

## **The Construction of Artificial Intelligence Education Innovation Mechanism: A Review Framework and Research Agenda**

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### **ABSTRACT**

The swift advancement of artificial intelligence (AI) technology, exemplified by ChatGPT, has had a profound influence on higher education by presenting novel prospects for inventive approaches to teaching and learning. The capacity of AI to handle and examine vast quantities of data allows for the development of customized and adaptable learning experiences, hence revolutionizing conventional educational frameworks. This study examines the possible advantages and difficulties of artificial intelligence (AI) in higher education. It reveals that AI can improve educational material, facilitate collaboration between humans and machines in intelligent classrooms, and foster critical thinking, creativity, and collaboration among students. Nevertheless, the incorporation of AI also brings both ethical and pragmatic obstacles, such as apprehensions over data confidentiality, academic honesty, and the necessity for educators to cultivate digital proficiency and adjust to novel responsibilities. To get favorable results, it is crucial to embrace a well-rounded strategy that incorporates cutting-edge instructional methods, comprehensive digital literacy instruction, and explicit ethical principles. This research establishes a basis for additional investigation and the creation of policies, emphasizing the substantial capacity of AI to transform teaching techniques and improve academic achievements in higher education.

**Keywords:** Artificial Intelligence (AI), educational framework, education innovation, higher education, educational research.

### **INTRODUCTION**

The latest generation of ChatGPT products developed by OpenAI has garnered considerable global interest, extending their impact beyond the technology sector into education. These tools have generated interest in the potential of artificial intelligence (AI) to transform conventional teaching and learning methodologies. Educators are increasingly investigating how AI's capacity for extensive data processing might personalize learning experiences, enhance student results, and tailor education to the requirements of the digital era. In recent years, artificial intelligence has become a fundamental component of educational technologies, with numerous companies offering innovative solutions to the education sector. These innovations are revolutionizing material delivery and student interaction, fostering a more engaging and adaptive learning environment. AI-driven platforms may now provide students with immediate feedback, monitor their progress, and offer tailored study pathways according to their specific requirements and preferences.

In addition to improving individual learning experiences, the use of AI in education presents considerable opportunities for administrative efficiency. By automating monotonous duties such as grading, scheduling, and resource allocation, AI enables educators to concentrate more on instruction and student growth. This transition may result in more opportunities to cultivate critical thinking, creativity, and collaboration—skills that are progressively esteemed in the contemporary, rapid-paced, innovation-oriented environment. Furthermore, the significance of AI in education is being examined in the context of wider societal transitions toward digital transformation. As enterprises implement AI-driven procedures, educational institutions must equip students for a future in which AI will be integral to the workforce. Nonetheless, these opportunities present obstacles, especially with ethical considerations, data protection, and the risk of excessive dependence on technology. Collaboration among educators, politicians, and technology developers is essential to overcome these concerns, ensuring that the incorporation of AI in education is advantageous and inclusive.

The integration of AI in higher education represents a paradigm shift and presents a challenge. Although AI offers the potential to enhance accessibility and flexibility in education, it necessitates a reevaluation of conventional educational structures. This entails revising curricula to integrate AI literacy and digital competencies, allowing students to critically engage with AI technologies. Simultaneously, educators must cultivate new competencies to proficiently incorporate AI tools into their pedagogical activities. The potential of AI to transform education is significant, although its effectiveness relies on the

implementation of strong innovation frameworks. This entails promoting interdisciplinary research that connects AI technology with instructional theory while developing frameworks that emphasize ethical considerations and equal access. By adopting these improvements, education systems may guarantee that they not only align with technological advancements but also utilize them to establish more efficient and inclusive learning environments.

## LITERATURE REVIEW

### **Change the mode of Education and Teaching**

Because of its strong learning ability and its application in classroom teaching, after-school tutoring, and self-directed learning, the new artificial intelligence technology will further enrich the teaching content, enhance the teaching experience, and promote the reform and innovation of classroom teaching mode. AI is currently viewed by many as a driver that is integral to the fourth industrial revolution, and it may trigger the fourth revolution in education. Learning about AI has also begun to be part of the school curriculum (Dai, 2020; Knox, 2020). The introduction of virtual teachers into the classroom is conducive to breaking the spatial barrier and promoting the reform of the new teaching mode of online and offline dual-teacher classrooms. (Loeckx, 2016) suggested that AI could be an effective learning tool that lessens the burdens of both teachers and students and offers effective learning experiences for students. Through dialogue, it provides students with an intelligent, personalized, and humanized ubiquitous learning environment, and returns more time to students, which is conducive to the development of flipped classroom teaching. Promote the development of human-machine collaborative smart classrooms, and provide teachers with support for precise intervention and personalized learning of students' learning through educational big data. According to a survey conducted by Study.com of online course providers in the United States, 57% of teachers believe that ChatGPT will make their teaching job easier.

### **Impact on the Training Objectives and Evaluation Methods**

The new type of artificial intelligence can replace people collecting, organizing, and presenting all kinds of information, and from this perspective, it may replace some low-tech or low-creative jobs, such as data analysts, media workers, customer service personnel, etc. On the one hand, this puts forward new requirements for the talent training goals of the education industry. Students' ability to innovate, think critically, communicate collaboratively, and interact with people will become crucial, while the traditional education system, which aims at knowledge transfer, will find it difficult to adapt to the new situation. On the other hand, the goal of competence development requires a change in the way education is evaluated. It is difficult to evaluate the teaching effect of the application of new artificial intelligence technology in the traditional examination method with knowledge examination as the main goal, and it is urgent to change the evaluation objectives and evaluation methods.

### **Put Forward Higher Requirements for Teachers' Professional Ability**

The application of new artificial intelligence technology has gradually replaced traditional teacher skills such as simple knowledge teaching, homework correction, and Q&A. To cultivate students into innovative talents with multiple skills to adapt to the intelligent era, higher requirements are put forward for teachers' professional ability, and teachers need to become new teachers with profound academic attainments, proficient in network information technology, and mastering the "academic, technical and artistic" combination of superb teaching art. In the information society, where information technology and education are deeply integrated, teachers are required to change their roles and become organizers, guides, educational researchers, and lifelong learners of learning activities. According to the teacher survey, 43% of teachers believe that the application of ChatGPT will make their jobs more difficult.

### **Ethical Risks to Education**

While new AI technologies help teachers teach and students learn, they also bring some ethical risks to education, causing dissatisfaction among schools and educators. On the one hand, it may lead to educational copyright disputes. Because the content it learns is the knowledge generated by human society in the past, the content generated by it can hardly be called "creation". It is not a subject in the legal sense; does the copyright of the generated content belong to the individual who generates the text through the AI system, the company that makes the AI, or the scientist who trains the AI system? The jury is still out. Teacher surveys show that 26% of teachers have found students using ChatGPT to cheat. At the beginning of 2023, the world's top academic journals such as Science and Nature took drastic measures against ChatGPT, explicitly prohibiting it from being listed as a co-author of the paper. On the other hand, it can cause students to lose the ability to think. The new type of artificial intelligence makes it incredibly easy to learn knowledge, prompting students to become overly dependent on it and give up thinking and become tools to operate artificial intelligence. Some British academics said that if students start using ChatGPT, they will outsource not only writing but also thinking. Since January 4, 2024, the New York City Department of Education has imposed restrictions on it due to "concerns about the negative impact on student learning, as well as concerns about the safety and accuracy of content."

### **The Legal and Regulatory System for AI is Not Perfect**

Although ChatGPT has broad application prospects in the field of education, its involvement in the education ecosystem also brings potential risks of alienation. First, is the risk of knowledge alienation? It is difficult to distinguish the authenticity of knowledge, it is difficult to guarantee authority, which exacerbates the phenomenon of knowledge fragmentation and endangers people's belief in knowledge. The second is the risk of alienation of students' subjectivity. The development of ChatGPT may lead to physical retreat, which can easily eliminate students' autonomy and lead to the obscuring of students'

creativity. The third is the risk of alienation in the teaching process. Teaching may be alienated into one-way knowledge transfer, and the emotional interaction and emotional generation of teachers and students may be hindered. Fourth, the digital ethical risks; These include the risk of data breaches, the risk of some teachers losing their jobs, and the risk of academic misconduct in the publication of academic papers. As for how to deal with the risks brought by artificial intelligence there are lack of clear guidelines laws, and regulations.

### THE CONSTRUCTION OF ARTIFICIAL INTELLIGENCE EDUCATION INNOVATION MECHANISM

The swift incorporation of artificial intelligence (AI) into the educational sphere has resulted in substantial changes in pedagogy, learning processes, and the administration of educational institutions. Although AI presents numerous chances for enhancing student outcomes and operational efficiencies, its effective implementation necessitates a thorough innovation framework to tackle both advantages and obstacles. The objective of developing an AI education innovation mechanism is to not only include AI into current educational frameworks but also to transform the education system to better address the changing needs of a technologically sophisticated society.

To do this, several foundational elements must be established: institutional frameworks, research and development, digital literacy for educators and students, ethical principles, and infrastructural support. These components are essential for cultivating a comprehensive and flexible system that can harness AI's capabilities while alleviating its hazards.

#### Carry out extensive Research and Discussion on Topics

Although new artificial intelligence technologies such as ChatGPT are gradually being applied to the field of education and attracting widespread attention, there is still controversy about what impact it will have on education. The New York Times believes that AI will change education, but how it will change is still undecided in the academic community. Attitudes towards AI are also widely divided. 72% of college students believe ChatGPT should be banned from their school's network, while 67% of faculty disagrees. It is suggested that under the framework of artificial intelligence application, the theoretical and practical research of new artificial intelligence technology and education should be actively carried out. Through project bidding, academic conferences, etc., guide domestic research forces to organize specialized research teams to carry out special research on theoretical and practical issues such as the mode, method, path, and impact of the integration of new artificial intelligence technology and education, to provide support for the formulation of relevant education policies and the improvement of education and teaching.

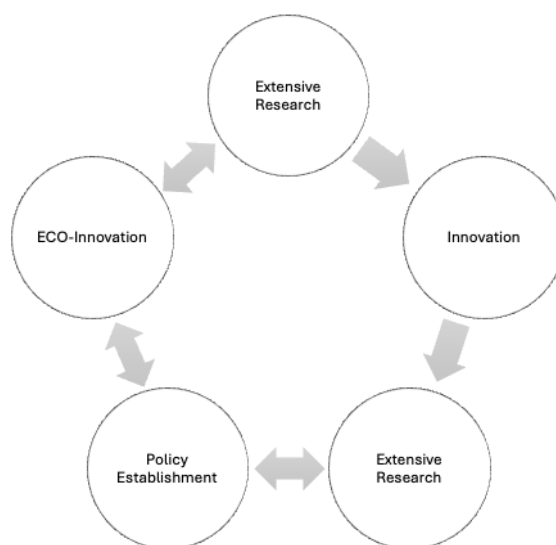


Diagram 1: Proposed Artificial Intelligence Education Innovation Mechanism

#### Actively Innovate Education and Teaching Models

In the era of artificial intelligence, students need to master critical thinking, effective communication skills, learning and innovation capabilities, interpersonal skills, independent problem-solving skills, and mutual collaboration skills, which put forward new requirements for school education. It is suggested to actively carry out education and teaching reforms, such as "dual-teacher" classrooms, flipped classrooms, and hybrid classrooms based on information technology. The modeling potential of AI techniques has been exploited systematically to develop reactive and adaptive tutorials for the construction of decasualized learning environments as compensation for the shortage of teachers through the use of intelligent tutoring systems (ITS) (Boulay, 2016). Through the integration of online education and traditional education, and the collaboration between physical and virtual teachers, a learning situation is created that triggers students' cognitive conflicts and stimulates students' active thinking activities. ITSs provide personalized learning experiences in four main ways: monitoring students' input, delivering appropriate tasks, providing effective feedback, and applying interfaces for human-computer communication (Abidoye, The Fourth Education Revolution, 2018). Design blended, project-based, inquiry-based, collaborative, and collaborative learning activities to optimize the classroom organizational structure; Use virtual simulation software, subject

tools, thinking tools, etc. to support students' self-reliance, inquiry, and cooperative learning process; Foster individualized and creative human resources who can solve complex real-world problems.

### **Vigorously Cultivate the Digital Literacy of Teachers and Students**

Since artificial intelligence is learned and programmed based on human knowledge, it will face the problem of untimely knowledge updates; Social biases such as race, sexism, and so on can be embedded in technology due to algorithmic bias. Therefore, in addition to learning to use AI to generate content, you should also learn to discern the values behind generated content and the ability to treat and use it. Artificial intelligence is an extension of human beings, and the real protagonists are the individuals who use artificial intelligence. There is an emerging recognition that teachers' professional roles need to be adjusted as AI advances and this will trigger new organizational forms (Fenwick, 2018). It is recommended to vigorously cultivate the digital literacy of teachers and students. Digital literacy includes digital awareness, digital technology knowledge and skills, digital application, and digital social responsibility. In addition to training teachers and students on how to use new AI technologies to carry out teaching and learning, it is also necessary to focus on cultivating teachers' digital awareness and digital social responsibility, helping teachers and students understand and view the role that ChatGPT and other new AI should assume in teaching and learning, and at the same time avoid possible educational ethical risks.

### **Build an Ecosystem for Educational AI Innovation**

ChatGPT is generative and cognitive artificial intelligence, and attention should be paid to the research and development of cognitive intelligence models, and the value of cognitive intelligence models in the fields of education and AIGC should be promoted. The construction should be carried out from many aspects such as the domestic software and hardware technology base of artificial intelligence, the public computing power platform of large models, and the national data resource platform. The first is to strengthen the design and development of AI chips, realize the optimization of the underlying operator support, system architecture solutions, and software ecological support, and create a system-level artificial intelligence software and hardware platform with higher performance, friendliness, and ease of use. The second is to strengthen the layout of computing power and build a public computing platform required for large models. At the same time, to ensure the demand for the use of ChatGPT in the education field, it is necessary to rely on the construction of new educational infrastructure and accelerate the layout of computing infrastructure represented by data centers and intelligent computing centers. The third is to strengthen data management, sort out the data of education scenarios, screen and clean up, and rely on the national smart education platform to build a national education data resource platform.

## **CONCLUSION**

The incorporation of artificial intelligence (AI) in higher education presents an opportunity to transform and enhance pedagogical practices. The integration of AI technologies like ChatGPT can revolutionize teaching and learning methods, resulting in significant changes to educational delivery, evaluation, and educator roles. This article examines the capacity of AI to improve educational content, enable personalized learning experiences, and promote collaboration between humans and machines in intelligent classrooms. Nonetheless, these technological breakthroughs present challenges and ethical dilemmas that necessitate resolution to guarantee a harmonious and advantageous implementation of AI in education.

A significant challenge is the necessity for innovative educational frameworks that can adeptly integrate the capabilities of artificial intelligence. This involves establishing new training objectives that emphasize critical thinking, creativity, and collaboration over rote memorization. Moreover, it is essential to modify traditional assessment methodologies to effectively evaluate the competences necessary in an AI-enhanced educational setting. Educators must cultivate digital literacy and adapt to careers that encompass academic, technical, and artistic competencies. The integration of AI in education must be executed judiciously, weighing both its advantages and possible hazards. A proactive approach to tackling ethical issues, including data privacy, academic integrity, and the potential for excessive dependence on AI, is essential. Educational institutions must adopt comprehensive regulations that safeguard student data and ensure that AI applications in classrooms foster intellectual independence rather than impede critical thinking skills.

Future integration of AI in education will necessitate sustained emphasis on research, development, and innovation. Educational institutions must cultivate settings that not only embrace AI but also actively influence its position in future educational frameworks. This entails broadening research on adaptive learning technologies, investigating AI's capacity to provide tailored educational experiences, and creating AI systems that assist educators rather than supplant them. Moreover, educators, politicians, and technologists must collaborate to mitigate the digital gap, guaranteeing that AI-driven educational resources are available to all students, irrespective of their financial level or geographic location. Closing this gap is crucial for establishing an equal and inclusive AI-driven educational system.

As artificial intelligence becomes increasingly integrated into educational settings, the human component must remain fundamental to the learning process. Educators will persist in their essential function of navigating pupils through intricate problem-solving, cultivating creativity, and providing emotional and social support—domains where AI remains deficient. By prioritizing collaboration between AI and human educators, educational institutions can provide more enriching and comprehensive learning experiences that integrate the skills of both parties. To prepare for the future, it is essential to establish ongoing professional development programs for educators, ensuring they possess the abilities to utilize AI tools efficiently.

Educators must be adept not only in employing AI for administrative functions but also in analyzing AI-generated insights to enhance student performance.

The enduring success of AI in education relies on establishing a sustainable ecosystem that fosters innovation while upholding ethical standards. Institutions must emphasize the cultivation of AI literacy, enhancement of digital infrastructure, and establishment of explicit ethical frameworks to facilitate the appropriate utilization of AI. Moreover, cultivating collaborations across academia, industry, and government will be essential for progressing AI technology in accordance with educational objectives. Ultimately, the role of AI in education will transform as technology progresses and societal demands change. It is essential for educational leaders to be adaptable and visionary, consistently updating curricula, pedagogical approaches, and regulations to guarantee that AI functions as an instrument of empowerment rather than division.

The future of higher education in the era of artificial intelligence presents extensive opportunities and significant responsibilities. By deliberately integrating AI technology, educational institutions may create dynamic, inclusive, and efficient learning environments that prepare students with the essential skills and knowledge to address future problems and opportunities. Achieving this aim necessitates meticulous preparation, interdisciplinary cooperation, and unwavering dedication to maintaining ethical standards. In this way, education can fully harness the transformative potential of AI, ensuring its continued positive impact on society.

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