested.

- H₀1: There is no significant combined influence of digital competence on the academic performance of students offering Office Technology and Management programme in Oyo State-owned Polytechnics, Nigeria.
- H₀2: There is no significant relative influence of digital competence on the academic performance of students offering Office Technology and Management programme in Oyo State-owned Polytechnics, Nigeria.

Methodology

The study used a descriptive survey research design. The study covers the four Oyo State-owned polytechnics in Nigeria – The Polytechnic, Ibadan, Ibadan; Adeseun Ogundoyin Polytechnic, Eruwa (AOPE); The Oke-Ogun Polytechnic, Saki (TOPS); and Oyo State College of Agriculture and Technology, Igboora (OSCATECH). The population consisted of students in National Diploma (ND) II, and Higher National Diploma (HND) II of Office Technology and Management 2021/2022 who were expected to have access to digital resources for 9 to 12 months in Oyo State-owned Polytechnics, Nigeria. Three out of the four polytechnics that have offered the OTM programme for at least five years were selected - The Polytechnic, Ibadan, Ibadan; Adeseun Ogundoyin Polytechnic, Eruwa (AOPE); and Oyo State College of Agriculture and Technology, Igboora (OSCATECH). The total population of OTM, ND II, and HND II of session 2021/2022 was 278 students. At the Polytechnics Ibadan, Ibadan, the number of ND II was 65; HND II was 75; at Adeseun Ogundoyin Polytechnic, Eruwa, ND II was 74; while HND II was 31; at Oyo State College of Agriculture and Technology, Igboora, ND II was 33, HND OTM programme had not be accredited at OSCATECH at the specified time. The 1979 Krejci and Morgan table was applied to determine a sample size of 162. The Proportional Stratified Sampling Technique was used to select the sample size in each unit, using percentage (value/total) x 100 such that 40, 44, 43, 17, and 18

resulted in 162, using the Random Sample Technique. The study used a structured questionnaire to collect data on the most prominent digital resources used, and the level of digital competencies of students offering the OTM programme in Oyo State-owned polytechnics, Nigeria. The instrument was adapted from a validated questionnaire (Mehvarz et al, 2021), and the structured OTM Curriculum and Course Specifications (National Board for Technical Education – NBTE Curriculum and Course Specification, 2004). The initial internal consistency reliability coefficient of the instrument was 0.81 - digital competence, and 0.87 - academic performance. A pilot study was employed to determine the reliability of the scales. The results showed that the Cronbach Alpha values of digital competence were -0.87, and academic performance - 0.89. The data collected were analyzed using Frequency Counts, Mean scores, Standard Deviation and Regression Analysis.

Results

Demographic Characteristics of Participants

The demographic characteristics of the participants are analyzed below using frequency counts and simple percentages.

Table 1: Respondents Demographic Characteristics

Gender of Respondents	Frequency	Percentage %
Male	61	38.1
Female	99	61.9
Age of Respondents		
15-20 years old	7	4.4
21-25 years old	47	29.4
25-30 years old	82	51.3
30 years and above	24	15.0
Total	160	100.0

Table 1 provides key demographic information from the study on the impact of digital competence and academic performance of students in the Office Technology and Management program at Oyo State Polytechnics, Nigeria. The table provided information on the gender distribution of the 160 respondents and revealed that 61 (38.1%) identified as male and 99 (61.9%) as female. This indicates a larger proportion of female respondents in the study. Examining the age groups of the respondents, the data shows that from the total sample, 7 respondents (4.4%) were between the ages of 15 and 20, 47 respondents (29.4%) fell into the 21 to 25 years category, 82 Respondents (51.3%) were between 25 and 30 years old, and 24 respondents (15.0%) were 30 years and older. Consequently, the majority of respondents, namely 51.3% of the participants, were aged between 25 and 30 years. These results provide an overview of the gender and age distribution within the sample. Although gender was not included as a variable in this study, it should be

noted that the larger proportion of female respondents may indicate that there are more female students at Oyo State-owned polytechnics, and may indicate that the study places greater emphasis on the experiences and perspectives of female students. In addition, the age distribution indicates a significant presence of respondents in the 25-30-year-old category, which can provide valuable insight into the digital competence and academic performance of Office Technology and Management students in this age group.

Research Question One: What are the most prominent digital resources used for teaching students in the Office Technology and Management programme in Oyo State-owned Polytechnics, Nigeria?

Data on the prominent digital resources used for teaching students in the Office Technology and Management programme are analysed below using mean scores and simple percentages.

Table 2: Descriptive Analysis of the Most Prominent Digital Resources Used for Teaching Office Technology and Management Programme in Oyo State-owned Polytechnics, Nigeria

Descriptive Items	N	Min.	Max.	Std.	Mean	Rating
Scanner	160	1.00	5.00	1.43	3.34	Often used
Internet facility in your institution	160	1.00	5.00	1.19	3.26	
The computer system in ICT Practical class						
Personal Internet subscription	160	1.00	5.00	1.35	3.21	
Flash Drive/CD/Hard Disk	160	1.00	5.00	1.02	3.21	
Photocopier	160	1.00	5.00	1.21	3.20	
Voice Recording devices e.g. Tape Recorder, Phone Audio Recorder	160	1.00	5.00	1.18	3.11	
Printer	160	1.00	5.00	1.32	3.11	
Laptop for personal use	160	1.00	5.00	1.29	3.11	
Installation of Social media applications for learning e.g. WhatsApp, Telegram, YouTube, Google Meet, Zoom	160	1.00	5.00	1.10	3.08	
Smartphone	160	1.00	5.00	1.12	3.04	
Microsoft Office Suite applications	160	1.00	5.00	1.30	3.04	
Valid N (listwise)	23				3.03	

Never Use ($\bar{x}$ =1.00-1.49), Rarely Use ($\bar{x}$ =1.50-2.49), Sometimes Use ($\bar{x}$ =2.50-2.99), Often Use ($\bar{x}$ =3.00-3.49), and Always Use ($\bar{x}$ =4.00-5.00)

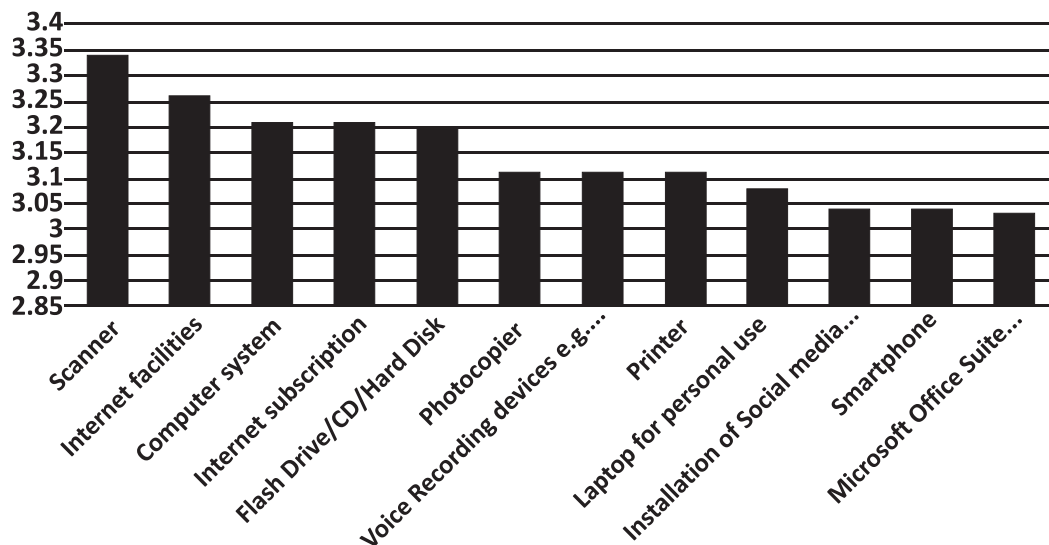


Figure 1: Most Prominent Digital Resources Used for Teaching students in Office Technology and Management Programme in Oyo State-owned Polytechnics, Nigeria

Table 2 and Figure 1 show the findings on the most prominent digital resources used for teaching in Office Technology and Management programme in Oyo State-owned Polytechnics, Nigeria. The digital resources were found to be often used in the school including a scanner ($x=3.34$), internet facilities ($x=3.26$), flash drive/CD/Hard Disk ($x=3.21$), personal Internet subscription ($x=3.21$), computer system in ICT Practical classes ($x=3.20$), voice Recording devices such as tape recorders, phone audio recorders ($x=3.11$), photocopier ($x=3.11$), printer ($x=3.11$), laptop for personal use ($x=3.08$), Microsoft Office Suite applications ($x=3.04$), the installation of social media applications for learning e.g. WhatsApp, Telegram, YouTube, Google Meet, Zoom ($x=3.04$) and smartphone ($x=3.03$). The research showed that the leading digital resources in the school are flash drive/CD/Hard Disk, scanners, and internet facilities.

Research Question Two: What is the level of digital competence of students offering the Office Technology and Management programme in Oyo State-owned Polytechnics, Nigeria?

Data on the level of digital competence of students offering office technology and management programme are analyzed below using mean scores and simple percentages.

Table 3: Descriptive Analysis of the level Of Digital Competence Students Offering Office Technology and Management programme in Oyo State-owned

Polytechnics, Nigeria

Descriptive Items	N	Min.	Max.	Std. Dev.	Mean	Rating
Skills in Microsoft Excel	160	1.00	5.00	1.47	3.46	High
Skills in Microsoft PowerPoint	160	1.00	5.00	1.23	3.29	
Skills in Microsoft Word	160	1.00	5.00	1.29	3.25	
Ability to access correct information online	160	1.00	5.00	1.25	3.25	
Skills in Microsoft Publisher	160	1.00	5.00	1.26	3.11	Moderate
Skills in Microsoft Access	160	1.00	5.00	1.39	3.11	
Using social media for learning e.g. WhatsApp, Telegram, YouTube, Google Meet, Zoom, etc.	160	1.00	5.00	1.44	3.07	
Downloading applications from the Internet	160	1.00	5.00	1.36	3.03	
Ability to search for information online	160	1.00	5.00	1.39	3.03	Low
Use of E-mail and attachment	160	1.00	5.00	1.31	2.98	
Valid N (listwise)	23					

Very Low ($\bar{x}$ =1.00-1.49), Low ($\bar{x}$ =1.50-2.49), Moderate ($\bar{x}$ =2.50-2.99), High ($\bar{x}$ =3.00-3.49), and Very High ($\bar{x}$ =4.00-5.00)

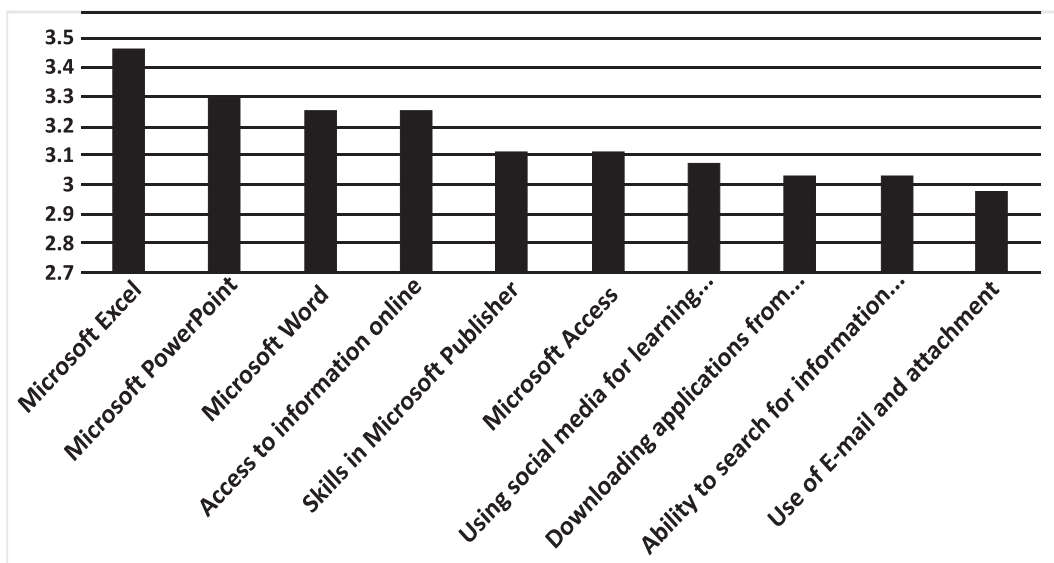


Figure 2: The Level of Digital Competence Students Offering Office Technology and Management programme in Oyo State-owned Polytechnics, Nigeria

Table 3 and Figure 2 show the findings on the level of digital competence students offering the Office Technology and Management programme at Oyo State-owned Polytechnics, Nigeria. It was shown that there has been a high level of digital literacy among the students. These cut across skills in Microsoft Excel ($\bar{x}$ =3.46), skills in Microsoft PowerPoint ($\bar{x}$ =3.29), skills in Microsoft Word ($\bar{x}$ =3.25), ability to access correct information online ($\bar{x}$ =3.25), skills in Microsoft Publisher ($\bar{x}$ =3.11), skills in Microsoft Access ($\bar{x}$ =3.11) social media for learning such as WhatsApp, Telegram, YouTube, Google Meet, Zoom, etc. ($\bar{x}$ =3.07), downloading applications from the Internet ($\bar{x}$ =3.03), the ability to search for information online ($\bar{x}$ =3.03) and the use of E-mail and attachments ($\bar{x}$ =2.98). By implication, the students are more skilled in Microsoft packages such as Microsoft Excel, Microsoft PowerPoint, Microsoft Access, and Microsoft Publisher.

Hypothesis One: There is no significant combined influence of digital competence on the academic performance of students offering the Office Technology and Management programme in Oyo State-owned Polytechnics in Nigeria.

Data on the combined influence of the usage of relevant digital resources and digital competence on the academic performance of students in OTM programme are analyzed below using regression analysis.

Table 4: Regression Analysis Showing Combined Influence of Usage of Relevant Digital Resources and Digital Competence on Academic Performance of Students in Office Technology and Management Programme in Oyo State-owned Polytechnics

Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
	B	Std. Error	Beta		
1 (Constant)	1.951	.525		3.718	.000
Usage of Relevant Digital Resources	.006	.015	.040	.374	.709
Digital Competence	.039	.017	.247	2.302	.023

a. Independent Variable: Academic Performance of Students in Office Technology and Management Programme in Oyo State-owned Polytechnics

The results presented in Table 5 show Students enrolled in the Office Technology and Management Programme at Oyo State-Owned Polytechnics and their academic performance were positively influenced by their use of relevant digital resources and their digital competence, as shown in Table 3. Starting with the constant term, the estimated coefficient of 1.951, the standard error of 0.525, and the t-value of 3.718 indicate that the constant term is statistically significant at the 0.05 level of

significance. This suggests that factors other than the use of digital resources and digital competence influence the academic performance of students in this programme. Examining the predictor variables reveals that the utilization of pertinent digital resources has a positive relationship with academic performance, as indicated by the positive coefficient of 0.006. However, this relationship is not statistically significant, as the t-value of 0.374 is not statistically significant at the 0.05 level. This suggests that the utilization of digital resources, particularly pertinent ones, has little effect on the academic performance of students in this context. In contrast, digital competence demonstrates a statistically significant positive correlation with academic performance. The coefficient of 0.039 indicates that a higher level of digital competence is associated with a higher perception of academic performance. This finding is corroborated by the t-value of 2,302 at the 0.05 level of significance. Digital competence influences the academic performance of students in the Office Technology and Management Programme to a greater extent than the use of pertinent digital resources, according to the overall analysis. A higher level of digital competence was associated with improved academic performance, but there was no correlation between the use of digital resources and academic performance. These findings suggest that developing and enhancing digital competence among these students could have a positive effect on their academic performance. Additional research and interventions concentrating on enhancing digital competence within the context of the Office Technology and Management Programme may be advantageous for improving student outcomes.

Discussion of Findings

In response to the research hypothesis which stated that Digital competence will not have a significant joint influence on the academic performance of students in the Office Technology and Management programme in Oyo State-owned polytechnics. The result shows that there was a joint effect of the factors on the academic performance of students in the Office Technology and Management programme. It was further revealed that 4.9% variance is the prediction of the academic performance of students in the Office Technology and Management programme; this was due to the prediction of the independent variables. On the other hand, digital competence shows a statistically significant positive relationship with academic performance. The coefficient of 0.039 suggests that an increase in digital competence is associated with a higher academic performance. The ANOVA results from the regression analysis also attest to the causal effect of the independent variables on the dependent variables. This result is consistent with the findings of Adeleke & Awogbami (2022); Apuke & Tunca, (2022); Affum (2022), Abbas et al. (2019), Fairlie et al. (2018) & Adeogun (2015) that the use of digital technology has a vital impact and can improve students' academic engagement and performance. Devices like the iPad, iPhone, and personal computer (PC) facilitate student learning and group problem-solving. Students in higher institutions would benefit from tools like the Internet (Adenekan and Odusanya, 2022; Brew et al., 2021). It can motivate OTM students to acquire in-depth knowledge and skills of office information

systems, and modern computer software application systems, work efficiently on any Windows environment for e-business and e-commerce, and keep up with current events. The findings of Idris et al. (2020), and Leung et al. (2018) revealed that students can be motivated to learn in a variety of ways; one of these is through developing their digital competencies. Students can make use of a wide range of new learning opportunities made possible by digital technology, both in and out of the classroom (Idris et al. 2020; Florence and Eremie, 2021; Hernandez-Martin et al. (2021).

Conclusion

The findings of this research highlight the symbiotic relationship between digital competence and the academic performance of students offering OTM programme. The independent variable—digital competencies and usages—points to the importance of reorienting students on digital and internet use to improve academic performance. If students develop digital competence, their academic performance may stay high. By embracing innovative teaching methods and providing access to relevant resources, educators can empower students to navigate the complexities of the digital landscape with confidence and competence. This holistic approach not only fosters academic achievement but also cultivates a generation of lifelong learners capable of adapting to the evolving demands of the digital era. Thus, fostering digital competence among students in the Office Technology and Management course is not merely a pedagogical imperative but a strategic investment in their future success

Recommendations

The study recommends that:

- The management of the polytechnics should provide adequate access to digital resources.
- The ICT Unit and the library of the polytechnics needs to create more awareness of the use of digital resources for personal study by conducting workshops, seminars, and practical training.
- Lecturers are to integrate digital technologies into their teaching.
- The curriculum needs to be revised to incorporate more ICT courses that are able to build digital competencies.
- Students should maximize the use of widespread ICTs to promote and enhance their learning and not for frivolity.
- Further research could investigate the relationship between digital competence and the academic achievements of students in other programmes in the educational contexts in Nigeria.

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