

The applications, risks and countermeasures of ChatGPT integration into school education

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Abstract. As a typical representative of generative artificial intelligence, ChatGPT plays a positive role in improving students' self-learning ability, assisting teachers in efficient education, and innovating education and teaching methods. In view of the fact that there are two sides to any technology, there are also potential risks in the process of integrating ChatGPT into school education, such as inadequate construction leads to cognitive inaccuracy, "digital dependence" alienates the teacher-student relationship, and information security concerns raise ethical considerations. Therefore, it is suggested to start with strategies such as building a regulatory mechanism and awakening the awareness of individual subjectivity, breaking the "technology dependence" and improving digital literacy, controlling information leakage and avoiding algorithmic bias, so as to provide useful guidance for the integration of ChatGPT into school education.

Keywords: ChatGPT; schooling; applications; risks; countermeasures.

1. Introduction

ChatGPT is a new type of chat-like artificial intelligence developed by OpenAI, an American artificial intelligence research laboratory, which is trained on a massive text corpus database and uses deep learning techniques to optimize data analysis. Under the effect of preset content generation rules, it can interact with humans in the form of text, pictures and videos according to the questions entered by users, and can even perform a variety of functions including writing code, writing papers, language translation and so on. As a major breakthrough in the field of artificial intelligence, ChatGPT caused an uproar in the Internet field as soon as it was launched, and in just two months, the number of registered users exceeded 100 million, setting a new historical record in the popularity of human consumer applications.

ChatGPT has not only sparked an unprecedented attention in the field of science and technology, but its application in the field of education has caused a lot of discussion among educators. Some see ChatGP as an extraordinary achievement and a great advance in the history of human science and technology, arguing that the emergence and application of ChatGPT will promote the digital transformation of education[1], but others argue that while ChatGPT is a powerful tool in education, it still needs to be used with more caution[2], its application in education can bring many negative effects. Based on this, this paper discusses the innovative application of ChatGPT in school education, analyzes its hidden potential risks, and proposes corresponding coping strategies, so as to provide a valuable reference for the correct application of ChatGPT in school education.

2. The innovative application of integrating ChatGPT into school education

The launch of ChatGPT has set off a milestone technological revolution, and although its application in schooling has only just started and has not had a widespread impact, its value to schooling should not be underestimated.

2.1 "Assistants" for students' self-directed learning

Generative artificial intelligence, represented by ChatGPT, has super information retrieval capabilities, text generation capabilities, and natural language processing capabilities, and it can automatically generate content and answer open questions in the form of chatting, which makes ChatGPT can be an auxiliary tool for students to learn independently. On the one hand, ChatGPT

can broaden students' knowledge horizons. With the development of artificial intelligence, the channels for students to acquire knowledge have become more and more diverse, and teachers are no longer the only source of knowledge for students. ChatGPT effectively integrates all kinds of educational resources based on a huge database, and realizing two-way human-computer interaction in various forms such as human-computer text language, pictures, sounds, and videos, and students can obtain rich learning materials by inputting relevant content according to specific needs, which helps to broaden students' knowledge horizons and improve students' creativity. For example, if you input the words "the laws of the earth's operation", ChatGPT will automatically generate detailed information about "rotation and revolution", "seasonal changes", "sunshine changes", and so on. On the other hand, ChatGPT can help students to fill in the knowledge gaps through questions and answers. Traditional school education is mainly based on classroom lectures and other forms of instruction, which belongs to collective education, and lacks attention to the level of individual education, which inevitably leads to the uneven level of students' knowledge reserves. The emergence of ChatGPT has broken the "host-guest" binary opposition framework of the traditional human-computer relationship, and established a new form of two-way human-computer interaction, students can ask questions to ChatGPT through ChatGPT's dialogue function according to their own knowledge blind spots, and ChatGPT will provide targeted "human-like" answers to the questions, and if the students are still confused about the answers, they can also ask questions in multiple rounds.

2.2 "Multiplier" for teachers to teach efficiently

In the process of traditional school education, teachers are often faced with heavy work tasks, and it is difficult to effectively evaluate and feedback the teaching effect, the personalized teaching design is not clear enough, and the actual needs of students are not met, while the emergence of ChatGPT enables teachers to accurately understand the dynamics of students' thoughts, and helps teachers to improve the efficiency of their work and the quality of teaching. First of all, ChatGPT can make it easier for teachers to prepare lessons. Through large-scale data analysis and natural language processing functions, ChatGPT can not only provide teachers with teaching ideas, teaching materials and teaching programs, but also automatically generate test questions based on the content of the course. For example, if you type in "help me write a teaching courseware design on 'cell division'", ChatGPT will generate a simple curriculum design framework about "cell division", and teachers can make appropriate supplements based on it. This greatly reduces the complexity of teachers' work, so that teachers can be liberated from heavy teaching tasks and have more time to devote to the improvement of teaching ability and humanistic care for students. Secondly, ChatGPT can improve the accuracy of teachers' education. With the help of ChatGPT's educational evaluation system and feedback methods, teachers can analyze students' acceptance of education courses, monitor students' learning progress and grades, and summarize students' strengths and improvement methods, so as to formulate more targeted teaching plans and after-class homework, and improve the accuracy of education. Finally, ChatGPT can help teachers achieve professional growth. ChatGPT can provide teachers with rich resources for online training and professional development according to their needs, helping teachers to efficiently educate people while improving teachers' teaching ability and level.

2.3 "Aids" for innovative teaching methods

The traditional school education classroom is dominated by teachers' lectures, and the classroom atmosphere is relatively boring, but after ChatGPT is integrated into school education classroom, it can assist in the innovation of teaching strategies and the creation of diversified teaching practices. On the one hand, the integration of ChatGPT into school education classrooms can make teaching more interesting. "Based on the ability to understand conversational situations, systems such as ChatGPT can act as a teaching assistant in the classroom, providing teachers with interactive support for the teaching process according to the current teaching activity situation"[3]. Specifically,

ChatGPT has powerful information gathering capabilities that can help teachers provide engaging course content; ChatGPT can also help teachers automatically generate educational games and projects that are entertaining and educational, so that students can increase their interest in the classroom through interactive forms; and teachers can use ChatGPT to combine with the entire Internet resources in the form of videos, images, and text to evolve theoretical knowledge into virtual practice. Teachers can also combine ChatGPT with the entire Internet resources in the form of videos, images, and texts to evolve theoretical knowledge into virtual practical teaching and increase students' intuition feelings. On the other hand, the integration of ChatGPT into the school education classrooms can stimulate students' subjective initiative. ChatGPT plays the role of a "digital mentor" in education, it "can handle conversations on various topics and fields, and can deal with a wide range of problems and topics"[4], students can independently complete the process of topic selection, design, analysis and reporting through ChatGPT, which can increase the subjective initiative of students in the classroom, so that students can be fully engaged in the course learning, and finally achieve the goal of the unity of knowledge and action.

3. The potential risks of integrating ChatGPT into school education

Although ChatGPT has shown great potential in school education, science and technology have two sides, and school education is a social practice that cultivates people, which is related to the future and hope of the nation. Therefore, we need to be cautious about the risks brought by the integration of ChatGPT into school education.

3.1 Inadequate construction leads to cognitive inaccuracy

As a new thing, ChatGPT is still in the initial exploration stage, and there are many shortcomings in the process of applying it to school education. On the one hand, it is difficult to distinguish between the real and the fake content automatically generated by ChatGPT. Due to the lack of sufficient learning and training, ChatGPT's content output will inevitably have blind spots, and sometimes there will even be risks of lack of reliability and uneven information quality. For example, when asking the question "the latest update of the Russia-Ukraine conflict", ChatGPT suggests that , whose last knowledge update is due in January 2022, is unable to provide the latest situation of the Russian-Ukrainian conflict. At the same time, ChatGPT may also produce incorrect answers in information interaction, such as misuse of concepts, misuse of information, fabrication of facts, etc., which can easily mislead students if they are not screened. On the other hand, ChatGPT has the risk of algorithmic black-box in content generation. Because users do not understand the thinking logic and information processing process inside ChatGPT, they directly receive the answers and content generated by ChatGPT, which lacks transparency and interpretation. When ChatGPT is used in school education, it can only passively accept the secondary information processed by the algorithm, and it cannot explain the source of the document and the rationality of the content, which makes it difficult for students to establish the internal connection between the relevant knowledge in the process of learning, and over-reliance of such tools may result with students being deprived of developing foundational skills[5], thus falling into the situation of cognitive inaccuracy.

3.2 Digital dependency alienates the teacher-student relationship

While ChatGPT helps teachers achieve efficient education, it also comes with the risk of digital dependence. Digital dependence is mainly manifested in individuals overexaggerating the role of ChatGPT technology as an auxiliary tool, blindly believing in the scientificity and comprehensiveness of the data, resulting in technical dependence, and with the gradual improvement of algorithm programs, people are addicted to this kind of responsive self-satisfaction, no longer seeking the improvement of self-ability. On the one hand, the excessive use of ChatGPT will weaken the subjective position of teachers. In school education, teachers originally held the

initiative in curriculum setting and the control of discourse cohesion, but if teachers rely excessively on ChatGPT for teaching plan design and classroom teaching, it will cause the solidification of teaching forms, which will not only fails to achieve the purpose of improving the quality and efficiency of teaching, but also weakens the subject position of teachers. On the other hand, teachers' over-reliance on such chatbots will dilute the emotional communication between teachers and students. In essence, school education is a kind of planned and organized practical activities to guide people's physical and mental conscious development to meet the needs of people and society , and the physical and mental development and personal growth of students can not be separated from teachers' humanistic care and emotional communication. However, the process of integrating ChatGP into school education has replaced the emotional communication between teachers and students with cold data, ignoring people's emotional needs, and simply simplifying real people into data-based people. The end result is that the relationship between teachers and students becomes increasingly indifferent, and it is difficult for students to perceive the humanistic spirit of school education through humanistic care and edification, and finally deviates from the essence of school education.

3.3 Information security concerns raise ethical consideration

The issue of information security has always been a key issue for AI information systems. ChatGPT involve the collection and processing of personal data, which raises concerns about privacy and data security[6].On the one hand, ChatGPT has the risk of leaking personal information.ChatGPT, as an important technology, itself can only imitate human language behavior on the basis of large-scale data, which requires a large amount of personal information of actors related to school education, such as biological information, travel trajectory, family information, physical conditions, and even psychological status, demand information, value orientation, and other private contents. If ChatGPT is not handled with effective data encryption and privacy protection, these data are likely to face the risk of reuse and information leakage. On the other hand, ChatGPT may also hide algorithmic bias. The development and application of generative artificial intelligence represented by ChatGPT cannot be separated from human support, which will make ChatGPT unconsciously integrate into the value orientation and ideological concepts of relevant technical personnel and information sources, Dilution-filtered corpus based on large-scale training language models still has implicit biases of predisposition based on gender, culture, geography, disease, etc., which not only affects the learning experience of teachers and students to a certain extent, but also may affect the fairness and justice of school education, and even intensify social contradictions.

4. Coping strategies forintegrating ChatGPTinto school education

ChatGPT Generative artificial intelligence has built a new format and model for the development of school education with technological change, bringing more possibilities for the digital transformation of school education. However, ChatGPT and school education are not inherently compatible, and there are hidden dangers in the process of integrating into school education. Therefore, it is necessary to strengthen supervision, scientific guidance, and reasonable response in order to form an effective strategy to deal with the challenges of ChatGPT's generative AI.

4.1 Construct a regulatory mechanism and awaken the consciousness of individual subjectivity

There is a risk that ChatGPT will mislead students' perceptions in the process of integrating into school education. Therefore, in order to make ChatGPT truly become an auxiliary tool for school education, it is necessary to adhere to the problem-oriented, and formulate an effective supervision mechanism, which is a proper response to guide students to use ChatGPT correctly. First of all, in order to prevent ChatGPT from outputting wrong information to mislead students, a corresponding

network supervision mechanism should be established, not only strengthens supervision in the qualification review of relevant subjects and the filing of algorithm information, and to improve the access evaluation mechanism for ChatGPT integration into school education, but also to strengthen supervision in the process of integrating ChatGPT into school education, builds an intelligent risk monitoring and early warning mechanism for school education, and timely correct errors in algorithm retrieval and logic. Secondly, in view of the algorithmic black box of ChatGPT, the supervision of ChatGPT algorithm design and data selection should be strengthened, especially the management of data sources and processing processes should be strengthened, so as to avoid ChatGPT from introducing wrong information into its design. Finally, the individual's subjective consciousness should be awakened. Teachers and students, as the main body of ChatGPT practice, should not only improve their ability and awareness of consciously using ChatGPT technology to empower themselves, but also have an in-depth understanding of ChatGPT's technical defects, be familiar with the operation of ChatGPT, enhance their thinking and discernment ability in dialoguing with ChatGPT, and give full play to the utility of ChatGPT. Currently, some schools and universities have begun to integrate AI education into their curricula to teach students the fundamentals of AI, as well as its potential risks and benefits, which can help students understand the technology and its impact on their future careers[7].

4.2 Break the “technology dependency” and improve digital literacy

In view of the risk of alienating teacher-student relationship when ChatGPT is integrated into the school education process, Educators should critically evaluate any AI-generated resource and adapt it to their specific teaching contexts[8]. On the one hand, it is necessary to strengthen digital training and improve the technical awareness and intellectual literacy of educators. School educators should maintain a prudent and objective attitude and rational value cognition when using ChatGPT to assist teaching, clearly analyze the technical limitations and algorithmic biases of ChatGPT, and avoid "technological supremacism" encroaching on people's thinking rationality and moral concepts. At the same time, for the problem of emotional indifference between teachers and students caused by ChatGPT's integration into school education, school educators should always adhere to the people-oriented education concept, influence students through humanistic care and daily communication, so that they can open their hearts to each other and talk about everything, so as to realize the sharing of knowledge, wisdom, emotion and life insights. On the other hand, educators should constantly reflect on their work content and improve their professional quality. Although in the era of intelligence, the channels for students to acquire knowledge are becoming more and more diverse, and the integration of ChatGPT into school education can greatly improve the independent learning ability of students, the content automatically generated by ChatGPT lacks spirituality and systematization, and the knowledge is relatively fragmented, which requires giving full play to the professional ability of teachers, conducting in-depth integration and analysis, and then forming a profound, systematic and vivid curriculum content to increase students' cognition.

4.3 Control information leakage and avoid algorithmic bias

The openness and collection of data is the premise and foundation for ChatGPT to be integrated into school education, while the privacy protection of teachers and students is also an important guarantee for its sustainable development. On the one hand, it is necessary to improve the laws and regulations on personal information and privacy security. Protecting the information security of teachers and students is the key to the application of ChatGPT in school education, and relevant laws and regulations need to be formulated to protect it. Specifically, through the establishment of privacy protection laws and regulations, the rights and responsibilities of information managers are clarified; through the technical protection mechanism, the information of teachers and students is anonymized and encrypted and stored; through the risk monitoring system, collaborate with the government, schools, and social supervision to strengthen the process of supervision, and carry out timely investigations and handling of privacy and security issues that arise in the process of using

ChatGPT, so as to effectively protect the rights and safety of teachers and students. On the other hand, it is necessary to avoid algorithmic bias in a timely manner. As an extension of real-world bias in the algorithmic world, algorithmic bias hinders the healthy application of artificial intelligence technology, and the governance of the ecological environment of algorithmic bias should be strengthened from the institutional and legal levels, such as attaching great importance to and consciously abiding by the ethics of scientific and technological applications, and further strengthening the constraints of laws and regulations. At the same time, it is necessary to give full play to the collaborative guidance of mainstream values and artificial values, strengthen the moral education of teachers and students, and improve the awareness of prevention and rights protection of teachers and students, so as to realize multi-party supervision and multiple measures for algorithmic bias, and better play the potential of ChatGPT in school education.

5. Summary

To sum up, as an intelligent chatbot, ChatGPT has good prospects in improving students' independent learning ability, improving the efficiency of teachers' education, and realizing the innovation of teaching methods. However, at present, the application of ChatGPT in school education is still in the initial exploration stage, and there are still controversies in terms of teacher-student relationship and information security. However, it is undeniable that generative artificial intelligence, represented by ChatGPT, in the era of big data, is promoting the arrival of a new era of digitalization in school education, and how to better integrate and release technological dividends in school education practice has become a new problem that needs to be studied in depth. In the future, it is necessary to carry out continuous, multi-faceted, and large-sample high-quality randomized controlled studies to further verify the feasibility of integrating ChatGPT into school education, strengthen the innovative development of localized ChatGPT applications in China, broaden its application space in school education, and promote the digital transformation of school education in China to a new level.

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