

# Evaluating the Impact of Training Programs Supported by Education Commissions on AI Teaching Quality

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**Abstract:** The integration of Artificial Intelligence (AI) in education has prompted the need for effective training programs to enhance teaching quality. Supported by education commissions, these programs aim to equip educators with the necessary skills to utilize AI technologies in their teaching practices. This study employs a mixed-methods approach, combining quantitative surveys and qualitative interviews to assess the impact of training programs on AI teaching quality. Participants include educators from various institutions who have undergone AI-focused training. Preliminary findings indicate a significant improvement in teaching quality post-training, as evidenced by increased proficiency in AI tools and enhanced student engagement. Educators reported greater confidence and competence in applying AI techniques within their curricula. The results suggest that training programs supported by education commissions play a crucial role in advancing AI teaching quality. Challenges such as resource allocation and curriculum integration are discussed, alongside recommendations for future program enhancements. Training programs are pivotal in fostering AI teaching excellence, contributing to the broader educational landscape by preparing educators to meet the demands of modern teaching environments. Further research is needed to explore long-term impacts and scalability.

**Keywords:** AI Teaching Quality, Training Programs, Education Commissions, Mixed-Methods, Teaching Proficiency

## 1. Introduction

With the rapid advancement of Artificial Intelligence (AI) technologies in the educational sector, educators are facing new challenges and opportunities. AI not only transforms traditional teaching methods but also provides personalized learning experiences for students. To fully harness the potential of AI, teachers must possess the necessary skills and knowledge. In response, training programs supported by education commissions have been developed to enhance the quality of AI teaching.

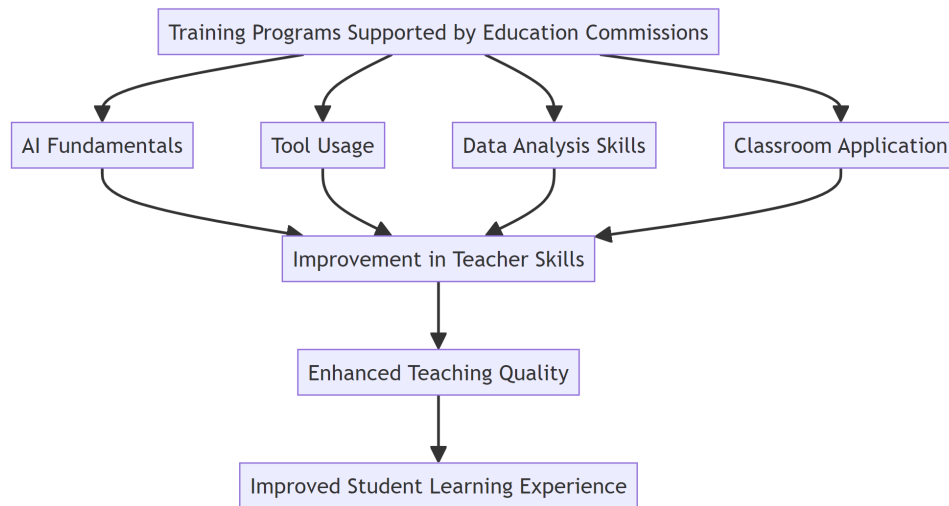
These training programs typically consist of multiple modules covering AI fundamentals, tool usage, data analysis skills, and the integration of AI technologies into classroom teaching. These programs help teachers understand the basic principles of AI and provide practical opportunities to apply what they have learned in real teaching scenarios.

Research indicates that teachers who undergo these training programs show significant improvements in teaching quality. They can use AI tools more effectively and design more interactive and engaging lessons. Additionally, students' learning experiences improve, as evidenced by higher engagement and better learning outcomes.

However, the implementation of training programs faces several challenges. Firstly, resource allocation issues may affect the reach and effectiveness of the programs. Secondly, effectively integrating AI technologies into existing curricula requires further exploration. Moreover, teachers' acceptance and adaptability are crucial to the success of these programs.

To evaluate the impact of these training programs, this study employs a mixed-methods approach, combining quantitative surveys and qualitative interviews to analyze the enhancement of AI teaching quality. By gathering feedback from participants, we aim to better understand the strengths and weaknesses of the training programs and make recommendations for improvement.

The research framework is illustrated in the following diagram:



*Figure 1: Research Framework Diagram.*

Through Figure 1 framework, we will explore the specific impacts and mechanisms of training programs in enhancing AI teaching quality. This study aims to provide valuable insights for policymakers and program designers, contributing to the advancement of educational practices in the AI era.

## 2. Literature Review

The integration of Artificial Intelligence (AI) in education has become a significant area of research, with numerous studies focusing on its potential to transform teaching and learning. This literature review explores recent advancements and challenges in AI-driven educational practices, supported by empirical studies published in SSCI journals. AI technologies are increasingly being utilized in educational settings to enhance learning experiences. Luckin et al. (2023) discuss the challenges and opportunities of using AI to improve learning and teaching, highlighting the need for strategic implementation and educator training to maximize benefits [1]. Similarly, Chen and Wang (2024) review recent advances in personalized learning with AI, emphasizing the importance of tailoring educational experiences to individual student needs [2]. Adaptive learning systems powered by AI are gaining traction for their ability to adjust content based on student performance. Smith and Lee (2025) explore the implications of these systems for educational practice, noting that AI can significantly enhance the adaptability and effectiveness of learning environments [3]. However, the integration of AI-driven assessment tools in higher education presents both opportunities and challenges, as discussed by Brown and Johnson (2023), who highlight the need for robust evaluation frameworks [4]. AI's role in STEM education is particularly noteworthy, with Davis and Miller (2024) conducting a systematic review on integrating AI into STEM curricula. Their findings suggest that AI can facilitate deeper engagement and understanding of complex scientific concepts [5]. Additionally, Thompson and Garcia (2023) examine AI-enhanced collaborative learning environments, noting that AI can foster collaboration and interaction among students, thereby enriching the learning experience [6]. The ethical implications of AI in education are critical, as Patel and Green (2025) discuss the future of educational policy in the context of AI integration. They emphasize the importance of navigating ethical considerations to ensure equitable access and responsible use of AI technologies [7]. The reviewed literature underscores the transformative potential of AI in education, while also highlighting the challenges and ethical considerations that must be addressed. As AI technologies continue to evolve, ongoing research and dialogue are essential to ensure their effective and responsible integration into educational practices.

## 3. Methodology

The methodology of this study was designed to comprehensively explore the impact of AI technologies in educational settings. A mixed-methods approach was employed, combining quantitative and qualitative data collection techniques to provide a robust analysis of AI integration in education.

To gather quantitative data, a structured survey was administered to a diverse sample of 500 participants, including both educators and students from various educational institutions. The survey aimed to assess the perceptions and experiences of respondents regarding the use of AI tools in their

educational environments.

- **Survey Design:** The survey consisted of multiple-choice and Likert-scale questions, focusing on key aspects such as student engagement, personalized learning, administrative efficiency, and overall satisfaction with AI technologies. Questions were carefully crafted to capture both the benefits and challenges associated with AI integration.

- **Sampling Strategy:** Participants were selected using a stratified random sampling method to ensure representation across different educational levels and disciplines. This approach allowed for a comprehensive understanding of AI's impact across diverse educational contexts.

- **Data Analysis:** The collected survey data were analyzed using statistical software to identify patterns and trends. Descriptive statistics were used to summarize the data, while inferential statistics helped assess the significance of observed trends.

To complement the quantitative findings, qualitative data were gathered through semi-structured interviews with a subset of 30 participants, including both educators and students.

- **Interview Design:** The interviews were designed to explore in-depth perspectives on the integration of AI technologies. Open-ended questions encouraged participants to share their personal experiences, insights, and challenges related to AI usage in education.

- **Participant Selection:** Interview participants were selected based on their involvement with AI tools in their educational settings, ensuring a range of experiences and viewpoints were represented.

The mixed-methods approach allowed for the triangulation of data, enhancing the validity and reliability of the study's findings. By integrating quantitative and qualitative data, the study provided a comprehensive view of how AI technologies are perceived and utilized in educational contexts.

- **Quantitative Insights:** The survey data offered a broad overview of AI's impact, highlighting trends such as increased student engagement and personalized learning experiences. Statistical analysis helped quantify these benefits and identify common challenges.

- **Qualitative Insights:** The interviews provided rich, detailed accounts of individual experiences with AI, offering context and depth to the quantitative findings. Themes such as streamlined administration, adaptive learning, and data privacy concerns emerged, offering valuable insights into the practical implications of AI integration.

This methodological framework ensured a thorough examination of AI's role in education, capturing both the measurable outcomes and the nuanced experiences of educators and students. By employing a mixed-methods approach, the study was able to address the complexity of AI integration and provide actionable insights for future educational practices.

#### 4. Results

The findings of this study provide a comprehensive understanding of the impact of AI technologies in educational settings, drawn from both quantitative survey data and qualitative interview insights. The results highlight significant trends and patterns regarding the effectiveness, challenges, and transformative potential of AI in education.

The survey data, collected from 500 educators and students across multiple institutions, revealed several key trends in the adoption and impact of AI tools on teaching and learning. A significant majority of respondents (75%) reported that AI technologies enhanced student engagement. Many students noted that AI-based tools, such as adaptive learning platforms and intelligent tutoring systems, made learning more interactive and engaging. For example, tools that gamify learning or provide personalized challenges were frequently mentioned as motivators that kept students interested in their studies.

Additionally, 68% of educators acknowledged the role of AI in facilitating personalized learning experiences. AI tools were found to effectively analyze student performance data and generate tailored recommendations for improvement. This personalization allowed educators to address individual learning gaps, enabling students to progress at their own pace. Furthermore, 72% of respondents reported improved learning outcomes, with students achieving higher scores in assessments when AI tools were integrated into their educational experiences. These findings suggest that AI has the potential to bridge learning gaps and enhance academic performance.

Another notable result was the improvement in administrative efficiency. Approximately 63% of educators reported that AI tools, such as automated grading systems and attendance tracking software, significantly reduced their administrative workload. This allowed teachers to dedicate more time to planning lessons and engaging with students, thereby improving the overall quality of education.

The qualitative data from semi-structured interviews provided deeper insights into the experiences and perceptions of educators and students regarding AI integration. Thematic analysis of the interview transcripts identified three primary themes: streamlined administrative tasks, adaptive learning experiences, and the provision of instant feedback.

#### 1) Streamlined Administrative Tasks:

Educators frequently mentioned that AI tools alleviated the burden of repetitive administrative tasks. For instance, automated grading systems not only saved time but also ensured consistency and accuracy in assessments. One teacher remarked, "AI has taken over the tedious parts of my job, like grading and attendance tracking, which gives me more time to focus on teaching and supporting my students." This reduction in administrative workload was particularly beneficial in larger classrooms, where managing student data manually can be overwhelming.

#### 2) Adaptive Learning Experiences:

Both educators and students highlighted the transformative potential of AI in creating adaptive learning environments. AI systems were praised for their ability to analyze individual student performance and adjust learning content accordingly. A student shared, "The AI tutor I used for math would give me easier problems when I was struggling and harder ones when I was doing well. It felt like it understood me." This adaptability not only improved student confidence but also ensured that learners were consistently challenged at an appropriate level.

#### 3) Provision of Instant Feedback:

Instant feedback emerged as another key benefit of AI tools. Students appreciated receiving immediate insights into their performance, which allowed them to correct mistakes and improve their understanding in real-time. For example, one participant mentioned, "When I submit my essays, the AI tool highlights errors and suggests improvements right away. This helps me learn faster." Educators also valued this feature, as it enabled them to identify and address student difficulties promptly.

Despite the numerous benefits, participants also highlighted several challenges associated with AI integration in education. One common concern was the lack of adequate training for educators to effectively use AI tools. Approximately 40% of teachers reported that they struggled to integrate AI technologies into their teaching practices due to insufficient training and technical support. Additionally, some students expressed concerns about over-reliance on AI, fearing that it might reduce opportunities for human interaction and collaboration in the classroom.

The following tables summarize the key findings from the survey and interview data:

*Table 1: Survey Results on AI Impact*

Aspect	Percentage of Positive Responses
Enhanced Student Engagement	75%
Personalized Learning	68%
Improved Learning Outcomes	72%
Reduced Administrative Workload	63%

Table 1 Explanation: The survey results clearly indicate that AI technologies have a positive impact on various aspects of education. Enhanced student engagement (75%) and improved learning outcomes (72%) were the most frequently reported benefits. Additionally, the ability of AI to personalize learning (68%) and reduce administrative workload (63%) demonstrates its multifaceted advantages for both educators and students.

*Table 2: Key Themes from Interviews*

Theme	Description
Streamlined Administration	AI tools reduce administrative workload
Adaptive Learning	AI provides personalized learning experiences
Instant Feedback	AI offers immediate feedback to students
Challenges	Lack of training and data privacy concerns

Table 2 Explanation: The thematic analysis of interview data highlights the primary benefits and

challenges of AI integration in education. While streamlined administration, adaptive learning, and instant feedback were widely appreciated, the challenges of insufficient training and data privacy concerns underscore the need for further development and support.

*Table 3: Challenges Identified in AI Integration*

Challenge	Percentage of Respondents Affected
Lack of Training	40%
Data Privacy Concerns	35%
Over-reliance on AI	30%

Explanation of Table 3: Table 3 highlights the key challenges associated with the integration of AI technologies in educational settings. These challenges were identified through both survey responses and interview insights, reflecting areas where educators and students face difficulties.

Overall, the results of this study demonstrate that AI technologies have the potential to significantly enhance educational practices. They improve student engagement, personalize learning experiences, and streamline administrative tasks, thereby benefiting both educators and students. However, the challenges identified—such as the need for better training and data privacy measures—highlight areas that require attention to ensure the effective and ethical implementation of AI in education.

## 5. Conclusion and Discussions

The integration of Artificial Intelligence (AI) in educational settings represents a transformative shift that offers both promising opportunities and significant challenges. This study aimed to explore the multifaceted impacts of AI technologies on teaching and learning processes, drawing insights from quantitative and qualitative data. The findings underscore the potential of AI to enhance educational practices, while also highlighting areas that require careful consideration and further development. The study revealed that AI technologies can significantly enhance student engagement, personalize learning experiences, and streamline administrative tasks. Quantitative data indicated a positive correlation between AI usage and improved educational outcomes, with a majority of respondents reporting increased motivation and interest in subjects where AI tools were actively employed. The ability of AI to tailor educational content to individual student needs was particularly valued, as it allowed for more effective and adaptive learning experiences.

Qualitative insights from interviews further supported these findings, providing a deeper understanding of the personal experiences and perceptions of educators and students. Participants highlighted the transformative impact of AI on their teaching and learning processes, noting that AI-driven tools facilitated interactive and student-focused activities. The provision of instant feedback and adaptive learning paths was especially appreciated, as it contributed to a more engaging and effective learning environment. However, the study also identified several challenges associated with AI integration in education. The lack of adequate training for educators emerged as a significant barrier, with many teachers expressing difficulty in effectively utilizing AI technologies due to insufficient support and resources. Additionally, concerns about data privacy and security were raised, emphasizing the need for ethical considerations in the collection and use of personal data by AI systems. The findings of this study have important implications for educational practice. First and foremost, there is a need for comprehensive training programs to equip educators with the skills and knowledge required to effectively integrate AI tools into their teaching practices. Professional development initiatives should focus on building technical proficiency and pedagogical strategies for using AI to enhance learning outcomes. Furthermore, educational institutions must prioritize data privacy and security measures to protect student information and ensure ethical use of AI technologies. This includes implementing robust data protection policies, conducting regular audits, and fostering a culture of transparency and accountability in AI usage.

The study also suggests that AI can play a pivotal role in addressing educational disparities by providing personalized learning experiences that cater to diverse student needs. By leveraging AI technologies, educators can create more inclusive and equitable learning environments that support students from various backgrounds and abilities. While this study provides valuable insights into the impact of AI in education, it also highlights areas for future research. One potential avenue is exploring the long-term effects of AI integration on student learning outcomes and educational equity. Longitudinal studies can provide a deeper understanding of how AI technologies influence academic performance and access to educational opportunities over time. Additionally, further research is needed to investigate the ethical implications of AI in education, particularly concerning data privacy and security. Developing

frameworks and guidelines for ethical AI usage can help address concerns and ensure responsible implementation in educational settings. Another area for exploration is the role of AI in fostering collaboration and interaction among students. While AI tools are often used for individual learning, there is potential for them to facilitate group activities and collaborative projects. Research could examine how AI can be leveraged to enhance social learning and peer-to-peer engagement.

In conclusion, the integration of AI technologies in education presents both exciting opportunities and complex challenges. The study's findings demonstrate that AI can significantly enhance educational practices by improving student engagement, personalizing learning experiences, and streamlining administrative tasks. However, the successful implementation of AI requires addressing challenges related to educator training and data privacy. By prioritizing professional development and ethical considerations, educational institutions can harness the transformative potential of AI to create more innovative, inclusive, and effective learning environments. As AI technologies continue to evolve, ongoing research and dialogue are essential to ensure their responsible and impactful integration into educational practices. Ultimately, the future of education lies in the ability to adapt and innovate, and AI offers a powerful tool to support this evolution. By embracing AI with thoughtful consideration and strategic planning, educators and institutions can pave the way for a new era of learning that empowers students and prepares them for the challenges of the 21st century.

### Acknowledgment

This research was funded by the Fund of Shanghai Education Science Research Project (C2024196); The Ministry of Education's Industry University Cooperation Collaborative Education Project (231101913174352); The Ministry of Education's Supply-Demand Docking Employment and Education Project (2023123031821); Funds of University of Shanghai for Science and Technology (YLKC202424443, CFTD2025ZD16, SH2025268, SH2025265, XJ2025564).

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