

INFLUENCE OF ARTIFICIAL INTELLIGENCE TOOLS ON ADMINISTRATIVE EFFICIENCY AMONG OFFICE TECHNOLOGY AND MANAGEMENT STUDENTS IN COLLEGES OF EDUCATION IN DELTA STATE

By

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Abstract

This study investigated the influence of artificial intelligence tools on administrative efficiency among Office Technology and Management Students in Colleges of Education in Delta State. The study was guided by two research questions. The study adopted a descriptive survey research design. The population of the study comprised 101 office Technology and management students the three colleges of Education in Delta state. There was no sampling since the population was small and manageable. The instrument used for data collection was a structured questionnaire title: Influence of Artificial Intelligence Tools on Administrative Efficiency Among Office Technology and Management Students Questionnaire (IAITAEAOTMSQ). The instrument was face and content validated by two experts in the field. One from measurement and evaluation Federal College of Education (Technical) Asaba and another OTM from College of Education Warri, Delta State. The reliability test was determined using cronbach Alpha which yielded overall coefficient value of 0.73. which shows that the instrument was reliable. out of 101 questionnaire administered, 97 were retrieved representing 98% return rate which was used for data analysis. The findings of the study revealed that Artificial Intelligence tools play significant roles in enhancing administrative efficiency among Office Technology and Management students in Colleges of Education in Delta State. The effective utilization of AI technologies can help students develop relevant digital and administrative competencies required in modern office environments. Based on the findings, It was recommended that institutions should provide adequate AI-powered office technologies and digital facilities to enable Office Technology and Management students acquire practical administrative skills relevant to modern workplaces. Lecturers in Office Technology and Management should integrate the use of AI-powered document editing, communication, and scheduling tools into classroom instruction and practical office training activities.

Keywords: Artificial Intelligence, Tools, Administrative, Efficiency, Office Technology and Management, Colleges of Education.

Introduction

Rapid technological advancement has continued to transform educational systems, business organizations, and administrative practices globally. One of the most significant technological innovations influencing modern society is Artificial Intelligence (AI). Artificial Intelligence refers to the development of computer systems capable of performing tasks that ordinarily require human intelligence, including learning, reasoning, speech recognition, problem-solving, decision-making, and information processing (Russell & Norvig, 2021). The growing adoption of AI technologies has transformed workplace operations, communication systems, educational delivery, and office administration globally.

In recent years, Artificial Intelligence has become an important component of educational and administrative processes due to its ability to improve productivity, efficiency, and accuracy in task performance. Educational institutions now utilize AI-driven technologies to support teaching, learning, communication, data management, and administrative operations. According to Holmes, Bialik and Fadel (2019), AI technologies can enhance educational effectiveness through automation, personalized support systems, and intelligent learning environments. Similarly, UNESCO (2021) maintained that Artificial Intelligence has the capacity to improve educational administration, facilitate institutional management, and support effective decision-making processes.

The increasing digitalization of workplaces has created the need for graduates to possess technological competencies relevant to modern office environments. Consequently, tertiary institutions are expected to equip students with practical digital skills necessary for workplace effectiveness. Office Technology and Management (OTM) is an academic programme specifically designed to prepare students with competencies in office administration, communication technology, records management, information processing, keyboarding, and other managerial skills required in contemporary organizations (Osuala, 2018). The programme emphasizes practical and technological competencies needed for efficient office operations in both public and private establishments.

The integration of Artificial Intelligence into office administration has significantly transformed the way administrative activities are carried out in organizations. Traditional office practices that were previously dependent on manual operations are gradually being replaced by intelligent digital systems capable of automating routine office functions. AI tools such as automated scheduling applications, virtual assistants, speech-to-text software, cloud collaboration platforms, intelligent document editing systems, chatbots, and automated email management systems are increasingly utilized to improve workplace productivity and administrative efficiency (Aremu & Adeyemi, 2023).

AI-powered office technologies play important roles in enhancing communication, reducing operational errors, facilitating information storage and retrieval, improving task coordination, and increasing speed in office operations. According to Luckin et al. (2018), Artificial Intelligence can support administrative efficiency by reducing workload pressures and enabling

users to perform office tasks more effectively. Furthermore, Chiu, Chai and Liang (2021) observed that AI technologies improve organizational productivity by enhancing information management and supporting efficient administrative processes.

Administrative efficiency refers to the ability to perform administrative duties accurately, promptly, effectively, and with minimal waste of time and resources. In the context of Office Technology and Management, administrative efficiency may involve effective communication, proper records management, timely task execution, document preparation, office coordination, scheduling, and effective utilization of office technologies. The effective use of Artificial Intelligence tools may therefore improve administrative efficiency among OTM students by enhancing their technological competencies and office management skills.

Despite the increasing relevance of Artificial Intelligence technologies in education and office administration, many tertiary institutions in Nigeria still experience challenges associated with the integration and utilization of AI-driven technologies. Researchers have identified inadequate ICT infrastructure, poor internet connectivity, insufficient funding, inadequate training opportunities, low digital literacy, and poor awareness of AI applications as major constraints affecting the effective utilization of Artificial Intelligence in Nigerian educational institutions (Okeke & Nwosu, 2022; Ezeani & Akpotohwo, 2020).

In Colleges of Education in Delta State, Office Technology and Management students are expected to possess competencies required for modern office administration and digital workplace operations. However, it appears that some students still experience difficulties in effectively utilizing emerging office technologies and AI-powered applications for administrative tasks. This situation may affect their administrative efficiency, workplace readiness, and employability in technologically driven organizations. Although previous studies have examined Artificial Intelligence in education generally, there is limited empirical evidence on the influence of Artificial Intelligence tools on administrative efficiency among Office Technology and Management students in Colleges of Education in Delta State. It is on this basis that this study seeks to investigate the influence of Artificial Intelligence tools on administrative efficiency among Office Technology and Management students in Colleges of Education in Delta State.

The increasing adoption of Artificial Intelligence technologies in educational institutions and workplaces has transformed administrative activities and office operations globally. Modern organizations now rely heavily on AI-driven systems for records management, communication, scheduling, document processing, information storage, and other administrative functions. As a result, Office Technology and Management students are expected to acquire competencies in utilizing Artificial Intelligence tools to enhance administrative effectiveness and workplace productivity.

Despite the growing importance of AI technologies, observations indicate that many Office Technology and Management students in Colleges of Education still demonstrate inadequate competencies in utilizing modern office technologies for administrative activities. Some

students experience difficulties in document processing, digital communication, records management, task coordination, and effective utilization of AI-powered office applications. These deficiencies may reduce their administrative efficiency and negatively affect their preparedness for contemporary workplaces.

Furthermore, inadequate ICT facilities, unstable internet services, poor technological exposure, insufficient training opportunities, and limited awareness of AI applications may hinder effective utilization of Artificial Intelligence tools among students in Colleges of Education (Ezeani & Akpotohwo, 2020). Although several scholars have conducted studies on Artificial Intelligence and educational technology, there is limited empirical research specifically addressing the influence of Artificial Intelligence tools on administrative efficiency among Office Technology and Management students in Colleges of Education in Delta State.

The absence of adequate empirical evidence on this issue creates a knowledge gap regarding the role of Artificial Intelligence tools in improving administrative efficiency among OTM students. Therefore, this study becomes necessary to investigate the influence of Artificial Intelligence tools on administrative efficiency among Office Technology and Management students in Colleges of Education in Delta State.

The main objective of the study is to examine the influence of Artificial Intelligence tools on administrative efficiency among Office Technology and Management students in Colleges of Education in Delta State. Specifically, the study seeks to:

1. Determine the extent to which AI-powered document editing tools influence administrative efficiency among Office Technology and Management students in Colleges of Education in Delta State;
1. Examine the influence of AI-based communication and scheduling tools on administrative efficiency among Office Technology and Management students in Colleges of Education in Delta State.

The following research questions guided the study:

1. To what extent do AI-powered document editing tools influence administrative efficiency among Office Technology and Management students in Colleges of Education in Delta State?
2. What is the influence of AI-based communication and scheduling tools on administrative efficiency among Office Technology and Management students in Colleges of Education in Delta State?

Concept of Artificial Intelligence

Artificial Intelligence (AI) refers to computer-based systems designed to perform tasks that typically require human intelligence, including learning, reasoning, decision-making, problem-solving, and language processing. AI technologies are increasingly integrated into educational and administrative environments to automate routine activities and improve operational effectiveness. According to Russell and Norvig (2021), AI enables machines to simulate

intelligent human behavior, thereby enhancing efficiency and productivity in various sectors. In educational institutions, AI applications such as virtual assistants, intelligent document editing tools, automated scheduling systems, and communication platforms have become valuable resources for supporting administrative functions and improving organizational performance (Holmes, Bialik, & Fadel, 2019).

Concept of Administrative Efficiency

Administrative efficiency refers to the ability to accomplish administrative tasks accurately, promptly, and effectively while minimizing the use of time and resources. It involves effective communication, records management, scheduling, coordination, information processing, and decision-making within an organization. In the context of Office Technology and Management (OTM), administrative efficiency is reflected in students' ability to utilize technological tools to perform office duties effectively and meet organizational objectives. The use of AI-powered technologies can enhance administrative efficiency by reducing errors, improving workflow management, and facilitating faster task completion (Aremu & Adeyemi, 2023).

Theoretical Framework

The study is primarily anchored on the Technology Acceptance Model (TAM). The theory provides a suitable framework for understanding how students' perceptions of the usefulness and ease of use of Artificial Intelligence tools influence their adoption and utilization. The framework assumes that effective utilization of AI-powered document editing tools, communication platforms, virtual assistants, and scheduling applications will positively influence administrative efficiency among Office Technology and Management students in Colleges of Education in Delta State.

Technology Acceptance Theory (TAM)

This study is anchored on the Technology Acceptance Model (TAM) developed by Davis (1989). The theory explains the factors that influence an individual's acceptance and use of technological innovations. According to TAM, users are more likely to adopt a technology when they perceive it as useful and easy to use. Perceived usefulness refers to the degree to which an individual believes that a technology will improve performance, while perceived ease of use refers to the extent to which the technology is considered effortless to operate (Davis, 1989).

The relevance of TAM to this study lies in its explanation of how Office Technology and Management students may embrace AI-powered document editing, communication, and scheduling tools. When students perceive these technologies as beneficial in improving administrative performance and reducing workload, they are more likely to utilize them effectively. Consequently, increased utilization of AI tools may enhance administrative efficiency among students.

Diffusion of Innovation Theory

The Diffusion of Innovation Theory, proposed by Rogers (2003), explains how new technologies and innovations spread within a social system over time. The theory identifies innovation characteristics such as relative advantage, compatibility, complexity, trialability, and observability as major factors influencing adoption. Rogers (2003) argued that individuals are more likely to adopt innovations that offer clear advantages over existing practices. This theory is relevant to the present study because AI technologies represent innovations within educational and administrative settings. The extent to which OTM students perceive AI tools as advantageous, compatible with their academic activities, and easy to use may determine their level of adoption. Greater adoption of AI applications can contribute to improved administrative efficiency and workplace preparedness.

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Methods

The study adopted survey research design to examine the influence of artificial Intelligence tools on administrative efficiency among Office Technology and Management Students in

Colleges of Education in Delta State. According to Good fellow (2023) survey research design is suitable for studies that investigate respondents' opinions, perceptions, attitudes and behaviors through the use questionnaires and other structured data collection. The study was carried out in colleges of Education. The choice of the study area was based on the researcher's adequate knowledge of the environment, availability of relevant data, and the presence of a sizable population of respondents for the study. The population for the study consists of one hundred and one Office Technology and Management students in Colleges of Education in Delta State which include Federal College of Education (Technical) Asaba. College of Education Warri. College of Education Mosogar. The census sampling technique was used for the study. The reason is because the population was small and manageable. The instrument used for data collection was a structured questionnaire title: Influence of Artificial Intelligence Tools on Administrative Efficiency Among Office Technology and Management Students Questionnaire (IAITAEAOTMSQ) Twenty (20) items of questionnaire were used to elicit the opinion of the respondents. The questionnaire was structured on a four-point rating scale of Very High Extent (VHE) =4, High Extent (HE) =3, Low Extent (LE)=2, very low extent (VLE)= 1. The scale was used because it enables respondents to indicate their given information. The instrument was validated by two experts from measurement and Evaluation Federal college of Education(Technical) Asaba, and another from OTM department ,College of Education Warri using face and content validation. The reliability of the instrument was obtained using test-retest method. Ten (10) students from Federal College of Education (Technical) Umunze and College of Education Nsugbe in Anambra State were used and after two weeks. The reliability of the instrument was established using the Cronbach Alpha technique, which produced a reliability coefficient of 0.73, indicating that the instrument was reliable for the study. Out of 101 questionnaire administered by the researcher with the help of three research assistants, 97 of the instrument were retrieved representing 98% return rate. The data was analyzed using mean and standard deviation. The decision rule states that ,any item with a mean score of 2.50 and above is accepted while any item with a mean score less than 2.50 will be rejected/ Disagree.

Results

Research Question One: To what extent do AI-powered document editing tools influence administrative efficiency among Office Technology and Management students in Colleges of Education in Delta State?

Table 1: Mean ratings on the extent to which AI-powered document editing tools influence administrative efficiency among Office Technology and Management students in Colleges of Education in Delta State.

S/N	ITEM	MEAN	SD	DECISION
1	AI-powered document editing tools improve the speed of document preparation among OTM students.	3.16	0.89	High Extent
2	AI document editing applications help students reduce errors in typing and formatting official documents.	3.20	0.82	High Extent
3	The use of AI grammar correction tools enhances the quality of written communication among OTM students.	3.42	0.72	High Extent
4	AI-powered editing tools improve students' ability to organize office documents effectively.	2.79	1.04	High Extent
5	OTM students utilize AI document editing tools to improve accuracy in office tasks.	3.34	0.82	High Extent
6	AI-powered office applications help students save time during administrative activities.	3.03	0.97	High Extent
7	The use of AI editing tools enhances students' competence in preparing professional office documents.	3.49	0.52	High Extent
8	AI-powered document editing systems improve records management among OTM students.	3.52	0.49	Very High Extent
9	AI document processing tools enhance productivity during office practice activities	3.17	0.92	High Extent
10	The utilization of AI-powered document editing tools improves administrative performance among OTM students.	3.37	0.75	High Extent
	Grand Mean/ SD	3.25	0.79	High Extent

Source Field survey 2026.

The analysis presented in Table 1 revealed that AI-powered document editing tools influence administrative efficiency among Office Technology and Management (OTM) students to a high extent. This is evident from the grand mean score of 3.25 with a standard deviation of 0.79, which is above the benchmark mean of 2.50. The result indicates that respondents agreed that AI-powered document editing tools improve several aspects of administrative activities

among OTM students. Specifically, the respondents indicated that AI tools improve the speed of document preparation, reduce typing and formatting errors, enhance grammar correction, improve organization of office documents, and increase accuracy in office tasks. The respondents also agreed that AI-powered office applications save time during administrative activities and enhance competence in preparing professional office documents.

Furthermore, the item with the highest mean score (3.52) showed that AI-powered document editing systems greatly improve records management among OTM students, while the item with the lowest mean score (2.79) still indicated agreement that AI-powered editing tools improve students' ability to organize office documents effectively. The relatively low standard deviation values suggest that respondents shared similar opinions regarding the influence of AI-powered document editing tools on administrative efficiency. Overall, the result implies that the utilization of AI-powered document editing tools positively contributes to administrative efficiency among OTM students in Colleges of Education in Delta State.

Research Question Two

What is the influence of AI-based communication and scheduling tools on administrative efficiency among Office Technology and Management students in Colleges of Education in Delta State?

S/N	ITEM	MEAN	SD	DECISION
1	AI-based communication tools improve information sharing among OTM students.	3.48	0.64	Agree
2	AI scheduling applications help students manage office tasks effectively.	3.25	0.81	Agree
3	The use of AI communication tools enhances coordination of administrative activities among students.	3.07	1.00	Agree
4	AI-powered virtual assistants improve task organization among OTM students.	3.30	0.73	Agree
5	AI communication technologies improve response time during office-related activities.	3.20	0.72	Agree
6	AI scheduling tools help students meet deadlines for administrative tasks.	3.20	0.82	Agree
7	The use of AI-based communication platforms enhances collaboration among OTM students.	3.03	0.97	Agree
8	AI scheduling applications improve time management skills among students.	3.01	0.86	Agree

9	AI-powered communication tools improve effectiveness in handling office responsibilities.	3.08	0.94	Agree
10	The utilization of AI-based communication and scheduling tools enhances administrative efficiency among OTM students.	3.18	0.76	Agree
	Grand Mean/ SD	3.18	0.82	Agree

Source Field survey 2026.

The analysis in Table 2 showed that AI-based communication and scheduling tools positively influence administrative efficiency among OTM students. This is supported by the grand mean score of 3.18 and standard deviation of 0.82, which exceeded the criterion mean of 2.50. The findings revealed that respondents agreed that AI-based communication tools improve information sharing among students, enhance coordination of administrative activities, improve collaboration, and increase effectiveness in handling office responsibilities. The respondents also agreed that AI scheduling applications help students manage office tasks effectively, meet deadlines, and improve time management skills. The highest mean score (3.48) indicated strong agreement that AI-based communication tools improve information sharing among OTM students, while the lowest mean score (3.01) still reflected agreement that AI scheduling applications improve time management skills among students. The standard deviation values showed that respondents had close opinions on the influence of AI-based communication and scheduling tools.

Generally, the findings imply that AI-based communication and scheduling tools significantly enhance administrative efficiency among OTM students by improving communication, coordination, collaboration, and time management in office-related activities.

Discussion of Findings

The findings of the study revealed that AI-powered document editing tools influence administrative efficiency among Office Technology and Management students to a high extent. The respondents agreed that AI tools improve document preparation, reduce errors, enhance records management, and increase productivity during office practice activities. This finding agrees with the view of Luckin, et al. (2018), who stated that Artificial Intelligence supports administrative efficiency by reducing workload and enabling users to perform office tasks more effectively. The finding also supports the position of Chiu, Chai, and Liang, (2021), who observed that AI technologies improve productivity and information management within administrative processes. The implication of this finding is that AI-powered editing tools are essential in improving the technological competencies and workplace readiness of OTM students. The study further revealed that AI-based communication and scheduling tools positively influence administrative efficiency among OTM students. The respondents agreed that these tools improve information sharing, task coordination, collaboration, response time, and time management skills. This finding is consistent with the submission of UNESCO

(2021), which maintained that Artificial Intelligence can enhance educational administration and support effective decision-making processes. The finding also aligns with the work of Holmes, Bialik, and Fadel,(2019), who asserted that AI technologies improve efficiency through automation and intelligent support systems.

The overall findings of the study therefore suggest that Artificial Intelligence tools play significant roles in enhancing administrative efficiency among Office Technology and Management students in Colleges of Education in Delta State. The effective utilization of AI technologies can help students develop relevant digital and administrative competencies required in modern office environments.

Conclusion

The study concluded that Artificial Intelligence tools significantly influence administrative efficiency among Office Technology and Management students in Colleges of Education in Delta State. The findings revealed that AI-powered document editing tools enhance document preparation, reduce errors, improve records management, and increase productivity in office-related activities. The study also established that AI-based communication and scheduling tools improve information sharing, task coordination, collaboration, response time, and time management among students. The high mean ratings obtained from the respondents indicate that the utilization of Artificial Intelligence technologies contributes positively to the development of administrative competencies required in modern office environments. Therefore, the integration and effective utilization of AI tools can enhance the workplacereadiness, technological competence, and overall administrative performance of Office Technology and Management students in Colleges of Education in Delta State.

Recommendations

Based on the findings of the study, the following recommendations were made:

1. Colleges of Education in Delta State should provide adequate AI-powered office technologies and digital facilities to enable Office Technology and Management students acquire practical administrative skills relevant to modern workplaces.
2. Lecturers in Office Technology and Management departments should integrate the use of AI-powered document editing, communication, and scheduling tools into classroom instruction and practical office training activities.
3. Educational institutions should organize regular workshops, seminars, and training programmes to improve students' knowledge and competencies in the utilization of Artificial Intelligence applications for administrative purposes.
4. Government and educational stakeholders should improve ICT infrastructure and internet connectivity in Colleges of Education to support effective utilization of Artificial Intelligence technologies among students.

5. Office Technology and Management students should be encouraged to regularly utilize AI-based office applications in carrying out academic and administrative tasks in order to improve their technological competence and administrative efficiency.

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