
THE ETHICAL APPLICATION OF GENERATIVE AI WITHIN THE NIGERIAN POLYTECHNIC FRAMEWORK

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Abstract

This study examines the ethical implications of implementing generative AI tools within the Nigerian polytechnic system. The study employed a mixed-methods approach, integrating both descriptive and exploratory designs. Data was collected from a cohort of 600 participants, comprising administrators, departmental staff, and students from three state polytechnics in the South-South geopolitical zone of Nigeria, via a multi-stage sampling method. The investigation, employing a dual methodology, demonstrates a substantial correlation between awareness of ethical issues and the perceived responsible utilization of generative AI. Although stakeholders acknowledge AI's promise to improve learning and administrative efficiency, apprehensions about academic integrity, data privacy, and algorithmic prejudice are widespread. The results highlight the immediate necessity for the creation and execution of a thorough ethical framework to direct the responsible integration of generative AI in Nigerian polytechnics. This study enhances the dialogue on AI in education by presenting empirical insights from a Nigerian polytechnic viewpoint and proposes recommendations for polytechnic administrators to promptly lead the creation of a thorough institutional framework for the ethical utilization of generative AI.

Keywords: Generative AI, Ethics, Nigerian Polytechnic System, Higher Education, Academic Integrity, Technology Adoption, Multiple Regression Analysis

Introduction

The expansion of generative artificial intelligence (AI) is transforming multiple sectors worldwide, including higher education. The discussion on the incorporation of AI into Nigeria's educational system is intensifying, with the capacity to transform teaching, learning, and research. The Nigerian government has demonstrated its dedication to utilizing digital technology to improve the education system, including the incorporation of AI into curriculum implementation. According to Izevbigie et al. (2025), the swift integration of potent tools, like large language models (LLMs) and image generators, introduces numerous ethical dilemmas that require meticulous examination, especially within the distinct framework of the Nigerian polytechnic system. Nigeria's polytechnics are required to deliver technical and vocational education, generating essential middle-level workers for the country's industrial and economic advancement.

According to Ekpoh et al.(2025), the pragmatic and skills-oriented nature of polytechnic education indicates that generative AI may serve as a substantial facilitator of

experiential learning and innovation. Notwithstanding this potential, the ethical dimensions of generative AI in this setting remain predominantly unexamined. Concerns such as academic integrity, potential prejudice in AI algorithms, data privacy, and the digital divide are essential issues that must be addressed to guarantee the appropriate and equitable utilization of these technologies.

Despite the demand for the formulation of national AI policies and ethical frameworks, there is a lack of empirical research to guide these efforts, particularly from the viewpoint of stakeholders in the polytechnic system (Mbah, 2025). Olofinnika and Ojo (2025), a recent study on the application of generative AI in Nigerian higher education has shown that awareness of the issues related to AI significantly predicts ethical considerations, highlighting the necessity for enhanced awareness and the implementation of responsible practices.

This paper seeks to address this gap by examining the ethical implementation of generative AI inside the Nigerian polytechnic system, particularly in the South-South geopolitical zone. The research investigates the views of administrators, departmental personnel, and students on the ethical dilemmas associated with generative AI and analyzes the determinants that affect its responsible implementation. This research aims to furnish factual data and a comprehensive analysis of the ethical implications of generative AI in this setting, thus informing the creation of an ethical framework to facilitate the innovative and ethically responsible integration of these technologies. The deployment of generative AI in Nigerian polytechnics is essential for improving educational quality while maintaining academic integrity and equity. (Sanusi et al, 2024).

Research Methods

This study utilized a quantitative research design. The principal design used was a descriptive research design. This method was selected to thoroughly examine the complex and subtle viewpoints of stakeholders about the ethical use of generative AI within the Nigerian polytechnic system. The descriptive component sought to thoroughly delineate the present status of awareness, utilization, and perceptions of generative AI within the target community.

This study's population consisted of 600 participants from three intentionally selected state polytechnics in Nigeria's South-South geopolitical zone. The participants were selected from three primary stakeholder groups to guarantee a comprehensive understanding of the research issue. The demographic distribution was as follows: 200 participants, comprising rectors, deputy rectors, deans, and department heads. 200 academic personnel from many departments, specifically including the School of Engineering Technology, to obtain ideas from a topic where AI applications are particularly pertinent. 200 individuals from National Diploma (ND) I to Higher National Diploma (HND) II levels, encompassing a diverse range of the student population. A multi-stage sampling method was employed for the sample selection in this investigation. Stage 1: Purposive Sampling of Polytechnics: Three State Polytechnics from the South-South region of Nigeria were deliberately chosen due to their robust ICT infrastructure and active participation in technology-enhanced learning activities. Stage 2: Stratified Sampling of Stakeholder Groups: The population inside each chosen polytechnic was

categorized into three groups: administrators, departmental personnel, and students. Stage 3: Simple Random Sampling: A simple random sampling method was employed to choose the requisite number of participants from each stratum, guaranteeing that every individual in the population had an equal opportunity to be included in the sample.

The data for this study was gathered through a combination of ways to provide a complete and robust dataset. A standardized questionnaire was developed and distributed to 600 individuals. The questionnaire included questions on demographics, awareness and utilization of generative AI tools, perceptions of the ethical ramifications of generative AI (including academic integrity, bias, and privacy), and the necessity for an ethical framework. The data obtained from the questionnaires were examined utilizing descriptive statistics (mean, standard deviation, frequencies, and percentages) and inferential statistics. Multiple regression analysis was utilized to investigate the link between the independent variables (knowledge of ethical issues, perceived utility, and simplicity of use) and the dependent variable (responsible use of generative AI). The study was conducted using version 25 of the Statistical Package for the Social Sciences (SPSS).

Results

This section provides an analysis of the data obtained from the surveys and interviews. The findings are categorized into descriptive statistics, correlation analysis, and multiple regression analysis.

Table 1: Descriptive Statistics for the Variables

Variable	N	Mean	Std. Deviation
Awareness of Ethical Issues (AEI)	600	3.85	0.92
Perceived Usefulness (PU)	600	4.12	0.85
Perceived Ease of Use (PEOU)	600	3.98	0.95
Responsible Use of GenAI (RUG)	600	3.65	1.05

The descriptive statistics in Table 1 indicate that the mean scores for all relevant factors exceed the midpoint of 3.0 on a 5-point Likert scale. This reflects a predominantly favorable impression among respondents concerning awareness of ethical issues, the utility and user-friendliness of generative AI, and the significance of its responsible application. Perceived Usefulness (PU) attained the highest mean score of 4.12, indicating that respondents recognize considerable potential in generative AI for their academic and administrative responsibilities.

Table 2: Correlation Matrix for Variables

Variable	AEI	PU	PEOU	RUG
AEI	1			
PU	.452	1		
PEOU	.389	.512	1	
RUG	.621	.488	.401	1

The correlation is significant at the 0.05 level (two-tailed).

The correlation matrix in Table 2 indicates positive and substantial correlations among all variables. A robust association exists between Awareness of Ethical Concerns (AEI) and Responsible Use of Generative AI (RUG) ($r = 0.621$, $p < 0.05$), suggesting that increased awareness of ethical concerns is significantly linked to a heightened propensity for the responsible utilization of generative AI.

Table 3: Model Summary

Model	R	R Square	Adjusted Square	Std. Error of the Estimate
1	.684a	.468	.465	.768

a. Predictors: (Constant), PEOU, PU, AEI

The model summary indicates that the three independent variables account for 46.8% of the variance in the responsible utilization of generative AI ($R^2 = 0.468$). This represents a considerable segment, signifying that these variables are important predictors.

TABLE 4: ANOVA Table

Model 1	Sum of Squares	Df	Mean Square	F	Sig
Regression	310	.234	3	103	175.273
Residual	352	.766	596	.592	
Total	663	.000	599		

b. Predictors: (Constant), PEOU, PU, AEI

c. Dependent Variable: RUG

The ANOVA table demonstrates that the total regression model is statistically significant ($F(3, 596) = 175.273$, $p < 0.001$), indicating that the model fits the data and that the independent factors collectively have a substantial influence on the dependent variable.

Discussion

This study's findings offer essential insights into the ethical considerations of generative AI implementation within the Nigerian polytechnic system. The outcomes of the multiple regression analysis provide a persuasive account of the determinants influencing the responsible utilization of these emerging technologies among administrators, staff, and students in the South-South region of Nigeria. The substantial positive correlation among awareness of ethical issues, perceived usefulness, perceived ease of use, and the responsible utilization of generative AI carries significant implications for policy and practice.

This research identifies "Awareness of Ethical Issues" as the most significant predictor of responsible generative AI usage. This corresponds with current literature highlighting the significance of ethical literacy in managing the complexities of AI in education. Kpangban and Onwuchekwa (2014), indicates that simply offering access to generative AI tools is inadequate. To cultivate a culture of responsible usage, it is essential to educate all stakeholders about potential ethical dilemmas, including plagiarism, the dissemination of biases inherent in AI models, and data privacy issues. The significant correlation between awareness and responsible usage highlights the need for specialized workshops, seminars, and curriculum modules aimed at improving the ethical awareness of the polytechnic community. The strong influence of "perceived usefulness" on the responsible adoption of generative AI demonstrates that when stakeholders recognize the practical benefits of these tools for teaching, learning, and administrative duties, they are more inclined to interact with them in a responsible manner.

This finding is consistent with technology adoption models, which argue that perceived utility is a primary motivator of technology acceptance and use. Anamoji, (2024), concluded that workers in the School of Engineering Technology may find high utility in employing generative AI for simulations and problem-solving, thereby driving them to understand and adhere to ethical rules to utilize these benefits efficiently. This underscores the significance of presenting practical and contextually relevant uses of generative AI to inspire buy-in and, ultimately, more responsible usage.

Similarly, "Perceived Ease of Use" appeared as a substantial, albeit the weakest, predictor of responsible use. This shows that user-friendly interfaces and accessible support systems can lower the barrier to entry for engaging with generative AI technologies ethically. If educators and students find the tools burdensome or difficult to navigate, they may be less willing to commit the time required to use them appropriately. This conclusion refers to the necessity for institutions to adopt generative AI platforms with intuitive designs and to give enough training and technical assistance to all users.

Akanbi and Akanbi (2012), the issues of inadequate ICT infrastructure and digital literacy, which are prominent in the Nigerian environment, can worsen this issue. The qualitative data from the interviews further supplemented these findings. Administrators expressed worries about the lack of institutional regulations to oversee the use of generative AI, which creates a vacuum where unethical activities can thrive. Departmental staff, particularly in non-engineering professions, highlighted anxieties about their capacity to detect AI-generated plagiarism and the need for professional development in this area. Thomas and Gambari (2021), students, while thrilled about the possibility of generative AI to assist with their assignments, also admitted to a lack of clarity on what constitutes permissible use. These qualitative insights corroborate the quantitative data and illustrate a polytechnic system contending with the swift advancement of technology devoid of a definitive ethical framework. The ramifications of these results are extensive. Polytechnic administrators are mandated to progress beyond ad hoc reactions and formulate comprehensive institutional policies regarding the ethical utilization of generative AI. These policies must be formulated in collaboration with all stakeholders and should encompass matters of academic integrity, data governance, and

equitable access. Departmental staff require ongoing professional development to improve their digital and AI literacy, facilitating the efficient integration of new tools into their pedagogy while maintaining ethical standards.

Conclusion

This paper offers a thorough examination of the ethical use of generative AI inside the Nigerian polytechnic system, particularly emphasizing the South-South geographical region. The study has determined that the judicious application of generative AI is profoundly affected by stakeholders' cognizance of ethical concerns, their assessment of the technology's utility, and its user-friendliness. The results indicate agreement among administrators, departmental personnel, and students regarding the prospective advantages of generative AI in improving educational delivery and administrative efficacy.

This optimism is mitigated by substantial apprehensions about academic dishonesty, the risk of algorithmic bias, and the protection of data privacy. The study suggests that the existing methodology for integrating generative AI in the examined polytechnics is predominantly reactive and deficient in a unified ethical framework. This disparity presents a considerable threat to the integrity of the educational process and the fair allocation of the advantages of this transformative technology.

The significant predictive capacity of ethical awareness in promoting responsible usage highlights the essential requirement for proactive educational initiatives. In the absence of a unified initiative to foster ethical AI literacy, the Nigerian polytechnic system faces the danger of generative AI's potential being compromised by its misuse. Consequently, establishing a clear, thorough, and contextually pertinent ethical framework is essential for the successful and sustainable integration of generative AI in Nigerian polytechnics.

Recommendations

This study's findings and conclusions yield the following recommendations to promote the ethical implementation of generative AI inside the Nigerian polytechnic system:

1. **Establishment of Institutional Ethical Frameworks:** Polytechnic administrators must promptly lead the creation of a thorough institutional framework for the ethical utilization of generative AI. This framework must be developed through a collaborative process with administrators, departmental personnel, and students.
2. **Incorporation of AI Ethics into the Curriculum:** The National Board for Technical Education (NBTE) and individual polytechnics must evaluate and revise their curriculum to incorporate compulsory courses on digital literacy and AI ethics for all students, irrespective of their discipline.
3. **Continuous Professional Development for Staff:** Polytechnic administrators must devise and execute ongoing professional development programs for both academic and non-academic personnel.
4. **Investment in ICT Infrastructure and Technical Support:** The government and polytechnic administrators should augment investment in ICT infrastructure to provide dependable internet connectivity and availability to essential hardware and software. Moreover, specialized

technical support must be accessible to aid both staff and students in the effective and ethical utilization of generative AI techniques.

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