Advances in Educational Technology and Psychology (2023)
Clausius Scientific Press, Canada

DOI: 10.23977/aetp.2023.070219
ISSN 2371-9400 Vol. 7 Num. 2

Research on the Future Vision of the Intelligent Integration of ChatGPT and Online Education

Minghui Wang[1], Yanyan Chen[2,*]

[1]*College of Applied Science and Technology, Beijing Union University, Beijing, China*
[2]*Institute of Mathematics and Physics, Beijing Union University, Beijing, China*
**Corresponding author*

Keywords: Online education, ChatGPT, intelligent education, digital transformation

Abstract: With the acceleration of the new round of technological revolution, all walks of life are facing tremendous reform and innovation, and education is also facing new challenges. On the basis of investigating the current development of online education, this paper conducts an in-depth analysis of the existing problems in online education, and decides to deeply integrate the recently popular ChatGPT language model with online education to form a new intelligent learning model. Among them, it includes intelligent tutoring, generation of personalized learning materials, and learning assessment. Finally, key issues and reflections on the integration of online education intelligence are discussed. Online education integrated with ChatGPT technology will provide students with better learning experience and support, will promote the improvement of learning efficiency and quality, and promote the digital transformation of education.

1. Introduction

The rapid development of the Internet has promoted the continued enthusiasm for informatization, and at the same time technology is also reshaping the educational ecology. Education is gradually closely linked with artificial intelligence, among which, as an innovative form of education, online education has attracted the attention and pursuit of more and more learners. However, there are still some challenges in online education, such as how to improve learning effects, how to better achieve personalized tutoring, etc. For the sustainable development of education, after seeing the powerful functions of the chat robot ChatGPT, we have to think deeply about the next step in education.

As early as the 1950s, the mathematician Turing discussed in his paper "Computing Machines and Intelligence" whether it is possible for computers to have the ability to think and be intelligent like humans. He proposed the concept of "machine intelligence" for the first time, and predicted that a computer capable of competing with humans would appear in the future [1]; then in 1966, the world's first real chat robot - ELIZA, appeared. Although it was originally used to imitate the dialogue between doctors and patients, it was a "dialogue" robot based on a simple matching model [2], but then the first robot LOGO in the field of education came into being, both of which are today's The exploration of educational intelligence has laid a solid foundation; in 2000, the intelligent robot ASIMO, which was produced in Japan, can already perform activities such as running and jumping. At that time, it had been widely used in STEM education, promoting education towards autonomy

development [3]. In China, from the "Ten-Year Development Plan for Educational Informatization (2011-2020)" and "Educational Informatization 2.0 Action Plan" [4], to the "About Promoting the Construction of New Educational Infrastructure and Building High-quality Education" issued by the Ministry of Education in 2021 Guiding Opinions on the Supporting System", and the emergence of the term "Education Digitalization Strategic Action" in the Ministry of Education's document in 2022 [5], all point out the direction for the further development and transformation of education in the future. At present, it has entered the stage of innovative development of digital education. Digital education has become a major trend in the field of education, and its development momentum is good. Various digital education products and services are also emerging. It is expected that the digital education market will further expand in the future and will become an integral part of education.

Among them, ChatGPT based on the natural language processing model can be integrated with online education to provide ideas and directions for its further development, gradually realize the improvement of students' participation in learning and personalized homework guidance, and provide learners with more accurate educational services. Through the continuous optimization and improvement of this integration method in practice, we are also expected to promote digital education in the country, so that more people can enjoy better educational resources.

2. Analysis of Development Overview

The digital economy is developing rapidly, leading to the emergence of many new forms of education. As an important way for people to learn, online education is not only applicable to the daily course learning of minors, but also applicable to the promotion and lifelong learning of adults in enterprises. Therefore, the digital economy brings new opportunities and challenges to education, and at the same time provides more possibilities and choices for the development of individuals and society. Compared with offline education, online education is more free in terms of time and space. Students can flexibly arrange class time according to their own life and learning rhythm, and can also provide excellent students from all over the country. Learning Resources. Compared with traditional education, the cost of online education will be lower. With its high cost performance, it has won a high market share.

At the same time, more and more countries and regions realize the importance of online education and have introduced a series of policies to support its development. In 2020, China promulgated the "Guiding Opinions of the Ministry of Education on Strengthening the Application of the "Three Classrooms", which clearly pointed out that it is necessary to vigorously develop integrated online education, build a normalized integrated development mechanism for online and offline education, and decide to carry out pilot programs for online education[6]. In 2021, the "Opinions on Vigorously Strengthening the Construction and Application of Online Education and Teaching Resources in Primary and Secondary Schools" analyzed three problems that need to be solved in current education: the problem of rich and high-quality resource construction, and the problem of network platform operation guarantee, online resources and the integration and application of education and teaching [7]. It is hoped that by 2025, the basic goal of building an online education platform system with clear positioning, interconnection, and co-construction and sharing will be realized; and the World MOOC and Online Education Conference held in December last year The theme of the conference is "Education Digitalization Leads the Future". The future of education generally insists on informatization as the main body and promotes "Internet plus education".

According to the report of ResearchAndMarkets.com, the global online education market will reach US$252.5 billion in 2020, and it is expected to reach US$506.7 billion by 2026, with a growth rate of 10.3%; According to the market investment report, the financing amount of the global online education market will reach 16.6 billion US dollars in 2020, a record high; focusing on the report

released by the China Internet Education Industry Association, the number of online education users in China will reach 435 million in 2022, a year-on-year increase of nearly 30%. Among them, the number of K12 online education users reached 266 million, a year-on-year increase of nearly 50%.

At the same time, China is a global leader in information infrastructure, having built the world's largest optical fiber and fourth generation mobile communication (4G) networks, and accelerating the construction and application of the fifth generation mobile communication (5G) network. The proportion of optical fiber users has exceeded 94%, the penetration rate of mobile broadband users has reached 108%, and the number of active Internet Protocol Version 6 (IPv6) users has reached 460 million[8]. And the country is increasing the research and development of 6G technology, which will provide a broader user base for the expansion of online education. At the same time, some Internet giants are also driving the development of online education, and companies are actively exploring new models of online education on the Internet. According to the 2022 "Tianyancha" data, there are currently over 230000 related online education enterprises on the market. The above data indicate that online education has shown a good development trend worldwide. With the continuous innovation of technology, online education will continue to maintain a growth trend in the future.

Online education covers a wider range of subjects and richer course resources, and most of these courses are free. From this point of view, it is very convenient for students whose family conditions are not very good. The online education platform has its own unique learning community and forum. Students can exchange learning experiences with students and teachers from all over the world, and get timely interaction and learning feedback. It has many advantages and is more suitable for the diverse learning needs of modern people. However, due to the high degree of autonomy in online education, students are required to have higher self-discipline and restraint, be able to independently plan the progress and time of learning, and learn to complete learning tasks independently. Although online education is not limited by time and space, it may also lead to a higher student turnover rate. Students may give up learning for various reasons, resulting in poor learning effect and unable to truly guarantee the quality of learning.

ChatGPT is a large-scale natural language model developed by OpenAI, which is trained through in-depth learning technology and can answer people's questions or provide relevant and useful information to help people better understand and solve problems. Its answer is no longer a silly monologue, but rather a real simulation of interpersonal communication and dialogue, which distinguishes the existing intelligent assistants such as Xiaoai classmate and Siri on the market. It can use massive amounts of data to learn language and reasoning, and automatically generate human language. It has strong language processing capabilities and flexible autonomy. Currently, it has developed to version 4.0, and its debut has broken TikTok's historical record in the United States. It not only brings fire to the AIGC (AI Generated Content) concept, but also causes panic among domestic technology companies. A new round of artificial intelligence technology competition is being secretly planned. What is most lacking in online learning is the communication and interaction between teachers and classmates, as well as related personalized services. The ChatGPT language model that emerged at this time happens to have relatively strong natural language processing and dialogue capabilities, so it can well solve problems arising in the online learning process, better provide students with a comfortable learning experience, improve the flexible interaction of education, strengthen communication between students and teachers and classmates, improve learning efficiency, and enhance students' learning and growth.

3. Online Education and Learning Model Integrated with ChatGPT Technology

Online education that integrates ChatGPT technology can be successfully upgraded to an intelligent learning platform. The learning model implemented on this platform can be roughly divided into three main roles: teacher, student, and ChatGPT. The details are shown in Figure 1.

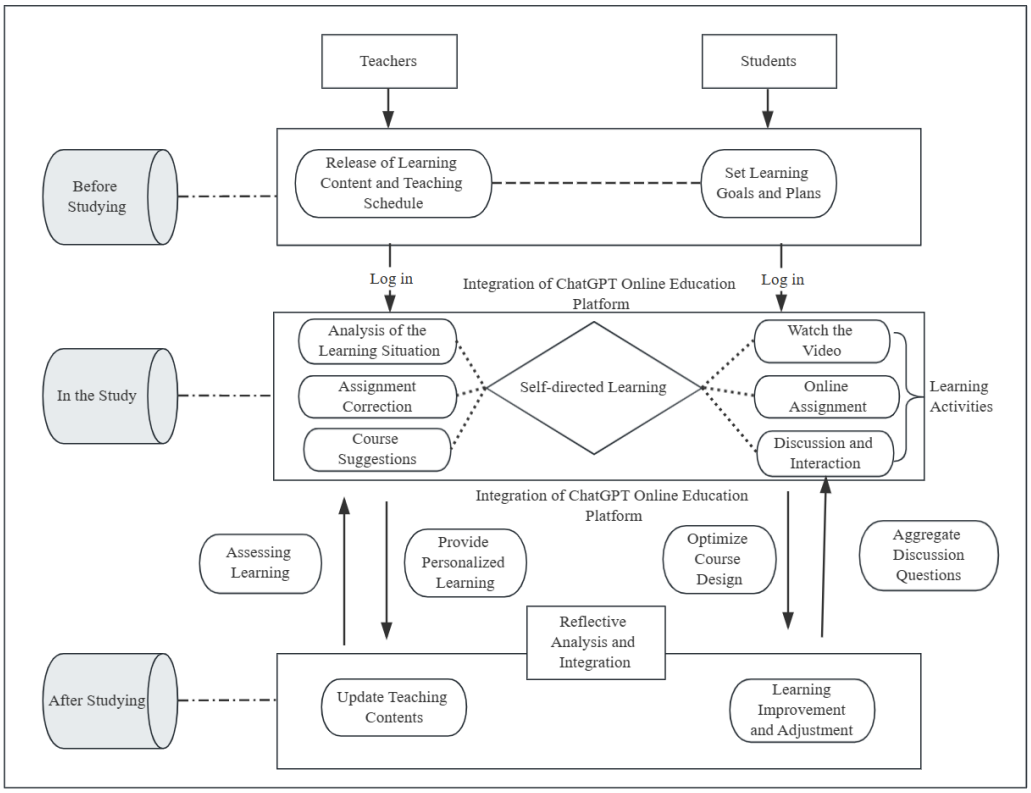

Figure 1: Online Education and Learning Model Integrated with ChatGPT Technology

The role of a teacher is to supervise and guide students' learning content and progress, and to implement teaching. The online education platform integrated with ChatGPT can analyze students' emotional state through a series of autonomous learning activities such as watching videos, online assignments, and discussing interactive data, using technology such as machine learning to help better understand students' real-time emotional state, provide more accurate teaching support, and make teaching more humane. The integrated online education platform can provide students with more intelligent homework correction services. Traditional online homework correction can only check for simple grammatical and computational errors, and cannot correct assignments with subjective answers such as compositions. ChatGPT can more accurately identify and correct students' homework errors through its unique natural language processing and machine learning technology, and provide targeted evaluations and suggestions. This can not only improve the efficiency of homework correction, but also improve the quality of homework correction, greatly reducing the workload of teachers. At the same time, by analyzing students' learning behavior data and generating a radar chart of their learning reports, it is possible to predict their future learning behavior and provide more specific and personalized teaching support. Teachers provide feedback and suggestions on students' learning based on the results of the analysis, and design and update the teaching content and form of online education courses more targeted based on different students' mastery of different knowledge points and planning arrangements [9].

Students develop their own learning goals and plans based on the teacher's teaching arrangements. Conduct autonomous learning through access to the online education platform. When watching videos, small classroom questions will pop up randomly based on historical learning and question data, facilitating the detection of current knowledge absorption. ChatGPT can generate learning paths and resource recommendations based on students' learning progress and performance. For questions raised in students' homework, it can interact more vividly and naturally with classmates through language interaction, helping students to achieve timely, accurate, and detailed answers. For some high-quality videos from abroad, real-time automated translation can also be achieved, making it easier for students to understand and learn the course content, thereby broadening their international perspective of learning. On weekdays, students may dislike taking notes or feel that taking notes is a waste of time. Sometimes people may miss out on some knowledge content because they are too involved in taking notes, but the online education platform integrated with ChatGPT technology can automatically generate notes based on video content, effectively reducing learning difficulty and time costs. After students conduct autonomous learning through this platform, they can obtain relevant learning data and clearly understand their personal learning status. At the same time, students on this platform can also see more popular topics and opinions among similar learners, which can trigger more and deeper thinking.

ChatGPT is based on the process and results of students' autonomous learning, analyzes their learning performance and habits, and automatically generates personal learning paths and course resource recommendations. Students can learn according to their own learning rhythm, breaking the old teaching style. In traditional online education, students need to ask questions to their teachers through email or after class forums, and then wait for their answers. However, the online education platform combined with ChatGPT technology allows students to ask questions at any time. The platform can conduct intelligent analysis, provide students with detailed answers and feedback on questions, and provide some more in-depth and enlightening content, in order to stimulate students' continuous thinking and improve their learning effectiveness and interest. This real-time dialogue can help students better understand the course content. Under the integrated learning model of ChatGPT and online education, students can learn more independently, taking care of their level and interests, and helping them plan their learning independently. During the whole learning process, can the students' learning progress and performance be recorded, which can be used as the basis for evaluating the students' learning status. At the same time, it can also aggregate hot topics and opinions in the discussion area among students. In the overall process, it has always played the role of a virtual human-computer interaction interface. Students and teachers can communicate online according to their actual needs. , discuss and collaborate.

In short, the learning mode that integrates ChatGPT and online education has the advantages of personalization, practicality, autonomy and timeliness, which can effectively improve the teaching effect and provide students with a more efficient, flexible and convenient learning experience.

4. Key Issues in Integrating ChatGPT Technology into Online Education

4.1. Technology Cost and Platform Usability

An online education platform that integrates ChatGPT technology requires advanced artificial intelligence technology and powerful data resources as support, which can be costly and complex for some startups or academic institutions to implement. The combination of the two requires that both students and teachers can easily use this platform to quickly and effectively obtain the required knowledge and information. Therefore, when designing a platform, both the overall page layout, function selection, personalized preferences, and user experience need to be considered. Therefore,

how to reduce technology costs and improve the ease of use of the platform is an important issue in integrating ChatGPT technology applications in online education.

4.2. Students' Learning Motivation and Quality

Although the integration of online education with ChatGPT technology can provide intelligent and personalized learning services and feedback, it does not completely solve the problems of students' learning motivation and quality. In the process of practical application, students' learning motivation and quality are affected by many factors, including the design of the curriculum itself, whether they have clear learning goals, and timely learning feedback, which involve issues in multiple fields such as education, technology, and society. Only by stimulating students' interest and potential in learning while improving their learning motivation and quality can online education truly achieve a value enhancement by integrating ChatGPT technology applications.

4.3. Privacy and Copyright Protection of Data

In the online education platform integrating ChatGPT technology application, the personalized service provided by the platform mainly relies on the students' online learning data, which includes but not limited to the students' learning records, test scores, after-school assignments and interactive data. At the same time, these data may contain some personal private information, such as personal identity, preferences, behavior, etc., which involve a large amount of learning data and intellectual property issues. These language model data should be controlled and managed to prevent data from being illegally stolen and abuse. Protecting the data privacy and intellectual property rights of students and teachers, and avoiding data leakage and infringement are issues that need to be paid attention to in the application of network integration ChatGPT technology. Various measures and methods need to be taken for protection and management to ensure data security and confidentiality.

4.4. Stability and Reliability of the System

For online education that integrates ChatGPT technology, system stability and reliability are very critical, and have an important impact on the learning and teaching of students and teachers. If the online education platform integrated with ChatGPT technology often has system failures or flashbacks, it will seriously affect the learning experience of students in the short term and reduce the interactive experience between students and the platform. From a long-term perspective, it will greatly reduce users' trust and satisfaction with the online education platform. If things go on like this, it will lead to the loss of users and affect the future development of online education. Therefore, it is particularly important to ensure the stability and reliability of the platform.

In summary, the online education platform integrating ChatGPT technology will face multiple challenges and limitations, which need to be addressed and improved in terms of technology implementation, student learning, data privacy, and system stability. At the same time, the application of ChatGPT technology in online education also has a very broad prospect and application value. We should seize the opportunity of innovation and try to provide a more intelligent, efficient, and convenient learning method for the development of online education.

5. Conclusions

Online education incorporating ChatGPT technology is one of the important components of education intelligence and digital transformation, which is the application and innovation of digital technology and artificial intelligence in the field of education, providing a broader development

prospect and application value for the future development of education [10], because with time and geographical flexibility and free autonomy, and also able to provide students with autonomous teaching and learning. Precise learning recommendations and customized learning content can promote efficient learning for students. In addition, by monitoring students' learning process and analyzing these dynamic data, thus better understanding students' learning status and needs and providing more accurate educational services and support, it provides a new idea and direction for digital transformation and intelligent development of education.

Intelligentization and digital transformation of education is an important trend in the field of education today. It is not only the digitization, informatization, networking, and intellectualization of the educational process, but also an important means and means to promote educational reform, improve educational quality, and meet the personalized needs of students. With the application of digital technologies such as cloud computing and big data, educational intelligence and digital transformation will face more opportunities and challenges. On the one hand, the continuous emergence of new technologies, models, and formats will bring more innovation and transformation to education, such as MOOC, artificial intelligence, big data, and blockchain. On the other hand, issues such as the digital divide, education equity, education privacy protection, and education quality evaluation also require our common consideration and solution. We have every reason to believe that with the continuous innovation and application of technology, education will take on a richer and more diverse outlook and better serve the development of human society.

In the future, education will inevitably develop towards students' individuality, paying more attention to the cultivation of students' autonomous learning ability, ability to think and solve problems, as well as their innovative and practical abilities. Digital technology and artificial intelligence will be more widely used in the field of education, achieving a deep integration, providing students with more intelligent, efficient, and convenient learning methods and educational resources, thereby achieving high-quality, efficient, and personalized education. In this process, it is necessary to uphold the original intention and mission of education, pay attention to educational fairness and sustainable development, promote the sharing of educational resources and the improvement of educational quality, strengthen the innovation and reform of the educational system, and jointly promote the progress and development of educational intelligence and digital transformation.

References

[1] Turing A M. Computing machinery and intelligence//Computation & intelligence. American Association for Artificial Intelligence, 1950: 433-460.

[2] Weizenbaum J. ELIZA-a computer program for the study of natural language communication between man and machine. Communications of the Acm, 1966, 9(1): 36-45.

[3] Haifeng G, Weijun Z, Shaohua W. Research Status of Humanoid Robot Technology. Machine Tool & Hydraulics, 2017, 45(21): 164-172.(in Chinese)

[4] Yinghao B. A Study of the Basic Education Informatization in Minority Areas; Yanbian University, 2020.(in Chinese)

[5] Zhu L, Wang L. Behind the ChatGPT+ Dducation Fever: When Digital Transformation is in Progresss. China Academic Journal Electronic Publishing House, 2023-02-13.(in Chinese)

[6] Bing S. Analysis on the Development Path of Vocational Education Teachers in the Era of Artificial Intelligence. China Educational Technology, 2021, 10: 86-90+119.(in Chinese)

[7] Yi Z. Development and utilization of micro-lessons on junior high school physics mechanics in the context of smart campus; Southwest University, 2021.(in Chinese)

[8] Qin J. Research on the Influence of Information Infrastructure on Total Factor Productivity of High-tech Manufacturing; Taiyuan University of Technology, 2022.(in Chinese)

[9] Sijia L. The Design and Development of Educational Game for young people's ethical decision-making experience; Shandong Normal University, 2019.(in Chinese)

[10] Guozheng H. Study on Cross-Cultural Translation of Graphical Signs in Visual Communication Design; Anhui Polytechnic University, 2018.(in Chinese)