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ENHANCING OFFICE TECHNOLOGY AND MANAGEMENT PROGRAMME THROUGH THE INTEGRATION OF ARTIFICIAL INTELLIGENCE (AI) FOR TEACHING AND LEARNING

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Abstract

The paper examined the prospect of integrating artificial intelligence (AI) in the teaching and learning process in Office Technology and Management programme. The study adopted the descriptive survey research design. Two research questions and two hypotheses were formulated to guide the study. The study was carried out in Delta State. The population of the study consists of 24 lecturers from Delta State Polytechnics, Ogwashi-Uku and Otefe-Oghara. The instrument for data collection was a structured 28 items questionnaire developed by the researchers for the study. The instrument (questionnaire) was validated by experts in the field of Office Technology and Management, while the reliability of the instrument was determined by the use of Cronbach Alpha reliability formula which yielded reliability co-efficient of 0.83 and 0.89 for cluster 1 and 2 with a general reliability coefficient of 0.86. Mean and standard deviation and t-test were used to analyze data collected for the study. The findings for the study revealed that integrating (AI) in Office Technology and Management programme can enhance Office Technology and Management and that AI can address the diverse learning needs of students and can aid lecturers in teaching among others. It was recommended that Office Technology and Management programme lecturers and students should embrace AI and proactively leverage its capabilities to empower teaching and learning in order to prepare students for the future.

Keywords: Enhancing, OTM Programme, Integration, Teaching and Learning.

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Introduction

Education is today accepted as the instrument for human capital development. It achieves this through teaching and learning which involves impartation of knowledge, attitude, values and skills in line with the current trends. According to Ikelegbe (2020) and Ikelegbe (2024), education is a process of transmission, preservation and improvement of the culture of a people, a process through which human beings become morally good members of the society as it is relied upon as the bedrock and tool for nation building. In support of the above assertion, Okenazu and Okenazu (2023) posit that education lies at the heart of every society. It is a key and total element in broad development of the nation's youth's capacity to address and solves societal problems. This implies that meaningful development in any country is achieved through proper education of its citizens. Baba, Baba and Iwuoha (2024) opined that education is a tool through which a person is taught by means of a set of instructions (formal and informal) to bring about beneficial changes in the learners actions and allow him/her to lead a useful and appropriate life in society. This is true of every nation that has taken education of its people seriously.

Education entails teaching and learning. Teaching and learning according to Meta AI (2025) can be powerful tools for transformation, enabling individuals, communities and society to grow, adapt, and evolve. Teaching and learning promote tolerance and understanding, drive economic growth and improve health and wellbeing. Teaching is the process of guiding facilitating and supporting others in acquiring knowledge, skills, values and attitudes. Teaching can occur in various settings including classrooms, workshops, online platforms and informal environments. Its ultimate goal is to empower learners with knowledge, skills and confidence to succeed, while learning is the process of acquiring new knowledge, skills, attitudes or understanding through study, experience or teaching. Learning involves absorbing information, applying knowledge, developing skills, changing perspective and adapting to new situations. Learning can occur formally (e.g. in schools) or informally (e.g. through experiences self-study). It's a lifelong process that helps individuals to grow, develop and navigate the world.

Artificial intelligence was first mention in 1956 at a conference by John Mccarthy. He proposed to use the term artificial intelligence to describe computer with ability to mimic or duplicate the functions of human brain. According to Benhamon and Jawin (2018), Artificial Intelligence involves a collection of technologies that enable machines to act with a very high level intelligence similar to humans. Nidhi and Meghna (2021) believe that AI was designed to focus on providing solutions that are as effective as those provided by humans. The term is usually used to refer to systems endowed with seemingly human intellectual capacities such as reasoning, discovering meanings, idea generalization among others. This assertion is today a reality as AI tools have proven firmly and vastly helpful in various fields in education or in business. Amongst them today, are computer vision prediction systems, data mining (Das et al in Surugiu et al, 2024), intelligent learning or teaching systems, learning analytics (Ley et al, 2023), facial recognition systems, voice or speed recognition systems, visual laboratories augmented reality, virtual reality, hearing and sensing technologies, edge computing, virtual personalized assistants, real time analysis, image recognition, personalized learning approach, academic analytic and adaptive learning method (Park and Lee, 2000).

Ibrahim (2023) stated that AI has the potential to address some of the biggest challenges in education in areas such as innovative teaching and learning practices, also AI is used to develop innovative tools and technologies that have the potential to transform the traditional

method of teaching and learning. This means that machines are assisting in a way more efficiently.

Cromption, Jone and Burke (2022) believed that artificial intelligence can play a great role in teaching and learning process. While Ademiluyi, Adegboye and Akande (2025) stated that artificial intelligence is becoming an increasing important part of our daily lives, and it has the potential to revolutionize the way we work, communicate and learn. In education, artificial intelligence has the potential benefits to provide students with a more personalized and engaging learning experience and help teachers more to effectively meet the needs of each student. According to Asakura (2020), AI ensures universal access to education, cost effective learning, increases efficiency and enhances students' performance, close skill gap, provides opportunity to deepen students understanding of evolving technology, help students develop a critical perspective on technology and prepare them for the challenges and opportunities of the digital age. Furthermore, integrating artificial intelligence into education can also help students develop important 21st century skills such as problem-solving, critical thinking, and collaboration (Elhajar, Karam and Boma, 2021). These skills are essential for success in the digital age, and they can be developed with artificial intelligence tools and applications. It should be noted that though AI is potentially beneficial in education, it has its myriad of challenges such as threat to teachers job, lack of technical expertise, limited resource, dehumanized learning experience, ethical concern and expensive implementation dependency among others.

Office Technology and Management (OTM) programme is concerned with training students to acquire skills, understanding, attitudes, work habits competencies that are requisite to success in office management occupations. According to Ikelegbe (2024), the National Board for Technical Education basically design the OTM curriculum with the aims of producing graduates who would be equipped with secretarial and office skills for employment in various field of endeavor. Umoru and Enonche (2021) averred that OTM programme is a skill administrative and management programme of study aimed at preparing recipients for office job and/or to become self-employed or to help enhance further learning to be prepared for greater roles as teachers, instructors or lecturers.

Adamma in Eze and Emeasoba (2024) identified the objectives of OTM programme as equipping the students with knowledge, skill, attitude and competencies needed to prepare the students for employment after graduation; develop in students an occupational intelligence that will make them versatile and acceptable to the changing situation in the world of work, prepare students to be self-reliant, develop students potentials for further academic and professional pursuit, to equip the students with skills and knowledge to meet the manpower needs of society and to enable the student to develop good working habit and attitude needed to develop personal traits to help him/her in achieving efficiency at work.

According to Surugiu, Gradinaru and Surugiu (2024), the demand for innovative teachers, integrating new technologies and enabling students AI interaction in education is increasing and there is the need to integrate AI in education. In OTM the need to integrate AI in the programme will open better opportunities to both learners and teachers. According to Culican (2023), AI holds great potentials to enhance teaching and learning experiences, making education more personalized efficient and engaging. Lecturers in OTM should embrace the use of AI and proactively leverage its capabilities to empower classroom and prepare students for the future.

Statement of the Problem

Office Technology and Management programme play a crucial role in preparing students for the world of work. This is achieved in preparing them with essential skills, knowledge and competencies. OTM programme which is an integral part of business education is suppose to be a pacesetter in the integration of novel initiative and innovations as it concern technology in education settings. However, it has been observed that educational programme generally in Nigeria are yet to fully adopt artificial intelligence tools in teaching and learning processes and OTM programme is not exempted in this. Kong (2020), started that if OTM lecturers must excel they should utilized AI tools in enhancing their delivery methods. None utilization of AI tools has already created a gap which has in turn poses significant problem. The researchers are therefore interested in examining how OTM programme could be enhanced through the integration of AI in teaching and learning.

Purpose of the Study

The main purpose of the study was to examine the enhancement of OTM programme through the integration of artificial intelligence (AI) for teaching and learning. Specifically, the study will examine;

1. How artificial intelligence integration in OTM programme can enhance teaching and learning.
2. Challenges of integrating artificial intelligence in the teaching and learning inOTM programme.

Research Questions

Two research questions guided the study as follows;

1. In what ways can integration of AI in OTM programme enhance teaching and learning?
2. What are the challenges of integrating artificial intelligence in teaching and learning in OTM programme?

Hypotheses

Ho_1: There is no significant difference in the mean ratings of experienced and less experience lecturers in ways integration of artificial intelligence in OTM programme can enhance teaching and learning.

Ho_2: There is no significant difference in the mean ratings of male and female lecturers on the challenges of integrating artificial intelligence in teaching and learning to enhance OTM programme.

Method

The descriptive research design was adopted for the study. The study was carried out in Delta State. The population for the study comprises of 24 lecturers in Delta State Polytechnics, Ogwashi-Uku and Otefe-Oghara. The instrument was a structured questionnaire developed by the researchers. The instrument was titled “Questionnaire on Integration of Artificial Intelligence for Teaching and Learning in Office Technology and Management Programme (QIAITLOTMP). The instrument was structured on a 4 point Likert rating scale of Strongly

Agree (SA), Agree (A), Disagree (D) and Strongly Disagree (SD). The instrument was validated by three experts in Office Technology and Management department. The instrument was further subjected to a pilot test on 10 lecturers in Federal Polytechnic, Oko, Anambra State. The application of the Cronbach Alpha reliability test on the returned data yielded co-efficient values of 0.83 and 0.89 for clusters 1 and 2 with a general reliability coefficient of 0.86. Data collected from respondents were analyzed using mean and standard deviations to answer the research questions and to determine the homogeneity or otherwise of the respondents' ratings, while t-test was used to test the hypothesis at 0.05 level of significance. In analyzing the mean, any item with mean score above 2.50 is agreed upon while any mean score below the mean score of 2.50 is disagree. Where the calculated t-value was less than the critical value of t, it means that the variable did not significantly affect respondents mean ratings and the hypothesis was accepted. Conversely, where the calculated t-value was equal to or greater than the critical t-value, it means that the variable had a significant effect on the respondents mean ratings and the hypothesis was rejected.

Results

Research Question 1: In what ways can integration of artificial intelligence in OTM programme enhance teaching and learning?

Table 1: Respondents mean ratings on ways integration of artificial intelligence in OTM programme can enhance teaching and learning.

S/N	Integration of AI in OTM will enhance:	Mean	SD	Remarks
1.	Individual needs of students in OTM programme	2.85	1.05	Agree
2.	Intelligent tutoring system	3.06	0.93	Agree
3.	Accessibility to learning including disable students	3.14	0.92	Agree
4.	Adequate feedback as quickly as possible	3.08	0.82	Agree
5.	Automation of administrative task in OTM	3.40	0.64	Agree
6.	Predictive analytics for students success in OTM programme	3.30	0.76	Agree
7.	Proper decision making	3.05	0.94	Agree
8.	Personalized career guidance	3.02	0.98	Agree
9.	Emotional support	3.02	0.98	Agree
10.	Students to develop innovative solutions	3.28	0.84	Agree
11.	Students research participation	3.33	0.73	Agree
12.	Students to develop analytical skills	3.21	0.84	Agree
13.	Students interest and drive to study better	2.91	1.03	Agree
14.	Development of technical skills	3.36	0.66	Agree
15.	Development of digital skills	3.09	0.82	Agree
16.	Students hands on learning experiences that stimulate critical thinking	3.23	0.81	Agree
17.	Students creative skills	3.17	0.86	Agree
18.	Improving students career prospects	3.04	0.96	Agree
19.	Students collaboration with other students	3.30	0.76	Agree
20.	Students communication skills	3.14	0.92	Agree
	Cluster Mean/SD	**3.15**	**0.86**	**Agree**

Source: Field study, 2025.

Data in table 1 reveal that all the items analyzed achieved mean ratings of 2.85-3.40 and standard deviation ranges between 0.66-1.05. With a cluster mean of 3.15, it is summarized that lecturers agreed that integration of artificial intelligence in OTM can enhance the

programme. The standard deviation scores of 0.66-1.05 shows that OTM lecturers opinion on the items listed are homogeneous, therefore integration of artificial intelligence can enhance teaching and learning in Office Technology and Management programme.

Research Question 2: What are the challenges of integrating AI in OTM programme to enhance teaching and learning?

Table 2: Respondents mean ratings on the challenges of integrating AI in OTM programme to enhance teaching and learning.

S/N	Challenges of Integrating AI in OTM Programme	Mean	SD	Remarks
21.	Lack of funds to provide infrastructure to support integration	3.06	0.82	Agree
22.	Absence of experts to handle technical issues related to integration	2.92	1.03	Agree
23.	High cost of materials and necessary tools required for AI integration	3.23	0.81	Agree
24.	Poor institutional commitment to integrating AI in OTM programme	3.11	0.87	Agree
25.	Poor attitude of lecturers towards the integration of AI in OTM programme	2.67	1.13	Agree
26.	Lack of training of lecturers on the current trends in integrating AI in OTM programme	3.28	0.79	Agree
27.	Present OTM curriculum do not align adequately with AI integration	2.81	0.80	Agree
28.	Resistance to change towards integration of AI among lecturers	2.54	1.19	Agree
	Cluster Mean/SD	**2.95**	**0.93**	**Agree**

Source: Field study, 2025.

Data in table 2 reveal that the respondents rated all the items in serial number 21-28 as challenges of integrating artificial intelligence to enhance teaching and learning on OTM. The mean ranges from 2.54 – 3.23 with a cluster mean of 2.95. The standard deviation ranges from 0.79 – 1.19 which shows that opinions of respondents were closely related as it shows consistency of scores of respondents in their observed challenges of integration of AI to enhance teaching and learning in Office Technology and Management programme.

Test of Hypotheses

Ho_1: There is no significant difference in the mean ratings of experienced and less experience lecturers in ways integration of artificial intelligence in OTM programme can enhance teaching and learning.

Table 3: Summary of t-test analysis of experienced and less experience lecturers on ways integration of AI in OTM programme can enhance teaching and learning

Variable	N	Mean	SD	Df	t-cal	t-value	Decision
Experienced Lecturer	7	2.91	0.76				
				22	0.74	1.96	NS
Less Experience Lecturer	17	2.71	0.66				

Table 3 shows that experienced OTM lecturers had a mean rating of 2.91 and standard deviation of 0.76, which yield a calculated t-value of 0.74 at 22 degree of freedom. Since the calculated t-value of 0.74 is less than the t-value of 1.96, the null hypothesis is accepted. This

means that there is no significant difference in the mean ratings of experienced and less experience lecturers in ways integration of AI can enhance teaching and learning.

Ho_2: There is no significant difference in the mean ratings of male and female lecturers on the challenges of integrating artificial intelligence in teaching and learning to enhance OTM programme.

Table 4: Summary of t-test analysis on the mean ratings of male and female lecturers on the challenges of integrating AI in teaching and learning to enhance OTM programme

Variable	N	Mean	SD	Df	t-cal	t-value	Decision
Male	9	3.24	0.76				
				22	0.46	1.96	NS
Female	15	3.18	0.74				

Result in Table 4 show that male lecturers had a mean rating of 3.24 and a standard deviation of 0.76. These yielded a calculated t-value of 0.46 at 22 degrees of freedom. Since the calculated t-value of 0.46 is less than the critical table vale of 1.96, the null hypothesis is accepted. This means that there is no significant difference in the mean ratings of male and female lecturers on the challenges of integrating AI in teaching and learning to enhance OTM programme.

Discussion of Findings

The findings in research question one revealed that Office Technology and Management lecturers agreed that artificial intelligence integration in OTM programme can enhance teaching and learning in Delta State Polytechnics. All the items presented for this study were agreed upon. This means that artificial intelligence integration in OTM can enhance students ability to achieve their needs, helps in intelligent tutoring, enhance students both disables ones to learn, provide adequate feedback, assist the department in automation of administrative task, assist in predictive analytics for students success, assist in proper decision making, help in personalize career guidance, assist in emotional support, help students to develop innovative solutions. Others are that AI can assist students in research participation, assist students to develop analytical skills, enhance interest and derive students to study better, assist in developing technical and digital skills, assist students in development on entrepreneurial skills required for business experience that stimulate critical thinking while learning. AI integration also assists students in problem solving, enhance students creative skills, help in improving students career prospect, assist students in better collaboration among other students and enhance better students communication skills. This study is in agreement with Patridge and Piccoli (2018) whose study revealed that integration of AI into educational space holds a plethora of potentials for improving learning outcomes. The study is also in concurrence with Eze-Dessy and Emeasoba (2024) in their study titled "integration of AI in teaching and learning OTM programme in polytechnics in South-East, Nigeria" where they revealed that OTM lecturers agreed that artificial intelligence chatbots and simulation have positive influence on teaching and learning of OTM courses in polytechnics. The results of hypothesis one showed that there is no significance difference in the mean ratings of experienced and less experience lecturers in ways integration of AI can enhance teaching and learning. This finding is in agreement with Ufondu and Obi (2023) that there was no significant difference between teachings and learning on the extent artificial intelligence is integrated on business education programme.

The findings in research question two revealed that respondents agreed that all items presented for the study are potential challenges of integrating AI into Office Technology and Management, they include lack of funds, absence of experts, high cost materials for integration. Other challenges expected included poor institutional commitment, poor attitude of lecturers, non alignment of present OTM curriculum with AI integration and resistance to change. This finding is in consonance with the findings of Ademiluyi, Adegboye and Akande (2024) on their study titled "prospects and challenges of integrating artificial intelligence into OTM pedagogy" where they concluded that integration of AI technology into OTM pedagogy presents a range of challenges which may hinder the effective integration of artificial intelligence-driven educational initiatives. The hypothesis 2 in this study also showed that respondents i.e. male and female lecturers showed that there is no significant difference in their ratings on the challenges of integrating AI in teaching and learning to enhance OTM programme in polytechnics in Delta State.

Conclusion

Based on the findings of this study, it is concluded that OTM lecturers agreed that AI can enhance teaching and learning in OTM. It was also concluded that AI integration will be faced with challenges such as funding, absence of experts in using AI for teaching, none alignment with present OTM curriculum with AI and resistance to change.

Recommendations

The following recommendations were drawn from the study;

1. Polytechnics management should provide adequate atmosphere to incorporate AI in teaching and learning system.
2. OTM lecturers should explore AI enable resources to enable them use them in teaching and learning in OTM programme.
3. Self-training and attendance of capacity-building workshops where OTM lecturers can gain AI knowledge to be prepared for AI revolution should be encouraged.
4. National Board for Technical Education (NBTE) should ensure regular review and update of OTM curriculum to provide for artificial intelligence integration to enhance teaching and learning

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