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EVALUATION OF TEACHERS' PERCEPTION ON THE INTEGRATION OF AI IN MATHEMATICS EDUCATION USING THE CIPP MODEL IN SENIOR SECONDARY SCHOOLS IN OBIO/AKPOR LOCAL GOVERNMENT AREA

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ABSTRACT

The integration of Artificial Intelligence (AI) in education has gathered significant attention for its potential to enhance teaching effectiveness, personalize learning, and improve student outcomes, particularly in mathematics education. However, the successful adoption of AI technologies depends heavily on teachers' perceptions, access to resources, and implementation practices. This study evaluated mathematics teachers' perspectives on AI integration in senior secondary schools within Obio/Akpor Local Government Area of Rivers State, Nigeria, using the Context, Input, Process, and Product (CIPP) evaluation model. A descriptive survey design was employed, involving all 72 mathematics teachers (38male and 34 female) in the public senior secondary schools in the area. Data were collected using a validated 21-item questionnaire titled "Artificial Intelligence in Mathematics Education Evaluation Questionnaire" (AIMEEQ), which examines four dimensions of program evaluation: Context, Input, Process, and Product. The reliability of AIMEEQ was achieved using Cronbach's alpha and the instrument yielded a coefficient of 0.87. Mean and standard deviation were used to answer the research questions, and inferential statistics (t-test) was used to test the hypothesis at a 0.05 level of significance. The findings revealed that while teachers perceive AI as highly relevant and beneficial to mathematics education, there are significant deficiencies in infrastructural inputs and actual classroom implementation processes. Teachers reported positive outcomes about what AI can do for students. No significant gender-based difference was found across all CIPP dimensions. Recommendations include increased investment in teacher training, improved infrastructure, and context-specific policy support to enhance effective AI adoption schools.

Keywords: Artificial Intelligence, Mathematics Education, CIPP Model, Teacher Perceptions, Instructional Technology

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Introduction

In recent years, Artificial Intelligence (AI) has emerged as a transformative force across various sectors, including education. The integration of AI into educational practices has demonstrated the potential to personalize learning, automate administrative tasks, and enhance teaching and learning experiences (Holmes, Luckin, & Luan, 2022). In mathematics education, AI is reshaping how students engage with mathematical concepts by offering adaptive feedback, personalized instruction, and interactive problem-solving experiences tailored to individual learning styles and pace (Tahiru, 2021; Ojeda-Bazaran et al., 2021).

This targeted approach not only improves learning outcomes but also makes complex mathematical concepts more accessible and engaging ((Zhai et al., 2021). However, successful AI integration requires more than technological availability; it depends on teachers' technical competence and pedagogical adaptability (Ede & Ojo, 2021).

Mathematics, often considered the gateway subject to science, technology, engineering, and mathematics (STEM) fields, plays a vital role in cognitive development, logical reasoning, and problem-solving skills (Adebayo & Yusuf, 2020). Despite its essential role, mathematics education in Nigeria is still affected by significant failure rates and ineffective instructional strategies (Ajinuhi & Honmane, 2024). Artificial Intelligence (AI) is the ability of a digital computer, computer-controlled machine or robot to perform tasks commonly associated with intelligent beings like humans (Mellor, 2022). In the digital age, AI technologies such as intelligent tutoring systems, adaptive platforms, and automated grading offer innovative ways to address instructional challenges like overcrowded classrooms, diverse learner needs, and insufficient instructional time (Zawacki-Richter et al., 2019). For these innovations to be impactful, assessing teachers' readiness and perceptions becomes critical, as teachers are the frontline agents of change in classrooms (Alsharidah & Alkramiti, 2024).

Teacher perception plays a significant role in educational reform. It influences their attitudes, practices, and willingness to embrace technological innovations in pedagogy. According to Zavalevskyi et al. (2024) teachers' perceptions form the lens through which they interpret new teaching approaches and policies. Research shows that while many teachers acknowledge the potential of AI to enhance learning, their actual implementation is constrained by workload concerns, limited training, and a lack of institutional support (Wardat et al., 2024; Utami et al., 2024). To ensure AI integration enhances rather than hinders mathematics education, it is essential to evaluate the process systematically. The CIPP (Context, Input, Process, and Product) evaluation model, developed by Stufflebeam, provides a comprehensive framework for examining educational innovations (Stufflebeam & Zhang, 2017; Zhang & Aslan, 2021). It assesses the relevance of educational goals (context), the availability and quality of resources (input), the implementation procedures (process), and the outcomes achieved (product). The model enables formative and summative evaluations that inform stakeholders and policymakers, aiding decision-making and program improvement (Stufflebeam, 2003; Damayanti & Ismail, 2022).

In applying the CIPP model to AI in education, context evaluation explores how well AI aligns with the educational goals and environment. Teachers perceive a generally supportive environment for AI integration, particularly where infrastructure and policy support are evident (Kim & Han, 2023; Asanre et al., 2024). Luckin et al. (2022) affirm that Input evaluation focuses on resources such as training, infrastructure, and curriculum adaptation areas where many teachers express concerns. Process evaluation examines actual classroom practices, revealing challenges like increased workload and inconsistent integration strategies (Wardat et al., 2024). Product evaluation captures perceived outcomes, including improved student performance and instructional efficiency (Fadli et al., 2024).

Several researches confirm the benefits of AI in mathematics education. For example, Haddock Murray, and Yu, (2020), and Jackson and MacGillivray (2019) highlight AI's capacity to enhance personalization and feedback. Studies by Smith et al. (2020), and also Chen and Wang (2019) show that AI-supported environments significantly improve learning outcomes. Yet, implementation challenges persist globally and locally, especially in Nigeria, where access to training and digital tools remains irregular (Aina & Kolapo, 2022).

Gender is a socially constructed phenomenon shaped by the roles, behaviours, and responsibilities that society assigns to individuals based on their sex (Ezeanyi & Okigbo, 2021). In many African societies, particularly in Nigeria, gender bias is deeply entrenched and influences multiple aspects of social and professional life. Gimba (2017) noted that within the Nigerian context, males are typically assigned more challenging tasks, while females are often given roles perceived as less demanding. These ingrained societal norms have implications for educational and technological engagement. Specifically, Chukwuemeka and Eyo (2022) reported that female teachers tend to show lower awareness of artificial intelligence (AI), which they attributed to historical gender disparities in access to technology-related professional development. These disparities may influence how male and female teachers perceive and adopt AI tools in the classroom. It is important to consider the potential impact of gender-based experiences and access. Therefore, the study evaluates teachers' perceptions of AI integration in mathematics education.

Studies indicates that teachers generally have positive perceptions towards AI integration, recognizing its potential to facilitate teaching, improve student performance, and increase motivation (Wardat et al., 2024; Asanre et al., 2024). However, challenges exist, including increased workload and pressure on teachers (Wardat et al., 2024). The CIPP (Context, Input, Process, Product) model has been used to evaluate mathematics curricula, revealing significant differences in teachers' views based on factors such as experience and training (Keskin, 2020). Teachers acknowledge AI's role in pedagogical reform and its capacity to enhance students' digital age skills (Niken Wahyu Utami et al., 2024). While teachers generally embrace AI in mathematics education, proper training is crucial for effective integration (Asanre et al., 2024). These findings provide valuable insights for future integration of AI in mathematics education.

Despite extensive global discourse on AI in education, there is a shortage of studies in Nigeria that assess teachers' perspectives using a robust model like CIPP. Understanding teachers' perceptions through the lens of the CIPP model can provide critical insights into barriers and implementers of AI integration in mathematics instruction. This study seeks to fill that gap and offer evidence-based recommendations for aligning policy, practice, and training initiatives to foster effective AI integration in senior secondary schools in Obio/Akpor, local government area, Rivers State.

Statement of the Problem

Although artificial intelligence (AI) tools such as intelligent tutoring systems, adaptive learning platforms, and automated grading systems have shown competence in addressing key challenges in mathematics education, such as large class sizes, diverse learner needs, and limited instructional time (Zawacki-Richter et al., 2019), their effective implementation in Nigerian secondary schools remains constrained. This is largely due to factors related to teachers' perceptions, attitudes, and preparedness, which significantly influence the successful adoption of these technologies (Alsharidah & Alkramiti, 2024). Despite the recognized benefits of AI in enhancing personalized learning and student engagement, many Nigerian educators continue to face obstacles such as limited access to training and professional development (Aina & Kolapo, 2022). These challenges undermine teachers' ability to effectively utilize AI tools to improve mathematics instruction, a subject that plays a vital role in cognitive development and national advancement in STEM disciplines (Adebayo & Yusuf, 2020). While several international studies have applied the Context, Input, Process, Product (CIPP) evaluation model to assess AI integration in education

(Stufflebeam & Zhang, 2017), few studies in Nigeria have explored mathematics teachers' perspectives using this comprehensive framework. Understanding these perspectives through the CIPP model can provide critical insights into the enabling and limiting factors surrounding AI integration, and support data-driven decisions to improve educational outcomes (Kim & Han, 2023). Despite teachers' recognition of AI's potential to enhance student performance and motivation, concerns about insufficient training, infrastructure, and institutional support remain unresolved (Fadli et al., 2024; Asanre et al., 2024). These challenges highlight the need for a context-specific evaluation of teachers' perceptions to uncover the realities influencing AI integration. Therefore, a systematic evaluation of teachers' perceptions using the CIPP model is essential for informing targeted interventions and policies that will support the effective and sustainable adoption of AI in mathematics instruction in senior secondary schools in Obio/Akpor Local Government Area, Rivers State

Purpose of the Study

This study, therefore, aims to evaluate teachers' perceptions regarding the integration of AI in mathematics education using the CIPP model. By analyzing teachers' views on the contextual relevance, resource availability, implementation processes, and perceived outcomes of AI integration, the study seeks to provide evidence-based recommendations for improving policy and practice. Specifically, the study aim to:

1. To examine the relevance of AI in mathematics education from the perspective of teachers (Context).
2. To determine the availability and adequacy of resources supporting AI integration (Input).
3. To investigate the processes involved in the integration of AI in mathematics instruction (Process).
4. To evaluate the perceived outcomes of using AI in mathematics education (Product).

Research Questions

1. What is the perceived relevance of AI in mathematics education by teachers?
2. What input resources are available to support AI integration in mathematics education?
3. What implementation processes are currently in place for integrating AI in mathematics teaching?
4. What are the perceived outcomes of AI use in mathematics education?

Hypothesis

1. There is no significant difference in teachers' perceptions of AI integration in mathematics education based on gender.

Methodology

The study adopted a descriptive survey research design to evaluate teachers' perception on the integration of artificial intelligence (AI) in mathematics education using the Context, Input, Process and Product (CIPP) evaluation model. The descriptive survey design was considered appropriate because it enable the collection of data from specific population to describe the correct status of a phenomenon without manipulating any variables (Siedlecki, 2020). The population for this study comprised all 72 mathematics teachers (38 male and 34 female) from 20 public senior secondary schools in Obio/Akpor Local Government Area of Rivers State, (Rivers State Senior Secondary School Board). Due to the manageable size of the population, a census approach was adopted. As such, all 72 mathematics teachers were involved in the study. This approach eliminates the need for sampling and ensured that every member of the population was represented, thereby increasing the validity and generalizability of the findings within the local context (Etikan, 2021). The instrument used for data collection in this study is titled “Artificial Intelligence in Mathematics Education Evaluation Questionnaire” (AIMEEQ). It was developed by the researcher and designed in alignment with the CIPP evaluation model (Stufflebeam, 2007), which examines four dimensions of program evaluation: Context, Input, Process, and Product. The questionnaire was tailored to explore the integration and relevance of artificial intelligence (AI) in mathematics education, as perceived by mathematics teachers in senior secondary schools. It comprised 21 items, each was rated on a 4-point Likert scale ranging from 1 = Strongly Disagree to 4 = Strongly Agree. This format allowed for an in-depth understanding of respondents’ opinions and ensured ease of data analysis. To ensure content validity, the questionnaire was subjected to expert review. Three professionals in the fields of mathematics education, educational technology, and artificial intelligence from the Science Education Department in Faculty of Education, Rivers state University assessed the instrument for relevance, clarity, and alignment with the CIPP framework. Their suggestions were incorporated to refine ambiguous statements and improve logical consistency. To determine the reliability of the instrument, a pilot study was conducted using sample of 20 mathematics teachers from a neighboring local government area who were not part of the main study population. Their responses were analyzed using Cronbach’s alpha and the instrument yielded an internal consistency coefficient of 0.87, indicating high internal consistency. The subscale reliabilities were also acceptable: Context ($\alpha = 0.82$), Input ($\alpha = 0.79$), Process ($\alpha = 0.84$), and Product ($\alpha = 0.86$). Data were collected through the administration of hard copied of the questionnaire to all 72 mathematics teachers. The researcher, with the assistance of trained research assistance, ensured proper administration and retrieval of the completed questionnaires. Respondents were assured of confidentiality to encourage honest and unbiased participation. The collected data were analyzed using descriptive statistical methods such as mean, and standard deviation to answer the research questions and inferential statistics (t-test) to test the hypothesis at a 0.05 level of significance. For the purpose of interpretation, a criterion mean of 2.5 was adopted. Mean score above 2.5 were interpreted high perception while score below 2.5 indicate low perception.

Results

Research Question 1: What is the perceived relevance of AI in mathematics education by teachers?

Table 1: Mean and standard deviation on the perceived relevance of AI in mathematics education by teachers

S/N	Item Statement	SD	D	A	SA	Mean	S.D	Decision
1	AI can significantly improve the teaching and learning of mathematics.	1 (1.4%)	8 (11.1%)	60 (83.3%)	3 (4.2%)	2.90	.449	High Perception
2	The integration of AI into the mathematics curriculum supports 21st-century education goals.	4 (5.5%)	4 (5.5%)	59 (81.9%)	5 (6.9%)	2.90	.585	High Perception
3	AI enables personalized and adaptive learning	5 (6.9%)	3 (4.2%)	61 (84.7%)	3 (4.2%)	2.86	.589	High Perception

S/N	Item Statement	SD	D	A	SA	Mean	S.D	Decision
	experiences in mathematics.							
4	Using AI in mathematics helps address students' individual learning needs	5 (6.9%)	3 (4.2%)	64 (88.9%)	0	2.82	.539	High Perception
5	AI use in mathematic classrooms fosters critical thinking and problem-solving.	1 (1.4%)	7 (9.7%)	64 (88.9%)	0	2.88	.373	High Perception
6	AI increases students' interest and engagement in mathematics.	2 (2.8%)	6 (8.3%)	19 (26.4%)	45 (62.5%)	3.49	.769	High Perception
	Cumulative Mean					**2.95**	**.551**	

SD= Strongly Disagree 1, D=Disagree 2, A= Agree 3, SA = Strongly Agree 4.

Table 1 shows the mean and standard deviation of responses to the perceived relevance of AI in mathematics education. The results indicate that teachers generally perceive AI as relevant to mathematics education with a cumulative mean of 2.95. The data indicate that all items had mean scores above 2.50, suggesting a high perception of AI's relevance. The highest-rated item was "AI increases students' interest and engagement in mathematics" (M = 3.49, SD = 0.769), while the lowest-rated item was "using AI in mathematics helps address students' individual learning needs" (M = 2.82, SD = 0.539). These results reflect a readiness among teachers to accept and potentially use AI tools, driven by their awareness of its alignment with 21st-century educational demands such as personalization, critical thinking, and engagement.

Research Question 2: What input resources (infrastructure, training tools) are available to support AI integration in mathematics education?

Table 2: Mean and standard deviation on the perceived resources to support AI integration in mathematics education.

S/N	Item Statement	SD	D	A	SA	Mean	S.D	Decision
1	There are adequate AI tools available in my school for teaching mathematics.	29 (40.3%)	36 (50.0%)	7 (9.7%)	0	1.69	.642	Inadequate Resources
2	Teachers have received training on using AI tools for teaching mathematics.	11 (15.3%)	56 (77.8%)	5 (6.9%)	0	1.92	.467	Inadequate Resources
3	I have access to reliable internet connectivity to use AI tools in my teaching.	13 (18.1%)	54 (75.0%)	5 (6.9%)		1.89	.491	Inadequate Resources
4	Educational policies support the integration of AI in math teaching.	4 (5.6%)	63 (87.5%)	5 (6.9%)	0	2.01	.356	Inadequate Resources
5	Teachers are competent in integrating technology into their lessons.	9 (12.5%)	58 (80.6%)	5 (6.9%)	0	1.94	.441	Inadequate Resources

Cumulative Mean	**1.89**	**.479**

SD= Strongly Disagree 1, D=Disagree 2, A= Agree 3, SA = Strongly Agree 4

Table 2 presents responses regarding the availability of resources and support systems for AI integration. All items mean were below 2.5, indicating that teachers perceived significant inadequacies in training, infrastructure, and policy support for AI integration. The findings highlight a lack of essential resources, indicating that despite teachers' willingness, effective AI integration is hindered by insufficient infrastructure and professional development opportunities. The cumulative mean score of 1.89 with a standard deviation of 0.479 confirms a consistent perception of inadequate input conditions for effective AI adoption.

Research Question 3: What implementation processes are currently in place for integrating AI in mathematics*?*

Table 3: Mean and standard deviation on the implementation processes currently in place for integrating AI in mathematics

S/N	Item Statement	SD	D	A	SA	Mean	S.D	Decision
1	I actively integrate AI tools in my mathematics teaching.	22 (30.6%)	40 (55.6%)	10 (13.9%)	0	1.83	.650	inadequate Implementation
2	I use AI platforms to provide students with personalized math tasks or assessments.	22 (30.6%)	40 (55.6%)	10 (13.9%)	0	1.83	.650	Inadequate Implementation
3	I design lesson plans that integrate AI applications.	24 (33.3%)	39 (54.2%)	9 (12.5%)	0	1.79	.649	Inadequate Implementation
4	I collaborate with colleagues to improve AI integration in teaching mathematics.	24 (33.3%)	39 (54.2%)	9 (12.5%)	0	1.79	.649	Inadequate Implementation
5	I continuously update my knowledge about AI applications in education	10 (13.9%)	53 (73.6%)	9 (12.5%)		1.99	.518	Inadequate Implementation
				Cumulative Mean		**1.85**	**0.623**	

SD= Strongly Disagree 1, D=Disagree 2, A= Agree 3, SA = Strongly Agree 4

Table 3 highlights the extent to which AI is currently implemented in classroom processes. All item means were below 2.5, reflecting inadequate or inconsistent practices. The cumulative mean score of 1.85 falls below the benchmark of 2.5, indicating a generally inadequate level of AI integration. The item with the highest mean was "I continuously update my knowledge about AI applications in education" (M = 1.99, SD = 0.518), but this still falls within the inadequate range. The lowest mean scores (1.79) were observed for items related to lesson planning and collaboration indicating that teachers rarely incorporate AI into their lesson design or engage in joint efforts to support AI use. These results indicate that although teachers are aware of AI's potential, they have not rooted AI practices into their daily instructional processes due to systemic challenges.

Research Question 4: What are the perceived outcomes of AI use in mathematics education?

Table 4: Mean and Standard Deviation on the Perceived Outcomes of AI use in Mathematics Education.

S/N	Item Statement	SD	D	A	SA	Mean	S.D	Decision
1	Students demonstrate improved performance when AI is used in mathematics instruction.	3 (4.2%)	10 (13.9%)	43 (59.7%)	16 (22.2%)	3.00	.732	Positive Perception
2	AI integration leads to better classroom engagement instructional efficiency in mathematics lessons.	3 (4.2%)	11 (15.3%)	43 (59.7%)	15 (20.8%)	2.97	.731	Positive Perception
3	Students show more enthusiasm when AI is used in mathematics lessons.	2 (2.8%)	11 (15.3%)	54 (75.0%)	5 (6.9%)	2.86	.564	Positive Perception
4	Teachers can better assess students' progress using AI-based tools	1 (1.4%)	13 (18.1%)	16 (22.2%)	42 (58.3%)	3.38	.830	Positive Perception
5	The integration of AI has enhanced the quality of mathematics education	1 (1.4%)	12 (16.7%)	55 (76.4%)	4 (5.6%)	2.86	.512	Positive Perception
					Cumulative Mean	**3.01**	**0.674**	

SD= Strongly Disagree 1, D=Disagree 2, A= Agree 3, SA = Strongly Agree 4

Table 4 shows the teachers' perception of the outcomes of AI integration in mathematics education. All item means were above 2.5, indicating positive perceptions of AI's impact on learning, engagement, and assessment. The highest-rated item was "teachers can better assess students' progress using AI-based tools" (M = 3.38, SD = 0.830). The cumulative means of 3.01 confirms an overall positive perception of AI's impact, suggesting that teachers believe AI can enhance student engagement, improved instructional quality, and provided useful tools for assessment and personalization in mathematics teaching. These findings suggest that even though AI implementation is limited, its use, whether minimal or perceived, has yielded notable outcomes in classroom engagement, student performance, and assessment practices.

Hypothesis 1: There is no significant difference in teachers' perceptions of AI integration in mathematics education based on gender.

Table 5: Independent Sample T-Test Results of teacher's perceptions regarding the context, input, process and product (CIPP) dimension of AI integration in mathematics education according to gender

Domain	Gender	N	Mean	S.D	Df	P-value	T	Decision
Context	Male	38	3.04	.423	70	0.239	1.187	Not significant
	Female	34	2.90	.557	70			
Input	Male	38	1.93	.425	70	0.396	0.855	Not Significant
	Female	34	1.85	.280	70			
Process	Male	38	1.83	.468	70	0.690	-0.400	Not significant
	Female	34	1.87	.470	70			
Product	Male	38	3.03	.593	70	0.787	0.271	Not significant
	Female	34	2.99	.577	70			

Table 5 indicates that there are no statistically significant differences in teachers' perceptions of AI integration based on gender across all four CIPP dimensions. In Context domain**, t**he mean score for male teachers (M = 3.04) was slightly higher than females (M = 2.90), but this difference was not statistically significant (t = 1.187, p = 0.239). Input domain**,** males reported slightly higher mean scores (M = 1.93) compared to females (M = 1.85), yet the difference was not significant (t = 0.855, p = 0.396). Process domain, female teachers had marginally higher mean scores (M = 1.87) than males (M = 1.83), but this too was not significant (t = -0.400, p = 0.690). Product domain, male teachers had a slightly higher mean (M = 3.03) than their female counterparts (M = 2.99), with no significant difference (t = 0.271, p = 0.787). Since all p-values are greater than the significance level of 0.05, the null hypothesis (H_{01}) is retained. This means that, there is no significant gender-based difference in mathematics teachers' perceptions of the implementation of AI in the classroom. This suggests that both male and female teachers hold relatively similar views regarding the relevance, availability, implementation, and outcomes of AI in mathematics education

Discussion of Findings

This study explored mathematics teachers' perceptions of artificial intelligence (AI) integration in secondary school mathematics classrooms using the Context, Input, Process, and Product (CIPP) evaluation model. The findings offer a detailed view into teachers' views on the relevance of AI, the availability of supporting resources, current classroom practices, and perceived outcomes of AI use in mathematics instruction. Results in table 1 showed that teachers strongly agreed on the relevance of AI in mathematics education. They perceived AI as a tool capable of enhancing student engagement, supporting personalized learning, and promoting 21st-century education goals. This finding aligns with the conclusions of Luckin et al. (2022) and Alsharidah and Alkramiti (2024), who emphasized the educational benefits of AI in supporting differentiated instruction and improving critical thinking.

However, in table 2, teachers reported significant inadequacies in infrastructure, access to AI tools, professional training, and internet connectivity, indicating a lack of input support. This verifies the findings of Ede and Ojo (2021) and Wardat et al. (2024), who identified infrastructural deficiencies and inadequate teacher preparedness as barriers to AI integration in Nigerian classrooms. In terms of implementation (process) in table 3, the study revealed minimal or inconsistent integration of AI tools in lesson planning and classroom instruction.

Few teachers reported actively using AI or collaborating with peers on AI-based strategies. These results reinforce findings by Zavalevskyi et al. (2024) and Fadli et al. (2024), who noted the importance of collaborative professional practices and ongoing AI training to ensure meaningful adoption.

Despite these challenges, in table 4, teachers perceived positive outcomes from even limited AI exposure, particularly improvements in student engagement and assessment. This optimistic view may reflect an anticipatory perception of AI's potential rather than experience-based judgment, consistent with Asanre et al. (2024), who noted a tendency among teachers to conflate digital technologies with AI. The hypothesis test revealed no statistically significant gender-based differences in perception across all four CIPP dimensions. This finding suggests a shared experience among teachers regardless of gender, echoing earlier findings that emphasize institutional rather than individual factors as critical barriers to effective AI adoption (Wardat et al., 2024).

Generally, this study exposes a critical disconnect between the perceived potential of AI and the actual conditions supporting its implementation. While the relevance and positive outcomes of AI are widely acknowledged, the lack of resources and insufficient implementation practices pose significant barriers. The application of the CIPP model effectively illuminated these gaps, supporting the view of Stufflebeam and Zhang (2017) and Damayanti and Ismail (2022) that comprehensive evaluation frameworks are essential for guiding educational innovations. These findings have practical implications for policy and practice. To enhance the benefits of AI in mathematics education, there is a need for systematic investment in infrastructure, equitable professional development programs, and ongoing support for teachers. Addressing these areas will not only bridge the gap between theory and practice but also enhance the quality of mathematics instruction in Nigerian secondary schools and potentially across similar contexts.

Conclusion

This study concludes that while secondary school mathematics teachers perceive artificial intelligence as highly relevant and potentially transformative, the successful integration of AI in teaching is hindered by inadequate input resources and limited implementation processes. Despite these barriers, teachers remain optimistic about the outcomes of AI use, suggesting a readiness to adopt such innovations if provided with adequate support. To close the gap between perception and practice, targeted efforts must be made by stakeholders to equip teachers with the tools, skills, and policies needed for effective AI integration in mathematics education.

Recommendations

Based on the findings of this study, the following recommendations are made:

1. Government and education stakeholders should prioritize sustained professional training focused on AI tools, pedagogical integration, and curriculum alignment. Structured workshops, certification programs, and in-service training will build teacher competence and confidence in utilizing AI technologies
2. Adequate infrastructure including reliable internet access, digital devices, and AI-based educational platforms must be provided, particularly in underserved regions. These resources are foundational for the successful deployment and use of AI in classrooms

3. Schools should foster collaboration among teachers through communities of practice, peer mentoring, and inter-school partnerships to support AI adoption. Sharing best practices and lesson plans can ease the burden of individual implementation and foster innovation
4. Policymakers should develop and implement AI integration strategies tailored to local educational contexts. Using comprehensive models like the CIPP framework can guide data-driven decision-making and ensure that AI initiatives align with national education goals and classroom realities.

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