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The Role of Artificial Intelligence in Curriculum Development at the Tertiary Education Level

Chukwuka Judith Nkolika
Nwafor Orizu College of Education Nsugbe, Nigeria

ABSTRACT

Background: Integrating Artificial Intelligence (AI) into higher education holds significant potential to enhance pedagogy, yet institutional and contextual barriers often hinder implementation in developing regions. **Objective:** This study investigated the factors influencing lecturers' teaching practices, professional competency needs, and perceived challenges regarding AI integration in curriculum development across tertiary institutions in Anambra State, Nigeria. Method: A descriptive survey design was employed with 62 lecturers sampled through an online Likert-scale questionnaire (alpha = 0.85) distributed via Google Forms. Data were analyzed using descriptive statistics and Analysis of Variance (ANOVA) in SPSS version 23. **Result:** Findings revealed that AI offers substantial benefits, notably replicating effective teaching strategies, supporting data-driven curriculum planning, and personalizing student learning. However, prominent systemic barriers emerged, particularly insufficient technical expertise, educator resistance, limited access to high-quality data, and financial constraints. ANOVA tests indicated no significant perceptual differences regarding these benefits and limitations across varying years of teaching experience ($p > 0.05$). **Conclusion:** AI presents transformative opportunities for tertiary curricula, but effective institutional adoption necessitates mitigating operational bottlenecks, bridging skill deficits, and establishing ethical frameworks. **Originality/Value:** This research enriches the empirical discourse on educational technology in developing economies by uncovering critical faculty perspectives on AI-driven curriculum development. It provides strategic references for policymakers to direct digital infrastructure investments and design sustainable faculty training programs.

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1. INTRODUCTION

The integration of Artificial Intelligence (AI) in curriculum development at the tertiary education level has been a significant focus in recent academic literature. Tertiary education, also known as higher education, refers to the level of education following the completion of secondary school (Su & Zhong, 2022). It includes universities, colleges, and vocational institutions that offer undergraduate, graduate, and professional degrees, diplomas, or certificates. Tertiary education provides advanced knowledge, specialized skills, and critical thinking abilities in various academic and professional fields. It serves as a pathway for individuals to deepen expertise, pursue research, and enhance career prospects (Chiu et al, 2021). This level of education is crucial for personal development, societal progress, and economic growth, often aligning with national and global workforce demands. AI offers immense potential to enhance curriculum design, learning outcomes, and student experiences through intelligent systems, data analytics, and automation (Bae et al, 2020).

* **Corresponding Author:** Chukwuka Judith Nkolika, judithchukwuka70@gmail.com
Department of Curriculum and Instructional Technology, Nwafor Orizu College of Education Nsugbe
Address: No. 1 college road, Abata, Nsugbe 432108, Anambra, Nigeria

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Artificial Intelligence (AI) refers to the simulation of human intelligence in machines designed to think, learn, and problem-solve autonomously (Oluyemisi, 2023). AI systems use algorithms and data to perform tasks typically requiring human cognitive functions, such as recognizing patterns, making decisions, understanding language, and visual perception (Oladipo et al, 2024). These systems can improve over time through machine learning, adapting their actions based on new data. AI is applied in various fields, including robotics, healthcare, finance, and education, enabling innovations that enhance efficiency, accuracy, and the automation of complex processes previously dependent on human intervention (Iweuno et al, 2024).

AI enables personalized learning by tailoring educational experiences to individual students' needs. AI-driven platforms use machine learning algorithms to analyze students' learning styles, preferences, and progress, thus facilitating adaptive learning (Chisom et al, 2023). Adaptive learning systems adjust the curriculum content and pace to meet the needs of diverse learners, offering a more student-centered approach compared to traditional teaching models. For instance, AI can assess students' strengths and weaknesses and adapt the curriculum to focus on areas requiring improvement, ensuring that learning pathways are both efficient and effective (Awan, 2024).

AI's ability to process large volumes of data helps inform curriculum development by providing data-driven insights into student performance, engagement, and learning trends. Curriculum development is the systematic process of designing, organizing, and refining educational programs and instructional materials to meet specific learning objectives (Ayanwale et al, 2024). It involves identifying the knowledge, skills, and competencies that students need to acquire, as well as determining the appropriate content, teaching methods, assessment strategies, and learning experiences. This process often considers the needs of learners, societal demands, and evolving industry trends. Curriculum development is iterative and responsive, requiring regular updates to stay relevant and effective in achieving desired educational outcomes (Nja et al, 2023). It aims to ensure coherence, continuity, and progression in learning at various educational levels.

Through the use of big data analytics, institutions can track and analyze student learning behaviors, identifying which aspects of the curriculum are most and least effective. Such insights can guide curriculum developers in refining course content, restructuring instructional strategies, and incorporating relevant skills based on real-time data from the learning environment. For example, Ukeje et al, (2024) emphasize that AI-based learning analytics can highlight gaps in curriculum design, which allows educators to make informed adjustments to improve learning outcomes and alignment with industry demands.

AI also plays a pivotal role in curriculum mapping and alignment by analyzing course structures and aligning them with academic standards and learning outcomes. AI tools are capable of automating the mapping of curriculum content to learning objectives, accreditation requirements, and industry competencies. This is especially relevant in ensuring that courses remain up-to-date with evolving industry standards and technological advancements (Sanusi et al, 2024). Curriculum alignment ensures that the educational experience is coherent and prepares students for the demands of the modern workforce. AI systems can evaluate whether the curriculum supports desired outcomes and provide recommendations for course improvements or additions, ensuring that programs remain relevant and competitive (Jatileni et al, 2023).

AI has the potential to foster interdisciplinary learning by facilitating the integration of diverse subject areas within the curriculum. As the global economy increasingly values skills that span multiple disciplines, AI can assist in creating curricula that break down traditional academic silos (Endurance et al, 2021). AI tools can analyze patterns and relationships across different knowledge domains and suggest ways to integrate subjects such as computer science, engineering, the arts, and social sciences in innovative ways. According to Eiriemiokhale et al, (2024), AI-enhanced curriculum design can lead to more holistic and interdisciplinary learning experiences, which are essential in preparing students for complex, real-world challenges.

The urgency of studying the role of Artificial Intelligence (AI) in curriculum development at the tertiary education level stems from its potential to address current educational needs and challenges. AI offers significant benefits in enhancing curriculum design, including personalized learning, data-driven insights, and curriculum alignment with evolving industry requirements (Oluyemisi et al, 2024). AI-powered tools facilitate adaptive and responsive curricula, tailored to individual learning styles and job market demands, which can lead to improved student outcomes. However, AI implementation in curriculum development faces considerable limitations. Ethical concerns such as algorithmic bias and the risk of reinforcing existing educational inequities remain pressing issues. Additionally, data privacy challenges arise, as AI systems require the collection and analysis of vast amounts of student information. These limitations highlight the need for further exploration to ensure AI-driven curriculum design remains equitable, transparent, and secure.

Research objectives (1) to identify the benefits of artificial intelligence in enhancing curriculum design at the tertiary education level; (2) to analyze the limitations of implementing artificial intelligence in curriculum development at the tertiary education level

Research questions (1) what are the benefits of using artificial intelligence in enhancing curriculum design at the tertiary education level?; (2) what are the limitations of implementing artificial intelligence in curriculum development at the tertiary education level?

Hypotheses (1) there is no significant difference in the perceived benefits of artificial intelligence in enhancing curriculum design among lecturers of different working experience; (2) there is no significant difference in the perceived limitations of implementing artificial intelligence in curriculum development among lecturers of different working experience.

2. METHOD

2.1 Research Design

This study employs a descriptive survey design to explore the challenges and factors influencing lecturers' teaching practices and professional competency needs in tertiary institutions across Anambra State, Nigeria. The research focuses on universities, polytechnics, and colleges of education within the state.

2,2 Research Subject

The research focuses on universities, polytechnics, and colleges of education within Anambra State. The population of the study consists of lecturers working in these institutions.

2.3 Data Collection

The primary data collection instrument was a structured questionnaire designed to gather information on lecturers' teaching effectiveness, resource management, and professional challenges. The questionnaire comprised two sections: one for demographic data and another using a five-point Likert scale to assess teaching practices and competency needs. It was administered online via Google Forms to facilitate wide participation and overcome logistical barriers. A total of 62 lecturers responded to the survey. To ensure validity, the questionnaire was reviewed by experts in education and research methodology, and subsequently pilot-tested. The instrument demonstrated good internal consistency, with a Cronbach's alpha reliability score of 0.85. The survey link was disseminated through institutional email lists, professional networks, and social media platforms.

2.4 Data Analysis

Data collected were analyzed using both descriptive and inferential statistical methods. Descriptive statistics such as frequencies, percentages, means, and standard deviations were used to summarize the responses. Inferential statistics, specifically Analysis of Variance (ANOVA), were employed to examine the relationships between variables. All analyses were conducted using SPSS version 23, and findings were presented in tables with corresponding interpretations.

3. RESULT AND DISCUSSION

3.1 Result

Table 1: Demographic data for Years of Teaching Experience

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0-5 years	13	21.0	21.0	21.0
	6-10 years	16	25.8	25.8	46.8
	11-15 years	14	22.6	22.6	69.4
	16 -26 years	12	19.4	19.4	88.7
	26+ years	7	11.3	11.3	100.0
	Total	62	100.0	100.0	

The demographic data for teaching experience in table 1 shows that most respondents have between 6-10 years of experience (25.8%), followed by those with 11-15 years (22.6%) and 0-5 years (21.0%). Educators with 16-26

years of experience account for 19.4%, while those with over 26 years represent the smallest group at 11.3%. The total sample includes 62 individuals, with cumulative percentages reaching 100% across all experience categories.

Table 2: Demographic data for Gender

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Male	22	35.5	35.5	35.5
	Female	40	64.5	64.5	100.0
	Total	62	100.0	100.0	

The demographic data for gender in table 2 shows that the majority of respondents are female (64.5%), while males make up 35.5% of the sample. The total number of participants is 62, with cumulative percentages reaching 100%. This indicates a higher representation of females in the sample compared to males.

Research Question 1: Benefits of using artificial intelligence in enhancing curriculum design at the tertiary education level

Table 3: Descriptive Statistics on benefits of using artificial intelligence in enhancing curriculum design at the tertiary education level

	Mean	Std. Deviation	Variance	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
AI can personalize curriculum design to meet diverse student needs effectively.	3.31	.616	.380	-.296	.304	-.596	.599
AI helps in optimizing course content based on student performance data.	3.37	.607	.368	-.392	.304	-.627	.599
AI-driven tools can streamline curriculum development processes for efficiency.	3.26	.571	.326	-.041	.304	-.384	.599
AI provides real-time feedback to improve instructional materials and methods.	3.24	.592	.350	-.113	.304	-.408	.599
AI enables adaptive learning experiences tailored to individual student progress.	3.27	.705	.497	-.446	.304	-.880	.599
AI assists in predicting future educational trends and content requirements.	3.31	.616	.380	-.296	.304	-.596	.599
AI supports data-driven decisions for more effective curriculum planning.	3.47	.646	.417	-.820	.304	-.341	.599
AI tools facilitate continuous assessment and adjustments of curriculum effectiveness.	3.34	.626	.392	-.393	.304	-.624	.599
AI enhances collaboration between educators by sharing best curriculum practices.	3.34	.626	.392	-.393	.304	-.624	.599
AI identifies successful teaching strategies and replicates them across courses.	3.53	.646	.417	-1.067	.304	.062	.599

	Mean	Std. Deviation	Variance	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
Valid N (listwise)							

The descriptive statistics in table 3 reveal that the perceived benefits of using AI in curriculum design are generally positive, with mean scores ranging from 3.24 to 3.53 on a 5-point scale. The highest-rated benefit is AI's ability to identify and replicate successful teaching strategies across courses (Mean = 3.53, Std. Deviation = 0.646). Other key benefits include AI's support for data-driven curriculum planning (Mean = 3.47, Std. Deviation = 0.646) and personalization of curriculum design (Mean = 3.31, Std. Deviation = 0.616). The skewness and kurtosis values suggest a slight negative skew, indicating mild agreement with the benefits of AI.

Research Question 2: Limitations of implementing artificial intelligence in curriculum development

Table 4: Descriptive Statistics on limitations of implementing artificial intelligence in curriculum development

	Mean	Std. Deviation	Variance	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
Limited access to high-quality data hinders effective AI implementation.	3.52	.646	.418	-1.003	.304	-.058	.599
High costs of AI technologies can be a financial burden.	3.39	.930	.864	-.861	.304	-1.302	.599
Insufficient technical expertise limits the successful deployment of AI tools.	3.61	.636	.405	-1.426	.304	.901	.599
Resistance from educators can impede the integration of AI solutions.	3.61	.636	.405	-1.426	.304	.901	.599
AI systems may perpetuate existing biases present in the data.	3.32	.621	.386	-.344	.304	-.615	.599
The complexity of AI algorithms can be challenging to understand.	3.19	.568	.323	.012	.304	-.130	.599
Continuous updates are required to keep AI tools relevant and effective.	3.45	.645	.416	-.763	.304	-.412	.599
Over-reliance on AI may reduce the role of human judgment.	3.26	.974	.949	-1.208	.304	.436	.599
AI tools might not adequately address diverse learning needs of students.	3.47	.646	.417	-.820	.304	-.341	.599
Security vulnerabilities can expose sensitive student data to breaches.	3.47	.646	.417	-.820	.304	-.341	.599

	Mean	Std. Deviation	Variance	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
Valid N (listwise)							

Table 4 presents descriptive statistics on the limitations of implementing AI in curriculum development. The mean scores for limitations range from 3.19 to 3.61 on a scale, indicating moderate concern. "Insufficient technical expertise" and "resistance from educators" both have the highest mean (3.61), suggesting significant perceived challenges. "High costs of AI technologies" and "over-reliance on AI" have lower means (3.39 and 3.26), indicating somewhat less concern. The standard deviations range from 0.568 to 0.974, reflecting varying degrees of consensus among respondents. Skewness and kurtosis values indicate most concerns are fairly balanced, though some issues like "complexity of AI algorithms" show more variability.

Hypothesis 1: There is no significant difference in the perceived benefits of artificial intelligence in enhancing curriculum design among lecturers of different working experience.

Table 5: Analysis of variance (ANOVA) for difference in the perceived benefits of artificial intelligence in enhancing curriculum design among lecturers of different working experience

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	137.640	4	34.410	1.133	.350
Within Groups	1731.602	57	30.379		
Total	1869.242	61			

The analysis of variance (ANOVA) in Table 5 examines whether there are significant differences in the perceived benefits of AI in enhancing curriculum design among lecturers with varying years of teaching experience. The F-value is (1.133) with a significance level of (0.350), which is above the typical alpha level of (0.05). This indicates that there are no statistically significant differences in perceived benefits across the different experience groups.

Table 6: Least Significant Difference (LSD) post hoc tests for perceived benefits of artificial intelligence in enhancing curriculum design among lecturers of different working experience

(I) Years of Teaching Experience	(J) Years of Teaching Experience	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval Lower Bound	Upper Bound
0-5 years	6-10 years	-2.08173	2.05804	.316	-6.2029	2.0394
	11-15 years	-1.76923	2.12292	.408	-6.0203	2.4818
	16 -26 years	-4.26923	2.20645	.058	-8.6876	.1491
	26+ years	-3.91209	2.58393	.136	-9.0863	1.2621
6-10 years	0-5 years	2.08173	2.05804	.316	-2.0394	6.2029
	11-15 years	.31250	2.01708	.877	-3.7266	4.3516
	16 -26 years	-2.18750	2.10482	.303	-6.4023	2.0273
	26+ years	-1.83036	2.49771	.467	-6.8319	3.1712
11-15 years	0-5 years	1.76923	2.12292	.408	-2.4818	6.0203
	6-10 years	-.31250	2.01708	.877	-4.3516	3.7266
	16 -26 years	-2.50000	2.16830	.254	-6.8419	1.8419
	26+ years	-2.14286	2.55143	.404	-7.2520	2.9663
16 -26 years	0-5 years	4.26923	2.20645	.058	-.1491	8.6876
	6-10 years	2.18750	2.10482	.303	-2.0273	6.4023
	11-15 years	2.50000	2.16830	.254	-1.8419	6.8419
	26+ years	.35714	2.62134	.892	-4.8920	5.6063
26+ years	0-5 years	3.91209	2.58393	.136	-1.2621	9.0863
	6-10 years	1.83036	2.49771	.467	-3.1712	6.8319
	11-15 years	2.14286	2.55143	.404	-2.9663	7.2520
	16 -26 years	-.35714	2.62134	.892	-5.6063	4.8920

Table 6 provides the results of the Least Significant Difference (LSD) post hoc tests, showing pairwise comparisons between groups. None of the comparisons reveal significant differences, as all p-values exceed (0.05). For instance, the mean difference between "0-5 years" and "6-10 years" is (-2.08173), with a p-value of (0.316), and between "16-26 years" and "26+ years" is (-0.35714), with a p-value of (0.892). These results confirm that the perceived benefits of AI do not vary significantly based on teaching experience. Therefore, the hypothesis stating that there is no significant difference in perceived benefits of AI among lecturers of different working experience is accepted.

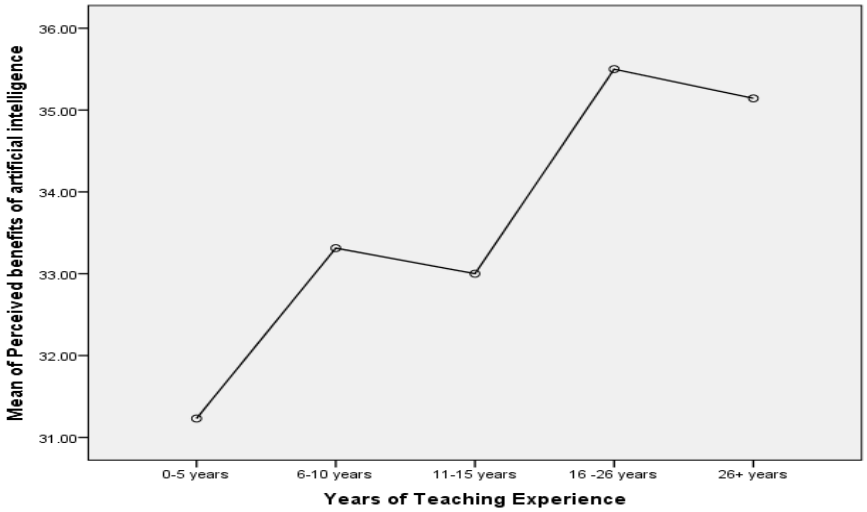


Figure 1: Mean plot of perceived benefits of artificial intelligence in enhancing curriculum design

Figure 1 shows the mean plot of perceived benefits of artificial intelligence (AI) in enhancing curriculum design across various years of teaching experience. Teachers with 16–26 years of experience have the highest perceived benefits, followed by those with 6–10 years. New teachers (0–5 years) report the lowest perceived benefits of AI.

Hypothesis 2: There is no significant difference in the perceived limitations of implementing artificial intelligence in curriculum development among lecturers of different working experience.

Table 7: Analysis of variance (ANOVA) for difference in the perceived limitations of implementing artificial intelligence in curriculum development among lecturers of different working experience

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	149.808	4	37.452	1.221	.312
Within Groups	1748.966	57	30.684		
Total	1898.774	61			

The analysis examines whether there are significant differences in perceived limitations of implementing AI in curriculum development among lecturers with varying years of teaching experience. Table 7 presents an ANOVA, showing an F-value of 1.221 with a significance level of 0.312, indicating no significant difference between the groups.

Table 8: Least Significant Difference (LSD) post hoc tests for perceived limitations of implementing artificial intelligence in curriculum development among lecturers of different working experience

(I) Years of Teaching Experience	(J) Years of Teaching Experience	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval Lower Bound	95% Confidence Interval Upper Bound
0-5 years	6-10 years	-3.27885	2.06833	.118	-7.4206	.8629
	11-15 years	-1.58242	2.13353	.461	-5.8547	2.6899
	16 -26 years	-3.82051	2.21749	.090	-8.2610	.6199
	26+ years	-4.43956	2.59685	.093	-9.6397	.7606
6-10 years	0-5 years	3.27885	2.06833	.118	-.8629	7.4206
	11-15 years	1.69643	2.02717	.406	-2.3629	5.7558
	16 -26 years	-.54167	2.11535	.799	-4.7776	3.6942

	26+ years	-1.16071	2.51020	.646	-6.1873	3.8659
11-15 years	0-5 years	1.58242	2.13353	.461	-2.6899	5.8547
	6-10 years	-1.69643	2.02717	.406	-5.7558	2.3629
	16 -26 years	-2.23810	2.17914	.309	-6.6017	2.1256
	26+ years	-2.85714	2.56419	.270	-7.9918	2.2776
16 -26 years	0-5 years	3.82051	2.21749	.090	-.6199	8.2610
	6-10 years	.54167	2.11535	.799	-3.6942	4.7776
	11-15 years	2.23810	2.17914	.309	-2.1256	6.6017
	26+ years	-.61905	2.63445	.815	-5.8944	4.6564
26+ years	0-5 years	4.43956	2.59685	.093	-.7606	9.6397
	6-10 years	1.16071	2.51020	.646	-3.8659	6.1873
	11-15 years	2.85714	2.56419	.270	-2.2776	7.9918
	16 -26 years	.61905	2.63445	.815	-4.6564	5.8944

Table 8, which includes Least Significant Difference (LSD) post hoc tests, provides further detail. The mean differences between groups range from -4.440 (between 0-5 years and 26+ years) to 3.820 (between 0-5 years and 16-26 years), with significance values mostly above 0.05. The comparisons between different experience levels, such as 0-5 years vs. 6-10 years (p = 0.118) and 16-26 years vs. 26+ years (p = 0.815), show no statistically significant differences. These results suggest that perceived limitations of AI implementation do not significantly vary with teaching experience. Therefore, the hypothesis stating there is no significant difference in perceived limitations among lecturers of different working experience is accepted.

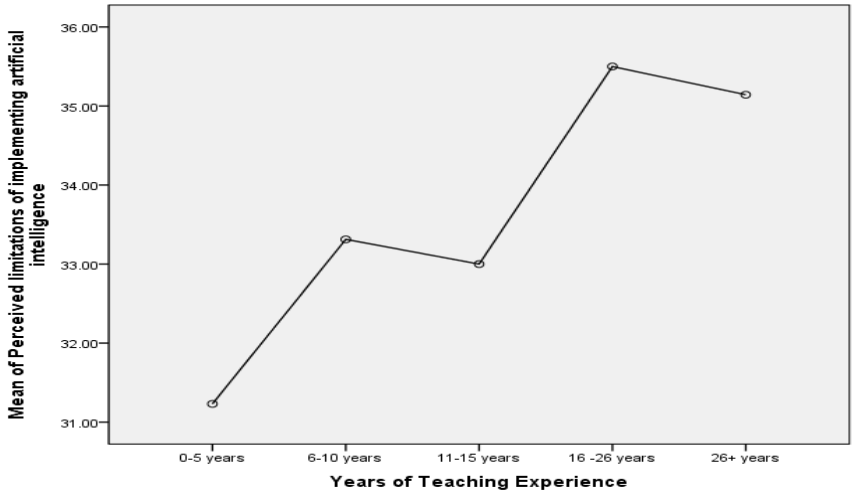


Figure 2: Means Plot of perceived limitations of implementing artificial intelligence in curriculum development

Figure 2 presents the mean plot of perceived limitations of implementing artificial intelligence (AI) in curriculum development across years of teaching experience. Teachers with 16–26 years of experience perceive the highest limitations, followed by those with 6–10 years. Newer teachers (0–5 years) report the fewest perceived limitations.

3.2. Discussion

Research question 1 covered the benefits of using artificial intelligence in enhancing curriculum design at the tertiary education level. The result showed that Artificial Intelligence (AI) has emerged as a transformative tool in curriculum design at the tertiary education level, offering multiple benefits. It allows for personalized curriculum design to meet diverse student needs, optimizing course content based on real-time performance data. AI-driven tools also streamline curriculum development, improving efficiency and effectiveness. Additionally, AI provides real-time feedback, enhancing instructional materials and methods, while adaptive learning technologies tailor educational experiences to individual student progress. AI further supports data-driven decision-making, predicting future educational trends and continuously assessing curriculum effectiveness, thus enhancing collaborative efforts among educators. In contrast, a study by Awan (2024) found that while AI facilitates curriculum personalization, some educators raised concerns about over-reliance on technology, which may reduce human judgment in teaching.

However, the findings agree with Chisom et al, (2023), who emphasized that AI optimizes course content by leveraging student data to adjust learning paths dynamically. In a related study, Oluyemisi (2023) demonstrated that AI tools streamline curriculum development, making processes faster and more efficient, which aligns with this research. In contrast, Iweuno et al, (2024) suggested that real-time feedback mechanisms, while useful, may sometimes overwhelm students, although their role in improving instructional materials is widely acknowledged. AI significantly enhances curriculum design efficiency and effectiveness in higher education.

Research question 2 was on the limitations of implementing artificial intelligence in curriculum development. The result showed that the limitations of AI implementation in curriculum development span various challenges. Limited access to high-quality data hinders the effectiveness of AI, as data is critical to AI performance. In contrast, a related study by Oladipo et al (2024) emphasizes that access to quality data enhances AI precision. High costs of AI technologies also pose a financial burden, particularly for low-income institutions (Bae et al, 2020). This finding agreed with Chiu et al, (2021) study, which observed that budget constraints can delay AI adoption in schools. Insufficient technical expertise further complicates AI deployment, limiting its potential in enhancing education (Su & Zhong, 2022). Resistance from educators similarly impedes AI integration, as highlighted by Ukeje et al, (2024), contrasting with findings in corporate settings, where AI is more readily embraced. Moreover, AI systems may perpetuate biases, reflecting the same biases present in their data sets (Nja et al, 2023). Additionally, the complexity of AI algorithms can be daunting, deterring some educators from fully utilizing AI tools (Ayanwale et al, 2024). Continuous updates are necessary to maintain AI relevance, adding another layer of difficulty.

4. IMPLICATIONS AND CONTRIBUTIONS

4.1 Research Implications

The findings underscore the need for a comprehensive institutional transformation to effectively integrate Artificial Intelligence into higher education curricula. For higher education administrators and policymakers, these results highlight the necessity of establishing clear strategic frameworks, securing budget allocations for digital infrastructure, and formulating robust ethical data-governance guidelines to prevent data breaches and algorithmic bias. For educators, the study emphasizes a pedagogical shift toward data-driven course optimization and adaptive instruction, requiring continuous professional development programs to mitigate educator resistance and build technical proficiency in AI tools.

4.2 Research Contributions

This study provides empirical and contextual contributions to the literature on curriculum studies and educational technology in developing economies. Theoretically, it offers empirical evidence from Anambra State, Nigeria, validating that while AI enhances personalized learning and instructional efficiency, its adoption is constrained by systemic barriers such as technical skill deficits and data accessibility. Practically, because ANOVA findings revealed no significant differences in perceived benefits and limitations across teaching experience groups, this research offers a unified baseline for institutional planners to design targeted, cross-faculty training initiatives and curriculum modernization policies.

5. LIMITATIONS AND FUTURE RESEARCH DIRECTION

5.1 Research Limitations

Several methodological and geographic limitations should be considered when interpreting these findings. First, the study utilized a descriptive survey design relying solely on self-reported questionnaires administered via Google Forms, which may introduce subjective reporting bias. Second, the sample size was relatively small (62 lecturers) and geographically restricted to tertiary institutions in Anambra State, thereby limiting the broader generalizability of the results across Nigeria or other developing regions. Third, the study examined faculty perceptions quantitatively without incorporating qualitative narratives or objective measures of actual classroom AI adoption and learning outcomes.

5.2 Recommendation for Future Research

Future investigations should employ mixed-method or longitudinal designs to gain deeper qualitative insights into educators' classroom experiences and evaluate the long-term impact of AI tools on actual student academic performance. Researchers are also encouraged to expand the sample size across diverse geographic zones and

institutional types, as well as incorporate students' and administrators' perspectives to capture a more holistic view of systemic readiness. Finally, subsequent studies should investigate specific interventions, such as the efficacy of targeted AI literacy workshops and the deployment of localized, bias-free datasets in curriculum planning.

6. CONCLUSION

The study on the role of artificial intelligence (AI) in curriculum development at the tertiary education level highlights the growing significance of AI in enhancing educational processes. The findings demonstrate that AI can provide substantial benefits, such as personalizing curriculum design, optimizing course content, and supporting data-driven decision-making. However, despite these advantages, the study also underscores several limitations, including high costs, technical challenges, and resistance from educators. Furthermore, concerns about AI perpetuating existing biases and its potential security vulnerabilities were noted. While AI presents promising opportunities for improving curriculum development, its successful implementation in tertiary institutions requires addressing key barriers such as access to quality data, financial constraints, and the need for continuous updates and technical expertise. Institutions must invest in both the necessary infrastructure and the professional development of educators to leverage AI effectively. Ultimately, the integration of AI into curriculum development holds the potential to revolutionize educational practices, but careful planning, ethical considerations, and ongoing support are essential to ensure its long-term success in fostering an adaptive and inclusive learning environment.

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Author Contribution Statement

The author declares that the entire research and writing process for this article was conducted independently. The author assumes full responsibility for all data associated with this research. No other individual contributed as a co-author or made any significant contribution to the content of this work.

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The authors declare that QuillBot was used solely to paraphrase and improve the clarity and readability of selected sentences in the manuscript. All AI-assisted revisions were carefully reviewed and edited by the authors to ensure linguistic accuracy, scholarly integrity, and consistency with the intended academic meaning. All instances of Generative AI usage in this article were conducted by the authors in accordance with the JIPPG GenAI Tool Usage Policy, with the authors assuming full responsibility for the originality, accuracy, and integrity of the work.

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