THE IMPACT OF ETHICAL GUIDELINES TRAINING ON AI USE AMONG STUDENTS IN ANAMBRA PUBLIC UNIVERSITIES

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Abstract
This research examined the impact of ethical guidelines training on AI use among students in Anambra public universities. It was a quasi-experimental research with two groups- the control and the experimental groups. This study involved 100 participants, with 50 randomly assigned to the experimental group receiving ethical guidelines training and 50 to the control group, which did not receive the training. Descriptive statistics, specifically the mean, independent T-Test were employed to address research questions. The findings of this study showed that participants in the experimental group had higher improvement scores in AI use in terms of awareness and attitudes. The findings show that integrating ethical guidelines training into education offers several key advantages, as this can enhance awareness and attitudes towards responsible AI use among learners. The results of this study contribute significantly to other related studies that focus on promoting responsible AI use in education.
Keywords: ethical guidelines; AI awareness; attitudes; efficacy; responsible AI use.

Introduction

The importance of education can never be overemphasized because of the role it plays in human development and societal progress, serving as a catalyst for individual growth, social mobility, and economic advancement. With globalization and the world's increasing focus on knowledge based economy, education has become more important than ever. It has also led to the global recognition of the rights of individuals. Education according to Offor, Offiah, Oyeyemi and Nwaru (2025) stimulates and empowers people to participate in development. This is because the world's faith lies in the power of education to transform individuals through the school system. Education takes various forms, ranging from formal schooling to isnformal learning experiences embedded within family, community, and workplaces in the society.

Formal education typically occurs within structured institutions such as secondary schools, colleges, and universities, following standardized curricula and assessment frameworks. Universities are established with the intention of promoting technology and technical education or producing technical manpower for the technological advancement and promotion of innovation in a country (CoghlanMiller & Paterson, 2021). Technological innovation, automation and effective adoption of telecommunication have greatly contributed to school operations all over the world. Adopting Artificial Intelligence in universities is the major driving force for the effective activities that goes on during lessons. It also promotes the quality of service delivery and users' satisfaction. Given the relevance of Artificial Intelligence in activities that goes on during academic activities, it is necessary for university students to be abreast of global trends and the adoption of Artificial Intelligence in their academic pursuit.

Artificial Intelligence means a machine-based system that can make predictions, recommendations or decisions influencing real or virtual environments. It is the process of building intelligent machines from vast volumes of data (Offor et al., 2024). Students learn from past learning experiences and perform human-like tasks, hence, artificial intelligence enhances the speed, precision, and effectiveness of human efforts. De Cremer and Kasparov (2022) explained AI as a system that changes behaviour based on data collected, usage analysis, and other observations without being explicitly programmed. This implies that AI is a constellation of technologies that

enable machines to act with higher levels of intelligence while emulating human capabilities to sense, comprehend and act. AI uses complex algorithms and methods to build machines that can make decisions on their own.
Some examples of Artificial Intelligence (AI) used by students are: Virtual learning technologies which include: Online course technologies like Udemy, Coursera, and edX, Intelligent tutoring systems, such as AI-powered tools like Khan Academy, DreamBox, and Carnegie Learning, Language Learning apps such as: Duolingo, Babbel, and Rosetta Stone, Essay Writing Tools such as AI-powered tools like Grammarly, Pro Writing Aid, and Turn it in, Mathematics and Science Problem Solvers which include: Wolfram Alpha, Symbolab, and Mathway, Research Assistants such as Google Scholar, Semantic Scholar, and Microsoft, Virtual Study Groups; they include: Discord, Slack, and Google Groups. Others are: AI-powered note-taking, such as: tools like Evernote, OneNote, and Simplenote, Learning Management Systems which include: Canvas, Blackboard, and Moodle (Estevez et al., 2019). These AI tools enhance student learning, productivity, and accessibility, and are becoming increasingly popular in education.

The integration of Artificial Intelligence (AI) in educational settings has revolutionized the way students learn and interact with complex subjects. In recent times, AI has been increasingly applied in various fields, including education, to enhance learning experiences and outcomes. The use of AI among students in higher education institutions has become a topic of interest. As students increasingly rely on AI-powered tools for various academic purposes, concerns about the ethical implications of AI use have emerged. Gallardo-Montes et al. (2022) rightly stated that the development and implementation of ethical guidelines are crucial in ensuring that students use AI responsibly and effectively. These guidelines can help students understand the potential benefits and risks associated with AI use, promoting a more informed and responsible approach to technology integration. In public universities, assessing the impact of ethical guidelines on AI use among students can provide valuable insights into the effectiveness of these guidelines in promoting responsible AI use. According to Gialamas et al. (2013), AI-powered tools have numerous benefits in education, including personalized learning experiences, improved academic performance, and enhanced student engagement. However, Holmes et al. (2022) posited that there are also concerns about the potential risks associated with AI use, such as bias, plagiarism, and academic dishonesty. To mitigate these risks, it is essential to develop and implement effective ethical guidelines that promote responsible AI use among students.

The use of AI in education has been affirmed to have the potential to transform the way students learn and interact with complex subjects. As opined by How et al. (2020), AI-powered tools can provide students' with personalized learning experiences, real-time feedback, and access to a wealth of educational and academic resources. However, Huang et al. (2021) buttressed that the development and implementation of ethical guidelines are crucial in ensuring that students use AI responsibly and effectively. The integration of AI in education has also been maintained to have the potential to improve student outcomes and enhance the quality of education. According to Johnson (2019), AI-powered tools can provide students with interactive learning exercises, adapt to different learning styles, and encourage immediate feedback, making language learning more accessible, flexible, and engaging. As opined by Kong et al. (2021), the use of AI in education can also promote student-centered learning, allowing students to take an active role in their learning process.

However, there are also challenges associated with the integration of AI in education. As posited by Lee & Lee (2021), one of the major challenges is the potential for bias in AI-powered tools, which can perpetuate existing inequalities and disadvantage certain groups of students. To mitigate these risks, it is essential to develop and implement effective ethical guidelines that promote responsible AI use among students. The development of ethical guidelines for AI use in education is a complex issue that requires careful consideration of multiple factors. According to Ng et al. (2021), ethical guidelines should be developed in consultation with stakeholders, including students, teachers, and policymakers. These guidelines should also be regularly reviewed and updated to ensure that they remain relevant and effective. In Anambra public universities, the development and implementation of ethical guidelines for AI use among students is crucial. The use of AI-powered tools among students in higher education institutions can have numerous benefits, including improved academic performance and enhanced student engagement.

Problem Statement

The increasing adoption of Artificial Intelligence (AI) in educational settings has raised concerns about the need for effective integration of AI-based tools into pedagogical practices. In the context of Anambra public universities, the use of AI among students has become a topic of interest. However, despite the recognized advantages of AI, a noticeable gap remains in the existing knowledge concerning the impact of ethical guidelines on AI use among students. Specifically, there is a lack of empirical evidence on the effectiveness of ethical guidelines in promoting responsible AI use, minimizing potential risks, and ensuring that students use AI in a manner that aligns with

academic integrity and quality standards. Many studies highlight the theoretical advantages of AI adoption without empirically evaluating their impact on students' awareness, attitudes, and behavior related to AI use. This paucity of empirical studies hinders the identification of best practices, effective strategies, and informed investment and support. Furthermore, the lack of assessment tools and robust evaluation frameworks impedes the development of practices and policies that are essential for implementing AI in a manner that ensures teaching and learning meet quality standards. The uneven adoption of AI-based tools is another gap existing in Anambra public universities. Although some students have access to AI-powered tools, many others may not have the same opportunities due to inadequate resources, poor infrastructural facilities, or lack of technical support. Consequently, disparities exist in the quality of education received by students, with some students having an advantage over others. Moreover, many students lack the awareness and understanding of AI ethics needed to use AI-based tools effectively and responsibly. The absence of ongoing technical support and professional development opportunities affects the quality of education and student outcomes. Therefore, it is crucial to address these gaps to ensure the effective integration of AI-based tools into pedagogical practices in Anambra public universities.

Research Aim

This study aims to evaluate the impact of ethical guidelines on the use of AI among students in Anambra public universities.

Research Questions

The following research questions guided the study:

1. What is the impact of ethical guidelines on students' awareness and understanding of AI ethics in Anambra public universities?
2. How does the use of AI-based tools affect students' attitudes towards responsible AI use in Anambra public universities?
3. What are the challenges and limitations of implementing ethical guidelines for AI use among students in Anambra public universities?

Significance of the Study

The findings of this study will be of immense benefit to students, educators, and policymakers. For students, the research will provide valuable insights into the impact of ethical guidelines on AI use, enabling them to make informed decisions about their technology use and develop a deeper understanding of the potential benefits and risks associated with AI.

Educators will benefit from the study's findings, which will inform the development of effective strategies for promoting responsible AI use among students. The study's results on the impact of ethical guidelines on AI use can also inform teacher training programs, equipping educators with the skills and confidence required to effectively integrate AI-based tools into their pedagogical practices while ensuring that students use these tools responsibly.

The findings of this study will also be of immense benefit to policymakers as they will provide them with more ideas on how to develop effective policies that promote responsible AI use in higher education. By examining the state of AI adoption in public universities, policymakers will be motivated to develop better initiatives and policies that encourage effective adoption and utilization of AI-based tools while ensuring that students use these tools in a manner that aligns with academic integrity and quality standards.

Literature Review

Currently, AI technology has advanced significantly along with the advancement of world science and technology. The usage of AI technology is widespread and it is constantly being upgraded (Tu et al., 2023). Although computers may have served as the foundation for the development of artificial intelligence, there is gravitation away from the computer alone, the hardware and software, or the equipment, as being artificial intelligence. According to Aigerim et al. (2025), AI is a branch of research that focuses on finding solutions to many cognitive issues that are frequently connected to human intelligence, such as learning, problem-solving, and pattern recognition, and then adapting.

According to Kim, Aldhafeeri and Alotaibi (2022), artificial intelligence generally refers to the creation of computer softwares that possess some level of intelligence and are capable of engaging in cognitive, learning, decision-making, and environmental adaptation processes similar to those of humans. As a result, several traits and principles stand out as being crucial for AI. The essential quality of AI that emerges from this definition and discussion of AI is its level of intelligence, or the machine's capacity to exhibit some level of intelligence and carry out a variety of tasks and talents that call for human-like abilities. According to Al-Emran et al. (2020),

intelligent education systems such as AI are created to increase the value and effectiveness of learning using a variety of computing technologies, particularly those linked to machine learning, and they provide timely and individualized training and feedback for both teachers and students. Operationally, artificial intelligence refers to some form of computer code that displays good amount of intelligence, problem solving and learning by which it can be analysed as super intelligent. This has been accessed by students all over the world including students.
The integration of Artificial Intelligence (AI) in educational settings has revolutionized the way students learn and interact with complex subjects. As opined by Al-Emran and Teo (2020), AI-based tools offer various benefits, including personalized learning experiences, real-time feedback, and adaptive assessment, which can enhance student outcomes and promote academic engagement. In the context of public universities, the use of AI among students has become a topic of interest. Alghamdi (2022) note that AI-based applications, such as Grammarly and Duolingo, have gained recognition for their potential to enhance language learning outcomes. These applications provide students with interactive and immersive learning experiences, real-time feedback, and personalized learning paths, which can promote motivation and engagement. Alnujaidi (2021) posit that AI-based tools can cater to the diverse needs and learning styles of students, providing them with a more effective and engaging learning experience. For instance, AI-powered tools can analyze students' writing styles and errors, offering suggestions for improvement and enhancing their writing skills. Additionally, gamified platforms, such as Kahoot, can promote academic engagement and motivation among students by creating a fun and competitive learning environment (Bitcoin Forum, 2023). The use of AI in education has also been found to promote critical thinking skills, enabling students to analyze and interpret complex information more effectively. According to Alharthi (2020), AI-based tools can provide students with experiential learning experiences that simulate real-life language use, promoting retention and learner engagement.

Studies have shown that AI-based tools can enhance language learning outcomes, particularly in philological education. Alsswey et al. (2020) found that digital technologies, including AI-based applications, can have a positive impact on students' language learning outcomes. Amir and Mustafa (2023) demonstrated that AI-powered tools can enhance language proficiency in various skills, including speaking, writing, reading, and listening. However, despite the recognized benefits of AI in education, there is a notable gap in empirical studies on the impact of ethical guidelines on AI use among students in Anambra public universities. Buabeng-Andoh (2021) noted that AI-based apps can promote motivation and engagement among learners, but the lack of effective ethical guidelines can lead to potential risks, such as bias and academic dishonesty. The integration of Artificial Intelligence (AI) in educational settings has also raised concerns about the potential risks associated with AI use. According to Burke and Larmar (2021), one of the major challenges associated with AI use in education is the potential for bias in AI-powered tools, which can perpetuate existing inequalities and disadvantage certain groups of students. To mitigate these risks, it is essential to develop and implement effective ethical guidelines that promote responsible AI use among students. Campbell (2020) posit that ethical guidelines should be developed in consultation with stakeholders and should be regularly reviewed and updated to ensure that they remain relevant and effective. As opined by Costello et al. (2023), the use of AI-powered tools among students in higher education institutions can have numerous benefits, including improved academic performance and enhanced student engagement. However, the lack of effective ethical guidelines can lead to potential risks, such as bias and academic dishonesty. Studies have shown that effective ethical guidelines can promote responsible AI use among students. According to Dağdeler and Demiröz (2022), ethical guidelines can help students understand the potential benefits and risks associated with AI use, promoting a more informed and responsible approach to technology integration.

Moreover, the development of ethical guidelines for AI use in education is a complex issue that requires careful consideration of multiple factors. As Devterov et al. (2024) rightly stated, ethical guidelines should be developed in consultation with stakeholders, including students, teachers, and policymakers. These guidelines should also be regularly reviewed and updated to ensure that they remain relevant and effective. In conclusion, the literature review highlights the importance of developing and implementing effective ethical guidelines for AI use among students in Anambra public universities. By promoting responsible AI use, these guidelines can help mitigate the potential risks associated with AI use and ensure that students use AI-powered tools in a manner that aligns with academic integrity and quality standards.

Theoretical Framework

The Tecshnology Acceptance Model (TAM)

The Technology Acceptance Model (TAM) is a valuable framework for understanding how individuals adopt and utilize technologies. As posited by Fred Davis in 1989, TAM identifies two key factors that influence people's decisions to use technology: perceived ease of use and perceived usefulness. Perceived usefulness refers to the

degree to which a person believes that technology enhances performance, while perceived ease of use implies the level of belief that using technology will be effortless.

This model is relevant to the present study because it can help researchers understand how students in Anambra public universities perceive the ease of use and usefulness of AI-based tools in their academic pursuits. By applying TAM, educators can determine the factors that influence the adoption and use of AI-based tools among students and develop measures to promote their integration and acceptance.

Constructivist Learning Theory

Constructivist learning theory, propounded by Jean Piaget and Lev Vygotsky, provides a fundamental understanding of language learning. This theory posits that learners construct their own meaning and knowledge by engaging actively in social interactions and their environment. In the context of AI-based tools, constructivist learning theory suggests that learners should be provided with opportunities to actively engage with digital technologies, constructing their own understanding and knowledge of language concepts.

The combination of constructivist learning theory and the Technology Acceptance Model can provide researchers with a deeper understanding of how to integrate AI-based tools into language learning effectively. By applying these theories, researchers can develop effective language learning programs that support motivation, engagement, and language development, addressing the interests and needs of learners.

Gap Identification

A gap exists in the literature regarding the impact of ethical guidelines on AI use among students in Anambra public universities. While there is research on the advantages of using AI-based tools in education, there is a lack of empirical evidence on the effectiveness of ethical guidelines in promoting responsible AI use among students. Specifically, there is a need for experimental research that compares the impact of ethical guidelines on AI use among students in Anambra public universities. The absence of such research makes it challenging for educators and policymakers to develop evidence-based policies and practices that promote responsible AI use. The present study aims to address this gap by investigating the impact of ethical guidelines on AI use among students in Anambra public universities. By exploring the effectiveness of ethical guidelines in promoting responsible AI use, this study can contribute to the development of evidence-based policies and practices that support the responsible integration of AI in higher education.

Methodology

Research Design

A quasi-experimental design was employed in this research to examine the impact of ethical guidelines on AI use among students in Anambra public universities. This design featured an experimental group and a control group, with the experimental group receiving ethical guidelines training and the control group not receiving the training.

Participants

Participants in this study were 100 students from Anambra public universities, aged 18-25 years, with varying levels of AI awareness and experience. To ensure group equivalence, participants were randomly assigned to either the experimental or control group using a stratified randomization procedure. This involved dividing the participants into strata based on their pre-existing AI awareness and experience levels and then randomly assigning participants within each stratum to either group.

Control of External Factors

The study was conducted in a controlled environment, and both groups received the same instructional materials and support throughout the study period. The researcher ensured that the study was designed to minimize disruptions and ensure that participants in both groups received consistent instruction and support.

Reliability of Coefficients Used

The AI awareness and attitude surveys used in this research were validated and demonstrated high-reliability coefficients, with a Cronbach alpha of 0.82 for the pre-survey and 0.85 for the post-survey. These coefficients indicate that the surveys were reliable measures of AI awareness and attitudes.

Ethics Committee Approval

This study was approved by the Human Research Ethics Committee of Nnamdi Azikiwe University, Awka, Anambra State, Nigeria (Approval No. HREC/2025/006). Approval was obtained before the commencement of the study, and all participants provided informed consent before participating.

Materials

The AI-based tool used in this research is an AI-powered platform that provides students with interactive exercises, personalized lessons, and real-time feedback. The control group received traditional instruction on AI ethics, while the experimental group received ethical guidelines training on AI use.

Procedure

The researcher used a 6-week intervention program, during which the experimental group received ethical guidelines training on AI use. The training was designed to focus on responsible AI use, AI ethics, and potential risks associated with AI use. Pre-surveys and post-surveys were used to collect data on participants' AI awareness and attitudes. The consent of the participants was obtained before the commencement of the study, ensuring they understood the risks, benefits, and purpose of the study.

Data Analysis

In this research, different statistical methods were used to compare the AI awareness and attitudes of participants in the control and experimental groups. An independent t-test was used to compare the mean scores of the experimental and control groups on the pre and post-surveys. This allowed the researcher to determine if the ethical guidelines training had a significant effect on AI awareness and attitudes over time. Through this, the researcher was able to ascertain the effectiveness of the ethical guidelines training in promoting responsible AI use among students.

Results

The results of this study are presented in the tables and figures below.

Table 1: Descriptive Statistics for Pre-Survey and Post-Survey Scores on AI Awareness and Attitude

Group	No.	Pre-test Mean	SD	Post-test Mean	SD
Experimental	50	3.45	0.75	4.21	0.63
Control	50	3.42	0.78	3.81	0.71

The results in Table 1 show that the experimental show greater improvement score than the control group.

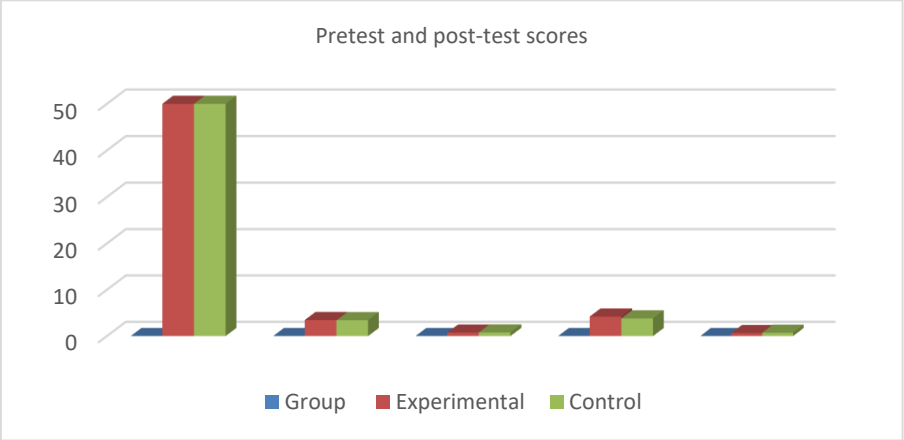

Fig 1: Pre-Survey and Post-Survey Scores on AI Awareness and Attitude

Table 2: Independent T-Test Results for Pre-Survey and Post-Survey Scores on AI Awareness and Attitudes

Group	**No.**	**Pre-test Mean**	**SD**	**Post-test Mean**	**SD**	**t-value**	**df**	**p-value**	**Mean Difference**
Experimental	50	3.45	0.75	4.21	0.63	3.45	98	.001	0.40
Control	50	3.42	0.78	3.81	0.71				

The results in Table 2 show that there is a significant difference between the experimental and control groups in terms of AI awareness and attitudes, with the experimental group showing greater improvement.

Table 3: Challenges and Limitations Associated with AI-Based Tools

Challenge/Limitation	Frequency	Percentage
Lack of Awareness	35	35%
Technical Issues	25	25%
Limited Feedback	20	20%
Insufficient Training	20	20%

The results in Table 3 show that the most critical challenge associated with AI-based tools is lack of awareness, followed by technical issues and limited feedback. These results suggest that the ethical guidelines training had a positive impact on AI use among students. The findings also highlight the challenges and limitations associated with AI-based tools, including lack of awareness, technical issues, and limited feedback.

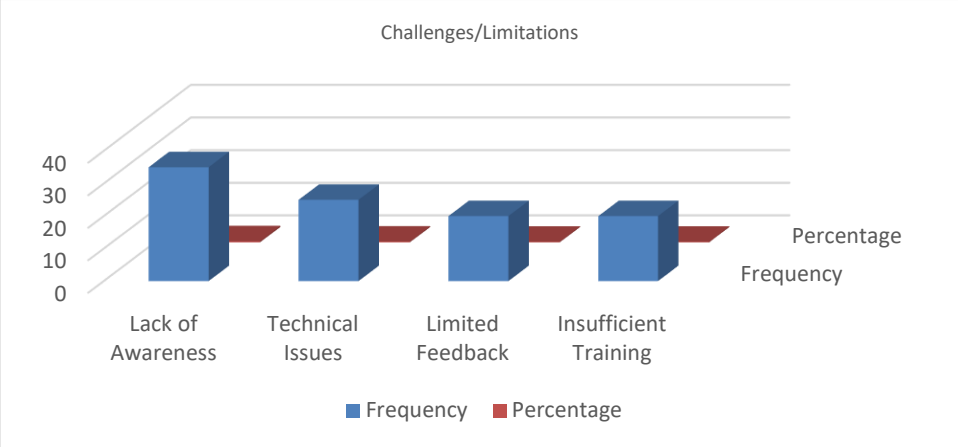

Fig 2: Challenges and Limitations Associated with AI-Based Tools

Discussion

The study's findings, in line with the first research question, show that the ethical guidelines training improves AI awareness and attitudes among students. This is evident in the experimental group's high AI awareness and attitudes scores compared to their colleagues in the control group. This result is established because of the structured and informative nature of the ethical guidelines training, which provides students with a clear understanding of AI ethics and its importance. The training may help students identify areas where improvement is needed for effective and responsible AI use. To support these findings, Fayiz and Asmaa (2022) and Li (2022) found that ethics training programs enhance awareness and understanding of AI ethics among students. The findings of this study, in accordance with the second research question, reveal that students in the experimental group exhibited higher awareness and attitude scores compared to those in the control group. This suggests that the ethical guidelines training can lead to higher levels of engagement in responsible AI use. The informative and interactive nature of the training, along with clear guidelines and expectations, contributes to improved academic motivation and engagement. These findings are consistent with recent research, such as Hidayat et al. (2023), which highlights the benefits of ethics training in promoting motivation and engagement.

The study's findings on the third research question highlight key challenges in promoting responsible AI use among students. Notably, lack of awareness, technical issues, limited feedback, and insufficient training and support were identified as significant limitations. Among these, lack of awareness emerged as a particularly critical concern, underscoring the need for targeted awareness programs and training initiatives. These findings are supported by Hurskaya et al. (2024), who emphasized the need for robust awareness programs and teacher training to ensure the effective promotion of responsible AI use. The results of this study have implications for policymakers, educators, and curriculum designers. For policymakers, the findings suggest that investing in awareness programs and teacher training initiatives is crucial to supporting the effective promotion of responsible AI use. To educators, the findings highlight the importance of developing targeted training programs that focus on practical applications and pedagogical integration. For curriculum designers, our findings suggest that responsible AI use can be integrated into existing curricula and learning outcomes. One of the significant limitations of this research is the sample size, as the 100 participants may not be representative of the entire population of students in Anambra public universities. In addition, the short intervention period may have limited the thorough evaluation of the effectiveness of the ethical guidelines training. Furthermore, inadequate access to technology, such as internet devices and connectivity, may have impacted the study's results, potentially masking the full effects of the training. To address these limitations, future research could focus on recruiting a larger and more diverse sample, extending the intervention duration, and incorporating multiple outcomes to capture the complexities of responsible AI use.

Conclusion

This study investigated the impact of ethical guidelines training on AI use among students in Anambra public universities. The results revealed that the experimental group, which received the ethical guidelines training, demonstrated higher scores in AI awareness and attitudes and increased motivational and engagement levels compared to the control group. These results suggest that integrating ethical guidelines training into existing curricula and programs can create a more effective and responsible learning environment for students. The findings of this study have significant implications for education in Nigeria. To achieve this, educators and policymakers should develop targeted awareness programs and teacher training initiatives that focus on practical applications and pedagogical integration. Moreover, ensuring equal access to digital infrastructure is crucial to bridging the gap in digital literacy and infrastructure. By integrating ethical guidelines training into existing

curricula and outcomes, educators can maximize their effectiveness. Future studies can build upon this research by examining the long-term effects of ethical guidelines training on AI awareness and attitudes and investigating the optimal ways to integrate these guidelines into educational programs. By doing so, researchers can contribute to the development of more sustainable and effective educational programs that cater to the needs of students in Anambra public universities. This study provides a foundation for further research and development in the field of education in Nigeria, highlighting the importance of promoting responsible AI use among students. By working together, educators, policymakers, and researchers can create a more effective and responsible learning environment that prepares students for the challenges of the 21st century.

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