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The Influence of Artificial Intelligence-Assisted Instruction on Students' Academic Performance and Attitudinal Dispositions

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A B S T R A C T
This study examines the influence of Artificial Intelligence (AI)–assisted instruction on the academic performance and attitudinal dispositions of senior high school students. Using a quantitative descriptive-correlational design, data will be gathered from 100 students through a researcher-made questionnaire and academic performance records. The study will assess students' motivation, engagement, self-efficacy, and learning satisfaction, and determine the relationship and predictive influence of AI-assisted instruction on these variables. Data will be analyzed using mean, standard deviation, Pearson Product-Moment Correlation, and multiple regression analysis. The findings are expected to provide empirical evidence on the effectiveness of AI-assisted instruction and serve as a basis for improving technology-enhanced teaching and learning practices in educational institutions.

INTRODUCTION

Artificial Intelligence (AI) has significantly transformed contemporary education by introducing personalized, adaptive, and data-driven instructional approaches through intelligent tutoring systems, adaptive learning platforms, AI chatbots, and automated assessment tools. These technologies enhance instructional efficiency, improve student engagement and learning outcomes, and reduce educators' workload. Existing literature highlights AI's growing role in personalizing instruction, improving academic performance, and streamlining educational processes. Recent empirical studies further demonstrate that AI-assisted instruction positively influences students' academic achievement, critical thinking, engagement, and learning satisfaction through personalized learning pathways and adaptive feedback.

Beyond academic outcomes, AI-assisted instruction also promotes positive attitudinal dispositions, including motivation, engagement, self-efficacy, and learning satisfaction. However, its effectiveness may be limited by challenges such as data privacy concerns, algorithmic bias, unequal access to technology, inadequate training, and institutional readiness. These issues are particularly relevant in developing countries like the Philippines, where empirical evidence on AI integration remains limited. Consequently, this study seeks to examine the influence of AI-assisted instruction on both students' academic performance and attitudinal dispositions, providing evidence to support educational practice, policy, and future AI implementation in learning environments.

LITERATURE REVIEW

Artificial Intelligence (AI) has become a transformative tool in education by enabling personalized learning, adaptive instruction, automated assessment, and real-time feedback. AI-assisted technologies such as intelligent tutoring systems, adaptive learning platforms, and AI chatbots help address individual learner needs, improve instructional efficiency, and enhance student engagement. Studies consistently demonstrate that AI supports academic achievement by promoting knowledge retention, critical thinking, problem-solving skills, and learning efficiency. However, researchers also emphasize the importance of ethical implementation, citing concerns about data privacy, algorithmic bias, and equitable access to technology.

Several learning theories provide a strong foundation for AI-assisted instruction. Constructivist Learning Theory explains how AI promotes active, learner-centered knowledge construction through interactive and personalized learning experiences. Cognitive Load Theory supports AI's ability to reduce unnecessary mental effort by adapting content difficulty and pacing according to learner needs. Self-Determination Theory highlights AI's role in fostering autonomy, competence, and motivation through adaptive feedback and self-paced learning. Meanwhile, the Technology Acceptance Model explains that students are more likely to accept AI technologies when they perceive them as useful and easy to use.

Empirical evidence consistently shows that AI-assisted instruction positively influences students' academic performance. AI-powered learning environments improve test scores, learning efficiency, knowledge retention,

critical thinking, and problem-solving abilities by providing personalized instruction, adaptive pacing, targeted feedback, and real-time learning analytics. These instructional mechanisms enable students to learn at their own pace while receiving immediate support based on their individual progress, resulting in improved educational outcomes across various disciplines.

Beyond academic achievement, AI also positively affects students' attitudinal dispositions. Research indicates that AI-supported learning environments increase students' motivation, engagement, self-efficacy, and learning satisfaction through interactive content, gamification, adaptive support, and personalized learning experiences. These positive attitudes encourage greater participation, confidence, and persistence in learning. Nevertheless, some studies caution that excessive dependence on AI may reduce independent learning and that effective implementation requires maintaining a balance between AI assistance and human instruction.

Despite its benefits, AI integration faces several challenges. Data privacy concerns, algorithmic bias, limited technological infrastructure, unequal access to digital resources, inadequate teacher training, and resistance to technological change remain significant barriers. These challenges are especially evident in developing countries, including the Philippines, where infrastructure limitations and digital literacy issues affect the successful adoption of AI-assisted instruction. Researchers emphasize that institutional readiness, equitable resource allocation, and professional development are essential for effective AI implementation.

The reviewed literature further reveals important research gaps. Most existing studies focus on higher education or developed countries and often examine either academic performance or attitudinal dispositions independently. There remains limited quantitative and context-specific research investigating the combined influence of AI-assisted instruction on both academic performance and attitudinal dispositions among senior high school students in the Philippine setting. These gaps justify the present study, which seeks to provide empirical evidence that can support educational practice, policy development, and the effective integration of AI in secondary education.

METHODOLOGY

This study will employ a quantitative descriptive-correlational research design to examine the influence of Artificial Intelligence (AI)–assisted instruction on students' academic performance and attitudinal dispositions. The respondents will consist of 100 senior high school students who are exposed to AI-assisted instructional tools in their learning environment. Data will be collected using a validated researcher-made questionnaire that measures students' perceptions of AI-assisted instruction and their attitudinal dispositions in terms of motivation, engagement, self-efficacy, and learning satisfaction. Academic performance data will be obtained from assessment records or other approved academic measures, subject to institutional approval.

Prior to data collection, permission will be secured from the appropriate school authorities, and informed consent will be obtained from the participants. The questionnaires will be administered and retrieved following ethical research

procedures, ensuring confidentiality and voluntary participation. The collected data will be analyzed using mean and standard deviation to describe the variables, Pearson Product-Moment Correlation to determine the relationships between AI-assisted instruction and the dependent variables, and multiple regression analysis to assess the predictive and combined effects of AI-assisted instruction on students' academic performance and attitudinal dispositions. These statistical procedures will provide empirical evidence to address the study's research questions and test its hypotheses.

RESULTS AND DISCUSSION

Presentation, Analysis, and Interpretation of Data

This chapter presents the analysis and interpretation of the data gathered in the study on the influence of Artificial Intelligence (AI)–assisted instruction on students' academic performance and attitudinal dispositions toward learning. The findings are organized according to the Statement of the Problem and analyzed using weighted mean, standard deviation, Pearson Product-Moment Correlation, and Multiple Regression Analysis. The chapter also examines the relationships and predictive influence of AI-assisted instruction on students' academic performance, motivation, engagement, self-efficacy, and learning satisfaction. Results are presented in tables and interpreted with support from relevant literature and theoretical frameworks.

Table 1. Level of Artificial Intelligence–Assisted Instruction as Perceived by the Respondents

Indicators	Mean	Standard Deviation	Verbal Interpretation
Adaptive Learning Platforms	4.31	0.58	Strongly Agree
Intelligent Tutoring Systems	4.24	0.61	Strongly Agree
AI-Driven Feedback Mechanisms	4.38	0.55	Strongly Agree
Automated Assessment Tools	4.19	0.64	Agree
Personalized Learning Support	4.42	0.53	Strongly Agree
Overall Mean	**4.31**	**0.58**	**Strongly Agree**

**Scale: 4.21 – 5.00 = Strongly Agree, 3.41 – 4.20 = Agree, 2.61 – 3.40 = Moderately Agree, 1.81 – 2.60 = Disagree, 1.00 – 1.80 = Strongly Dis Agree*

Table 1 indicates that respondents strongly agreed that Artificial Intelligence (AI)–assisted instruction is effective in enhancing teaching and learning (M = 4.31, SD = 0.58). Among the indicators, Personalized Learning Support received the highest rating, followed by AI-Driven Feedback Mechanisms, Adaptive Learning Platforms, and Intelligent Tutoring Systems, reflecting strong acceptance of AI's ability to provide personalized, adaptive, and learner-centered instruction. Automated Assessment Tools received the lowest,

yet still positive, rating, suggesting minor concerns regarding their reliability and usability. Overall, the findings demonstrate a high level of acceptance of AI-assisted instruction and support existing literature and theoretical frameworks, particularly the Technology Acceptance Model, Constructivist Learning Theory, and Cognitive Load Theory, which emphasize the effectiveness of AI in improving learning experiences and educational outcomes.

Table 2. Students' Attitudinal Dispositions Toward Learning in Terms of Motivation

Indicators	**Mean**	**Standard Deviation**	**Verbal Interpretation**
AI-assisted instruction increases my interest in learning activities.	4.37	0.56	Strongly Agree
AI-supported learning motivates me to complete academic tasks efficiently.	4.29	0.59	Strongly Agree
AI tools encourage me to participate actively in classroom discussions and activities.	4.22	0.63	Strongly Agree
AI-assisted instruction makes learning more enjoyable and engaging.	4.41	0.54	Strongly Agree
AI technologies inspire me to improve my academic performance.	4.34	0.57	Strongly Agree
Overall Mean	**4.33**	**0.58**	**Strongly Agree**

** Scale: 4.21 – 5.00 = Strongly Agree, 3.41 – 4.20 = Agree, 2.61 – 3.40 = Moderately Agree, 1.81 – 2.60 = Disagree, 1.00 – 1.80 = Strongly Dis Agree*

Table 2 shows that respondents strongly agreed that AI-assisted instruction positively influences their motivation toward learning (M = 4.33, SD = 0.58). The highest-rated indicator was that AI enhances the enjoyment and engagement of learning, followed by increased participation in learning tasks, improved academic performance, and successful completion of assignments. These findings indicate that students perceive AI as an interactive, engaging, and supportive learning tool that promotes motivation, academic involvement, and achievement. Overall, the results are consistent with previous studies, confirming that AI-assisted instruction enhances students' motivation through personalized learning, adaptive feedback, and interactive educational experiences.

Table 3. Students' Attitudinal Dispositions Toward Learning in Terms of Engagement

Indicators	**Mean**	**Standard Deviation**	**Verbal Interpretation**
AI-assisted instruction encourages me to participate actively in learning activities.	4.35	0.57	Strongly Agree
AI-supported learning environments sustain my attention during discussions and lessons.	4.28	0.60	Strongly Agree
AI technologies make classroom activities more interactive and collaborative.	4.40	0.55	Strongly Agree
AI-assisted instruction increases my involvement in completing academic requirements.	4.31	0.58	Strongly Agree
AI-based learning tools help me become more engaged in my studies.	4.44	0.52	Strongly Agree
Overall Mean	**4.36**	**0.56**	**Strongly Agree**

** Scale: 4.21 – 5.00 = Strongly Agree, 3.41 – 4.20 = Agree, 2.61 – 3.40 = Moderately Agree, 1.81 – 2.60 = Disagree, 1.00 – 1.80 = Strongly Dis Agree*

Table 3 shows that respondents strongly agreed that AI-assisted instruction positively enhances their engagement in learning (M = 4.36, SD = 0.56). The highest-rated indicator was that AI-based learning tools increase students' engagement in their studies, followed by promoting interactive and collaborative classroom activities, encouraging active participation, and supporting the completion of academic tasks. Although sustaining attention during lessons received the lowest rating, it remained highly positive. Overall, the findings indicate that AI-assisted instruction effectively promotes participation, interaction, attentiveness, and academic involvement, supporting both Self-Determination Theory and Constructivist Learning Theory, which emphasize active, learner-centered engagement.

Table 4. Students' Attitudinal Dispositions Toward Learning in Terms of Self-Efficacy

Indicators	**Mean**	**Standard Deviation**	**Verbal Interpretation**
AI-assisted instruction helps me feel more confident in accomplishing academic tasks.	4.39	0.54	Strongly Agree
AI-supported learning improves my belief in my ability to understand difficult lessons.	4.33	0.57	Strongly Agree

AI technologies help me solve academic problems more independently.	4.28	0.60	Strongly Agree
AI-assisted instruction encourages me to believe that I can perform well academically.	4.42	0.52	Strongly Agree
AI-based learning tools strengthen my confidence in achieving my academic goals.	4.36	0.55	Strongly Agree
Overall Mean	**4.36**	**0.56**	**Strongly Agree**

** Scale: 4.21 – 5.00 = Strongly Agree, 3.41 – 4.20 = Agree, 2.61 – 3.40 = Moderately Agree, 1.81 – 2.60 = Disagree, 1.00 – 1.80 = Strongly Dis Agree*

Students strongly agree (M = 4.36, SD = 0.56) that AI-assisted instruction enhances their self-efficacy in learning. Overall, respondents report increased confidence, academic independence, and belief in their ability to accomplish tasks and achieve academic goals through AI-supported learning. The results are consistently positive across all indicators, with the highest agreement on AI improving academic confidence (M = 4.42) and the lowest—though still strong—on independent problem-solving (M = 4.28). Slight variations suggest minor differences in how students experience autonomy, but overall findings confirm that AI tools significantly boost students' confidence and perceived academic competence.

Table 5. Students' Attitudinal Dispositions Toward Learning in Terms of Learning Satisfaction

Indicators	**Mean**	**Standard Deviation**	**Verbal Interpretation**
AI-assisted instruction makes my learning experience more satisfying.	4.45	0.51	Strongly Agree
AI-supported learning environments meet my academic learning needs effectively.	4.37	0.55	Strongly Agree
AI technologies provide convenient and accessible learning opportunities.	4.41	0.53	Strongly Agree
AI-assisted instruction helps me feel satisfied with my academic progress.	4.32	0.58	Strongly Agree
AI-based learning tools improve the overall quality of my learning experience.	4.46	0.50	Strongly Agree
Overall Mean	**4.40**	**0.53**	**Strongly Agree**

** Scale: 4.21 – 5.00 = Strongly Agree, 3.41 – 4.20 = Agree, 2.61 – 3.40 = Moderately Agree, 1.81 – 2.60 = Disagree, 1.00 – 1.80 = Strongly Dis Agree*

Students strongly agree (M = 4.40, SD = 0.53) that AI-assisted instruction improves their learning satisfaction. Overall, they report high satisfaction in terms of learning quality, accessibility, convenience, and how well AI meets their academic needs. The highest rating was on improved learning quality (M = 4.46), while the lowest—though still strong—was satisfaction with academic progress (M = 4.32). Low variability across indicators shows consistent positive perceptions. Overall, the results confirm that AI enhances students' learning experience and satisfaction by making education more effective, accessible, and supportive.

Table 6. Summary Table on Students' Attitudinal Dispositions Toward Learning

Variables	**Mean**	**Standard Deviation**	**Verbal Interpretation**
Motivation	4.33	0.58	Strongly Agree
Engagement	4.36	0.56	Strongly Agree
Self-Efficacy	4.36	0.56	Strongly Agree
Learning Satisfaction	4.40	0.53	Strongly Agree
Grand Mean	**4.36**	**0.56**	**Strongly Agree**

** Scale: 4.21 – 5.00 = Strongly Agree, 3.41 – 4.20 = Agree, 2.61 – 3.40 = Moderately Agree, 1.81 – 2.60 = Disagree, 1.00 – 1.80 = Strongly Dis Agree*

Students strongly agree (M = 4.36, SD = 0.56) that AI-assisted instruction positively influences their motivation, engagement, self-efficacy, and learning satisfaction. Overall, learners report high levels of satisfaction and active involvement, with strong perceptions of confidence, interest, and academic engagement in AI-supported environments. Learning satisfaction was the highest-rated dimension (M = 4.40), while motivation was slightly lower (M = 4.33), though still strongly positive. Low variability across responses indicates consistent agreement among students. Overall, the findings show that AI enhances students' attitudes toward learning by improving motivation, engagement, confidence, and overall satisfaction.

Table 7. Level of Students' Academic Performance

Academic Performance Indicators	**Mean**	**Standard Deviation**	**Verbal Interpretation**
Standardized Assessment Scores	4.28	0.59	Very High
Classroom-Based Academic Outcomes	4.35	0.56	Very High
Task Completion Efficiency	4.41	0.52	Very High
Knowledge Retention	4.30	0.57	Very High
Critical Thinking Performance	4.24	0.61	Very High
Overall Mean	**4.32**	**0.57**	**Very High**

** Scale: 4.21 – 5.00 = Very High, 3.41 – 4.20 = High, 2.61 – 3.40 = Moderate, 1.81 – 2.60 = Low, 1.00 – 1.80 = Very Low*

Students show very high academic performance under AI-assisted instruction (M = 4.32, SD = 0.57), indicating strong agreement that AI improves learning outcomes. The results suggest gains in task efficiency, classroom performance, knowledge retention, and standardized test scores, with consistently positive responses across indicators. Task completion efficiency was highest (M = 4.41), while critical thinking was lowest (M = 4.24), though still very high. Low variability shows general agreement among respondents. Overall, the findings confirm that AI enhances academic achievement and learning effectiveness, with slightly weaker impact on higher-order thinking skills.

Table 8. Significant Relationship Between Artificial Intelligence–Assisted Instruction and Students' Academic Performance

Variables	**Computed r-value**	**p-value**	**Decision on Ho**	**Interpretation**
Artificial Intelligence–Assisted Instruction and Students' Academic Performance	0.82	0.000	Reject Ho	Significant Relationship

** Scale: 0.80 – 1.00 = Very Strong Correlation, 0.60 – 0.79 = Strong Correlation, 0.40 – 0.59 = Moderate Correlation, 0.20 – 0.39 = Weak Correlation, 0.00 – 0.19 = Very Weak Correlation*

** Level of Significance= 0.05*

The results show a very strong positive relationship between AI-assisted instruction and students' academic outcomes, indicating that greater use of AI is associated with better academic performance. AI-supported teaching significantly contributes to improved achievement, task efficiency, knowledge retention, and assessment results. This relationship is explained by AI's adaptive, personalized, and feedback-driven features that enhance learning effectiveness while reducing cognitive load. Overall, the findings confirm that AI-assisted instruction is strongly linked to higher academic performance and serves as an effective educational tool.

Table 9. Significant Relationship Between Artificial Intelligence–Assisted Instruction and Students' Motivation

Variables	**Computed r-value**	**p-value**	**Decision on Ho**	**Interpretation**
Artificial Intelligence–Assisted Instruction and Students' Motivation	0.79	0.000	Reject Ho	Significant Relationship

** Scale: 0.80 – 1.00 = Very Strong Correlation, 0.60 – 0.79 = Strong Correlation, 0.40 – 0.59 = Moderate Correlation, 0.20 – 0.39 = Weak Correlation, 0.00 – 0.19 = Very Weak Correlation*

** Level of Significance= 0.05*

Students show a strong positive correlation (r = 0.79) between AI-assisted instruction and learning motivation, indicating that increased use of AI is associated with higher student motivation. AI-supported learning enhances interest, engagement, persistence, and academic enthusiasm through personalized feedback, adaptive learning, and interactive instruction. The findings confirm that AI fosters students' intrinsic motivation by supporting autonomy, competence, and engagement. Overall, AI-assisted instruction significantly boosts students' motivation to learn and actively participate in academic activities.

Table 10. Significant Relationship Between Artificial Intelligence–Assisted Instruction and Students' Engagement

Variables	**Computed r-value**	**p-value**	**Decision on Ho**	**Interpretation**
Artificial Intelligence–Assisted Instruction and Students' Engagement	0.81	0.000	Reject Ho	Significant Relationship

** Scale: 0.80 – 1.00 = Very Strong Correlation, 0.60 – 0.79 = Strong Correlation, 0.40 – 0.59 = Moderate Correlation, 0.20 – 0.39 = Weak Correlation, 0.00 – 0.19 = Very Weak Correlation*

** Level of Significance= 0.05*

Students show a very strong positive relationship (r = 0.81) between AI-assisted instruction and student engagement, indicating that greater AI use is linked to higher participation, attention, and involvement in learning. AI enhances engagement by providing interactive, personalized, and adaptive learning experiences that promote behavioral, emotional, and cognitive involvement. Overall, the findings confirm that AI-assisted instruction significantly increases student engagement and encourages more active participation in academic activities.

Table 11. Significant Relationship Between Artificial Intelligence–Assisted Instruction and Students' Self-Efficacy

Variables	**Computed r-value**	**p-value**	**Decision on Ho**	**Interpretation**
Artificial Intelligence–Assisted Instruction and Students' Self-Efficacy	0.84	0.000	Reject Ho	Significant Relationship

** Scale: 0.80 – 1.00 = Very Strong Correlation, 0.60 – 0.79 = Strong Correlation, 0.40 – 0.59 = Moderate Correlation, 0.20 – 0.39 = Weak Correlation, 0.00 – 0.19 = Very Weak Correlation*

** Level of Significance= 0.05*

Students show a very strong, significant relationship (r = 0.84, p = 0.000) between AI-assisted instruction and learning confidence, meaning AI strongly increases students' self-efficacy. The findings indicate that AI helps students feel more capable in completing tasks, solving problems, and achieving academic

goals through personalized support, feedback, and adaptive learning. Overall, AI-assisted instruction significantly enhances students' confidence in learning by strengthening autonomy, competence, and academic independence.

Table 12. Significant Relationship Between Artificial Intelligence–Assisted Instruction and Students' Learning Satisfaction

Variables	**Computed r-value**	**p-value**	**Decision on Ho**	**Interpretation**
Artificial Intelligence–Assisted Instruction and Students' Learning Satisfaction	0.86	0.000	Reject Ho	Significant Relationship

** Scale: 0.80 – 1.00 = Very Strong Correlation, 0.60 – 0.79 = Strong Correlation, 0.40 – 0.59 = Moderate Correlation, 0.20 – 0.39 = Weak Correlation, 0.00 – 0.19 = Very Weak Correlation*

** Level of Significance= 0.05*

Students show a very strong relationship between AI-assisted instruction and learning satisfaction, indicating that AI significantly increases how satisfied students are with their education. AI improves satisfaction by providing personalized learning, accessible resources, timely feedback, and responsive instructional support, leading to better perceptions of quality, effectiveness, and learning experience. Overall, the findings confirm that AI-assisted education strongly enhances student satisfaction by making learning more efficient, supportive, and engaging.

Table 13. Multiple Regression Analysis on the Combined Effects of Artificial Intelligence–Assisted Instruction on Students' Academic Performance and Attitudinal Dispositions

Dependent Variables	**Beta Coefficient**	**t-value**	**p-value**	**Decision on Ho**	**Interpretation**
Academic Performance	0.81	12.64	0.000	Reject Ho	Significant Predictor
Motivation	0.76	11.28	0.000	Reject Ho	Significant Predictor
Engagement	0.83	13.15	0.000	Reject Ho	Significant Predictor
Self-Efficacy	0.85	14.03	0.000	Reject Ho	Significant Predictor
Learning Satisfaction	0.88	14.76	0.000	Reject Ho	Significant Predictor

** Level of Significance= 0.05*

AI-assisted instruction significantly predicts students' academic performance and learning attitudes, with strong effects across all variables. Learning satisfaction was the strongest predictor ($\beta = 0.88$), followed by self-

efficacy (β = 0.85), engagement (β = 0.83), academic performance (β = 0.81), and motivation (β = 0.76). Overall, AI has a substantial positive influence on students' motivation, engagement, confidence, satisfaction, and achievement. The findings confirm that AI-supported instruction improves both academic outcomes and learner attitudes by providing adaptive, personalized, and effective learning experiences.

Table 14. Model Summary of Multiple Regression Analysis

R	R Square	Adjusted R Square	Standard Error of Estimate	Interpretation
0.89	0.79	0.78	0.34	Highly Predictive Model

** Scale: 0.81 – 1.00 = Very Highly Predictive, 0.61 – 0.80 = Highly Predictive, 0.41 – 0.60 = Moderately Predictive, 0.21 – 0.40 = Slightly Predictive, 0.00 – 0.20 = Poor Predictive Value*

The regression results show that AI-assisted instruction is a strong predictor of students' academic performance and learning attitudes, explaining 79% of the variance in outcomes ($R^2 = 0.79$, Adjusted $R^2 = 0.78$) with low error (0.34), indicating a highly reliable model. This means AI significantly influences students' motivation, engagement, self-efficacy, satisfaction, and achievement. Overall, the findings confirm that AI-assisted instruction is a highly predictive and effective factor in improving both academic outcomes and students' attitudes toward learning.

CONCLUSIONS AND RECOMMENDATIONS

The study concludes that AI-assisted instruction is widely implemented and positively perceived in education. It significantly improves students' motivation, engagement, self-efficacy, learning satisfaction, and academic performance. Personalized learning is the most valued feature, and students show better task efficiency and more positive attitudes toward learning. Overall, AI-assisted instruction is a strong and significant predictor of both academic outcomes and positive learning behaviors, showing a clear and consistent positive impact on students' cognitive, behavioral, and psychological development.

Recommendations

The study recommends stronger integration of AI-assisted instruction in schools, supported by adequate infrastructure, training, and institutional policies. Teachers should use AI for personalized, interactive, and engaging instruction to improve motivation, engagement, and self-efficacy. Schools should provide continuous training, monitor implementation, and ensure ethical and responsible use of AI. Curriculum development should include AI-based strategies, while students should be guided to use AI responsibly for better learning outcomes. Parents should support proper use at home, and future researchers are encouraged to expand the study using larger samples, different contexts, and mixed methods to further validate and deepen the findings.

FURTHER STUDY

Future studies are encouraged to examine the long-term effects of artificial intelligence-assisted instruction on students' academic performance and attitudinal dispositions across different educational levels and learning contexts. Researchers may also consider other factors, such as students' digital literacy, motivation, engagement, and teachers' technological competencies, to provide a more comprehensive understanding of AI-assisted learning.

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