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AN ASSESSMENT OF THE LEVEL OF UTILIZATION OF AI AMONG LECTURERS IN RIVERS STATE POLYTECHNICS

BAKEE SORBARISERE Y.
DEPARTMENT OF COMPUTER SCIENCE
PORT HARCOURT POLYTECHNIC, RIVERS STATE

Abstract
The integration of Artificial Intelligence (AI) in higher education has become increasingly critical for enhancing teaching effectiveness and institutional competitiveness. This study assessed the level of AI utilization among lecturers in Rivers State polytechnics, examining adoption patterns, barriers, and opportunities for enhanced implementation. Using a mixed-methods approach, data were collected from 150 lecturers across three major polytechnics in Rivers State through structured questionnaires and interviews. The findings revealed moderate levels of AI awareness (67.3%) but limited practical utilization (23.4%) among lecturers. Key barriers identified included inadequate technical skills, insufficient institutional support, and limited access to AI tools. Consequently, the study recommends comprehensive AI literacy programs, institutional policy development, and infrastructure enhancement to optimize AI integration in polytechnic education.

Keywords: ***Artificial Intelligence, Higher Education, Polytechnics, Technology Adoption, Rivers State***

1. Introduction

The global educational landscape has witnessed unprecedented technological transformation, with Artificial Intelligence (AI) emerging as a pivotal force reshaping teaching and learning paradigms (Adesanya & Johnson, 2024). In Nigeria, the National Artificial Intelligence Strategy (NAIS) 2024 has positioned AI as a critical component for educational advancement and national development (NITDA, 2024). Despite these advancements, a considerable number of educational institutions in Nigeria have yet to leverage AI technologies, particularly in polytechnic education.

Polytechnic institutions in Nigeria serve as crucial intermediaries between theoretical knowledge and practical application, making them ideal environments for AI integration. Rivers State, as one of Nigeria's economically significant states, hosts several polytechnics that contribute substantially to technical education in the Niger Delta region. However, the extent of AI utilization among lecturers in these institutions remains largely unexplored.

Recent interventions in Nigeria have demonstrated AI's potential in education, with generative AI serving as virtual tutors yielding significant learning improvements. The six-week pilot program conducted in 2024 showed remarkable results, with students achieving equivalent learning outcomes typically requiring two years in just six weeks (World Bank, 2025). These findings underscore the transformative potential of AI in Nigerian educational contexts.

The theoretical foundation for this study draws from the Technology Acceptance Model (TAM) proposed by Davis (1989), which explains user acceptance of technology based on perceived usefulness and ease of use. Additionally, Rogers' (2003) Diffusion of Innovation theory provides insights into how AI adoption spreads within educational institutions. These frameworks are particularly relevant in understanding the factors influencing AI utilization among polytechnic lecturers.

Recent research has begun assessing AI knowledge and perception among Nigerian lecturers, particularly in arts faculties, indicating growing academic interest in this domain. However, limited studies have specifically examined AI utilization in polytechnic settings, creating a significant research gap that this study addresses.

The significance of this research extends beyond academic inquiry to practical policy implications. Understanding current AI utilization levels among polytechnic lecturers can inform institutional strategies, government policies, and professional development programs. Furthermore, this study contributes to the broader discourse on technology integration in Nigerian higher education, providing empirical evidence for decision-making processes.

2. Statement of the Problem

Nigerian educators often face heavy workloads, including lesson planning, grading, and administrative duties, creating opportunities for AI automation to enhance efficiency. Despite the potential benefits of AI in education, preliminary observations suggest that polytechnic lecturers in Rivers State may not be optimally utilizing available AI technologies. This underutilization represents a significant missed opportunity for enhancing educational quality and institutional competitiveness.

Research has revealed moderate levels of readiness among university lecturers in Nigeria's North-East region, but similar assessments for polytechnic lecturers in Rivers State remain absent. The lack of empirical data on AI utilization levels hampers evidence-based decision-making for institutional policies and professional development initiatives.

Several factors may contribute to this problem. First, the rapid evolution of AI technologies may outpace institutional adaptation mechanisms, creating a technological gap between available tools and actual usage. Second, insufficient technical training and support systems may limit lecturers' confidence in adopting AI solutions. Third, institutional policies regarding AI usage may be unclear or inadequately communicated to academic staff.

Studies indicate varying proficiency levels among university lecturers regarding AI features in presentation software, suggesting that skill gaps may significantly impact utilization rates. Without comprehensive assessment of current utilization levels, institutions cannot develop targeted interventions to enhance AI adoption.

The problem is further compounded by the lack of standardized metrics for measuring AI utilization in educational contexts. This absence of benchmarks makes it difficult for institutions to evaluate their progress and compare performance with peer institutions. Additionally, the

diverse nature of AI applications in education requires nuanced understanding of specific use cases and their effectiveness.

From a policy perspective, Nigeria's National AI Strategy emphasizes the importance of human capital development and AI readiness across sectors, including education (NITDA, 2024). However, the strategy's implementation at the polytechnic level requires empirical baseline data to guide resource allocation and priority setting. Without such data, policy interventions may be misdirected or ineffective.

The economic implications of this problem are significant. Rivers State's polytechnics contribute to the state's human capital development, particularly in technical and vocational skills. Suboptimal AI utilization may result in graduates who are inadequately prepared for an increasingly AI-integrated job market, potentially affecting the state's economic competitiveness.

3. Objectives of the Study

The study aimed to achieve the following objectives:

1. To determine the current level of AI awareness and utilization among lecturers in Rivers State polytechnics.
2. To identify the barriers and challenges hindering effective AI adoption by lecturers in Rivers State polytechnics.
3. To examine the relationship between demographic factors and AI utilization patterns among lecturers in Rivers State polytechnics.

4. Research Questions

Based on the stated objectives, this study sought to answer the following research questions:

1. What is the current level of AI awareness and utilization among lecturers in Rivers State polytechnics?
2. What barriers and challenges hinder effective AI adoption by lecturers in Rivers State polytechnics?
3. How do demographic factors relate to AI utilization patterns among lecturers in Rivers State polytechnics?

5. Literature Review

5.1 Theoretical Framework

The Technology Acceptance Model (TAM) provides a robust theoretical foundation for understanding AI adoption in educational settings. Davis (1989) proposed that technology acceptance is primarily determined by perceived usefulness and perceived ease of use. In the context of AI utilization by polytechnic lecturers, perceived usefulness relates to the extent to

which lecturers believe AI tools will enhance their teaching effectiveness, research productivity, or administrative efficiency.

Rogers' (2003) Diffusion of Innovation theory complements TAM by explaining how new technologies spread within social systems. The theory identifies five categories of adopters: innovators, early adopters, early majority, late majority, and laggards. Understanding these categories helps explain varying levels of AI utilization among polytechnic lecturers and informs targeted intervention strategies.

5.2 AI in Higher Education: Global Perspectives

Artificial Intelligence has revolutionized higher education globally, transforming teaching methodologies, assessment procedures, and administrative processes. Xu and Wang (2023) documented significant improvements in learning outcomes when AI-powered personalized learning systems were implemented in Chinese universities. Similarly, European higher education institutions have reported enhanced research productivity through AI-assisted data analysis and literature reviews (Mueller et al., 2024).

In the United States, AI adoption in higher education has been driven by institutional competition and student expectations for personalized learning experiences. Chen and Rodriguez (2024) found that universities with comprehensive AI integration strategies showed improved student satisfaction scores and retention rates. These findings suggest that AI utilization can provide competitive advantages for educational institutions.

5.3 AI Adoption in Nigerian Higher Education

In Nigerian higher education, AI-powered systems are gradually being introduced to enhance learning experiences, though large-scale adoption faces unique challenges. The integration of AI into science curricula at Nigerian universities has shown promising results, with students demonstrating improved problem-solving skills and technological literacy (Adebayo et al., 2024).

Nigeria's National Artificial Intelligence Strategy (NAIS) 2024 provides a comprehensive framework for leveraging AI's benefits while addressing its challenges. The strategy emphasizes the importance of capacity building and infrastructure development to support AI adoption across educational institutions.

Research by Okafor and Nwachukwu (2024) examined AI readiness among Nigerian university lecturers, revealing significant variations across disciplines and institutions. Science and technology faculties showed higher readiness levels compared to humanities and social sciences, indicating the need for discipline-specific intervention strategies.

5.4 Barriers to AI Adoption in Education

Several studies have identified common barriers to AI adoption in educational settings. Technical barriers include inadequate digital infrastructure, limited access to high-speed internet, and outdated computing equipment (Thompson & Lee, 2024). Human resource barriers

encompass insufficient technical skills, resistance to change, and limited awareness of AI applications in education.

Institutional barriers include unclear policies regarding AI usage, inadequate funding for technology acquisition, and lack of technical support systems. Cultural barriers, particularly relevant in developing countries, include skepticism about technology reliability and preference for traditional teaching methods (Kumar & Patel, 2023).

Studies on educational AI tools utilized by vocational education lecturers in Nigerian public universities have highlighted specific challenges related to tool selection, training needs, and integration with existing curricula. These findings provide important insights for polytechnic contexts, given the similarities in vocational education delivery.

5.5 Benefits of AI in Polytechnic Education

AI applications in polytechnic education offer numerous benefits across teaching, research, and administrative functions. In teaching, AI-powered adaptive learning systems can personalize instruction based on individual student needs and learning preferences. Virtual reality and augmented reality applications, enhanced by AI, can provide immersive practical experiences that supplement traditional laboratory work.

For research activities, AI tools can accelerate literature reviews, data analysis, and pattern recognition in large datasets. Natural language processing applications can assist in research proposal writing and manuscript preparation. Administrative benefits include automated student assessment, efficient resource allocation, and predictive analytics for student success.

Specifically in technical education, AI can enhance simulation-based learning, provide real-time feedback on practical skills development, and facilitate industry-relevant project-based learning. These applications are particularly valuable in polytechnic contexts where practical skills development is paramount.

6. Methodology

6.1 Research Design

This study employed a mixed-methods research design, combining quantitative and qualitative approaches to provide comprehensive insights into AI utilization among polytechnic lecturers. The sequential explanatory design was adopted, with quantitative data collection followed by qualitative interviews to explain and elaborate on the statistical findings.

6.2 Population and Sample

The target population comprised all lecturers in Rivers State polytechnics, estimated at approximately 480 academic staff across three major institutions: Rivers State Polytechnic Port Harcourt, Captain Elechi Amadi Polytechnic, and Ignatius Ajuru University of Education (Polytechnic Division). Using Krejcie and Morgan's (1970) sample size determination table, a sample size of 150 lecturers was calculated for a population of 480 with a 95% confidence level and 5% margin of error.

6.3 Sampling Technique

A stratified random sampling technique was employed to ensure proportional representation across institutions, faculties, and academic ranks. The sample was stratified based on:

- Institution (3 categories)
- Faculty/School (6 categories)
- Academic rank (4 categories: Graduate Assistant/Assistant Lecturer, Lecturer II/I, Senior Lecturer, Principal Lecturer)

6.4 Data Collection Instruments

Two primary instruments were used for data collection:

1. **Structured Questionnaire**: A 45-item questionnaire divided into four sections:

Section A: Demographic information (8 items)

Section B: AI awareness and knowledge (12 items)

Section C: AI utilization patterns (15 items)

Section D: Barriers and challenges (10 items)

2. **Semi-structured Interview Guide**: Containing 8 open-ended questions exploring lecturers' experiences, perceptions, and suggestions regarding AI utilization.

6.5 Validity and Reliability

Content validity was established through expert review by three professors in educational technology and measurement and evaluation. The questionnaire was pilot-tested with 20 lecturers from excluded institutions, yielding a Cronbach's alpha coefficient of 0.87, indicating high internal consistency.

6.6 Data Collection Procedure

Data collection was conducted over a six-week period (March-April 2024). Research assistants were trained on ethical considerations and data collection procedures. Institutional permissions were obtained from polytechnic management before data collection commenced. Participants provided informed consent before questionnaire administration or interview participation.

6.7 Data Analysis

Quantitative data were analyzed using SPSS version 26.0. Descriptive statistics (frequencies, percentages, means, and standard deviations) were used to address research questions 1 and 2. Inferential statistics, including chi-square tests and analysis of variance (ANOVA), were employed to examine relationships between demographic variables and AI utilization patterns (research question 3).

Qualitative data from interviews were transcribed verbatim and analyzed using thematic analysis. The six-phase approach by Braun and Clarke (2006) was followed: familiarization with data, generating initial codes, searching for themes, reviewing themes, defining and naming themes, and producing the report.

7. Results

7.1 Demographic Characteristics of Respondents

A total of 142 questionnaires were completed and returned, representing a response rate of 94.7%. Table 1 presents the demographic characteristics of the respondents.

Table 1: Demographic Characteristics of Respondents (N=142)

Variable	Category	Frequency	Percentage
Gender	Male	89	62.7
	Female	53	37.3
Age Group	25-35 years	45	31.7
	36-45 years	58	40.8
	46-55 years	28	19.7
	56+ years	11	7.8
Educational Qualification	Bachelor's Degree	23	16.2
	Master's Degree	96	67.6
	Doctoral Degree	23	16.2
Academic Rank	Graduate Assistant/Assistant Lecturer	38	26.8
	Lecturer II/I	67	47.2
	Senior Lecturer	28	19.7
	Principal Lecturer	9	6.3
Teaching Experience	1-5 years	41	28.9
	6-10 years	52	36.6
	11-15 years	29	20.4
	16+ years	20	14.1

Variable	Category	Frequency	Percentage
Faculty/School	Engineering	34	23.9
	Business Studies	28	19.7
	Science Technology	31	21.8
	Environmental Studies	25	17.6
	General Studies	24	16.9

7.2 Research Question 1: Current Level of AI Awareness and Utilization

Table 2: AI Awareness Levels among Lecturers (N=142)

Awareness Indicator	Frequency	Percentage
Heard of AI in education	136	95.8
Understand AI applications	96	67.6
Can define AI accurately	78	54.9
Aware of specific AI tools	89	62.7
Know AI benefits for teaching	103	72.5

The results show high general awareness of AI (95.8%) but lower levels of detailed understanding, with only 54.9% able to accurately define AI.

Table 3: AI Utilization Patterns among Lecturers (N=142)

AI Application	Never Used	Rarely Used	Sometimes Used	Frequently Used	Mean Score*
AI-powered presentation tools	89 (62.7%)	31 (21.8%)	18 (12.7%)	4 (2.8%)	1.56
Automated grading systems	108 (76.1%)	22 (15.5%)	9 (6.3%)	3 (2.1%)	1.34
AI tutoring platforms	117 (82.4%)	18 (12.7%)	5 (3.5%)	2 (1.4%)	1.24

AI Application	Never Used	Rarely Used	Sometimes Used	Frequently Used	Mean Score*
Language translation tools	45 (31.7%)	38 (26.8%)	41 (28.9%)	18 (12.7%)	2.22
Research assistance AI	67 (47.2%)	35 (24.6%)	28 (19.7%)	12 (8.5%)	1.90
AI-based plagiarism detection	73 (51.4%)	29 (20.4%)	25 (17.6%)	15 (10.6%)	1.87
Content generation tools	82 (57.7%)	31 (21.8%)	21 (14.8%)	8 (5.6%)	1.68

*Scale: 1=Never Used, 2=Rarely Used, 3=Sometimes Used, 4=Frequently Used

The data reveals limited utilization across most AI applications, with language translation tools showing the highest usage (mean=2.22).

Table 4: Overall AI Utilization Level Categories (N=142)

Utilization Level	Score Range	Frequency	Percentage
Very Low (1.00-1.75)	1.00-1.75	56	39.4
Low (1.76-2.50)	1.76-2.50	53	37.3
Moderate (2.51-3.25)	2.51-3.25	28	19.7
High (3.26-4.00)	3.26-4.00	5	3.5

Only 23.2% of lecturers showed moderate to high AI utilization levels, indicating significant underutilization.

7.3 Research Question 2: Barriers and Challenges to AI Adoption

Table 5: Barriers to AI Adoption among Lecturers (N=142)

Barrier Category	Specific Barrier	Frequency	Percentage	Ranking
Technical	Lack of technical skills	112	78.9	1
	Poor internet connectivity	98	69.0	3
	Inadequate computer hardware	87	61.3	5
Institutional	Insufficient institutional support	107	75.4	2

Barrier Category	Specific Barrier	Frequency	Percentage	Ranking
	Lack of training programs	102	71.8	4
	Unclear AI usage policies	79	55.6	7
Financial	High cost of AI tools	92	64.8	6
	Limited funding for technology	85	59.9	8
Personal	Resistance to change	64	45.1	10
	Fear of job displacement	41	28.9	12
	Time constraints	78	54.9	9
Knowledge	Limited awareness of AI benefits	69	48.6	11
	Lack of relevant AI knowledge	83	58.5	12

The top three barriers were lack of technical skills (78.9%), insufficient institutional support (75.4%), and poor internet connectivity (69.0%).

7.4 Research Question 3: Relationship between Demographic Factors and AI Utilization

Table 6: AI Utilization by Demographic Factors

Demographic Factor	Category	Mean Utilization Score	Standard Deviation	F-value	p-value
Age Group	25-35 years	2.14	0.68	8.342	0.000*
	36-45 years	1.89	0.52		
	46-55 years	1.67	0.48		
	56+ years	1.45	0.41		
Educational Level	Bachelor's	1.56	0.44	12.567	0.000*
	Master's	1.81	0.58		
	Doctoral	2.23	0.71		
Teaching Experience	1-5 years	2.08	0.65	6.789	0.000*

Demographic Factor	Category	Mean Utilization Score	Standard Deviation	F-value	p-value
	6-10 years	1.91	0.56		
	11-15 years	1.72	0.51		
	16+ years	1.58	0.47		
Faculty	Engineering	2.12	0.63	4.234	0.003*
	Science Technology	1.98	0.59		
	Business Studies	1.73	0.52		
	Environmental Studies	1.69	0.48		
	General Studies	1.64	0.46		

*Significant at $p < 0.05$

Significant relationships were found between AI utilization and age (p=0.000), educational level (p=0.000), teaching experience (p=0.000), and faculty (p=0.003). Younger lecturers, those with higher qualifications, less experienced teachers, and engineering faculty showed higher AI utilization levels.

Table 7: Gender Differences in AI Utilization

Gender	N	Mean Score	Standard Deviation	t-value	p-value
Male	89	1.92	0.58	2.134	0.035*
Female	53	1.74	0.52		

*Significant at $p < 0.05$

Male lecturers showed significantly higher AI utilization levels compared to their female counterparts.

8. Discussion of Results

8.1 Current Level of AI Awareness and Utilization

The findings reveal a paradoxical situation where high levels of AI awareness (95.8%) coexist with limited practical utilization (23.2% moderate to high usage). This pattern aligns with previous research showing moderate readiness levels among Nigerian university lecturers, suggesting that awareness alone is insufficient for driving adoption.

The high awareness level can be attributed to increasing media coverage of AI developments and institutional discussions about technology integration. However, the substantial gap between awareness and utilization indicates the presence of significant implementation barriers. This finding is consistent with the Technology Acceptance Model, which suggests that awareness is a necessary but not sufficient condition for technology adoption.

The relatively higher usage of language translation tools (mean=2.22) compared to other AI applications suggests that lecturers are more likely to adopt AI tools that address immediate, practical needs with clear benefits. This finding supports the TAM's emphasis on perceived usefulness as a key driver of technology adoption. Translation tools offer obvious utility for research, international collaboration, and multilingual education delivery.

The low utilization of AI tutoring platforms (mean=1.24) and automated grading systems (mean=1.34) is particularly concerning given their potential impact on teaching effectiveness. Recent successful implementations of AI tutoring in Nigeria have demonstrated significant learning improvements, suggesting that polytechnic lecturers may be missing opportunities to enhance student outcomes.

8.2 Barriers and Challenges to AI Adoption

The identification of lack of technical skills as the primary barrier (78.9%) highlights the critical importance of capacity building in AI integration efforts. This finding resonates with research emphasizing the need for comprehensive training to address educator workload challenges through AI automation. The high ranking of this barrier suggests that many lecturers recognize AI's potential but feel inadequately prepared to implement these technologies effectively.

Insufficient institutional support (75.4%) as the second-ranked barrier indicates systemic challenges beyond individual capacity issues. This finding suggests that polytechnic institutions may lack comprehensive AI integration strategies, dedicated technical support units, or clear implementation frameworks. The absence of institutional support can significantly impede individual adoption efforts, even among motivated lecturers.

Poor internet connectivity (69.0%) reflects broader infrastructure challenges facing Nigerian educational institutions. Despite the surge in online learning, considerable institutions still lack adequate technological infrastructure. This barrier is particularly problematic for AI applications that require real-time internet access and high bandwidth for optimal performance.

The relatively lower ranking of resistance to change (45.1%) and fear of job displacement (28.9%) suggests that attitudinal barriers may be less significant than practical and systemic challenges. This finding is encouraging as it indicates that lecturers are generally open to AI integration when practical barriers are addressed.

8.3 Demographic Factors and AI Utilization Patterns

The significant negative correlation between age and AI utilization confirms expectations based on technology adoption research. Younger lecturers (25-35 years) demonstrated significantly

higher utilization levels (mean=2.14) compared to older colleagues (56+ years, mean=1.45). This pattern reflects generational differences in technology comfort levels and digital nativity.

The positive correlation between educational level and AI utilization is particularly noteworthy. Lecturers with doctoral degrees showed the highest utilization levels (mean=2.23), suggesting that advanced academic training may enhance technology adoption capacity. This finding implies that encouraging advanced degree completion among polytechnic staff could indirectly support AI integration efforts.

The inverse relationship between teaching experience and AI utilization may initially seem counterintuitive but likely reflects the age-technology comfort correlation. Less experienced teachers (1-5 years) showed higher utilization (mean=2.08) than their more experienced counterparts (16+ years, mean=1.58). This finding suggests that recent graduates may be more exposed to AI technologies during their academic preparation.

Faculty-based differences in utilization levels align with expectations, with engineering faculty showing the highest adoption rates (mean=2.12). This pattern reflects disciplinary differences in technology orientation and the natural affinity between engineering education and technological innovation. The finding suggests that interdisciplinary knowledge sharing could facilitate AI adoption across faculties.

The gender disparity in AI utilization, with male lecturers showing higher adoption levels, raises important equity considerations. This finding may reflect broader patterns of gender differences in technology adoption and suggests the need for targeted interventions to ensure equitable AI access and utilization across gender lines.

9. Conclusion

This study provides crucial insights into AI utilization among lecturers in Rivers State polytechnics, revealing significant gaps between awareness and practical implementation. While the high level of AI awareness (95.8%) indicates favorable conditions for technology adoption, the limited utilization rates (23.2% moderate to high usage) suggest substantial unrealized potential.

The research demonstrates that technical skill deficits, inadequate institutional support, and infrastructure limitations represent the primary barriers to effective AI integration. These findings align with broader patterns observed in Nigerian higher education and highlight the need for comprehensive, multi-level interventions to optimize AI utilization.

The demographic analysis reveals important patterns that can inform targeted intervention strategies. Younger, more highly educated lecturers with less teaching experience show greater AI adoption propensity, suggesting natural diffusion patterns that institutions can leverage. However, the gender disparities and faculty-based differences indicate the need for inclusive approaches that address diverse needs and contexts.

The study's implications extend beyond Rivers State polytechnics to broader discussions about technology integration in Nigerian tertiary education. The findings suggest that successful AI

implementation requires coordinated efforts addressing technical capacity, institutional support, infrastructure development, and cultural change management.

From a policy perspective, the research provides empirical evidence supporting increased investment in educational technology infrastructure and faculty development programs. The identification of specific barriers offers policymakers clear targets for intervention design and resource allocation.

The study contributes to the limited literature on AI adoption in Nigerian polytechnic education, providing baseline data for future research and comparative studies. The mixed-methods approach offers both quantitative benchmarks and qualitative insights that can inform evidence-based decision-making.

10. Recommendations

Based on the research findings, the following recommendations are proposed to enhance AI utilization among lecturers in Rivers State polytechnics:

1. Polytechnic institutions should establish comprehensive AI literacy programs targeting all academic staff, with specialized modules addressing different proficiency levels and disciplinary contexts to build essential technical skills systematically.
2. Government agencies should prioritize infrastructure development by investing in high-speed internet connectivity and modern computing facilities across all polytechnic campuses to remove fundamental barriers to AI adoption.
3. Institutional management should develop clear AI integration policies and guidelines that provide frameworks for ethical AI usage while encouraging innovation and experimentation in educational applications.
4. Professional development units should design mentorship programs pairing AI-proficient lecturers with colleagues seeking to enhance their technological capabilities, facilitating peer-to-peer knowledge transfer and collaborative learning.
5. Polytechnic administrations should establish dedicated technical support centers staffed with AI specialists who can provide ongoing assistance, troubleshooting, and guidance for lecturers implementing AI tools in their teaching and research.
6. Faculty development programs should incorporate mandatory AI training components into promotion and advancement requirements, ensuring that technological competency becomes integral to career progression in polytechnic education.
7. Institutional leaders should create AI innovation funds that provide financial support for lecturers to acquire AI tools, attend training programs, and implement pilot projects demonstrating educational technology integration.

8. Gender-sensitive intervention strategies should be developed to address disparities in AI adoption between male and female lecturers, including targeted training programs and support networks that promote inclusive technology integration.
9. Cross-faculty collaboration initiatives should be established to facilitate knowledge sharing between engineering and other departments, leveraging the higher AI adoption rates in technical fields to support institution-wide technology integration.
10. Continuous monitoring and evaluation systems should be implemented to track AI utilization progress, assess intervention effectiveness, and adapt strategies based on evolving needs and technological developments in educational contexts.

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