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EFFECT OF ARTIFICIAL INTELLIGENCE ON LECTURER'S PRODUCTIVITY AT FEDERAL COLLEGE OF EDUCATION, ABEOKUTA, OGUN STATE

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Abstract

Lecturers' productivity in Nigerian tertiary institutions has been challenged by heavy workloads, low research output, administrative burdens, and poor student engagement. Artificial Intelligence (AI) has emerged as a tool for improving teaching, research, and administrative efficiency in higher education. Therefore, the main objective of this study was to investigate the effect of Artificial Intelligence on lecturers' productivity at the Federal College of Education, Abeokuta. The study adopted a descriptive survey research design. The population of the study comprised 223 lecturers in the institution, from which a sample size of 90 lecturers was selected using stratified random sampling technique to ensure adequate representation across departments and academic units. A validated questionnaire was used to obtain data from the respondents. The reliability coefficient of the instrument using Cronbach Alpha method was 0.78 and 0.73. Data collected were analyzed using mean and standard deviation, while regression analysis was used to test the hypothesis at 0.05 level of significance. The findings revealed that Artificial Intelligence positively influenced lecturers' teaching efficiency and research productivity with a weighted mean score of 2.92, indicating agreement among respondents that AI improved personalized learning support, classroom management, grading tasks, literature review, and data analysis. Regression analysis further revealed that Artificial Intelligence had a significant effect on lecturers' productivity ($R = .270$, $R^2 = .073$, $F = 17.333$, $p < 0.05$). The study concluded that AI is an important tool for enhancing lecturers' productivity despite infrastructural challenges. The study therefore recommended that adequate AI-driven facilities should be provided to enhance lecturers' teaching efficiency and research productivity.

Keywords: Artificial Intelligence, FCE Abeokuta, Lectures, Productivity

Introduction

Lecturers' productivity is a major determinant of the quality and effectiveness of tertiary education. In Nigerian higher institutions, particularly Colleges of Education, lecturers are expected to perform multiple responsibilities, including teaching, research, students supervision, community service, and administrative duties. However, lecturers' productivity has increasingly been challenged by heavy teaching workloads, large class sizes, excessive administrative responsibilities, inadequate technological facilities, and limited access to digital resources. These challenges often reduce efficiency in lesson delivery, research output, and student engagement, thereby affecting the overall quality of education delivery in tertiary institutions (Oke & Olawale, 2020). Previous studies have shown that many lecturers in Nigerian institutions struggle to effectively combine teaching, research, and administrative functions due to time constraints and limited technological support (Okoye, Nwankwo, & Eze, 2021).

In recent years, the rise of Artificial Intelligence (AI) has emerged as one of the most transformative developments in contemporary education. AI refers to computational systems capable of performing

tasks that traditionally require human intelligence, such as reasoning, problem-solving, learning, and decision-making (Russell & Norvig, 2021). Within higher education, AI applications are increasingly being integrated into teaching, research, and institutional administration. This development has significant implications for lecturers' productivity because AI tools can improve efficiency, reduce workload, and enhance academic performance (Zawacki-Richter et al., 2019).

One major area where AI contributes to lecturers' productivity is teaching efficiency. AI-driven technologies such as automated grading systems, adaptive learning platforms, virtual teaching assistants, and learning management systems enable lecturers to manage large classes more effectively and provide personalized learning support to students. Oke and Olawale (2020) observed that AI-based tools improve lesson delivery, classroom management, and feedback systems in tertiary institutions. Similarly, Adegbite (2019) emphasized that AI enhances lecturers' ability to integrate e-learning tools into conventional teaching, thereby improving classroom productivity and instructional effectiveness.

AI also plays a critical role in enhancing research productivity among lecturers. The use of AI-driven databases, plagiarism detection software, citation management tools, and natural language processing applications has simplified literature review, data analysis, and academic writing processes. According to Baker and Smith (2019), AI tools enable researchers to analyze large datasets quickly and generate more accurate insights, thereby improving the quality of research outputs. Through these innovations, lecturers are able to publish more effectively and contribute meaningfully to knowledge development.

Furthermore, predictive analytics and learning analytics platforms have improved lecturers' ability to monitor students' academic performance and participation. These technologies help lecturers identify at-risk students early and provide timely academic support, thereby improving student outcomes and strengthening lecturer-student interactions (Zawacki-Richter et al., 2019). Adedeji and Adeyemi (2021) further noted that predictive analytics enhances mentorship outcomes and reduces dropout rates in tertiary institutions. AI communication tools such as chatbots and interactive learning platforms also improve students' engagement and participation in coursework.

Despite these benefits, the adoption of AI in Nigerian tertiary institutions remains limited. Challenges such as inadequate infrastructure, poor internet facilities, insufficient digital literacy among lecturers, resistance to technological change, and limited institutional support continue to hinder effective AI integration (Okoye, Nwankwo, & Eze, 2021). Consequently, many lecturers still rely heavily on traditional methods of teaching, research, and administration, thereby limiting productivity gains that AI could provide. Although previous studies have examined AI adoption in education, limited empirical attention has been given to its direct effect on lecturers' productivity in Colleges of Education in Nigeria. Therefore, this study seeks to fill this gap by investigating the effect of Artificial Intelligence on lecturers' productivity at the Federal College of Education, Abeokuta, with emphasis on teaching efficiency, research productivity, administrative duties, and student engagement.

Objectives of the Study

The main objective of the study is to investigate the effect of artificial intelligence on workers productivity among lecturers in Federal College of Education, Abeokuta. The following are specific objectives to:

1. examine the effect of Artificial Intelligence on lecturers' teaching efficiency and research productivity at the Federal College of Education, Abeokuta.
2. determine the extent to which Artificial Intelligence influences lecturers' administrative duties and

student engagement in the Federal College of Education, Abeokuta.

Research Questions

The following research questions were answered in this study

1. How does Artificial Intelligence affect lecturers' teaching efficiency and research productivity at the Federal College of Education, Abeokuta?
2. To what extent does Artificial Intelligence influence lecturers' administrative duties and student engagement in the Federal College of Education, Abeokuta?

Hypothesis

H_0: Artificial Intelligence has no significant effect on lecturers' productivity (teaching efficiency, research productivity, administrative duties, and student engagement) at the Federal College of Education, Abeokuta.

Methodology

This study adopted a descriptive survey research design to investigate the effect of Artificial Intelligence on lecturers' productivity at the Federal College of Education, Abeokuta. The population of the study comprised 223 lecturers in the institution. From the population, a sample size of 90 lecturers was selected using stratified random sampling technique to ensure adequate representation across departments and academic units.

Data were collected through a validated questionnaire containing closed-ended and Likert-scale items designed to obtain information on two major variables of the study: (i) Artificial Intelligence and lecturers' teaching efficiency/research productivity, and (ii) Artificial Intelligence and lecturers' administrative duties/student engagement. The instrument was validated by experts in Educational Technology and Measurement and Evaluation, while the reliability of the instrument was established using Cronbach Alpha reliability method, which yielded a coefficient of 0.78 and 0.73 respectively, indicating that the instrument was reliable for the study.

Data collected was analyzed using descriptive statistics (mean and standard deviation) to address the research questions, while inferential statistics (regression ANOVA) was employed to test the stated hypothesis at a 0.05 level of significance.

Results

Table 1: Descriptive Responses on how Artificial Intelligence affect lecturers' teaching efficiency and research productivity at the Federal College of Education, Abeokuta
N = 90

1	ITEMS	Mean	Std Dev	Rank	Remarks
1.	AI has enhanced my ability to provide personalized learning support to students.	3.14	1.065	1st	Agree
2.	AI has made classroom management and assessment more effective in my teaching practice.	2.97	.803	3rd	Agree
3.	AI has made classroom management and assessment more effective in my teaching practice.	2.92	1.081	4th	Agree
4.	AI has enhanced the speed and accuracy of data analysis in my research work.	2.70	.815	7th	Agree
5.	AI applications have reduced the challenges I face in literature review and academic writing.	2.85	.871	8th	Agree
6	AI-powered tools (e.g., automated grading systems, learning analytics) have reduced the	3.01	.971	2nd	Agree

	time I spend on routine teaching tasks.				
7	AI improves communication between me and my students (e.g., chatbots, discussion platforms).	2.74	1.080	6th	Agree
8	AI enhances my ability to adapt lessons to diverse learning needs of students.	2.75	1.004	5th	Agree
	Weight Mean	**2.92**	**0.92**		**Agree**

Note: Decision Rule = 2.5

Table 1 presents descriptive responses on how Artificial Intelligence (AI) affects lecturers' teaching efficiency and research productivity at the Federal College of Education, Abeokuta. The weighted mean of 2.92, which is above the decision rule of 2.5, shows that lecturers generally agreed that AI contributes positively to their teaching and research activities. The highest-ranked item was AI enhancing lecturers' ability to provide personalized learning support to students (Mean = 3.14, Rank 1). This suggests that lecturers recognize AI as a useful tool for tailoring instruction to individual student needs. Closely following is AI-powered tools reducing time spent on routine tasks such as grading (Mean = 3.01, Rank 2), which highlights the efficiency gains AI brings to teaching. Classroom management and assessment effectiveness ranked third (Mean = 2.97), showing further value of AI in instructional support.

On research productivity, lecturers agreed that AI enhances the speed and accuracy of data analysis (Mean = 2.70, Rank 7) and reduces challenges in literature review and academic writing (Mean = 2.85, Rank 8). While these were ranked lower, they still fall within the "Agree" range, meaning AI is perceived as supportive, though less impactful, in research compared to teaching. Overall, the findings indicate that AI is most valued for improving teaching efficiency, while its contribution to research is acknowledged but less pronounced.

Table 2: Descriptive Responses on the extent to which Artificial Intelligence influence lecturers' administrative duties and student engagement in the Federal College of Education, Abeokuta
N = 90

S/N	ITEMS	Mean	Std. Dev.	Ranks	Remark
9.	AI-supported interactive learning content (e.g., quizzes, simulations, gamified tasks) increases students' interest in my classes.	2.73	.824	8th	Agree
10.	AI reduces the time I spend on repetitive administrative tasks, allowing me to focus more on teaching and research.	3.17	.921	1st	Agree
11.	AI applications help me prepare and organize official reports (e.g., course evaluations, assessment summaries).	2.65	.927	7th	Agree
12.	AI chatbots or virtual assistants encourage students to seek clarification outside normal lecture hours.	3.05	1.060	2nd	Agree
13.	AI applications help me prepare and organize official reports (e.g., course evaluations, assessment summaries).	3.01	.971	3rd	Agree
14	AI applications allow me to provide more personalized feedback to students, which improves	2.85	.954	6th	Agree

	their learning engagement.				
15	AI communication platforms (e.g., automated bulk emails, chatbots) reduce delays in disseminating administrative information to students.	2.96	.932	4th	Agree
16	AI-powered learning platforms (e.g., Moodle, Google Classroom with AI features) improve student participation in coursework.	2.92	1.081	5th	Agree
	Weighted mean	**2.92**			**Agree**

Note: Decision Rule = 2.5

Table 2 presents the descriptive responses on the extent to which Artificial Intelligence (AI) influences lecturers' administrative duties and student engagement at the Federal College of Education, Abeokuta. The weighted mean of 2.92, which is above the decision rule of 2.5, indicates that respondents generally agreed that AI positively impacts these areas. Among the items, the highest ranked was the statement that AI reduces the time spent on repetitive administrative tasks, allowing more focus on teaching and research (Mean = 3.17, Rank 1). This suggests that lecturers find AI effective in minimizing routine workload and increasing efficiency. Similarly, AI chatbots encouraging students to seek clarification outside lecture hours (Mean = 3.05, Rank 2) and AI applications helping in report preparation and organization (Mean = 3.01, Rank 3) further highlight AI's usefulness in administrative support.

On student engagement, respondents agreed that AI communication platforms (Mean = 2.96, Rank 4) and AI-powered learning platforms (Mean = 2.92, Rank 5) improve interaction and participation. Although ranked lower, items such as interactive content increasing students' interest (Mean = 2.73) and personalized feedback improving learning engagement (Mean = 2.85) still received agreement. Overall, the findings show that AI plays a significant supportive role in enhancing lecturers' administrative efficiency and fostering student engagement.

Testing of Hypothesis

This section presents the result of the tested hypotheses

Hypothesis 1: Artificial Intelligence has no significant effect on lecturers' productivity (teaching efficiency, research productivity, administrative duties, and student engagement) at the Federal College of Education, Abeokuta.

Table 3: Summary of regression analysis of effect of Artificial Intelligence on lecturers' productivity (teaching efficiency, research productivity, administrative duties, and student engagement) at the Federal College of Education, Abeokuta.

R	R Square	Adjusted R Square	Std. Error of the Estimate
.270	.073	.069	5.85636

SUMMARY REGRESSION ANOVA

	Sum of Square	Df	Mean square	F	P	Remark
Regression	594.464	1	594.464	17.333	.000	Sig.
Residual	7579.634	221	34.297			
Total	8174.099	222				

Note: Hypothesis was tested at 0.05 significant level

Table 3 presents the regression analysis on the effect of Artificial Intelligence (AI) on lecturers' productivity at the Federal College of Education, Abeokuta. The regression result shows an R value of 0.270 and an R Square of 0.073, indicating that AI accounts for about 7.3% of the variance in lecturers' productivity across teaching efficiency, research productivity, administrative duties, and student engagement. The F-value of 17.333 with a p-value of 0.000, which is less than the 0.05 significance level, confirms that the model is statistically significant. This implies that AI has a significant effect on lecturers' productivity, thereby leading to the rejection of the null hypothesis which stated that AI has no significant effect. Although the explanatory power of the model is relatively low, the findings suggest that AI contributes meaningfully to enhancing lecturers' productivity, particularly in streamlining tasks and improving efficiency.

Discussion of findings

The findings of this study revealed that Artificial Intelligence (AI) significantly influences lecturers' productivity in the areas of teaching efficiency, research productivity, administrative duties, and student engagement at the Federal College of Education, Abeokuta. The regression result confirmed that AI has a meaningful though modest effect, accounting for 7.3% of the variance in lecturers' productivity. This supports earlier observations by Oke and Olawale (2020), who noted that AI-based tools help lecturers manage large classes, improve assessment feedback, and streamline lesson delivery, thereby boosting teaching efficiency.

The descriptive results showed that lecturers valued AI most for reducing routine tasks, such as grading and administrative reporting, and for enhancing personalized student support. This aligns with Adegbite (2019), who emphasized that AI integration into e-learning platforms enables lecturers to deliver instruction more effectively while also adapting to diverse learner needs. Similarly, Adedeji and Adeyemi (2021) highlighted the role of predictive analytics in improving student engagement by helping lecturers identify at-risk students and intervene promptly.

In terms of research productivity, the findings that AI tools reduce challenges in literature review and data analysis corroborate Aina and Adedoja (2020), who argued that AI applications provide lecturers with faster access to relevant scholarly resources. However, as Okoye, Nwankwo, and Eze (2021) observed, challenges such as infrastructural limitations and low ICT competence may reduce the full potential of AI in enhancing academic output.

Overall, the study confirms local scholars' assertions that while AI adoption in Nigerian tertiary institutions is still emerging, its influence on lecturers' productivity is already evident. With improved institutional support and digital literacy, AI can play a greater role in transforming teaching, research, and administrative processes in colleges of education.

Conclusion

This study examined the effect of Artificial Intelligence (AI) on lecturers' productivity at the Federal College of Education, Abeokuta, focusing on teaching efficiency, research productivity, administrative duties, and student engagement. The findings revealed that AI positively influences lecturers' work by reducing time spent on routine tasks, improving classroom management, enhancing personalized learning support, and streamlining administrative responsibilities. Similarly, AI applications were found useful in research processes, such as data analysis, literature review, and academic writing, although their impact in this area is less pronounced compared to teaching. Regression analysis confirmed that AI has a statistically significant effect on lecturers' productivity, leading to the rejection of the null hypothesis. However, the relatively modest variance explained by AI suggests that infrastructural, training, and adoption challenges still limit its full potential. Overall, the study concludes that AI is an emerging

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but important driver of lecturers' productivity in Nigerian Colleges of Education.

Recommendations

The following recommendations were made:

1. Management of the Federal College of Education, Abeokuta should provide adequate AI-driven facilities such as automated grading systems, plagiarism detection software, digital learning platforms, and research support tools to enhance lecturers' teaching efficiency and research productivity.
2. Regular training and workshops should be organized for lecturers on the effective use of AI applications in administrative tasks and student engagement activities in order to improve communication, personalized learning, and overall academic effectiveness.

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