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Reflections on China's Higher Education Reform Initiated by ChatGPT

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Abstract

Open AI, an artificial intelligence research laboratory in the United States, has developed an intelligent chat robot called ChatGPT. It can use multiple languages to respond to user requests for information, and can engage in simple conversations and discuss basic issues. It can also understand and analyze user language, and has certain anthropomorphic language abilities. As a representative of generative artificial intelligence, ChatGPT has become popular throughout the internet and has also attracted high attention from various levels and types of school education work worldwide. Is it an opportunity or a threat to China's higher education, and does it have a promoting effect on the reform of China's higher education? The full text briefly introduces ChatGPT and its focus, analyzes ChatGPT from a historical perspective, combines the current situation of China's higher education reform, analyzes the advantages and disadvantages of ChatGPT application in China's higher education, and finally proposes suggestions for Chinese universities to scientifically and reasonably use ChatGPT. It is hoped that Chinese universities could use artificial intelligence to empower a new round of "classroom revolution", better respond to the arrival of the ChatGPT era, and promote higher education reform in China.

Keywords: ChatGPT, Higher Education, China, AI, Reform

Introduction

In November last year, ChatGPT, launched by artificial intelligence research company OpenAI, exceeded one million registered users within five days and over one billion registered users within two months, setting a new record for the popularity of consumer applications in human technology history, and attracting high attention from the technology industry,

especially the internet industry and education industry in many countries (Jiao et al., 2023). The core of ChatGPT is a large language algorithm model, which has been upgraded since the first generation was released in 2018 (Li, 2023). The interface and usage of ChatGPT are very similar to various familiar chat robots (Wang, 2023). As a chat robot technology based on natural language processing (NLP), ChatGPT can understand users' intentions and generate corresponding responses in real time. Not only that, it can also achieve multiple rounds of conversational communication based on users' historical conversations, automatically generating more accurate responses. Based on user input, it can not only automatically provide intelligent recommendations, but also provide relevant information to help users solve problems. On the basis of this core function, ChatGPT can implement many intelligent tasks based on text (Jiao et al., 2023). For example, ChatGPT can accomplish a wide range of tasks including language translation, text summarization, question answering, creative writing (such as poetry or novels), generating high-quality short and long form content (such as blog posts), responding to prompts in conversations, explaining complex themes, concepts or themes, and fixing errors in existing code or generating new code (Eke, 2023). ChatGPT has quickly become a valuable resource for students and professionals (Adiguzel et al., 2023).

Although ChatGPT has a wide range of applications in various fields, its use has reignited debates about the potential and risks of artificial intelligence technology. Although advocates of ChatGPT praise its ability to support education in providing adaptive and personalized environments (Qadir, 2022), some scholars are concerned about ChatGPT's ethical considerations (Mhlanga, 2023), as well as its potential negative impact on evaluation practices (Rudolph et al., 2023), scientific integrity (Cotton et al., 2023), and students' higher-order thinking abilities (Susnjak, 2022). For a long time, the education community has had varying views on technological innovation and its application in teaching, with debates involving products and technologies ranging from electronic calculators to smartphones, laptops, and artificial intelligence (Wang, 2023). In fact, artificial intelligence (AIEd) in education has been established as a cohesive academic research field since at least the 1980s (Williamson and Eynon, 2020). The recent focus is undoubtedly the new generation of large-scale language model ChatGPT (Wang, 2023).

In China, the Ministry of Education launched the pilot work of AI assisted teacher team construction for the first time in 2018（The Chinese Ministry of Education, 2018）. In the "Notice on Carrying out the Pilot Work of Artificial Intelligence Assisted Teacher Team Construction Action", it was emphasized that it is urgent to strengthen the adaptability and competence of teachers under the support of AI tools. In 2022, the "Key Points of the Teacher Work Department of the Ministry of Education for 2022" launched the second batch of systematic talent cultivation plans for AI assistance in teacher professional development and teacher team construction, equipped with and driving the use of teacher AI assistants, exploring, and carrying out teacher independent intelligent learning, personalized intelligence training, etc.（The Chinese Ministry of Education, 2022）. Due to the ability of ChatGPT to master, organize, and present existing knowledge, its impact on Chinese education, especially higher education activities, has received widespread attention, and its impact on Chinese universities is comprehensive. The enormous impact of the application of ChatGPT on China's higher education has attracted the attention and reflection of scholars and the education industry, and corresponding measures have been taken to respond to this era of change. And China's higher education system is different from other countries, especially Western countries. Therefore, it is of great significance to study the changes it will bring to the future

of China's higher education teaching field, as well as the talent cultivation model for higher education.

Literature Review

From a Historical Perspective on ChatGPT

ChatGPT, as the latest breakthrough in natural language processing and large language model technology, is a new thing in rapid development and rapid change. Therefore, in order to truly understand and accurately grasp the essence, connotation, and profound significance and social value of ChatGPT for school education, it is necessary to examine it in the long history of educational technology (Jiao, 2023).

The history of educational technology can be traced back to the early 20th century, when learning and teaching methods mainly relied on physical displays, wall charts, paper textbooks, blackboards, and podiums for teaching. In 1905, the emergence of movies provided a new opportunity for the application of educational technology. Teachers could use movies as teaching materials to present vivid and vivid teaching content to students. Subsequently, the emergence of broadcasting broke through the limitations of space and could widely disseminate course content both domestically and internationally, making it one of the important means of educational technology dissemination at that time. In 1928, American Sydney invented the world's first teaching machine. In the 1930s, using teaching machines to conduct adaptive teaching experiments became the most cutting-edge research at that time. In the 1950s, Skinner began to explore the design of teaching machines based on program teaching theory. In the 1970s, personal computers emerged and were quickly introduced into school education scenarios, greatly promoting the development of automation in learning/teaching (Yunus et al. 2019; Zakaria et al., 2016). Since the 1970s and 1980s, the emergence of more complex and comprehensive educational software and hardware, such as educational software and multimedia teaching systems, has led to a new stage of teaching and learning automation - education personalization and interaction. In the past 20 years, with the rise of mobile internet, cloud computing, and artificial intelligence technology, educational technology has entered a new stage of development - the stage of educational automation (Jiao, 2023; Rajendran & Yunus, 2021; Said et al. 2013; Yunus & Salehi, 2012).

It is not difficult to find that the history of educational technology can almost be said to be the history of technology enhanced learning, and the history of technology supported teaching and learning automation. In this process, more and more new technologies have emerged and been introduced into school education, aiming to improve the efficiency and quality of teaching and learning, make education more universal and humane, and make important contributions to the progress and development of human society (Precintha et al. 2019, Yunus et al. 2014). The excitement of new technology entering education is always intertwined with concerns about its potential negative impact. On the one hand, introducing new technologies can bring more efficient and convenient teaching and learning methods, improve the universality, accessibility, and quality of educational resources, make human learning more interesting, vivid, and flexible, and promote students' comprehensive development and personalized growth (Arif et al., 2019; Lim et al., 2021; Nair & Yunus, 2021). On the other hand, new technologies have also brought negative impacts and many concerns. Many people are concerned that new technologies may change traditional teaching methods, undermine the humanistic essence, emotional experience, and humanization of education. Some people are concerned that excessive reliance on technology may lead to students losing

their ability to learn independently, think independently, and create (Jiao, 2023). The rapid popularity of laptops and smartphones has increased people's concerns, such as technology abuse, student vision damage, distraction, gaming addiction, and excessive dependence (Morris & Sarapin, 2020). In the past 100 years, whenever new technologies are introduced into education, there have been heated debates and widespread concerns. In fact, the introduction of educational technology has always faced various concerns and controversies (Jiao, 2023).

Reform of Higher Education in China

Zhang （2013）pointed out that looking back on the process of education reform, reflecting on the achievements already made and the remaining problems, looking forward to the future development of education, and restarting the education reform agenda is not only a synchronous response, but also an urgent need. Zhu et al.(2014) and others pointed out that China's education is now standing at a new historical starting point, and we must clearly recognize that China's education needs to overcome the 'education crisis', overcome the long-standing stagnation of institutional reform, and restart reform. Inspired by the restart of economic reform and education reform, the restart of higher education reform has begun to receive attention (Jia, 2021).

In terms of higher education, the widespread and profound application of information technology in the field of education is changing the traditional higher education model in all aspects, from learning methods to teaching models. In particular, it has promoted the transformation of higher education from a traditional teaching centered approach to a learning centered approach, from classroom learning as the main focus to a diversified learning approach that combines online and offline, and even reshaped such as virtual universities A new form of modern university organization such as ubiquitous universities (Jia, 2021). In the field of higher education in China, the use of educational technology to "push" teaching reform has been called for many years, but the effect has been minimal. Due to the strong educational inertia, teaching inertia, teacher inertia, spatial inertia, etc., online teaching has been severely restricted from advancing on the front line of teaching. (Wu and Li, 2020). The development of the Internet and educational technology as the dominant elements in the third transformation process of future higher education has important and positive significance for the entire transformation, especially for the transformation and development of traditional university teaching models and higher education talent cultivation models (Jia, 2021). From existing research, one aspect of China's higher education transformation is centered around the external utility value of technology itself, focusing on the transformation of external educational methods and environment from traditional forms to high-tech, high sharing, and efficient higher education (Jia, 2021).

In 2017, the Chinese government released the "New Generation Artificial Intelligence Development Plan" (State Council, 2017); In 2018, the Ministry of Education released the "Action Plan for Artificial Intelligence Innovation in Higher Education Institutions"（The Chinese Ministry of Education,2018), which focuses on promoting the development of artificial intelligence in the field of higher education. In February 2019, the document "Modernization of Education in China 2035" (the Xinhua News Agency, 2019) was released, proposing the construction of intelligent campuses, and promoting the reform of talent cultivation models. In May 2019, the "Beijing Consensus - Artificial Intelligence and Education" document formed a common vision of the international community for the development of education in the era of intelligence (The Chinese Ministry of Education， 2019). It can be seen

that the development wave of artificial intelligence has brought more and more opportunities and impacts to education reform and development, with higher education being the most prominent, and the impact of artificial intelligence on higher education is even more significant (Li et al., 2020).

The Impact of Artificial Intelligence such as Chat GPT on Higher Education in China

Social transformation will inevitably bring new changes and requirements to today's education. Currently, there are still some prominent problems in China's education reform, such as uneven development of education, uneven distribution of educational resources, and unscientific teaching evaluation. The development of artificial intelligence can help solve these prominent problems in education reform (Li et al., 2020). Minister Chen Baosheng pointed out that in the era of intelligence, we should pay close attention to the enormous impact of artificial intelligence on education, pay close attention to the problems and challenges it brings to education, uphold a positive and cautious attitude, and think about how to take the "future path" well (Chai, 2019). It can be expected that in the era of artificial intelligence, there will be profound changes in the concept of talent cultivation, teaching and learning methods, and the construction of traditional disciplines and majors in China's higher education. China's higher education must face these changes and conduct in-depth research on these issues, in order to prepare sufficient talents for the era of artificial intelligence (Yuan, 2019).

Since the release of ChatGPT on November 30, 2022, many scientists and researchers have attempted to use ChatGPT to assist certain tasks in scientific research, achieving exciting results and discovering many thought-provoking issues (Jiao, 2023). Alshater (2022) believes that ChatGPT should be helpful for scientific research, especially in constructing a series of tasks involved in research-based research, but it has not been empirically validated. Aydin et al. (2022) attempted to create a literature review on healthcare that is suitable for academic journals, and found that although ChatGPT can help generate literature reviews, there may be suspicion of "plagiarism" or poor interpretation. Gao et al. (2023) found that although the abstracts generated by ChatGPT can be identified as generated by AI platforms through AI generated text recognition systems, it can indeed generate novel paper abstracts without obvious signs of plagiarism. Chen et al. (2022) also explored the possibility of generating academic paper titles and abstracts. In the view of Dowling et al. (2023), ChatGPT has significant advantages in idea generation and data recognition.

Of course, as a natural language processing technology, ChatGPT is very intelligent and automatic in answering questions and generating articles. As a representative of generative artificial intelligence, ChatGPT can generate corresponding texts for teachers and students (Adiguzel, et al. 2023), such as course outlines, teaching materials, abstracts, translations, seminar works, paper writing, etc. (Kasneci, 2023). ChatGPT can also interact with users by answering a series of questions and providing appropriate answers (Clarizia et al., 2018). ChatGPT, as a dialogue system, should be able to understand the content of the conversation and identify users' social and emotional needs during the conversation process. It simulates and explains human communication, allowing individuals to use digital devices as if they are talking to real people (Ciechanowski, 2019). As a large-scale language model based on natural language, it is more conversational and seems to have more language talent, capable of answering subsequent questions, admitting errors, questioning incorrect premises, and rejecting inappropriate requests (Open AI, 2022).

Although its application has many advantages, there are also some potential threats (Fox News, 2017). For example , The content generated by ChatGPT is likely to be suspected of plagiarism or plagiarism (Marshall, 2023), especially in the writing of papers, which may seriously threaten the integrity and credibility of academic research. Some scholars and experts also believe that the content generated by ChatGPT may be completely independent ideas and viewpoints, rather than borrowing and imitating other works (Taecharungroj, 2023). Moreover, due to the intelligent and powerful ability of ChatGPT model to simulate human thinking, sometimes it may generate false information or inappropriate content, or even solemnly "nonsense", leading to misleading information and unreliable academic research (Jiao, 2023). In addition, the intelligence level of ChatGPT is becoming increasingly high, and improper handling of collected personal information may lead to many ethical issues such as personal information leakage (Jiao, et al., 2023). ChatGPT is even easily used by criminals to generate "toxic information" such as false or violent propaganda, including but not limited to affecting academic performance, mental health, values, etc. (Jiao, 2023). In China, we are also concerned that ChatGPT outputs results with ideological and specific value orientations, and has a systematic impact on the ideological concepts, methods, and institutional mechanisms of ideological management work (Du, 2023).

Conclusions and Recommendations

We believe that China's higher education has developed rapidly in the past 40 years, but if we really place China in a competitive environment like the world, you will find that our creativity, especially human creativity, and our overall technological research and development capabilities are actually very insufficient. The emergence of ChaGPT has sparked some scholars to think more about Chinese education, but there is not much research combining higher education. But it is certain that China has always been in a state of controversy and wait-and-see regarding the integration of artificial intelligence into higher education.

As an intelligent chat robot, ChatGPT has the ability to respond quickly, accurately, and 24/7. It can answer students' questions in the classroom, provide solutions, and help students better understand and master the learning content. However, it should be noted that ChatGPT cannot replace the role of a teacher and can only be used as an auxiliary teaching tool. ChatGPT has a very promising future in the field of education. ChatGPT can be used to provide personalized, one-on-one educational support for students. It can provide assistance in answering questions, providing explanations, and even helping students complete homework. ChatGPT can also be used to create interactive learning experiences tailored to each student's unique learning style and pace. In addition, ChatGPT can also be used to grade, analyze, and provide feedback on students' assignments or articles. With the continuous development and improvement of artificial intelligence technology, we can expect ChatGPT to become an increasingly valuable tool in both classroom and online learning environments. Of course, while we understand the potential risks it may bring, we should also consider how to use artificial intelligence tools such as ChatGPT to carry out higher education reform under the Chinese style education system. Therefore, I suggest that Chinese universities can respond to the emergence of ChatGPT as a new technology by

1. Integrating Artificial Intelligence Education into Curriculum

Some schools and universities have begun to integrate artificial intelligence education into their curriculum, teaching students the basic knowledge of artificial intelligence, as well as its potential risks and benefits. This can help students understand the technology and its impact

on their future careers. Looking ahead, using AI tools to learn and execute creative tasks, as well as collaborating and collaborating with AI, will undoubtedly become an important component of future educational goals. Early training of faculty and students in various levels and types of schools will greatly enhance their core competitiveness in a technologically rich environment.

2. Using ChatGPT for Teaching and Learning

Some educators have started using ChatGPT to help generate curriculum plans, questions, and answers for educational purposes, or to help students practice and improve their language skills. Whether any tool or technology is beneficial or harmful largely depends on the user and their methods. After all, technology is ultimately just a purposeful existence that aligns with human purpose. Teacher education institutions should strengthen training in the application of generative artificial intelligence in education, helping teachers and students apply artificial intelligence such as ChatGPT to learning and teaching.

3. Develop ethical guidelines related to ChatGPT

Some universities and schools have begun to develop ethical guidelines for the use of AI technology (including ChatGPT), ensuring that they are used in a responsible and ethical manner. We need to develop corresponding norms and standards to address the potential "threats" and "dangers" that ChatGPT may bring, while also advocating that academic researchers and users must adhere to the principles of academic ethics and research integrity when using ChatGPT related technologies, and maintain good order and reputation in the academic community as stated.

4. Actively promoting and monitoring the use of AI technology

Some schools and universities have begun to monitor the use of AI technology, such as ChatGPT, to ensure that it is not abused by students or employees. Some local education administrative departments and higher education institutions in the United States, France, and Australia have ordered students to prohibit the use of generative artificial intelligence in ghostwriting assignments. In the field of the Internet, there have also been many detection software specifically designed to help teachers and schools detect whether the text submitted by students is generated by artificial intelligence. OpenAI has also released similar tools to help schools and teachers prevent student abuse.

5. Accelerate and deepen the research related to ChatGPT

Some universities and schools have begun to use ChatGPT in research projects, such as natural language processing, machine learning and general artificial intelligence. We do see schools and universities beginning to recognize the potential of ChatGPT and other AI technologies, and they are taking proactive measures to integrate them into curriculum, research, and policies in a responsible and ethical manner. They are transitioning from fear based methods to more comprehensive methods of enlightenment and education.

Educators must keep up with the times, actively learn and master the generation of artificial intelligence, and fully understand the potential risks and misuse of ChatGPT and other artificial intelligence technologies. We must also educate and guide students to use technology in a responsible, ethical, and beneficial manner for their own and others' safety. However, to achieve this, educators first need to educate themselves on generating artificial

intelligence technology! Secondly, we must set an example to teach students the correct academic attitude, establish good academic ethics, adhere to technical ethics, and teach students to protect the privacy of individuals and others.

In addition, colleges and universities should introduce new artificial intelligence testing tools to identify and test which students' exercises and related works are generated by artificial intelligence and which are created by themselves. The government, academic associations, and scientific research management departments should quickly formulate relevant policies, regulations, and academic ethics and moral standards, regulate the scientific research and educational application of generative artificial intelligence technologies such as ChatGPT, and formulate specific and executable policies and suggestions.

ChatGPT has reshaped human understanding of "intelligence" with its outstanding creativity, leading to profound changes in today's society. If higher education institutions blindly adopt a prohibition attitude, the professional skills of future professionals will eventually be incomplete. Although ChatGPT has led to the questioning of the current authority of teachers, the partial subversion of the teaching field, and the crisis of trust in creativity, it has the ability to accelerate the Digital transformation of education because it can be used as a universal teaching resource to break the barriers of disciplinary knowledge and professional differentiation, trigger the "classroom revolution" to enable knowledge dissemination and change, and break the information cocoon room to accelerate knowledge production. Therefore, higher education needs to leverage artificial intelligence to empower a new round of "classroom revolution", by achieving diversified teaching objectives, polarized teaching content, intelligent teaching processes, diversified teaching evaluations, and collaborative knowledge production to better respond to the arrival of the ChatGPT era and promote higher education reform in China.

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