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Improvement Of The Management System For The Use Of Artificial Intelligence Technologies In The Training Of Specialists In The Field Of Information Technologies

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ABSTRACT

The rapid integration of artificial intelligence (AI) technologies into higher education has transformed the training of IT specialists. However, effective use of AI requires a well-structured management system to coordinate technological, pedagogical, and organizational aspects. This study examines strategies for improving the management system of AI usage in IT education and evaluates their impact on learning outcomes, instructor satisfaction, and institutional efficiency. A mixed-methods research design was applied among 100 IT students and 15 instructors over ten weeks. Quantitative results showed a 32% improvement in AI tool utilization and a 28% increase in student performance in practical tasks. Qualitative findings revealed enhanced instructor competence, better resource management, and higher student engagement. The study emphasizes the importance of combining centralized management, professional development, and data-driven decision-making to optimize AI integration in IT education.

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Introduction

Artificial intelligence technologies, including machine learning platforms, adaptive tutoring systems, and automated assessment tools, are increasingly integrated into IT education. Their potential to personalize learning, automate routine tasks, and support complex problem-solving is widely recognized. However, successful implementation of AI depends not only on technology availability but also on the management systems governing its integration.

Current research indicates that many educational institutions face fragmented AI adoption: tools are implemented inconsistently, instructors lack methodological guidance, and decisions are rarely data-driven. These gaps limit AI's potential to enhance learning outcomes and reduce institutional inefficiencies.

To address these issues, this study focuses on improving the management system for AI usage in IT training, emphasizing coordination, professional development, and analytics-driven decision-making. The main research objectives are:

1. To analyze existing AI management practices in IT education.
2. To design an improved management framework for AI integration.
3. To evaluate the effects of the improved system on student performance, instructor competence, and institutional efficiency.

Methods

This study involved 100 undergraduate IT students (62 males, 38 females), aged 18–23, and 15 instructors across programming, cybersecurity, and software engineering courses. All participants had prior experience with basic digital tools, and students had minimal prior exposure to AI-based learning platforms.

A mixed-methods research design was employed, combining quantitative and qualitative approaches:

- **Literature Review:** Analyzed existing AI management models in IT education, identifying strengths, weaknesses, and best practices.
- **Expert Interviews:** Conducted with 15 instructors and 5 IT administrators to collect insights on organizational challenges and effective management strategies.
- **Comparative Analysis:** Evaluated AI integration levels across four departments, focusing on resource allocation, instructor readiness, and student engagement.
- **Model Development:** Synthesized data to create an improved management framework integrating centralized coordination, professional development programs, and analytics-driven decision-making.

The intervention lasted ten weeks, during which students used AI platforms for adaptive exercises, automated assessment, and personalized feedback. Instructors participated in workshops to improve AI instructional competence. Quantitative data were collected via pre- and post-intervention assessments of student performance, AI tool utilization metrics, and instructor satisfaction surveys. Qualitative data included interviews, classroom observations, and reflective journals.

Results

Quantitative Findings

The implementation of the improved management system led to significant improvements in AI integration, student performance, and instructor competence in IT education. Table 1 presents the pre- and post-intervention metrics related to AI tool usage, resource management, student outcomes, and instructor readiness.

Table 1. Pre-test and Post-test AI Management and Student Performance Metrics

Parameter	Pre-test Mean	Post-test Mean	Percent Increase
AI tool integration level	50%	82%	+32%
Resource allocation efficiency	Low	High	–
Student performance in practical tasks	62%	90%	+28%
Instructor competence in AI usage	40%	78%	+38%
Data-driven decision-making frequency	Rare	Regular	–

Table 1 shows that after implementing the improved management framework, AI integration increased by 32%, demonstrating that centralized coordination and clear institutional strategies significantly enhanced the adoption of AI tools. Student performance in practical tasks improved by 28%, suggesting that structured AI-

assisted instruction and personalized feedback positively impacted learning outcomes. Instructor competence rose by 38%, reflecting the effectiveness of targeted professional development workshops. The frequency of data-driven decision-making increased, indicating that administrators and instructors were actively using analytics to adjust curricula, optimize teaching strategies, and improve student support. Overall, the data demonstrate that combining technological, organizational, and pedagogical improvements can substantially enhance AI utilization in IT education.

Student and Instructor Self-Report Ratings

In addition to objective performance metrics, subjective assessments from students and instructors provide insight into perceived competence, engagement, and satisfaction. Table 2 summarizes self-reported outcomes based on a Likert-scale survey (1–5) completed after the intervention.

Table 2. Student and Instructor Self-Report Ratings After Intervention (Likert Scale 1–5)

Item	Mean Score
AI integration improved my practical learning	4.6
Instructor guidance enhanced AI usage skills	4.5
Data-driven feedback helped me adjust learning pace	4.4
AI tools increased my confidence in completing tasks	4.5
I feel more competent in using AI technologies	4.4
Collaborative AI-supported projects improved teamwork	4.3
Overall satisfaction with AI-based learning	4.5

The self-report data indicate that students perceived AI tools as highly beneficial for practical learning and skill development. The integration of AI into tasks allowed them to receive real-time feedback, adapt their learning strategies, and improve problem-solving abilities. The responses also reflect that instructor support was crucial in helping students effectively use AI platforms, demonstrating the interplay between management, pedagogy, and technology. Collaborative AI-supported projects fostered teamwork and communication, which aligns with the increase in student performance observed in practical tasks. Overall satisfaction scores confirm that participants valued the structured, data-informed approach, and the combination of centralized management and professional guidance was effective in creating a positive learning environment.

Integrated Interpretation

Combining the quantitative metrics from Table 1 with the subjective perceptions in Table 2 reveals a coherent pattern of improvement:

1. **AI adoption and integration** improved due to structured management and centralized coordination.
2. **Student performance and practical skills** increased because of adaptive AI tools and project-based learning tasks.
3. **Instructor competence** was enhanced through targeted professional development, enabling more effective guidance.
4. **Data-driven decision-making** allowed continuous adjustment of teaching strategies, promoting personalized learning and timely interventions.

The integrated analysis demonstrates that management improvements are essential for maximizing the educational potential of AI technologies. Simply introducing AI tools is insufficient; success depends on coordinated planning, professional support, and ongoing assessment.

Discussion

The study confirms that AI technologies alone do not ensure improved learning outcomes. Effective integration relies on a robust management system that aligns technological, pedagogical, and organizational elements. Centralized coordination minimized fragmentation across departments, while professional

development strengthened instructor capability. Analytics-driven decision-making enabled institutions to adapt teaching strategies to students' needs, optimizing learning efficiency.

The results also suggest that improved management positively influences both student and institutional outcomes. Students became more engaged and performed better in practical tasks, while instructors reported higher confidence and satisfaction. Overall, the improved management system represents a strategic investment in the sustainability and scalability of AI integration in IT education.

Conclusion

This study demonstrates that improving the management system for AI usage in IT education significantly enhances learning outcomes, instructor competence, and institutional efficiency. By combining centralized coordination, professional development programs, and data-driven decision-making, educational institutions can maximize the benefits of AI technologies while ensuring their sustainable and consistent implementation across multiple departments. The approach not only optimizes resource allocation but also fosters a culture of continuous improvement, where instructors and administrators can adapt quickly to emerging challenges in AI integration.

The findings highlight the importance of strategic planning and holistic management in AI adoption, showing that structured processes—not technology alone—drive successful outcomes. Effective management ensures that AI tools are applied purposefully to curriculum design, assessment, and personalized learning paths, rather than being used sporadically or superficially. Future research should investigate long-term impacts on student competency development, the scalability of the management system across institutions with different sizes and technological capacities, and integration with emerging technologies such as adaptive learning systems, virtual labs, cloud-based AI platforms, and collaborative digital environments.

Ultimately, an effective AI management system equips IT students with the necessary skills to thrive in technologically advanced workplaces, promotes instructor confidence and professional growth, and ensures institutions remain competitive in the rapidly evolving digital era. By aligning technological capabilities with pedagogical strategies and organizational structures, educational institutions can create resilient, innovative, and student-centered learning ecosystems that prepare graduates for both current and future challenges in the field of information technology.

References

1. Anderson, P. (2021). *AI in Higher Education: Emerging Trends and Management Strategies.* Academic Press.
2. Brown, T., & Keller, M. (2020). "Management Models for AI Integration in Technical Education." *Journal of Digital Learning*, 14(3), 112–129.
3. Liu, H., & Zhao, W. (2022). "Adaptive Learning Systems in IT Training." *International Journal of Educational Technology*, 9(2), 45–59.
4. Smith, R. (2023). *Artificial Intelligence in Professional Skill Development*. Springer.
5. Thompson, D., & Lee, K. (2021). "Data-Driven Decision-Making in Modern Education Systems." *Education and Analytics Review*, 7(1), 88–103.
6. Johnson, A. (2022). *AI-Enhanced Learning Environments: Management and Pedagogical Approaches.* Routledge.
7. Verma, S., & Chandra, R. (2021). "AI Governance in Higher Education: Frameworks and Challenges." *Technology and Society Review*, 5(2), 67–84.
8. Morales, P. (2023). "The Role of Adaptive Systems in IT Skills Development." *Journal of Intelligent Education Systems*, 11(4), 201–218.
9. Carter, J., & Wilson, H. (2022). *Digital Transformation in Technical Universities.* Oxford University Press.
10. Patel, N. (2020). "Machine Learning Applications in Computer Science Education." *International Journal of Computer Training*, 8(1), 91–105.
11. Fernández, A. (2023). "Management Strategies for Scalable AI Implementation in Education." *Educational Innovations Quarterly*, 9(3), 59–80.
12. Kim, S., & Park, Y. (2021). "Instructor Readiness for AI Technologies: Institutional Perspectives." *Teaching and Digitalization Review*, 6(2), 128–144.

13. Zhou, L. (2022). *Smart Learning Ecosystems and AI Integration.* Springer.