Investigation and Countermeasure Analysis of Educational Development in Ordos City Under Artificial Intelligence Technological Transformation

Guirong Wang*, Ting Yan

Ordos Institute of Technology, Ordos 017010, China

*Author to whom correspondence should be addressed.

Abstract: With the rapid development of artificial intelligence (AI) technology, its application in education has gradually become a key driver of educational modernization. This study focuses on teachers and students from primary, secondary, and higher education institutions in Ordos City. Through questionnaire surveys, the study thoroughly analyzes the current application status, core challenges, and influencing factors of AI technology in local education, while proposing targeted countermeasures. The results indicate that although teachers and students hold positive attitudes toward AI technology, its practical application remains constrained by factors such as technical proficiency, resource allocation, and curriculum design. This study aims to provide theoretical foundations and practical guidance for the sustainable development of AI education in Ordos City's primary and secondary schools.

Keywords: Artificial intelligence technology; Educational application; Investigation and countermeasure analysis; Ordos City

1. Introduction

As the core driving force of the new technological revolution and industrial transformation, artificial intelligence (AI) technology is profoundly reshaping the global educational ecosystem [1–2]. Against the backdrop of China's vigorous promotion of digital education strategies (Outline of Digital Education Strategy Action (2024–2026), Ordos City has actively responded to the Ministry of Education's call for "AI Empowering the Construction of an Education Power" and fully implemented the Ordos City Smart Education Three-Year Action Plan (2023–2025) [3–4]. As an important city in western China, its level of educational informatization directly impacts regional economic development and social progress. However, constrained by geographical conditions and resource allocation, local primary and secondary schools still face numerous challenges in implementing the

Notice on Strengthening AI Education in Primary and Secondary Schools [5]. Through empirical research, this study systematically analyzes the root causes of these challenges and proposes region-specific solutions aligned with national policies, aiming to provide practical references for promoting digital transformation and balanced development of education in western China.

2. Data sources and methods

This study adopts a stratified random sampling method, covering five primary/secondary schools and two higher education institutions in Ordos City [6]. A total of 300 questionnaires were distributed (100 for teachers, 200 for students), with a 100% valid response rate. The questionnaire design encompasses four dimensions: Technical cognition: Teachers' and students' understanding and attitudes toward AI. Application practices: Frequency and scenarios of AI tool usage. Existing problems: Bottlenecks in technology, resources, and curriculum. Improvement needs: Suggestions for training, facilities, and curriculum optimization. Statistical analysis was conducted on the survey data, with results visualized through charts.

3. Current status of AI technology application

3.1. Teachers' cognition and application of AI technology

Figure 1 details the distribution of Ordos City teachers' perceptions of AI technology. Survey data shows that 70% of teachers hold positive attitudes, believing AI can effectively enhance teaching efficiency and student engagement; 25% remain neutral, viewing AI's impact on education as a mix of benefits and drawbacks; and 5% express negative attitudes, concerned about potential adverse effects. This distribution reflects overall optimism among teachers regarding AI's prospects in education, alongside some concerns about risks. Notably, despite high cognitive levels, practical application lags behind, attributed to insufficient technical skills and training resources. Therefore, promoting AI in education requires not only technological advocacy but also addressing teachers' needs through systematic training and guidance to bridge the cognition-practice gap.
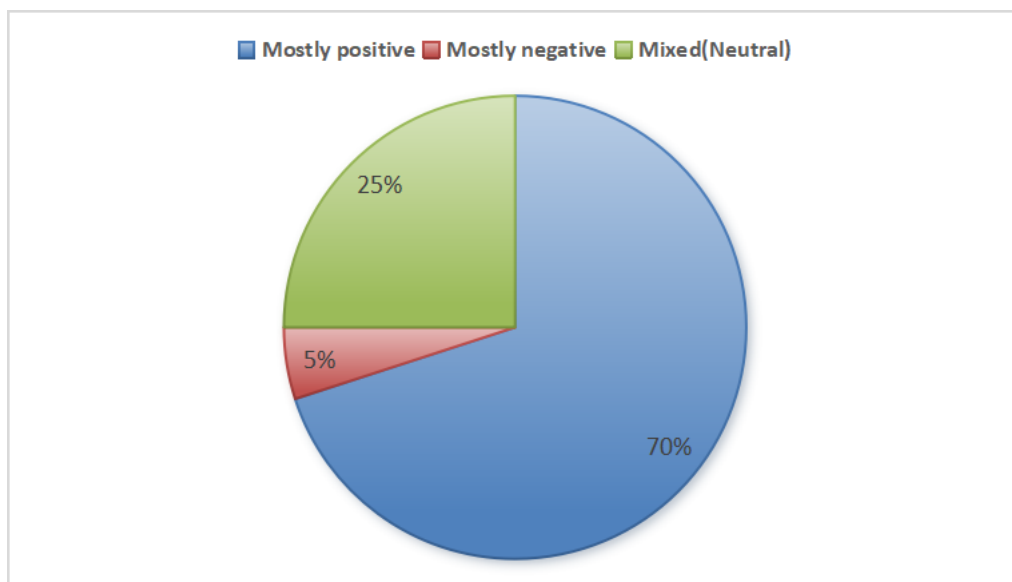

Figure 1. Distribution of teachers' perceptions of AI technology

Figure 2 illustrates the actual usage of AI teaching tools by Ordos City teachers. Data reveal that 54% occasionally use smart teaching platforms or AI-assisted software, often limited to specific scenarios; 32% frequently use AI but lack proficiency and troubleshooting skills; and 11% have never used such tools. This stratification highlights uneven adoption, driven by inadequate training, complex interfaces, and poor resource integration. To address this, a "training-practice-feedback" loop system is needed, featuring tiered training, case demonstrations, and technical support to enhance teachers' capabilities.
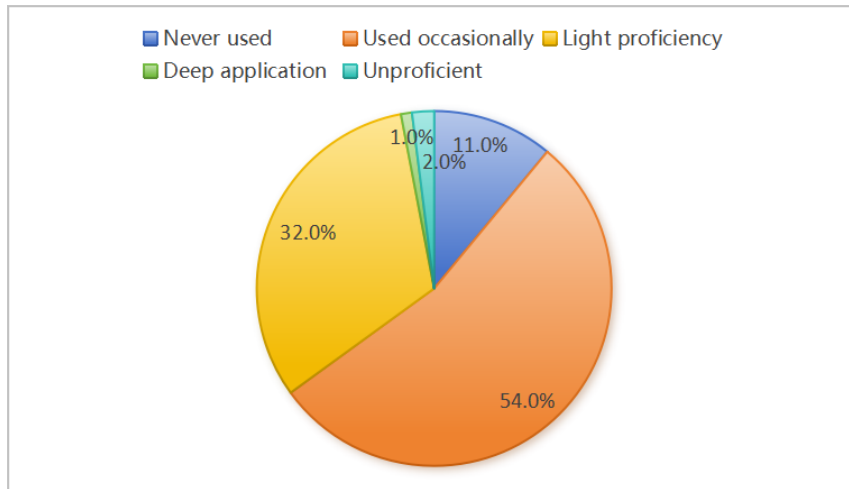

Figure 2. Frequency of teachers' use of AI teaching tools

Figure 3 reveals teachers' urgent demand for AI training. 71% express strong willingness to participate, reflecting a mix of proactive learning and technical anxiety. Needs span three levels: basic operations, pedagogical integration, and cutting-edge trends. Meanwhile, 29% remain indifferent due to heavy workloads, low confidence, or satisfaction with traditional methods. Differentiated strategies are recommended: advanced training for motivated teachers and low-threshold demonstrations for skeptics. Additionally, policymakers should integrate AI training into continuing education credits, while schools establish incentive mechanisms to foster sustainable professional development.
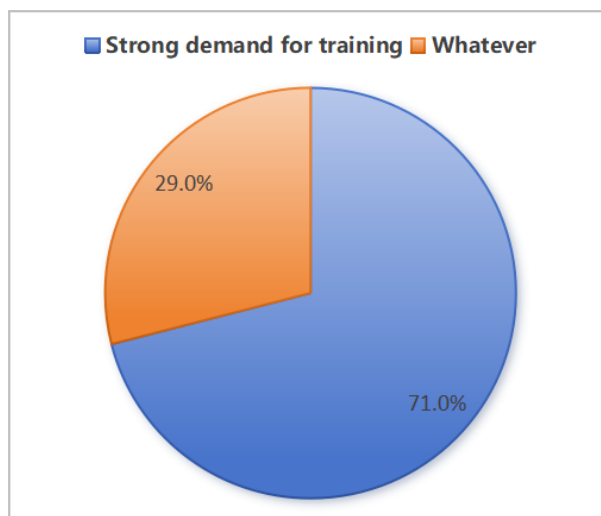

Figure 3. Teachers' demand for AI technology training

3.2. Students' awareness and use of AI technology

Figure 4 showcases students' diverse perceptions of AI. 45.5% are positive, valuing personalized learning; 45% are ambivalent, weighing benefits against risks like reduced teacher interaction; 7.6% are uncertain; and 1.9% are negative, fearing inequity. This "bimodal distribution" varies by age: positivity dominates in elementary students (52%), ambivalence in middle schoolers (58%), and criticism in college students (3.5%). Tailored AI literacy programs are needed—playful experiences for younger students, critical thinking for older ones, and clarity for the uncertain.
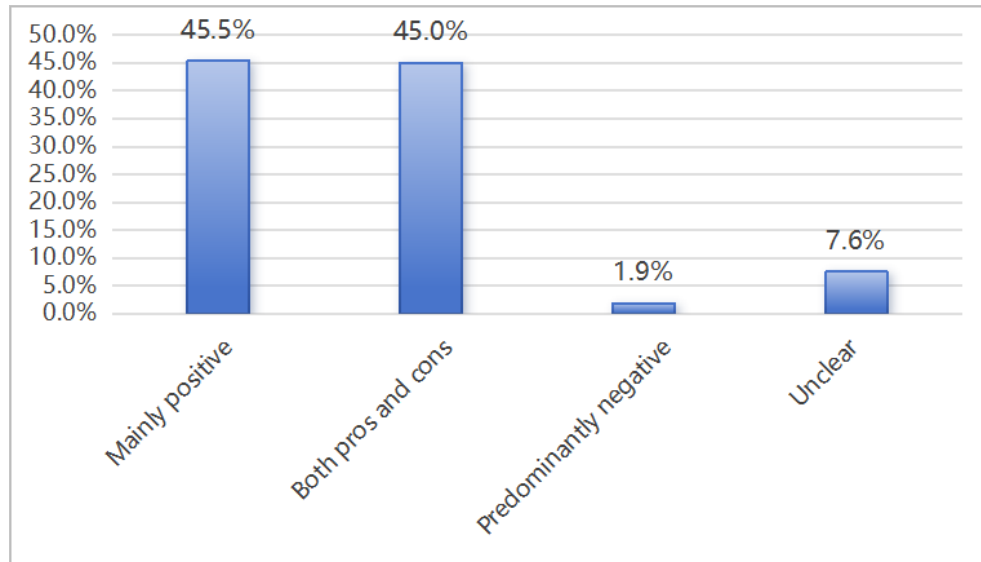
Figure 4. Students' perceptions of AI technology's impact

Figure 5 analyzes students' AI tool usage. 88.6% actively use platforms like Zhihuishu or AI writing assistants, reflecting digital natives' autonomy. In contrast, 11.4% abstain due to device shortages, traditionalist habits, or tech anxiety. Key challenges include ensuring equitable access, preventing exam-oriented misuse, and fostering creative applications. A three-tier support system (access-competence-innovation) is proposed to empower deep learning.
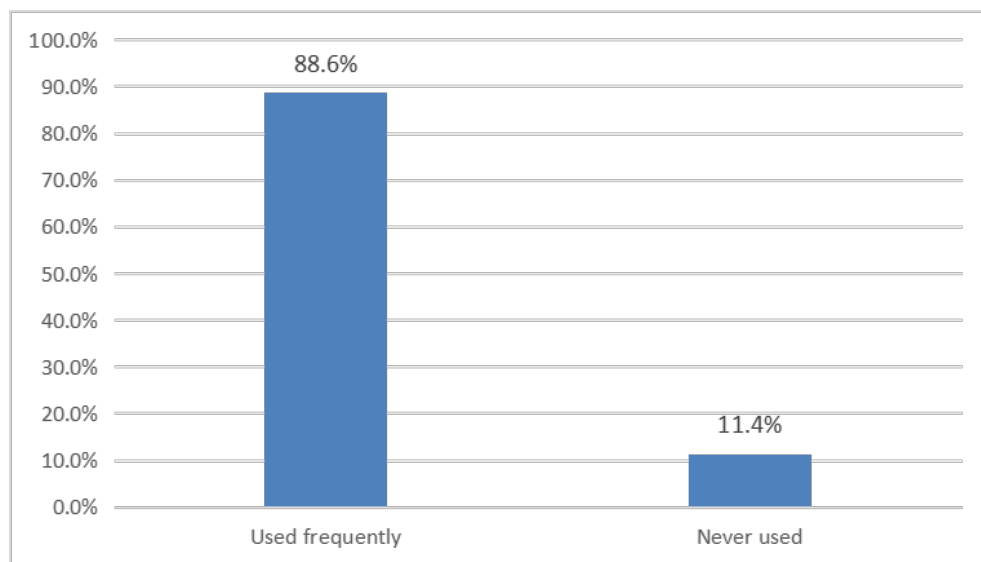
Figure 5. Frequency of students' use of AI learning tools

Figure 6 evaluates AI's perceived efficacy. Only 32.7% report significant improvement, praising personalized feedback; 65.9% see marginal benefits, citing poor adaptability and usability; 1.42% deem it useless, often in unguided settings. To enhance outcomes, a "development-practice-evaluation" cycle is urged: developers must align tools with curricula, teachers should guide usage, and schools need dynamic assessment systems.
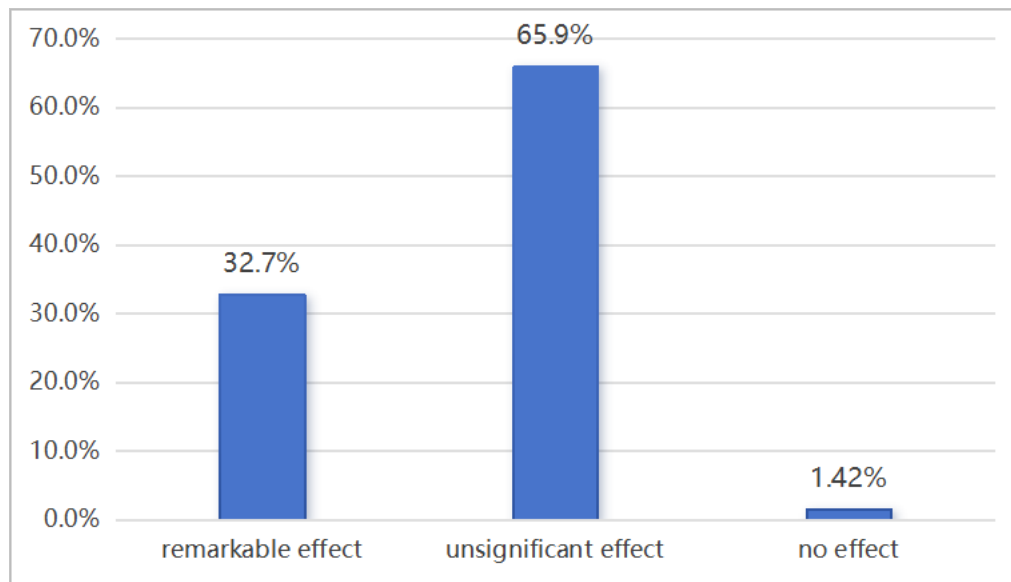

Figure 6. Students' evaluation of AI's learning impact

3.3. The application forms of artificial intelligence in schools

As shown in **Figure 7**, the application of intelligent teaching platforms in primary and secondary schools and universities in Ordos City has shown a trend of widespread popularization. Survey data shows that nearly 90% of schools have incorporated intelligent teaching platforms into their daily teaching systems, which has become the main form of the application of artificial intelligence technology. Through functions such as online courses, assignment distribution and marking, and learning progress tracking, these platforms provide convenient teaching aids for teachers and students. Teachers can use the data analysis function of the platform to grasp students' learning situations in real time, so as to adjust teaching strategies; students can obtain rich learning resources and personalized learning support through the platform. However, despite the high penetration rate, there are still differences in the actual usage effects of the platforms. Some schools have reported that the comprehensiveness and stability of the platform functions need to be improved, especially since the response speed problem is quite prominent when there is high concurrent usage. In addition, the adaptability of the platforms to local curriculum standards still needs to be strengthened to better meet the needs of local teaching.

Although the application of AI-assisted teaching tools has not yet reached the level of popularity of intelligent teaching platforms, their potential to enhance teaching interactivity and interest has been recognized by some schools. Currently, these tools are mainly focused on technological fields such as intelligent voice recognition and image recognition, and are applied to specific subjects like language and science [7]. For instance, voice recognition tools can help students correct their pronunciation, while image recognition tools can assist in the experimental teaching of subjects like biology. However, due to high technological barriers and

complex operation requirements, these tools face challenges in actual promotion. Many teachers have indicated that the lack of systematic training and technical support limits the frequency and effectiveness of using these tools. In the future, if the operation process can be simplified and more subject-specific examples are provided, the application scope of AI-assisted teaching tools is expected to expand further.

However, the comprehensive promotion of personalized learning still faces multiple obstacles: first, the comprehensiveness and accuracy of data collection need to be ensured; second, the scientificity and transparency of the algorithm model urgently need to be improved; third, teachers' understanding and acceptance of the concept of personalized learning need to be further deepened. In the future, with the maturation of technology and the renewal of educational concepts, personalized learning services may become an important development direction for the application of artificial intelligence in education.

Overall, schools in Ordos City demonstrate a dual pattern of "popularization and exploration" in their application of artificial intelligence (AI) technologies. Intelligent teaching platforms have been widely adopted as foundational tools, while AI-assisted teaching instruments show value in specific scenarios. Meanwhile, personalized learning services represent the future direction of development. This multi-tiered application framework reflects the gradual integration of AI technologies in education and provides a clear pathway for subsequent optimization and advancement.
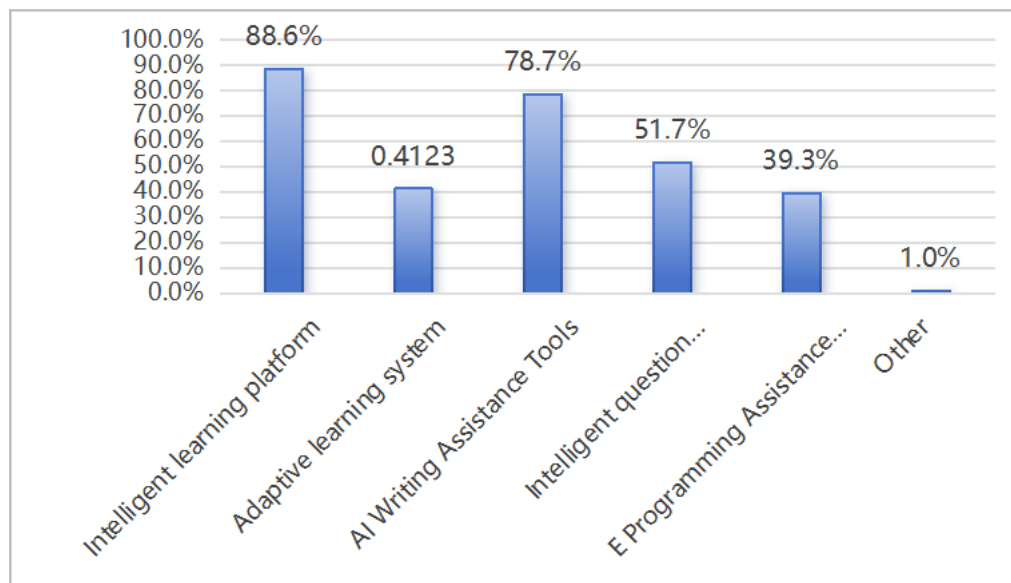

Figure 7. Distribution of AI application models in schools

4. Critical examination of current challenges

4.1. Teachers' insufficient technical competence

The application ability of artificial intelligence technology by teachers is one of the key factors affecting the promotion of artificial intelligence in education. The survey results show that 70% of teachers believe that they lack technical capabilities and find it difficult to effectively apply artificial intelligence teaching tools. This not only restricts the in-depth application of artificial intelligence technology in teaching but also affects students' learning and experience of artificial intelligence technology [8].

4.2. Shortage of hardware and software resources

The inadequacy of hardware facilities and software resources is another significant factor that restricts the development of artificial intelligence education in primary and secondary schools, as well as higher education institutions in Ordos. Many schools, due to limited funding, are unable to provide sufficient computer equipment, network facilities, and AI teaching software, thereby limiting the application of AI technology. In addition, some existing AI teaching platforms and tools also have deficiencies in terms of functionality and response speed, which affect the user experience of teachers and students.

4.3. Fragmented curriculum system

At present, the curriculum settings of artificial intelligence education in primary and secondary schools in Ordos City are relatively monotonous. They mainly focus on information technology courses and lack systematicness and coherence. The teaching content also mostly consists of theoretical knowledge, and there is a lack of cases and projects that combine with practical applications. As a result, it is difficult for students to apply the knowledge they have learned to their actual studies.

4.4. Data security risks

With the widespread application of artificial intelligence technology in education, data privacy and security issues have become increasingly prominent [9]. Survey results indicate that 75% of teachers and students are concerned about the potential data privacy breaches and security risks associated with AI applications in education. The lack of effective privacy protection measures in the process of data collection, storage, and usage by schools may lead to the leakage or misuse of personal information of students and teachers.

5. Proposed countermeasures

5.1. Enhance teacher training programs

In response to the problem of teachers' insufficient technical capabilities, it is recommended that the education department and schools regularly organize artificial intelligence technology training, invite experts and enterprise technicians to give lectures, and improve teachers' understanding and application capabilities of artificial intelligence technology. At the same time, teachers should be encouraged to participate in online learning and communication activities to continuously update their knowledge and skills.

5.2. Increase capital investment

The government and education departments should increase capital investment in artificial intelligence education in primary and secondary schools to improve the hardware facilities and software resources of schools. Give priority to the allocation of computer equipment, network facilities, and artificial intelligence teaching software to ensure that schools can smoothly carry out artificial intelligence teaching activities. In addition, enterprises and social forces should also be encouraged to participate in the construction of artificial intelligence education in primary and secondary schools to form a diversified investment mechanism.

5.3. Optimize curriculum design and teaching content

Schools should optimize the curriculum design of artificial intelligence education by integrating students' actual needs and subject characteristics, increasing practical teaching components, and developing cases and projects

that are closely related to real-world applications. At the same time, emphasis should be placed on cultivating students' innovative thinking and practical skills, guiding them to apply the knowledge they have learned to solving real-world problems.

5.4. Strengthen the protection of data privacy and security

Schools should establish and improve the mechanisms for protecting data privacy and security, and strengthen the management of data collection, storage, and usage. Advanced data encryption technologies and anonymization processing methods should be adopted to ensure the security of students' and teachers' personal information. At the same time, strengthen data privacy and security education for teachers and students to improve their security awareness and prevention capabilities.

6. Conclusion and prospects

This research systematically analyzes the current state of artificial intelligence (AI) in education in Ordos City, revealing both opportunities and challenges in advancing AI-driven education in the region. Survey results indicate that while educators generally hold a positive attitude toward AI technology (70%), their practical application proficiency remains limited (only 32% can use it skillfully), highlighting the need for tiered training and hands-on guidance to bridge the gap between perception and practice. Although students widely use AI learning tools (88.6%), only 32.7% report significant improvements in learning outcomes, suggesting that tool adaptability, interaction design, and content quality still require optimization. At the institutional level, smart teaching platforms have achieved relatively high adoption rates (90%), whereas personalized learning services remain in the pilot phase (20%), reflecting a pattern of "widespread basic applications but insufficient advanced exploration."

Moving forward, Ordos City should establish a closed-loop "technology-teaching-evaluation" system, focusing on enhancing educators' application skills, improving students' tool utilization efficiency, and deepening the integration of AI tools with local curriculum standards. Additionally, attention must be paid to ensuring equitable access for technologically disadvantaged groups (11.4% of students not using AI tools) to prevent AI adoption from exacerbating educational disparities. With support from national strategies such as "East Data, West Computing", Ordos can leverage policy and resource advantages to explore pathways for AI in education in less-developed regions, serving as a model for western China and beyond.

To achieve deep integration of AI and education, the following measures are recommended: refining teacher training systems to strengthen technical application support; optimizing funding and resource allocation to ensure sustainable development; and enhancing data security and privacy protection to guarantee the ethical use of technology. As AI technology continues to evolve and educational philosophies advance, AI in education in Ordos is poised to progress from tool-assisted learning to ecosystem empowerment, providing new momentum for high-quality educational development.

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Disclosure statement

The authors declare no conflict of interest.

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