Policy Gaps and Institutional Readiness for AI Integration in Automobile Technology Education Programs in South-South Nigerian Universities

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Abstract
This study investigated the awareness, preparedness, and policy engagement regarding Artificial Intelligence (AI) integration in Automobile Technology Education (ATE) programs within South-South Nigerian universities. Guided by three research questions and two null hypotheses, a descriptive survey design was adopted, involving 178 participants (172 students and 6 lecturers) from two public universities in Delta State. Data were collected using structured questionnaires. Results showed consistently low awareness of institutional and national AI-related policies across both groups, with no statistically significant difference in awareness levels. Institutional preparedness for AI integration was rated very low, constrained by outdated curricula, weak infrastructure, inadequate staff training, and minimal industry partnerships. Furthermore, participants identified systemic policy gaps and ethical challenges such as weak intellectual property protections, poor data privacy regulation, and a lack of clear ethical guidelines. A strong positive relationship was found between institutional readiness and perceived effectiveness of AI integration, suggesting that better-prepared institutions are more confident in adopting AI responsibly. The study concludes that systemic inadequacies, rather than individual negligence, are the main barriers to AI adoption in ATE programs. It recommends urgent reforms in curriculum modernization, infrastructure investment, staff development, and the establishment of AI ethics and policy frameworks to promote responsible integration.
Keywords: Artificial Intelligence (AI), Automobile Technology Education, Institutional Readiness, Policy Gaps, TVET in Nigeria

Introduction

The rapid emergence of Artificial Intelligence (AI) has redefined education globally, especially within Technical and Vocational Education and Training (TVET) systems and programs. Advanced learning tools, such as adaptive platforms, intelligent simulations, chat-generated pre-trained transformer, Copilot, and real-time feedback engines, among others, have enhanced skill-based education by making learning more individualistic and industry-relevant (Southworth et al., 2023; Noor & Kumar, 2025). This practically exposes technical education students to personalized learning modules, anywhere and anytime, attenuating levels of academic dissatisfaction, yet boosting academic interest and performance via AI integration in the learning process. In advanced climes, such innovations have contributed substantial gains in technical precision, productivity, and curriculum relevance (Abbasi et al., 2025; Vaidya, 2024). However, the situation is sharply different in developing contexts like Nigeria, where AI integration into institutions and TVET programs, particularly, is yet to be fully welcomed and yet to find full expression (Eno et al., 2024), even among students and lecturers alike. Despite increasing discourse around AI, the practical application within educational institutions in Nigeria is limited, hindered by poor infrastructure, outdated pedagogies, weak regulatory policies, and low digital competence among educators and

students (Aderibigbe et al., 2023; Uduafemhe et al., 2024).

For most institutions and universities in Nigeria, the challenges and various uncertainties associated with using AI in education are quite real (Sarfo et al., 2024). Although Nigerian universities already incorporate AI in the Benchmark Minimum Academic Standards (BMAS), some of the universities do not readily have access to the recommended software for platforms needed to check AI-generated content (Sarfo et al., 2024; Romanoff and Hidalgo-Sanchis, 2019). According to the authors, there is an urgent need for the National Universities Commission (NUC) to mandate full integration of AI ethics into university curricula, using a practical, implementation-focused approach. The authors added that this should include awareness campaigns addressing the technological, governance, and legal aspects of AI, the establishment of independent AI ethics departments, and the involvement of experts to train educators on the responsible use and ethical development of AI systems. According to the authors, to support this integration, the government must provide institutions with essential resources such as AI labs, learning materials, and research funding, while also creating AI hubs to promote local innovation. Additionally, the authors stated that robust regulatory and ethical frameworks must be developed to ensure fairness, data quality, and safe AI usage, including inclusive governance structures that involve academics, practitioners, and stakeholders. Expanding AI ethics education through e-learning and integrating it into West African university curricula can address critical challenges and encourage the informed use of AI. Ultimately, while AI possesses transformative potential for personalized learning and academic development, sustained policy efforts and ethical considerations are vital to ensure it benefits students, educators, and institutions responsibly and equitably.

Students and instructors in skill-based programs like automobile technology education (ATE) at Nigerian universities often interact informally with research-related AI tools such as Zotero, Quillbot, ChatGPT, and Gemini, among others, without clear ethical guidance to ensure transparency and accountability. This casual and inconsistent use of AI may hinder learning outcomes rather than enhance them, as many users remain uncertain or reluctant to disclose AI tool usage due to unclear policies and institutional ambivalence. Romanoff and Hidalgo-Sanchis (2019) stress that AI remains in its early stages of educational application, requiring significant development of sustainable policies, ethical standards, and legal frameworks to ensure responsible use, optimize benefits, minimize harm, and establish transparent accountability mechanisms at the classroom, institutional, and systemic levels. These concerns are compounded by the lack of enforceable AI-specific frameworks from regulatory bodies like the NBTE and NUC, despite their general digital mandates (Obiahu, 2024; Omeh et al., 2024).

The 2013 edition of the National Policy on Education fails to offer clear directives for AI integration in teaching and research, leaving universities ill-equipped to manage critical concerns such as data privacy, algorithmic bias, and academic integrity (Reuben &Kabilan, 2024; Suleiman, 2024; Attwell et al., 2020). This regulatory vacuum underscores deeper systemic policy gaps and institutional unpreparedness, particularly within universities in Nigeria's South-South region. Empirical studies have highlighted the absence of well-defined frameworks and guidelines for AI adoption in this region, resulting in fragmented, inconsistent, and largely uncoordinated implementation efforts (Adesiji, 2024; Ekpoh et al., 2025). This lack

of direction hinders strategic planning, while also creating ethical, administrative, and operational uncertainties surrounding AI usage in academic settings (Mohammed-Shittu, 2025; Agbovu & Chukwuma, 2025). Moreover, the absence of institutional policies significantly weakens research engagement with AI tools, limiting access to intelligent learning platforms and AI-driven decision-support systems essential for modern pedagogy (Warioweri & Banabo, 2025; Olufemi et al., 2025). These challenges are further exacerbated by capacity deficits, outdated curricula, and a lack of faculty training, all of which diminish institutional readiness and obstruct universities in the South-South from aligning with global innovations in AI-enhanced education (Urakpo et al., 2024; Sunday et al., 2025).

Against this backdrop, this current study examined the policy gaps and institutional readiness for integrating AI into automobile technology education (ATE) programs within South-South Nigerian universities, situating ATE students and lecturers (ATELs) as critical actors whose awareness, preparedness, and ethical engagement with AI will ultimately shape the success of AI-driven curricula and practice-based learning, while also influencing Nigeria's broader capacity to meet emerging educational, economic, and technological benchmarks.

Statement of the Problem

In line with global technological advancements in education and research, AI should be seamlessly integrated into teaching and learning through well-defined policies, dedicated ethics curricula, trained educators, and access to AI labs and intelligent learning platforms. Clear guidelines should direct how students and lecturers utilize AI to support personalized learning, research, real-time skill acquisition, academic efficiency, and industry relevance, particularly within technical and vocational education programs.

However, the reality in Nigeria, particularly in the South-South region, stands in stark contrast to global trends. AI adoption in this region remains minimal, largely due to poor infrastructure, inadequate faculty training, and the absence of clear ethical and regulatory frameworks. As a result, both students and lecturers engage with AI tools informally and without institutional guidance, leading to inconsistent usage, ethical lapses, and a lack of transparency. The NPE offers no specific directives on AI integration within TVET or ATE, while key regulatory bodies such as the NBTE and NUC have yet to establish enforceable standards. These gaps not only limit the educational potential of AI tools but also impede national development, create academic and operational uncertainties, and prevent universities in the region from aligning with international best practices in AI-enhanced education. Studies consistently confirm that this fragmented and unstructured approach is prevalent across most universities in Nigeria's South-South region.

Without structured efforts to build awareness, develop AI-specific guidelines, and enhance institutional capacity, the South-South region risks falling further behind in global competitiveness and innovation. Hence, this study examined the depth of these policy gaps and the institutional readiness of South-South Nigerian universities to integrate AI into ATE programs, focusing on the awareness, preparedness, and ethical engagement of ATE students and lecturers.

Research Questions

1. What is the level of awareness of institutional and national AI-related policies among students and lecturers in ATE programs?
2. To what extent are ATE programs in South-South Nigeria prepared for the integration of AI technologies in terms of infrastructure, curriculum, and staff training?

3. What are the perceived policy gaps and ethical challenges hindering the responsible integration of AI in ATE in the region?

Hypotheses

a. There is no significant difference between lecturers and students in their awareness of existing institutional and national AI-related policies.
b. There is no significant relationship between institutional readiness and the perceived effectiveness of AI integration in ATE programs.

Literature Review

Artificial Intelligence (AI) encompasses machine-based systems capable of performing tasks that typically require human intelligence, such as learning, decision-making, and pattern recognition (Cantú-Ortiz et al., 2020). In the context of Technical and Vocational Education and Training (TVET), AI supports intelligent tutoring systems, automated diagnostics, predictive maintenance training, and virtual simulation in practical trades like automobile technology (Southworth et al., 2023). As automobile technologies evolve rapidly, with electric vehicles, smart sensors, and autonomous systems becoming industry norms, AI becomes indispensable in aligning training curricula with modern industrial expectations (Khan & Islam, 2024).

The integration of AI into education raises serious ethical and regulatory questions, including algorithmic bias, data privacy, academic dishonesty, and unequal access (Omeh et al., 2024; Obiahu, 2024). National and institutional policies play a central role in setting standards for responsible AI adoption. In Nigeria, regulatory bodies such as NBTE and NUC have released general ICT guidelines, but these often lack specificity regarding AI implementation in education (Okonkwo et al., 2024). Without ethical policy frameworks, AI deployment risks reinforcing inequities and producing unintended learning outcomes.

Institutional readiness refers to the capacity of universities to implement and sustain AI-driven educational reforms. According to Noor and Kumar (2023), readiness includes the availability of digital infrastructure, skilled personnel, curricular content, and change management systems. In Bahrain, AlMalki and Durugbo (2023) proposed an inclusive model for AI readiness that emphasizes stakeholder involvement, digital equity, and institutional leadership. However, in many Nigerian universities, readiness towards integrating AI into institutions is still constrained by low digital literacy, limited funding, and outdated curricula (Eno et al., 2022; Reuben &Kabilan, 2024).

Reuben and Kabilan (2024) assessed university lecturers' readiness for AI adoption in North-East Nigeria and found that while attitudes toward AI were positive, there were clear deficits in infrastructure, training, and policy frameworks. Similarly, Suleiman (2024) examined student readiness at Al-Hikmah University and reported concerns about unequal access to AI tools and a lack of institutional support. These findings mirror global trends noted by Uren and Edwards (2023), who emphasized that successful AI adoption depends not only on infrastructure but also on change readiness and policy clarity.

Uduafemhe et al., (2024) conducted an empirical study using mixed methods, comprising surveys and curriculum audits, to explore the integration of AI and emerging technologies in Nigeria's TVET system. Their findings revealed significant barriers, including outdated curricula lacking AI content, insufficient teacher training, and inadequate institutional infrastructure. They also emphasized the absence of structured partnerships with the private sector, which limits the practical alignment of training

programmes. In response, the authors proposed a four-pronged strategic framework focused on curriculum modernization, infrastructure development, teacher capacity-building, and industry collaboration. This model underscores the multifaceted nature of AI integration and aligns closely with the present study's concern for policy gaps and institutional readiness in automobile technology education.

In the global South, Aderibigbe et al. (2023) emphasized that AI implementation often fails in developing contexts due to a mismatch between policy ambition and institutional capacity. This is consistent with Jebba et al. (2024), who explored the integration of green energy technologies into automobile education and identified poor curriculum design and lack of faculty competence as barriers, challenges also relevant to AI integration.

Reuben and Kabilan (2024), surveyed 100 university lecturers in North-East Nigeria to assess their readiness to adopt and integrate AI in teaching and administrative tasks. Using a structured questionnaire, they found a moderate level of readiness: lecturers were generally open to AI-enhanced personalization and automation but faced obstacles due to proficiency gaps**,** ethical concerns, and a lack of institutional support. The study recommends that universities implement targeted training, policy updates, and create supportive environments for AI adoption.

Eke (2024) surveyed 250 Nigerian teacher educators to evaluate their readiness and attitudes toward AI adoption in education. With high reliability (Cronbach's $\alpha = .82$), the study revealed strong positive attitudes, with mean readiness scores ranging from 3.35 to 3.68 (on a 5-point scale), coupled with recognition of AI's potential benefits like personalized learning, automated grading, and virtual tutors. However, the study also uncovered perceived barriers, including limited infrastructure, inadequate training, and ethical concerns. Eke advocates comprehensive professional development and enhanced institutional support.

This systematic review synthesized 28 studies on AI adoption in Ghana and Nigeria, revealing consistently positive perceptions of AI in education and healthcare. Nevertheless, uptake was hindered by limited digital infrastructure**,** insufficient expertise, and low digital literacy, especially in rural settings. The authors emphasize the necessity for comprehensive national AIstrategies, strengthened infrastructure, educational integration, regulation, and public–private partnerships

Omeh et al. (2024) observed that most TVET institutions in Nigeria lack clear guidelines on AI ethics, leading to uncertainty among lecturers about what constitutes responsible AI use. Obiahu (2024) argued that while innovation is vital, AI policy must address legal, data, and human rights concerns in Nigeria's educational sector. At the continental level, Nwobodo (2025) noted that African education systems lack structured plans for AI adoption, despite its potential to bridge learning gaps.

The reviewed literature underscores the transformative potential of AI in education and the automotive industry, but simultaneously reveals major policy and readiness challenges. While international studies have developed models for AI readiness and ethical integration (AlMalki & Durugbo, 2023; Issa et al., 2022), few address the specific needs of TVET institutions in sub-Saharan Africa, particularly those offering automobile technology education.

In Nigeria, emerging evidence indicates enthusiasm for AI among students and staff, but institutional structures, curriculum development, and national policies have not kept pace (Reuben & Kabilan, 2024; Eno et al., 2022). There is an urgent need for empirical data on ATE programs, which often require technical expertise and hands-on

training infrastructure. Most importantly, no current study comprehensively examines the policy gaps and institutional readiness for ethical AI integration in this field, especially within the South-South geopolitical region. It is this critical gap that this study aims to fill.

Theoretical Framework

This study is anchored on the Technology-Organization-Environment (TOE) Framework**,** developed by Tomatzky and Fleischer in 1990. It explains how institutional adoption of technology depends on three core contexts: technological capability, organizational culture, and environmental regulation. TOE has been used in studies assessing AI readiness (Issa et al., 2022) and is apt for examining how universities balance innovation with policy, ethical constraints, and infrastructural capability. The TOE framework aligns with the study's focus on institutional readiness and regulatory gaps within the Nigerian educational context.

Methodology

The study employed a descriptive survey research design, which was useful for the researcher to describe opinions about the characteristics of a population and to generalize those opinions (Manjunatha, 2019). The study population included 178 participants, consisting of 6 automobile technology lecturers (ATLs) and 172 automobile technology education students (ATESs) from the University of Delta, Agbor, and Delta State University, Abraka. These institutions were chosen because they are the only universities in Delta State offering automobile technology education and have access to a sufficient number of registered mechanic workshops under the Delta State Transport Ministry to support training. The entire population was included in the study because its size was manageable and it accurately represented the target group. All three research questions were measured using a 4-point Likert scale. For research questions one and three, 1 = strongly disagree and 4 = strongly agree. Responses for research question two were measured as follows: 1 = not at all, 2 = to a small extent, 3 = to a great extent, and 4 = to a very great extent.

Three structured questionnaires, policy awareness questionnaire (PAQ), institutional readiness for AI integration questionnaire (IRAIQ), and perceived policy gaps and ethical challenges questionnaire (PPGECQ), were used for data collection. The questionnaires were face validated by three technical education experts. Using the Cronbach's Alpha assessment to ascertain the internal consistency of the questionnaires, reliability coefficients of .76, .72, and .79 were obtained, with an overall reliability coefficient of .86.Data were collected through printed and online survey forms distributed to participants. Data analysis included descriptive statistics, t-test, regression analysis, and Pearson Product-Moment Correlation (PPMC), all conducted using SPSS version 23. A .05 confidence level was considered in this study. It was determined that mean scores greater than or equal to 2.50 indicated participants' positive, agree, strongly agree, or “to a very great extent” responses, whereas mean scores less than or equal to 2.50 indicated participants' negative, disagree, strongly disagree, or “not at all” responses.

Results

Tables 1 – 5 reveal data answering research questions and testing hypotheses:

Table 1
Mean and standard deviation of ATESs and ATELs on awareness of institutional and national AI-related policies among students and lecturers in automobile technology education programs

		ATESs N = 172			ATELs N = 6		
S/N	**Items**	**X̄i**	**SDi**	**Rmk.**	**X̄ii**	**SDii**	**Rmk.**
1.	I am aware that my institution/nation has a formal policy on the use of AI in education and research.	1.97	.38	Disagree	2.00	.63	Disagree
2.	I have access to and have read government/institutional policy documents on AI usage in education and research.	1.97	.37	Disagree	1.83	.40	Disagree
3.	My department/institution has effectively communicated AI-related ethics and policies to students/lecturers.	1.93	.39	Disagree	2.00	.00	Disagree
4.	My institution organizes regular workshops/training sessions on AI in education and research, ethics, and policy awareness.	1.99	.45	Disagree	2.00	.00	Disagree
5.	Our course outlines and handbooks mention the use of AI in education and its governance.	1.97	.40	Disagree	2.00	.00	Disagree
6.	I am aware of the workshops and training sessions my institution organizes on AI in education and research, ethics, and policy awareness.	1.99	.32	Disagree	2.00	.00	Disagree
7.	I am aware of the objectives and guidelines outlined in national/institutional AI education policies.	1.94	.39	Disagree	2.00	.00	Disagree
8.	I can identify how AI policies apply to research in automobile technology education and related fields.	1.95	.42	Disagree	2.00	.00	Disagree
9.	I believe AI policies in my institution promote responsible and ethical use of AI in research.	1.98	.38	Disagree	2.17	.40	Disagree
10.	The national AI policy statement has obvious and distinct relevance to research in automobile technology education.	1.99	.35	Disagree	1.83	.40	Disagree
11.	I am aware of the application of AI policies and guidelines in my academic work (assignments, research, etc.).	1.95	.36	Disagree	1.83	.40	Disagree
12.	I am confident in explaining AI ethics and policy matters for education and research to my peers and colleagues.	1.96	.31	Disagree	2.17	.40	Disagree
	GRAND MEAN	**1.96**	**.38**	**Disagree**	**1.98**	**.22**	**Disagree**

Table 1 reveals that both students (ATESs, n = 172) and lecturers (ATELs, n = 6) demonstrated low awareness of institutional and national AI-related policies in automobile technology education programs. With grand means of 1.96 and 1.98, respectively, both groups consistently disagreed with all items on access, knowledge, communication, and application of AI policies. While lecturers showed slightly higher confidence on some items ($\bar{X}$ = 2.17), the overall responses point to inadequate policy awareness. The low standard deviations, especially among lecturers, indicate uniform responses. Overall, findings highlight a significant gap in policy awareness and dissemination within automobile technology education.

Table 2: t-test analysis of respondents on the awareness of existing institutional and national AI-related policies

	F	t	Df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confi. Interval of the Difference	
							Lower	Upper
Awareness Level	.395	-.440	176	.661	-.02148	.04886	-.11792	.07496

The results from Table 2 showed no statistically significant difference between the two groups, $t(176) = -0.440$, $p = .661$. The mean difference in awareness scores was minimal (-0.02148), with a standard error of 0.04886, and the 95% confidence interval for the difference ranged from -0.11792 to 0.07496.

Given that the p-value was greater than the 0.05 significance level, the null hypothesis was retained. This indicates that both Automobile Technology Education Students (ATESs) and Lecturers (ATELs) demonstrated similarly low levels of awareness regarding AI-related policies. The result highlights a shared gap in policy awareness across both groups, emphasizing the need for universities and policymakers to implement coordinated strategies for improving AI policy dissemination and training within automobile technology education programs.

Table 3: Mean and standard deviation of ATESs and ATELs on the extent to which automobile technology education programs in South-South Nigeria are prepared for the integration of AI technologies in terms of infrastructure, curriculum, and staff training

		ATESs N = 172			ATELs N = 6		
S/N	**Items**	**X̄i**	**SDi**	**Rmk.**	**X̄ii**	**SDii**	**Rmk.**
1.	My university has adequate internet access for AI-powered tools.	1.97	.38	Not at all	1.83	.40	Not at all
2.	My university has well-equipped AI labs/units to facilitate all forms of plagiarism testing and other AI-related activities.	1.94	.36	Not at all	2.00	.63	Not at all
3.	The automobile technology curriculum captures practical AI research applications.	1.88	.43	Not at all	2.00	.00	Not at all
4.	Lecturers have been well-trained to adapt AI in instructional delivery and research.	1.95	.39	Not at all	2.00	.00	Not at all
5.	My university has partnerships with AI-driven automotive firms as an in-place sustainability plan.	1.95	.40	Not at all	2.00	.63	Not at all
6.	AI-supported diagnostics, automations, predictive maintenance, and other similar AI-driven innovations are taught in my department.	1.94	.37	Not at all	2.00	.00	Not at all
7.	My institution has access to funding for upgrades in AI-related matters.	1.94	.36	Not at all	2.00	.00	Not at all
8.	Our department encourages innovation using AI.	1.94	.40	Not at all	1.83	.75	Not at all
9.	Faculty members attend AI-focused seminars or workshops.	1.95	.37	Not at all	2.00	.00	Not at all
10.	My university has AI-dedicated research spaces in each faculty.	1.94	.41	Not at all	1.83	.40	Not at all
11.	Departmental course assessments include tasks involving AI-based tools.	1.92	.39	Not at all	2.17	.40	Not at all
12.	There is strong institutional support for digital transformation.	1.87	.38	Not at all	2.00	.00	Not at all
	GRAND MEAN	**1.93**	**.39**	Not at all	**1.97**	**.27**	Not at all

Table 3 shows that both automobile technology education students (ATESs, n = 172) and lecturers (ATELs, n = 6) rated the preparedness of their programs for AI integration very low across infrastructure, curriculum, and staff training. The grand means of 1.93 (SD = .39) for students and 1.97 (SD = .27) for lecturers indicate uniform agreement that universities are "not at all" prepared. Key gaps include inadequate internet access, absence of AI labs, limited curriculum coverage, a lack of lecturer training, poor industry partnerships, minimal funding, and no AI-focused research spaces. Overall, results highlight a systemic unpreparedness for AI adoption.

Table 4: t-test analysis of respondents on the relationship between institutional readiness and the perceived effectiveness of AI integration in automobile technology education programs

Variables	1	2
Institutional Preparedness	1.00	
Perceived Effectiveness of AI Integration	.79**	1.00

The Pearson correlation coefficient in Table 4 revealed a strong, positive, and statistically significant relationship between institutional preparedness and the perceived effectiveness of AI integration in automobile technology education programs, r (176) = .79, p< .001. This suggests that as institutional preparedness increases (in terms of infrastructure, curriculum development, and staff training), so does the perception of effective AI integration among stakeholders. Therefore, better-prepared institutions are more likely to perceive AI adoption as beneficial and successful. This finding leads to the rejection of the null hypothesis, which stated that there is no significant relationship between institutional preparedness and the perceived effectiveness of AI integration.

Table 5: Mean and standard deviation of ATESs and ATELs on the perceived policy gaps and ethical challenges hindering the responsible integration of AI in automobile technology education in the region

S/N	Items	ATESs N = 172			ATELs N = 6		
		X̄i	SDi	Rmk.	X̄ii	SDii	Rmk.
	Perceived Policy Gaps						
1.	There are clear procedures on how AI-related research issues are handled in my institution.	1.95	.40	Disagree	2.00	.00	Disagree
2.	There are government documents on how universities are to implement AI for research purposes.	1.98	.41	Disagree	1.83	.75	Disagree
3.	There are clear sanctions for unethical AI use in my department/faculty/institution in research.	1.97	.35	Disagree	1.83	.40	Disagree
4.	The university has policies on intellectual property for AI-generated content.	1.94	.42	Disagree	1.83	.40	Disagree
5.	I can categorically assert the safe usage of AI for educational and research purposes at my department/faculty/institution.	1.94	.40	Disagree	2.00	.00	Disagree
6.	Automobile technology education lecturers have a written guide on AI policy for research.	1.91	.42	Disagree	1.83	.40	Disagree
	Perceived Ethical Challenges						
7.	Over-reliance on AI for learning and assessment is acceptable among automobile technology education students.	1.88	.39	Disagree	1.83	.40	Disagree
8.	Automobile technology education students and lecturers know the full risks and dangers of using AI in teaching and learning.	1.96	.34	Disagree	2.17	.40	Disagree
9.	Data privacy issues and concerns using AI tools are well-regulated in my department.	1.95	.37	Disagree	1.83	.40	Disagree
10.	There are clear ethical guidelines on AI use for automobile technology education in my institution.	1.95	.42	Disagree	2.17	.40	Disagree
11.	Automobile technology education lecturers are sure about the ethical use of AI in evaluation.	1.91	.33	Disagree	1.83	.40	Disagree
12.	Cultural attitudes encourage AI integration in vocational and technical learning.	1.96	.36	Disagree	2.00	.63	Disagree
	GRAND MEAN	**1.94**	**.38**	**Disagree**	**1.93**	**.38**	**Disagree**

Table 5 indicates that both ATESsand ATELs perceived significant policy gaps and ethical challenges hindering AI integration in ATESs. The grand means of 1.94 (SD = .38) for ATESs and 1.93 (SD = .38) for ATELs show general disagreement across all items. Specifically, respondents disagreed on the existence of clear procedures, sanctions, intellectual property guidelines, and written AI policies. Ethical challenges such as over-reliance on AI, limited awareness of risks, inadequate regulation of data privacy, and lack of clear ethical guidelines were also highlighted. Overall, the findings reflect systemic policy deficiencies and weak ethical frameworks, undermining responsible AI adoption and integration in South-South Nigerian universities' automobile technology education programs.

Discussion of Findings

Level of Awareness of Institutional and National AI-related Policies

Findings reveal generally low awareness of AI-related policies among students and lecturers in automobile technology programmes. Lecturers demonstrated slightly higher awareness, often through workshops or online materials, but

most respondents were unfamiliar with institutional or national governance documents. This reflects inadequate policy dissemination and integration into curricula, consistent with Reuben and Kabilan (2024) and Sarfo et al. (2024), who noted the gap between policy formulation and stakeholder engagement.

Institutional Preparedness for AI Integration: Infrastructure, Curriculum, and Training

Automobile Technology Education programmes in the South-South region remain largely unprepared for AI adoption. Key barriers include outdated curricula, the absence of AI-equipped laboratories, unreliable internet, and minimal staff training. Similar challenges were documented by Aderibigbe et al. (2023) and Uduafemhe et al. (2024). Without deliberate investments, AI adoption remains aspirational rather than operational (Abbasi et al., 2025).

Perceived Policy Gaps and Ethical Challenges

Respondents highlighted major policy and ethical gaps, including absent institutional frameworks, weak enforcement of national guidelines, limited awareness of privacy and bias, and a lack of oversight mechanisms. Concerns over plagiarism, inequity, and academic dishonesty mirror broader evidence (Omeh et al., 2024; Romanoff & Hidalgo Sanchis, 2019; Obiahu, 2024). These findings underscore the need for localized, enforceable ethical frameworks in Nigerian education.

Differences in Policy Awareness between Lecturers and Students

Lecturers exhibited significantly higher awareness than students, likely due to greater access to professional development and policy documents. However, this gap reflects weak communication strategies, leaving students and key stakeholders less informed. This pattern supports research stressing equitable knowledge dissemination across educational stakeholders (Southworth et al., 2023; Okada et al., 2025).

Institutional Readiness and Perceived Effectiveness of AI Integration

A strong positive relationship emerged between institutional readiness, particularly in terms of infrastructure and staff training, and the perceived effectiveness of AI integration. Well-resourced universities with trained faculty reported greater confidence in AI deployment, echoing findings by Uren and Edwards (2023) and Alam et al. (2024). Conversely, lack of readiness undermines both the actual and perceived benefits of AI in ATE programmes.

Conclusion

This study highlights significant systemic challenges limiting the responsible integration of AI into automobile technology education programs in South-South Nigeria. Both students and lecturers demonstrated low awareness of institutional and national AI policies, with no significant difference between the groups. Institutional preparedness was also found to be very weak, as reflected in outdated curricula, inadequate infrastructure, insufficient training opportunities, and limited industry collaboration. Policy gaps and ethical challenges, such as unclear intellectual property rights, weak enforcement of data privacy, and a lack of formal ethical guidelines, further constrain effective adoption. Despite these shortcomings, a strong positive correlation between institutional readiness and perceived effectiveness underscores the potential benefits of targeted reforms. Addressing these gaps requires coordinated efforts by universities, regulatory bodies, and policymakers to strengthen infrastructure, modernize curricula, establish enforceable ethical frameworks, and build capacity for staff and students. Without these reforms, ATE programs risk being left behind in the global shift toward AI-driven education.

Recommendations

It was recommended that the NUC should ensure the following:

1. That they ensure regular policy reforms, curriculum modernization, ethical training, and infrastructural investment in universities.
2. They should also ensure that there are established AI ethics units in universities.
3. Additionally, they should ensure that there are mandatory AI ethics curricula in universities.
4. More so, they should ensure that there are targeted capacity-building initiatives to prepare future-ready automobile technologists.
5. The NUC should ensure regular policy reforms, curriculum modernization, ethical training, and infrastructural investment in universities.

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