



The Rise of ChatGPT: Unlocking Its Potential in Education

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Abstract. Whether ChatGPT is a helper or a poison to education has been a topic of concern. This paper outlines the impact of advances in artificial intelligence technology on the development of education. Then we propose how people can rationally view ChatGPT as a new form of artificial intelligence application. Finally, some suggestions are given to the two main subjects of education, teachers and students, to maximize the effectiveness of ChatGPT.

Keywords: ChatGPT · Education · Strengthen unique competencies of teachers · Cultivate core competencies of students

1 Introduction

The emerging technologies represented by artificial intelligence (AI) have brought great changes to the world. Chat Generative Pre-trained Transformer (ChatGPT) has created a worldwide sensation as a new form of AI application. ChatGPT is pre-trained with datasets so that it can communicate with humans in text like humans do [1]. The dataset contains billions of text messages, so ChatGPT is equipped with powerful natural language processing and generation capabilities. ChatGPT has also attracted a lot of attention in education. From the perspective of teachers, they can lighten work burden with ChatGPT, and students can do self-learning by talking with ChatGPT, which means that ChatGPT may cause some teachers to lose their jobs. From the perspective of students, although ChatGPT is powerful, many schools explicitly prohibit the use of ChatGPT, because many students will use it for inappropriate things, such as plagiarizing papers [2]. They argue that the ban on ChatGPT is an attempt to combat the erosion of AI on students' critical thinking and problem-solving skills. Therefore, the applications of AI in education at different stages are investigated. Then, this paper analyzes whether ChatGPT is an opportunity or a threat for education. Facing the test of ChatGPT in education, this paper puts forward some suggestions on how to deal with ChatGPT for the two subjects of education: teachers and students.

2 The Development of AI Technology in Education

AI technology is penetrating the education industry at a rapid pace. Every technological revolution brings sweeping changes to the education industry. AI is one of these technologies. The development of AI applications in education can be divided into three stages.

The first stage can be graphically expressed as automation that can store and calculate, and its representative technology is machine learning [3]. Machine learning mainly solves the problem of analysis and prediction of educational statistics. Learning style analysis and learning level prediction in MOOC (Massive Open Online Courses) are typical applications of machine learning. MOOC is an online platform that provides online public courses. It provides users with a large number of online courses. But it will collect information such as the learning style of the users. AI will count all the data and predict users' learning level. Then make relevant push. But AI at this stage is still difficult to achieve a human-like "recognition" ability.

The second stage is the perceptualization of seeing and hearing. Its representative technology is deep learning [4]. The application of deep learning in education extends from statistics of educational data to recommend teaching videos, learning resources, test papers and other multimodal teaching resources. Deep learning enables the machine to have human-like recognition ability, which can automatically "see" and "hear" the actions, gestures and conversations of teachers and students during the teaching process, and make personalized recommendations based on the recognition. Typical applications include intelligent marking system, intelligent classroom software, etc.

The third stage is the cognition of being able to understand and create. It is represented by the Universal Grand Model, which is the ChatGPT to be discussed in this paper. The changes that ChatGPT has brought to education can be summarized in three points. The first change is that ChatGPT has enabled the application model of AI to move from dedicated to generic. Previously, AI was targeted at a narrow caliber. Now AI services are geared towards a wide range of disciplines. The second change is that the application process of AI is moving from distribution to generation. In the past, educational resources were first produced as data resources. AI determined each user's needs through the information obtained from them. AI tailored resources to meet users' needs, and then pushed the pre-made educational resources to users. Nowadays, AI can aggregate a wide variety of educational resources and process them to generate personalized learning resources to meet the different needs of users. The third change is that the application scenario has shifted from singularity to diversity. For example, MOOC used to focus only on online classes, while smart assignments were limited to offline. And in the future, their application scenario is a new type of teaching field that integrates reality and imagination, such as metaverse.

3 Is ChatGPT an Opportunity? Or a Threat?

ChatGPT is a chatbot that can talk to humans [5]. In the past, chatbots were just information sifters and movers, but ChatGPT is not only a sifter and mover of information, but also an analyzer, generator and creator of information. ChatGPT becomes the new

intellectual arena of human intelligence and artificial intelligence, and its attention is no less than Alpha Dog playing chess with human. Whether ChatGPT can bring opportunities or threats has become a hot topic of discussion [6]. Here are some of our thoughts about ChatGPT.

3.1 This is an Opportunity to Reconfigure the Relationship Between Humans and Machines

ChatGPT's role is not just a tool, but also a conversation partner. ChatGPT is programmed by humans to guide and change machines in a systematic way, so that they can positively contribute to human growth and development. This brings a major shift in education for the age of intelligence: Keep the machine educated. Therefore, we need to reconceptualize the meaning of "human". As machines become more and more human-like, an old but frequently new question resurfaces: who people are, and why they live.

3.2 This is a Time to Push Humanity to Evolve Themselves

AI may cause the degradation of human intelligence. The smarter the machines get, the less people like to use their brains. For example, with the popularity of calculators, people's oral arithmetic skills are getting worse. Unknowingly, human beings become children coddled by machines. In particular, the powerful functions of ChatGPT, such as information retrieval, generation, etc., make many people worry that ChatGPT will replace their work. However, we believe that the biggest crisis caused by ChatGPT is not the displacement of jobs, but the long-term inaction of people in the face of technological progress. It was only a matter of time before such people were eliminated, but ChatGPT hastened the process. The only way to resolve the crisis is to creatively transform the process of human-computer dialogue into a process of self-transcendence and self-evolution of human life.

3.3 This is a Shift from Alternative Thinking to Symbiotic Thinking

Most people suffer from "substitution thinking", rooted in a dichotomous way of thinking: AI versus human intelligence. With this way of thinking, it is natural for people to see "competition", "confrontation" and "conflict", which turns man and machine into a "deadly" adversarial relationship of "who replaces whom". But people might look at the problem from a different perspective and notice that there is another way of thinking. With ChatGPT, people can explore and create a new state of cooperation and a new pattern of mutual transcendence between humans and machines. This will bring new goals in the age of intelligence: from vicious competition to healthy competition, from "one-way evolution" to "two-way evolution", creating a symbiotic pattern of AI and human intelligence "catching up with each other".

3.4 This will Help People Understand the Value of the Human Teachers

Although it is unlikely that human teachers will be completely replaced by a machinist like ChatGPT, some of the roles or functions of human teachers, such as designing

lessons, searching for knowledge, simulating classes, translating texts, assessing course-work, etc., will be replaced by machinists. What can human teachers do to avoid being replaced by ChatGPT? Let teachers do what only a ‘human teacher’ can do. For example, human teachers can develop students’ ideals and beliefs, thinking and emotions, will and courage, struggle and drive, creative and innovative abilities and so on [7].

3.5 This is an Event that Promotes the Reinvention of Teachers’ Competencies

The teaching profession itself will not be replaced by ChatGPT, but this does not mean that all teachers will never lose their jobs. Those “brain workers who do manual work” are at high risk of being eliminated at any time. This is because the work of these teachers can be replaced by ChatGPT, while they do not have special competencies that ChatGPT does not have. The fate of these teachers is not to be replaced, but to be eliminated.

4 What Competencies Do Teachers Need to Tackle ChatGPT?

ChatGPT can provide a full range of assistance and services for teachers [8]. ChatGPT can present the knowledge points required for the courses according to the parameters set by the teachers and can enrich the teaching content by finding targeted teaching materials in a huge database. ChatGPT can also generate personalised teaching solutions and improve teaching activities by setting different contextual tasks, etc. ChatGPT supports teachers in their work by relieving them of the conventional and repetitive workload through the function of automatically retrieving and generating information. The powerful functions of ChatGPT will undoubtedly replace some of the teachers’ work and thus reduce the number of teachers. Many teachers have a sense of crisis about ChatGPT. Under the pressure of ChatGPT, how can teachers fight back in order to survive? They must strengthen their unique competencies.

4.1 Teachers Must Be Good at Exploring and Transforming the Educational Value in Human-Machine Dialogue

When ChatGPT enters the classroom, complex dialogue relationships are formed: student-machine dialogue, teacher-machine dialogue, teacher-machine-student or student-machine-student dialogue. How can dialogues be educational and nurturing? Teachers need to enrich students’ rational understanding of technological tools by excavating the educational value of human-computer dialogue. This means that teachers need to educate students to understand that technology is not strictly good or bad, the focus is on how humans use it. Teachers need to master the paths and strategies of dialogue with machines to provide students with learning experiences and to help students enhance their thinking, emotional and aesthetic abilities that are only possible in human-machine dialogues, so that they can eventually learn to study and grow in human-machine dialogues.

4.2 The Teacher Must be Competent in Choosing and Teaching What only a Human Teacher can Teach the Students

With ChatGPT people need to rethink what knowledge is most valuable and what competencies are most critical? These old fundamental questions need to be rethought and re-answered in the ChatGPT era. ChatGPT is not only a technology and a platform, but also a new scale, a new benchmark: What knowledge and ability can no longer be taught to students in this era? The basic guideline is that teachers can teach less or even not teach the knowledge or ability that AI is specialized in. Any knowledge or ability that the AI is not good at or is incapable of, needs to be taught more or highlighted by the teacher. Teachers need to change the emphasis of teaching: from memorized, and test-training knowledge to those that cannot be replaced by AI. For example, higher-order thinking, curiosity, imagination, etc. [9].

4.3 Teachers Must Educate Students to Collaboration with ChatGPT

Today, it is a reality that teachers and robots work together in a class. The classroom becomes a trinity of human teachers, students, and robot teachers. In this new type of classroom, new requirements are put forward for teachers' ability: Man-robot collaborative education. This collaboration is no longer just a collaboration between human and tools, but a collaboration between two kinds of intelligence: human and robots. The interactive, generative and complex nature of this collaboration is unprecedented and presents an unprecedented challenge to teachers. How human teachers can proactively demonstrate their unique and irreplaceable parenting skills, while tugging or driving the ability of robotic teachers to collaborate on nurturing, are all essential new competencies for future teachers.

5 What Competencies Do Students Need to Tackle ChatGPT?

Emerging technologies, represented by ChatGPT, are redefining the value of human knowledge and capabilities. For example, human-computer collaboration, innovation, critical thinking and digital literacy will become important core competencies for talents in future [10]. Therefore, it is crucial to develop students' ability to use ChatGPT in a rational way.

5.1 Improve the Students' Sensitivity to Information and Judgment of Its Value

Students with low information judgment may be convinced by the answers from ChatGPT. But in many cases the answers given by ChatGPT are actually unreasonable. Many people will use ChatGPT to generate articles, but if we carefully screen them, we will find that many words in these articles are nonsense, and the density of information is not high, which requires students to process and secondary process the ChatGPT-generated articles. So we have higher requirements for students' information judgment than before.

5.2 Consciously Protect the Privacy of Oneself and Others

ChatGPT does not screen the information and does not mark the source of the quoted information. We need to pay high attention to the fact that every person who uses it will become the dataset for ChatGPT. For example, some users have a low awareness of privacy and security, or do not realize that ChatGPT may “steal” their ideas, so they will directly bring some of their good ideas or opinions to discuss with ChatGPT. Then ChatGPT is likely to learn from his research ideas and then use them directly in conversations with other users. ChatGPT may inadvertently give away very critical ideas of users.

5.3 Master the Basic Principle Knowledge of ChatGPT

Students who want to use ChatGPT to solve problems must have some knowledge of digital technology theory. For example, if a student doesn't know anything about ChatGPT, he might ask it to draw a picture. But in fact we know that ChatGPT uses text to communicate with humans, which means it can't draw. So if students don't have some fundamental knowledge, they may have some ineffective interactions with ChatGPT. Teachers need to develop students' ability to use ChatGPT, so that they can give ChatGPT more explicit instructions.

6 Conclusions

The advancement of technology will promote the development of education. Although ChatGPT will replace some of the teacher's functions, the teachers' role in guiding students' abilities and emotions cannot be replaced. It means that teachers urgently need to complete the evolutionary upgrading of their self-intelligence and self-competence. Therefore, this paper summarizes the different stages of AI application in education and analyzes how people should view ChatGPT's impact. Faced with the impact of ChatGPT, teachers should not only teach students knowledge, but also develop the competencies that students need most in the age of intelligence, including critical thinking and creativity. For students, while ChatGPT provides quick and easy answers to questions, it does not develop the critical thinking and problem-solving skills that are critical to students' academic and lifelong success. Let ChatGPT be a tool for students to learn, not a heroin, so this paper presents some considerations for instructing students to use ChatGPT.

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