



# Boosting Educational Reform with ChatGPT: Opportunities, Challenges, and Implications for Teachers' Coping Strategies

Xuan He

Qilu Normal University, Jinan, 250200, China

\*Corresponding author. E-mail: hx\_328@126.com

**Abstract.** As information technology continues to rapidly develop, artificial intelligence (AI) has emerged as a powerful tool in driving educational reform. Since its maiden release into the public domain on November 30, 2022, ChatGPT has garnered attention within the field of education. This advancement has sparked extensive discussions among scholars and educators, as it has the potential to revolutionize existing educational practices. The integration of ChatGPT in education presents both opportunities and challenges. It offers teachers an opportunity to reflect on their role and raises the bar for their requirements. This paper analyzes the advantages and disadvantages of ChatGPT in educational applications, emphasizes its value and significance for teachers and education, and provides implications for teachers' coping strategies.

**Keywords:** ChatGPT; Artificial Intelligence; Teacher Application; Educational Reform

## 1 Introduction

The 21st century has witnessed significant changes in educational practices, largely driven by advancements in artificial intelligence (AI). AI has undergone three stages of development in the field of education. The first stage, machine learning, enabled AI to automate storage and calculations, such as generating academic profiles of learners based on their data to predict learning outcomes. However, AI lacked the ability to identify. The second stage, deep learning, equipped AI with visual and auditory perception capabilities, allowing analysis of students' behavior, emotions, and speech in the classroom. Yet, creative abilities were still limited. The third stage, the general model stage, introduced AI models like ChatGPT, which possess understanding and generation capabilities. ChatGPT, as a content-generated AI product, leverages AI technology to generate various content forms, such as code, text, and images, with advanced information retrieval, natural language processing, and text generation capabilities[1]. Consequently, AI evolved from being a learning tool to becoming an active participant in the teaching process, contributing as knowledge generators and creators.

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The advent of the AI era, represented by ChatGPT as a disruptive technology, has spurred countries and regions worldwide to explore AI's potential in educational reform[2]. The application of ChatGPT in education has sparked debates among scholars and educators. Some view ChatGPT as a complementary tool in learners' knowledge acquisition process with positive implications for teaching. However, concerns also exist regarding the impact and threats posed by ChatGPT to the educational ecosystem, particularly regarding the risk of knowledge plagiarism. As technology continues to advance, it is crucial to address existing challenges objectively and analyze the advantages and disadvantages of AI integration in education to prevent cognitive biases and propose solutions to potential problems. Educators can integrate AI tools into classroom instruction, enabling students to better understand and leverage the power of ChatGPT to enhance productivity, understanding, and creativity[3].

## **2 Opportunities and challenges of ChatGPT in educational applications**

### **2.1 Opportunities of ChatGPT in educational applications**

Firstly, ChatGPT promotes the digital transformation of education[4]. In the context of digital transformation, the emergence and widespread adoption of ChatGPT highlight the significance and urgency of digitalizing education. On one hand, ChatGPT helps schools manage, allocate, and utilize educational resources more effectively, optimizing resource analysis and optimization to provide better educational materials for teachers and students. On the other hand, ChatGPT accelerates digital transformation and fosters an improved educational system, encompassing the educational environment, philosophy, teaching methods, and the selection of appropriate digital devices, platforms, and resources. It promotes the application of technology in teaching, facilitating effective teaching practices.

Secondly, ChatGPT enhances students' practical creativity[5]. Serving as a conversational text generation tool, ChatGPT employs a conversational teaching method to inspire students and foster innovative thinking by expanding their understanding and intuition. On one hand, ChatGPT stores a vast amount of data and knowledge, enabling detailed answers to most student questions. It provides students with abundant learning resources, diverse viewpoints, and the opportunity to challenge their biases, fostering unique insights. On the other hand, ChatGPT, when combined with other internet resources and AI technology, deepens students' intuitive understanding. In conventional teaching, students often rely on abstract words and memorization, making it challenging to achieve a deeper and effective understanding. ChatGPT creatively assists students by providing textual answers and generating more complex features such as images, videos, presentations, code, and websites when combined with internet resources. Furthermore, ChatGPT evaluates student solutions using algorithms and virtual conditions, enabling students to verify the feasibility of their problem-solving approaches. These diverse presentation methods deepen students' understanding, enhance comprehensive problem analysis, and stimulate imagination and creativity.

Thirdly, ChatGPT optimizes the educational process, improves teaching efficiency, and enhances the educational evaluation system<sup>[6]</sup>. ChatGPT serves as a comprehensive teaching aid, supporting teachers in course design, classroom instruction, learning evaluation, and other administrative tasks. Its powerful text generation capabilities assist teachers in lesson preparation, material searches, and knowledge point compilation. In class, ChatGPT helps teachers develop effective teaching strategies and methods while saving time in post-class activities such as grading homework. For educational administrators, ChatGPT streamlines textual work, including editing notices, rules, regulations, and analyzing teacher evaluations, ultimately enhancing teaching efficiency and quality<sup>[7]</sup>. Educational evaluation has also evolved, focusing on students' abilities rather than mere scores. It includes measuring creativity, critical thinking, teamwork, problem-solving skills, values, and more. Information technology-based evaluation methods have gained popularity due to their convenience, emphasizing not only knowledge mastery but also the process of acquiring and improving skills. Strengthening the integration of AI technology in educational evaluation ensures fair, scientific, and standardized assessments.

## 2.2 Challenges of ChatGPT in educational applications

Firstly, the development of ChatGPT easily leads to technological dependency. In 2023, an article on the official website of the United Nations Conference on Trade and Development (UNCTAD) pointed out that as more and more repetitive and procedural jobs are replaced by ChatGPT, which will force the knowledge-based talent training model to transform into the inter-disciplinary talent training mode<sup>[8]</sup>. This means the educational landscape may shift from imparting knowledge and skill training to cultivating qualities that highlight students' personalized advantages. However, the extensive use of AI technology poses a concern regarding technological dependency. For instance, students relying heavily on ChatGPT to complete homework or write papers undermines the trust-based relationship between teachers and students.

Additionally, while ChatGPT provides personalized assistance to students, it can diminish their independence, exploration, and decision-making abilities. Students may become overly reliant on ChatGPT for retrieving information or step-by-step instructions, hindering their application of knowledge to specific scenarios. Consequently, students may struggle to internalize fragmented external knowledge into a cohesive personal understanding, limiting the formation of a comprehensive knowledge structure. Rapid knowledge acquisition through ChatGPT may also lead to reduced engagement and interest in learning, resulting in inattentiveness during class and excessive reliance on ChatGPT outside of school. Moreover, the anthropomorphic nature of AI companionship can exacerbate emotional addiction, isolating students from real-life interactions with peers and teachers, thereby impacting self-awareness, mental health, and social interactions.

Secondly, the development of ChatGPT may lead to intelligent discrimination and create inequities in educational field. Currently, the application of AI technologies like ChatGPT is limited by the content and language of the training data, rendering them less applicable to specific industries or regions and potentially resulting in intelligent

discrimination. Biases embedded in the data settings, derived primarily from non-professional books and social media, may lead to biased responses, perpetuating stereotypes or discriminatory tendencies, especially affecting marginalized groups such as the disabled or the economically disadvantaged<sup>[9]</sup>. To address these limitations, AI applications in education should align with modern educational principles and methods. Moreover, risk control and ethical reviews should be implemented to ensure fairness, scientific rigor, and uniformity in the educational process. The widespread use of AI technology can exacerbate educational inequalities, particularly in developing countries where AI technology may not be readily accessible, creating disparities among students.

Thirdly, the application of ChatGPT can lead to the production of low-quality academic papers and disrupt the traditional academic order<sup>[10]</sup>. The academic field emphasizes originality, making it crucial to address intellectual property concerns associated with ChatGPT. Preventing researchers from using this technology to fabricate results, submit duplicate papers, or engage in plagiarism is of utmost importance. Although ChatGPT provides convenience to researchers, such as polishing academic work, improving paper readability, assisting non-native English researchers with translations, or supporting literature review writing and topic selection, its effect on academic writing still requires improvement. Moreover, students may be tempted to plagiarize or cheat in exams using ChatGPT, while teachers may neglect thorough lesson preparation, undermining the integrity of the traditional educational system. To mitigate these challenges, many reputable universities have imposed bans on the use of AI tools like ChatGPT in classes, assignments, and assessments, aiming to preserve the integrity of the educational process.

### **3 Implications for Teacher's Coping Strategies**

#### **3.1 Improving digital literacy and AI-integrated teaching ability**

With the rapid development of science and technology, digital information technology has become an important part of modern life and work. The emergence of ChatGPT is an inevitable development of the progress of AI technology in the past decade, and the deep integration of artificial intelligence technology such as ChatGPT with education is an inevitable requirement to promote the digital transformation of education[11]. The United Nations Educational, Scientific and Cultural Organization (UNESCO) highlights the critical status of digital literacy in the 21st century and provides a set of guiding principles and key competencies[12]. Therefore, as an important role in the digital era, teachers should improve digital literacy to better adapt to the teaching needs of the digital era. They should actively engage in reading, attend courses and training, and acquire theoretical knowledge in digital education. Mastering the use of digital tools, including AI technologies like ChatGPT, is crucial. Teachers should gradually integrate AI applications into their teaching practices, experimenting with digital teaching methods, and continuously improving their digital literacy and AI-integrated teaching abilities.

### **3.2 Establishing a new type of relationship and enhancing the communication between teachers and students**

In the era of artificial intelligence, teachers should prioritize emotional and humanistic education in the classroom[13]. ChatGPT lacks emotional understanding and response capabilities, hindering empathetic interactions. To compensate, teachers should dedicate more time and effort to areas where AI cannot replace human presence. They should focus on fostering students' character development, emotional values, and overall personality[14]. With AI's assistance, teachers can guide students towards active participation, leveraging verbal and non-verbal communication to enhance classroom interactions and create an engaging learning environment. During knowledge transfer, teachers should emphasize emotional values and cultivate students' emotions, as well as their qualities, ideals, and beliefs.

### **3.3 Shifting the concept of talent cultivation and enhancing the flexibility of educational assessment**

First of all, teachers change the concept of talent cultivation. Teachers can encourage students to explore themselves through digital technology and constantly update their knowledge system. Moreover, Recommending relevant books, reading materials, and providing various educational resources tailored to students' learning goals and personal development needs can foster a more conducive learning environment.

Furthermore, changes in talent cultivation concepts and modes necessitate adjustments to educational assessment methods[15]. In the AI era, educational assessments must be more flexible and adaptable. Teachers have creatively modified assessment practices to prevent overreliance on ChatGPT for assignments and essays. For example, some teachers have replaced after-class papers with in-class tests. Others allow students to utilize ChatGPT for paper assignments but require them to generate multiple versions and perform comparative analyses. These changes not only improve the reliability of assessments but also leverage AI technology to automatically record and evaluate student performance, enhancing convenience and systematization. Visual analysis technologies based on AI can offer insights into personal growth trajectories and predict future trends, providing scientific learning suggestions. Automated analysis of homework, student feedback, and learning data can also be facilitated by AI technology, reducing assessment costs and improving accuracy.

## **4 Conclusions**

As the world grapples with the educational and societal implications of ChatGPT and AI, it is evident that the development and improvement of such technologies are ongoing. In boosting educational reform, ChatGPT has the potential to enhance students' creativity by providing intuitive digital resources and evaluating their performance using algorithms. It optimizes teaching efficiency by automating repetitive tasks, enabling teachers to focus on core responsibilities such as designing teaching plans. Overall, ChatGPT's digital resource advantages and information platform construction

effectively promote the digital transformation of education and provide technological support to optimize educational efficiency.

However, like any new technology, ChatGPT carries risks and potential misuse. Overreliance on technology, diminished independent thinking and exploration, intelligent discrimination, misinformation, and academic integrity concerns are among the challenges that need to be addressed. Recognizing the value of AI tools like ChatGPT and implementing technological training and digital literacy enhancements can prevent misuse. Strengthening emotional and humanistic education, fostering real-life interactions, and encouraging students' active participation can compensate for AI's limitations. Furthermore, adapting talent cultivation concepts and assessment methods to the AI era ensures students' holistic development and enables flexible evaluation approaches.

In conclusion, it is crucial to acknowledge the potential of AI technologies such as ChatGPT while taking proactive measures to prevent misuse and optimize their integration in education. Through continuous adaptation and an ethical approach, educators can harness the power of AI to drive educational reform and provide students with enhanced learning experiences.

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