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GENERATIVE ARTIFICIAL INTELLIGENCE AND STUDENTS' PERCEPTIONS OF LECTURERS' CONTENT KNOWLEDGE IN FEDERAL COLLEGE OF EDUCATION, YOLA, ADAMAWA STATE, NIGERIA

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ABSTRACT

The study examined the relationship between generative artificial intelligence (Gen AI) and students' perception of lecturers' content knowledge in Educational Foundations in Federal College of Education, Yola, Adamawa State, Nigeria. Specifically, the study examined students' perception of lecturers' use of Gen AI in relation to content generation, assessment and pedagogical knowledge. A correlational research design was adopted for the study. The population comprise of 5,569 NCE I, II and III students of the 2025/2026 academic session. A sample of 668 students, selected using a proportionate stratified sampling to ensure adequate representation of the three NCE levels. Data was collected using a researcher developed questionnaire titled GenAI Questionnaire (GenAIQ). The data was analysed using Mean and standard deviation to answer the research questions, linear regression to test hypotheses one-three and multiple regressions to test hypotheses four at 0.05 level of significance. The findings reveal that Lecturers who make greater use of generative AI for content generation, assessment and pedagogical support are generally perceived by students as demonstrating greater knowledge of the subject matter. There is a statistically significant positive relationship between lecturers' use of generative AI for content generation, assessment and pedagogical support and students' perceptions of lecturers' content knowledge. Lecturers' use of generative AI for content generation and for assessment made a statistically significant positive contribution to students' perceptions of lecturers' content knowledge while there is no statistically significant positive contribution on lecturers' use of pedagogical support. The study recommends the responsible and purposive integration of GenAI in to lecturers' instructional practices, together with appropriate professional development to enhance effective use of the technology in teacher education programme.

Keywords: Generative AI, Content Generation, Assessment, Pedagogical Knowledge, Lecturers, Students' Perception

1 INTRODUCTION

As generative artificial intelligence (GenAI) becomes more and more integrated into educational practices, especially within federal tertiary institutions in Adamawa State, Nigeria, significant shifts in students' perceptions of teachers' content knowledge are emerging. This phenomenon raises important questions about the authenticity and depth of

educators' expertise in a landscape where AI can autonomously generate comprehensive and seemingly accurate educational content. The challenge is to understand how the integration of GenAI affects students' perceptions of their teachers' content knowledge, especially in the context of federal College of Education, Yola, Adamawa State. As GenAI technologies make information more accessible, students might start to doubt the value and necessity of their teachers, considering them to be secondary sources of information in comparison to AI systems' sophisticated capabilities. This change in perception presents a problem for teachers who have to balance the responsibilities of both content providers and critical thinking facilitators in a classroom that is becoming more and more tech-influenced.

In this study, Generative Artificial Intelligence (GenAI) refers to digital tools such as ChatGPT, Gemini, Microsoft Copilot and similar applications that can generate text, questions, summaries, explanations, images or other instructional materials. Teachers use these digital tools to generate various teaching contents required for effective lesson delivery. GenAI is used by teachers to develop lesson plan, lesson notes, assessment questions, pedagogical knowledge and many other related matters associated with teaching and learning processes. It is against this background that this study aimed to examine the relationship between lecturers' use of generative artificial intelligence and students' perceptions of lecturers' content knowledge in Educational Foundations in Federal College of Education, Yola, Adamawa State, Nigeria. The study specifically dwells on lecturers' use of GenAI for content generation, assessment and pedagogical support and students' perceptions of lecturers' content knowledge in educational foundations in the college under study.

Objectives of the Study

The main objective of the study is to examine the relationship between lecturers' use of generative artificial intelligence and students' perceptions of lecturers' content knowledge in Educational Foundations in Federal College of Education, Yola, Adamawa State, Nigeria. Specifically, the study sought to:

- Determine the relationship between lecturers' use of generative AI for content generation and students' perceptions of lecturers' content knowledge in Educational Foundations in Federal College of Education, Yola, Adamawa State, Nigeria.
- Examine the relationship between lecturers' use of generative AI for assessment and students' perceptions of lecturers' content knowledge in Educational Foundations in Federal College of Education, Yola, Adamawa State, Nigeria.
- Determine the relationship between lecturers' use of generative AI for pedagogical support and students' perceptions of lecturers' content knowledge in Educational Foundations in Federal College of Education, Yola, Adamawa State, Nigeria.

1.1 Research Questions

The following research questions guided the study:

- What relationship exists between lecturers' use of generative AI for content generation and students' perceptions of lecturers' content knowledge in Educational Foundations at the Federal College of Education, Yola, Adamawa State, Nigeria?
- What relationship exists between lecturers' use of generative AI for assessment and students' perceptions of lecturers' content knowledge in Educational Foundations at the Federal College of Education, Yola, Adamawa State, Nigeria?
- What relationship exists between lecturers' use of generative AI for pedagogical support and students' perceptions of lecturers' content knowledge in Educational Foundations at the Federal College of Education, Yola, Adamawa State, Nigeria?

1.2 Hypotheses

The following null hypotheses were tested at the 0.05 level of significance:

- **H0¹:** There is no significant relationship between lecturers' use of generative AI for content generation and students' perceptions of lecturers' content knowledge in Educational Foundations at the Federal College of Education, Yola, Adamawa State, Nigeria.
- **H0²:** There is no significant relationship between lecturers' use of generative AI for assessment and students' perceptions of lecturers' content knowledge in Educational Foundations at the Federal College of Education, Yola, Adamawa State, Nigeria.
- **H0³:** There is no significant relationship between lecturers' use of generative AI for pedagogical support and students' perceptions of lecturers' content knowledge in Educational Foundations at the Federal College of Education, Yola, Adamawa State, Nigeria.

- **H0⁴:** There is no significant relationship between Lecturers' use of generative AI (for content generation, assessment and pedagogical support) and students' perceptions of lecturers' content knowledge in Educational Foundations at the Federal College of Education, Yola, Adamawa State, Nigeria.

2 REVIEW OF RELATED LITERATURE

The theory adopted for this study is Mishra and Koehlar's (2006) Technological Pedagogical Content Knowledge (TPACK) framework. The framework proposes that effective technology integration requires interaction among technological knowledge, pedagogical knowledge and content knowledge. Applied to GenAI, lecturers need not only to know how to operate AI tools but equally need to understand the actual content they need to generate, how it should be evaluated and how to integrate it to teaching pedagogically. Hence, lecturers' use of GenAI involves both technological competence and professional judgment.

The use of GenAI in content creation has been demonstrated to greatly improve learning outcomes and student engagement. According to Liu et al. (2023), modifying AI-generated educational materials to accommodate a range of learning needs can increase students' motivation and engagement in the learning process. The study found that students who interacted with AI-generated content were more engaged and remembered than those who only used traditional textbooks. A reliance on AI may lead students to question the depth of human learning, so this shift in content delivery not only enhances the educational experience but also necessitates a reevaluation of how students perceive the expertise of their instructors.

AI help teachers to create effective lesson plans through the use of machines, it enable teachers to identify at risk students and intervene at the right time, provide personalized learning experiences for students and prepare teachers better for the tasks in the classroom. Teachers however faced a lot of challenges with regard to the usage of GenAI, these include developing new skill for the use of AI and hesitation for the adoption of new technology (Ukpokodu, 2024). UNESCO (2023) raised concern about academic integrity and who to regard as the author with regards AI-assisted educational materials and how much AI assistance is appropriate. It recommends clear institutional policies and human oversight in the use of AI.

The assessment of intelligence in connection with AI-enhanced education is a significant area of study. He et al. (2023) found that if AI techniques for assessing student intelligence are implemented, students' opinions of their professors' skills may shift. When AI-driven tests are used to evaluate teachers, students may perceive them as less informed or relevant, particularly if the AI appears to give faster or more accurate feedback. This phenomenon highlights how crucial it is for educators to emphasize their unique role in providing context and fostering learning—two things that artificial intelligence is unable to do. As more and more students use AI for assessments, educators must find ways to demonstrate their expertise and the value of individualized instruction.

Lecturers can use GenAI to develop assessment questions for different cognitive levels such as remembering, understanding, application, analysis and creation. This helps lecturers to include questions that examine higher order thinking in their assessments. Xia et.al. (2024) found out that GenAI has already made tremendous impact in assessment practices in higher education and provides opportunity for immediate feedback, self-assessment and new approaches to assessment. The study reports that AI-generated feedback may not always correspond with course-specific assessment criteria and therefore recommended maintaining an appropriate balance between AI-assisted and human-centered assessment.

Understanding the concept of Pedagogical Content Knowledge (PCK) is essential to understanding how educators can successfully integrate AI into their lesson plans. According to Shulman (1986), PCK encompasses the intersection of content knowledge and pedagogical strategies, which is essential when utilizing technology in the classroom. Teachers with high PCK are also more adept at utilizing AI tools to enhance teaching strategies while preserving the human element of instruction as asserted by Karlinger et al. (2024). This highlights the importance of ongoing professional development for educators, enabling them to adapt their PCK to the evolving landscape of educational technology.

The emergence of GenAI has added a new dimension to pedagogical knowledge. Lecturers can use GenAI to explore different ways of explaining subject concepts, generate examples and analogies, develop classroom activities and adapt explanations based on students' level of understanding. GenAI can function as a pedagogical support tool that assists lecturers in transforming disciplinary knowledge in to instructional materials.

3 RESEARCH METHODOLOGY

The research design adopted for this study is the correlational survey research design. Creswell and Creswell (2018) sees correlational research as a type of non-experimental research in which researchers use statistical procedures to

determine the degree of association between two or more variables. The area of the study is Yola metropolis and the place of study is Federal College of Education, Yola. The population comprises of all NCE students of 2025/2026 academic session which comprises of 5,569 students. Proportionate stratified random sampling technique was used to select 12% of the entire population of each level; NCE 1 = 213, NCE 2 = 238 and NCE 3 = 217 students giving a total of 668 students as the respondents. The instrument for data collection is a questionnaire titled GenAI Questionnaire (GenAIQ) which comprises of 24 items (18 and 8 items for the independent and dependent variables respectively) addressing the three research questions. A five point Likert scale was used to respond to the questionnaire items. The instrument was administered to the respondents and 596 were retrieved, 111 were rejected due to improper and incomplete filling. Therefore, 485 were used for the study. Mean and standard deviation was used to answer the research questions. Pearson correlation coefficient was used to test hypotheses one-three and multiple regressions was used to test hypotheses four at 0.05 level of significance.

3.1 Data Analysis

Three research questions were analyzed using Mean and standard deviation while four hypotheses were tested using Linear regression and multiple regressions at 0.05 level of significance.

3.2 Research Question 1

What relationship exists between lecturers' use of generative AI for content generation and students' perceptions of lecturers' content knowledge in Educational Foundations at the Federal College of Education, Yola, Adamawa State, Nigeria?

Table 1: Relationship between Lecturers' Use of Generative AI for Content Generation and Students' Perceptions of Lecturers' Content Knowledge

Variable	N	Mean	S. D	R-value
Lecturers' use of generative AI for content generation	485	3.35	0.3091	0.371
Students' perceptions of lecturers' content knowledge	485	3.39	0.2942	

Table 1 shows the relationship between lecturers' use of generative AI for content generation and students' perceptions of lecturers' content knowledge. The results indicate that lecturers' use of generative AI for content generation recorded a mean score of 3.35 with a standard deviation of 0.31, while students' perceptions of lecturers' content knowledge had a mean score of 3.39 with a standard deviation of 0.29. The Pearson correlation coefficient of $r = 0.371$ indicates a positive moderate relationship between lecturers' use of generative AI for content generation and students' perceptions of lecturers' content knowledge. This means that increased use of generative AI for preparing and generating instructional content tends to be associated with higher students' perceptions of their lecturers' content knowledge. Thus, lecturers who make greater use of generative AI for content generation are generally perceived by students as demonstrating greater knowledge of the subject matter.

3.3 Research Question 2

What relationship exists between lecturers' use of generative AI for assessment and students' perceptions of lecturers' content knowledge in Educational Foundations at the Federal College of Education, Yola, Adamawa State, Nigeria?

Table 2: Relationship between Lecturers' Use of Generative AI for Assessment and Students' Perceptions of Lecturers' Content Knowledge

Variable	n	Mean	S. D	R-value
Lecturers' use of generative AI for assessment	485	3.31	0.3071	0.337
Students' perceptions of lecturers' content knowledge	485	3.39	0.2942	

Table 2 presents the relationship between lecturers' use of generative AI for assessment and students' perceptions of lecturers' content knowledge. The results show that lecturers' use of generative AI for assessment had a mean score of 3.31 and a standard deviation of 0.31, while students' perceptions of lecturers' content knowledge recorded a mean score of 3.39 and a standard deviation of 0.29. The correlation coefficient of $r = 0.337$ indicates a positive but relatively moderate relationship between lecturers' use of generative AI for assessment and students' perceptions of their content knowledge. The positive relationship suggests that as lecturers increasingly use generative AI in developing assessment questions, evaluating students' work, providing feedback, and carrying out other assessment-related activities, students

tend to perceive them as having better content knowledge. Therefore, lecturers' use of generative AI for assessment is positively associated with students' perceptions of lecturers' mastery of their subject areas.

3.4 Research Question 3

What relationship exists between lecturers' use of generative AI for pedagogical support and students' perceptions of lecturers' content knowledge in Educational Foundations at the Federal College of Education, Yola, Adamawa State, Nigeria?

Table 3: Relationship between Lecturers' Use of Generative AI for Pedagogical Support and Students' Perceptions of Lecturers' Content Knowledge

Variable	n	Mean	S. D	R-value
Lecturers' use of generative AI for pedagogical support	485	3.29	0.3138	0.142
Students' perceptions of lecturers' content knowledge	485	3.39	0.2942	

Table 3 reveals the relationship between lecturers' use of generative AI for pedagogical support and students' perceptions of lecturers' content knowledge. Lecturers' use of generative AI for pedagogical support had a mean score of 3.29 with a standard deviation of 0.31, while students' perceptions of lecturers' content knowledge had a mean score of 3.39 with a standard deviation of 0.29. The correlation coefficient of $r = 0.142$ indicates a weak positive relationship between the two variables. This implies that greater use of generative AI for pedagogical support is associated with a slight increase in students' perceptions of lecturers' content knowledge. However, the weak magnitude of the relationship suggests that lecturers' use of generative AI for pedagogical support has only a limited association with how students perceive their lecturers' knowledge of the subject matter. Other factors beyond the use of generative AI for pedagogical support may therefore play more substantial roles in shaping students' perceptions of lecturers' content knowledge.

- **H0¹:** There is no significant relationship between lecturers' use of generative AI for content generation and students' perceptions of lecturers' content knowledge in Educational Foundations at the Federal College of Education, Yola, Adamawa State, Nigeria.

Table 4: Relationship between Lecturers' Use of Generative AI for Content Generation and Students' Perceptions of Lecturers' Content Knowledge

Variable	N	Mean	S. D	R-value	p-value	Decision
Lecturers' use of generative AI for content generation	485	3.35	0.3091	0.371	0.000	H ₀₁ rejected
Students' perceptions of lecturers' content knowledge	485	3.39	0.2942			

Table 4 presents the test of the hypothesis that there is no significant relationship between lecturers' use of generative AI for content generation and students' perceptions of lecturers' content knowledge. The result yielded a correlation coefficient of $r = 0.371$ with a $p\text{-value} < 0.05$. Since the $p\text{-value}$ is less than the 0.05 level of significance, the null hypothesis is rejected. This means that there is a statistically significant positive relationship between lecturers' use of generative AI for content generation and students' perceptions of lecturers' content knowledge. The positive correlation indicates that increased use of generative AI for content generation is associated with more favorable perceptions of lecturers' content knowledge among students. Therefore, lecturers' use of generative AI for content generation is significantly related to how students perceive lecturers' knowledge and mastery of their subject matter.

- **H0²:** There is no significant relationship between lecturers' use of generative AI for assessment and students' perceptions of lecturers' content knowledge in Educational Foundations at the Federal College of Education, Yola, Adamawa State, Nigeria.

Table 5: Relationship between Lecturers' Use of Generative AI for Assessment and Students' Perceptions of Lecturers' Content Knowledge

Variable	N	Mean	S. D	R-value	p-value	Decision
Lecturers' use of generative AI for assessment	485	3.31	0.3071	0.337	0.000	H ₀₂ rejected
Students' perceptions of lecturers' content knowledge	485	3.39	0.2942			

Table 5 presents the test of the hypothesis that there is no significant relationship between lecturers' use of generative AI for assessment and students' perceptions of lecturers' content knowledge. The analysis produced a correlation coefficient of $r = 0.337$ with a p -value < 0.05 . Since the p -value is lower than the 0.05 level of significance, the null hypothesis is rejected. The finding therefore indicates that there is a statistically significant positive relationship between lecturers' use of generative AI for assessment and students' perceptions of lecturers' content knowledge. This implies that greater use of generative AI for assessment-related activities is significantly associated with more positive student perceptions of lecturers' content knowledge. Consequently, the manner in which lecturers employ generative AI in preparing assessments, providing feedback and supporting evaluation processes is significantly related to students' perceptions of their lecturers' competence and mastery of the subject matter.

- **H₀₃:** There is no significant relationship between lecturers' use of generative AI for pedagogical support and students' perceptions of lecturers' content knowledge in Educational Foundations at the Federal College of Education, Yola, Adamawa State, Nigeria.

Table 6: Relationship between Lecturers' Use of Generative AI for Pedagogical Support and Students' Perceptions of Lecturers' Content Knowledge

Variable	N	Mean	S. D	R-value	p-value	Decision
Lecturers' use of generative AI for pedagogical support	485	3.29	0.3138	0.142	0.002	H ₀₃ rejected
Students' perceptions of lecturers' content knowledge	485	3.39	0.2942			

Table 6 presents the test of the hypothesis that there is no significant relationship between lecturers' use of generative AI for pedagogical support and students' perceptions of lecturers' content knowledge. The result shows a correlation coefficient of $r = 0.142$ with a p -value of 0.002. Since the p -value of 0.002 is less than the 0.05 level of significance, the null hypothesis is rejected. This indicates that there is a statistically significant positive relationship between lecturers' use of generative AI for pedagogical support and students' perceptions of lecturers' content knowledge. However, the magnitude of the correlation is weak, suggesting that although the relationship is statistically significant, the association between the two variables is relatively small. Thus, increased use of generative AI for pedagogical support tends to be associated with slightly more favorable perceptions of lecturers' content knowledge among students.

- **H₀₄:** There is no significant relationship between Lecturers' use of generative AI (for content generation, assessment and pedagogical support, and students' perceptions of lecturers' content knowledge in Educational Foundations at the Federal College of Education, Yola, Adamawa State, Nigeria.

Table 7: Coefficients of Beta

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.687	0.187		9.038	0.000
	Lecturers' use of generative AI for content generation	0.209	0.049	0.219	4.227	0.000
	Lecturers' use of generative AI for assessment	0.150	0.049	0.156	3.075	0.002
	Lecturers' use of generative AI for pedagogical support	-0.049	0.043	-0.052	-1.133	0.258

a. Dependent Variable: Students' perceptions of lecturers' content knowledge

Table 7 presents the regression coefficients showing the individual contributions of the three dimensions of lecturers' use of generative AI to students' perceptions of lecturers' content knowledge. The results show that lecturers' use of generative AI for content generation made a statistically significant positive contribution to students' perceptions of lecturers' content knowledge, with $\beta = 0.219$, $t = 4.227$, $p < 0.001$. This was the strongest contribution among the three predictors. Lecturers' use of generative AI for assessment also made a significant positive contribution, with $\beta = 0.156$, $t = 3.075$, $p = 0.002$. However, lecturers' use of generative AI for pedagogical support did not make a statistically significant unique contribution to students' perceptions of lecturers' content knowledge, as indicated by $\beta = -0.052$, $t = -1.133$, $p = 0.258$.

Summary of the major findings

The following are the major findings of the study:

- Lecturers who make greater use of generative AI for content generation are generally perceived by students as demonstrating greater knowledge of the subject matter.
- Lecturers' use of generative AI for assessment is positively associated with students' perceptions of lecturers' mastery of their subject areas.
- Lecturers' use of generative AI for pedagogical support has only a limited association with how students perceive their lecturers' knowledge of the subject matter.
- There is a statistically significant positive relationship between lecturers' use of generative AI for content generation and students' perceptions of lecturers' content knowledge.
- Greater use of generative AI for assessment-related activities is significantly associated with more positive student perceptions of lecturers' content knowledge.
- There is a statistically significant positive relationship between lecturers' use of generative AI for pedagogical support and students' perceptions of lecturers' content knowledge.
- Lecturers' use of generative AI for content generation and for assessment made a statistically significant positive contribution to students' perceptions of lecturers' content knowledge, with $\beta = 0.219$, $t = 4.227$, $p < 0.001$ and with $\beta = 0.156$, $t = 3.075$, $p = 0.002$ respectively. However, lecturers' use of generative AI for pedagogical support did not make a statistically significant unique contribution to students' perceptions of lecturers' content knowledge, as indicated by $\beta = -0.052$, $t = -1.133$, $p = 0.258$.

4 CONCLUSION

This study concludes that lecturers use of GenAI for content generation and assessment has significant contribution to students' perception on lecturers' content knowledge. The study also found out that there is a statistically significant positive relationship between lecturers' use of generative AI for pedagogical support and students' perceptions of lecturers' content knowledge. Based on this the study conclude that lecturers use of GenAI significantly enhance lecturers content knowledge. By extension, lecturers use of GenAI can improve teaching and learning and enhance better classroom activities.

Recommendations

The following are recommended:

- There is need for responsible and purposive integration of GenAI in to lecturers' instructional practices so as to enhance teaching and learning.
- There is need for appropriate professional development especially on the use of digital tools to enhance effective use of technology in teacher education programme.
- Clear institutional policies and human oversight in the use of AI should guide the lecturers in the use of GenAI.

STATEMENTS ON COMPLIANCE WITH ETHICAL STANDARDS

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Disclosure of conflict of interest

The authors declare no conflict of interest regarding this manuscript.

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