

# The Study on the Influence of ChatGPT on the Online Self-Directed Learning Ability of Contemporary College Students

Ruoting Li<sup>1</sup>, Ge Zhang<sup>2,\*</sup>

<sup>1</sup>College of Art, Hunan University of Information Technology, Ningbo, China

<sup>2</sup>National Institute of Education, Nanyang Technological University, Singapore, Singapore

\* Corresponding Author Email: NIE24.ZG@e.ntu.edu.sg

**Abstract.** With the wide adaptation of artificial intelligence represented by ChatGPT in the field of education, more and more contemporary college students begin to use ChatGPT in the process of independent learning. This research has shown that Artificial Intelligence (AI) memorization has a huge impact on the development of autonomous learning ability. ChatGPT can provide college students with a large number of learning content, saving learning costs and improving learning efficiency. It can also quickly answer students' doubts, and cultivate students' ability to find and solve problems. ChatGPT intervenes in online classes to interact with students, which helps students to carry out interdisciplinary learning, cultivate students' innovation ability and enhance their learning initiative. Exploring the ways of contemporary college students using ChatGPT in online autonomous learning and what positive and negative effects ChatGPT has on students' autonomous learning can contribute to research in the field of education under the backdrop of digitalization, and provides suggestions on how to properly use ChatGPT for students during the self-study process.

**Keywords:** ChatGPT, autonomous learning, college students.

## 1. Introduction

At present, ChatGPT has aroused a heated discussion in the academic circle, and its discussion is mainly concentrated in the fields of art, translation and medicine. For example, ChatGPT is widely used in the field of medical industry, which has a large population base, including medical imaging, auxiliary diagnosis and treatment, surgical robot and remote consultation [1]. However, it is less involved in the education field. ChatGPT's research in the field of education mainly focuses on the change of teacher-student relationship, the change of teacher's role and the improvement of classroom quality, while its research on the improvement of college students' online autonomous learning ability is relatively lacking.

First of all, it is supposed to understand that the essence of ChatGPT is a technology that uses computer to simulate human intelligence, and its core is algorithm and data. ChatGPT can analyze and process a large amount of data, extract rules and patterns from it through algorithms such as machine learning, deep learning and reinforcement learning, and automatically adjust the algorithm to adapt to new data [2]. The appearance of ChatGPT changes the traditional teaching mode, making students the center of learning, teachers the assistants of learning, and students can make personalized plans ChatGPT can meet the demands of college students to acquire and transfer knowledge. College students can enter keywords to start a conversation with ChatGPT according to their personalized learning needs and rely on natural language processing technology. ChatGPT automatically generates accurate replies, which facilitates college students' independent learning and saves learning costs. By browsing the massive learning content provided by ChatGPT over time, college students form their own knowledge system, stimulate innovative thinking and become knowledge producers. They actively explore and forge ahead in independent learning, and achieve a qualitative leap.

However, ChatGPT technology is not mature and there are still many hidden dangers, such as the knowledge provided by ChatGPT is not completely accurate and students need to identify themselves, and the originality of knowledge is controversial and may infringe on students' learning results. It is important to note that the widespread use of ChatGPT is a double-edged sword, bringing academic

risks as well as advances [3]. This paper will use the method of literature review to discuss the ways that college students can use ChatGPT to improve their self-learning ability.

## 2. The Application Status of ChatGPT in Higher Education

With the continuous innovation of knowledge transmission media, human-machine collaborative learning mode has become common. ChatGPT, as an interactive AI natural language processor, has super capabilities of information retrieval, natural language processing and text generation, and has become one of the main learning tools for more and more college students. ChatGPT can provide flexible learning space, rich learning resources and efficient learning planning and much more .which can be mentioned to a certain extent The independent learning ability of tall students. ChactGPT can also meet the diversified needs of students, making it more convenient and accurate for college students to obtain learning resources, which not only saves time and costs, but also enables them to extensively search for relevant learning content. ChatGPT can help students greatly improve learning efficiency. For example, Yale University is actively exploring and utilizing ChatGPT technology, the school has developed an intelligent chat robot, which can conduct interactive questions and answers independently, in order to achieve more personalized and efficient learning help, which greatly improves students' learning efficiency Help it save a lot of time and money [4].

In terms of knowledge acquisition and information search, ChatGPT can answer students' questions according to the keywords searched by students to meet the learning requirements of students' information collection. For example, in the field of materials science, ChactGPT can explain basic concepts and solve problems. Students can ask questions about the basic concepts and principles of material simulation to Chat GPT, and help students solve problems related to material simulation, such as mathematical problems, programming problems or theoretical problems. This helps them build basic knowledge to obtain clear explanations and definitions, helping students better understand problems and find solutions [5].

ChatGPT also meets the needs of the society for the cultivation of interdisciplinary talents, promotes the development of interdisciplinary disciplines and changes in curriculum teaching Change. There have been developments in frontier disciplines such as AI+ mathematics and AI+art. While learning more complex knowledge systems, college students master more abundant knowledge and skills, which are helpful to solve various subject problems.

Additionally, ChatGPT is introduced into the teaching evaluation system. The current assessment of college students' academic performance is based on paper results combined with regular classroom results. However, the volume of college learning content is very large, and just examining the mastery of classroom content is not enough to evaluate a student's effort, harvest and innovation. In view of these difficulties, ChatGPT is introduced into the evaluation system, and artificial intelligence software is used to establish a comprehensive quality teaching evaluation system transforming from "exam-oriented" to "multi-oriented". More student-centered, the use of group presentation and closing report form, to further strengthen students' grasp of the course learning content, but also reflect the degree of students' mastery of the course. In the process of investigation, students' organization and coordination ability can better reflect the accumulation and understanding of students' knowledge. ChatGPT is used to supplement relevant knowledge, build simulation models, match simulation environment with actual environment, select calculation methods, analyze and summarize simulation and results, and write reports after class in combination with classroom learning [5].

However, the most important thing is that ChatGPT technology is not mature at present, there may be problems of information leakage. Also, the originality of academic works cannot be fully guaranteed, which leads to related academic integrity issues. At present, ChatGPT has strong language understanding and language generation ability, and can be used in many scenes such as code generation, thesis writing, poetry creation, video news, music creation and many others. As ChatGPT becomes more and more widely used, it is not uncommon for college students to use ChatGPT for

exams and paper writing, which may inadvertently involve similar or repetitive content. Therefore, college students should not over-rely on CHATGPT for academic creation.

### **3. Positive and negative effects of ChatGPT on the Online Autonomous Learning Ability of undergraduate Student**

#### **3.1. Positive Impact**

The extensive use of ChatGPT in the process of college students' independent learning has brought about changes not only in the iteration and interaction of information technology, but also in the profound impact of contemporary college students' learning mode, thinking mode and even college teaching mode. As a learning paradigm, the core idea of autonomous learning is to highlight the learner's subjectivity. Contemporary college students' independent learning means that outside the scope of classroom teaching and teacher's guidance, students assume their own learning responsibilities, carry out reasonable self-planning and assessment, and achieve the established learning goals. The characteristics of autonomous learning are mainly embodied in three aspects: self-drive, self-regulation and self-reflection [6]. Self-drive means that learners can actively explore learning resources and opportunities according to their own interests and needs. Self-regulation is embodied in the learners' ability to reasonably manage the learning process and strategies to achieve the preset learning goals. Self-reflection refers to the continuous review and evaluation of learning results in the learning process, and based on this, the necessary adjustment and optimization. In the process of independent learning in these three stages, CHATGPT's interactive learning function can provide students with complete resource support, technical support and emotional support, thus having a positive impact on their independent learning ability. Generative AI can have a positive impact on students' motivation, learning plans, learning scenarios, and learning reflections in online self-directed learning by virtue of its four core competencies of inspirational content generation, conversational context understanding, sequential task execution, and procedural language parsing [7].

The intervention of ChatGPT in the process of students' independent learning can change students' learning motivation, enable students to take the initiative to choose knowledge out of their own learning interests, and change the passive learning status in the traditional education model. ChatGPT's advanced natural language parsing ability can accurately identify students' learning needs, guide students' autonomous learning in the chat dialogue, stimulate students' learning interest in the way of communication, and change the cramming learning mode. By using ChatGPT, students can optimize their learning plan, and by using ChatGPT, students can extend their learning time and enhance their concentration in the field they are interested in, thus improving the efficiency of independent learning. ChatGPT can understand different students' learning modes, interests and preferences, and develop personalized learning plans to meet the individual development needs of students.

The use of ChatGPT in the process of self-directed learning can meet various learning scenarios of students, and its application scenarios are rich, such as Q&A dialogue, homework feedback, task planning, material recommendation, academic guidance, etc., which can deeply intervene in professional learning to help students achieve higher quality knowledge output. In addition, ChatGPT can help students to actively reflect on learning. Students acquire a large amount of information through ChatGPT and begin to learn to screen and classify information. Through rational knowledge acquisition process, students can construct their own cognitive system and cultivate dialectical thinking. Reflect on learning outcomes and thinking errors.

#### **3.2. Negative Effects**

Students' excessive use of ChatGPT may lead to students' lazy thinking [7] and less output of self-learning content. At the same time, the explosion of knowledge brought by ChatGPT will bring

certain learning burden to students, which requires students to have a clearer grasp of their learning goals.

In addition, the ChatGPT system itself has certain limitations. ChatGPT has an information cocoon, and its limited knowledge domain may lead to homogenization of student content output. At the same time, ChatGPT still has information errors and black box thinking. Students sometimes receive incorrect information and do not fully understand ChatGPT's thought process for the problem, but only see the result.

The use of ChatGPT in students' self-directed learning also poses academic and ethical risks, such as the difficulty of defining whether it is the product of students' thinking or ChatGPT's thinking. If students over-rely on the answer function of ChatGPT, it may lead to the reduction of the teaching status of teachers, and even lead to students thinking that they do not need to listen to lectures, and ChatGPT will give more answers instead of teachers [8].

## **4. Discussions and Solutions**

For how ChatGPT can produce a better assistive role in the process of online self-directed learning for college students, this study suggests the following in this regard.

### **4.1. Designing a Knowledge-based Personalized Learning Path**

In CHATGPT's deeply engaged autonomous learning mode, CHATGPT designs a knowledge-based personalized learning path for self-learners to meet their individual learning needs. In the process of rational design of personalized learning, college students' autonomous learning ability will be imperceptibly improved. Students can use ChatGPT's advanced data analysis technology to conduct in-depth interaction and analysis of students' knowledge level, learning preference and progress feedback, and provide a comprehensive learning content profile for self-learners, so that self-learners can have a more comprehensive grasp of self-learning level and established target content, understand the design ideas of personalized learning content, and improve their self-learning ability [9].

### **4.2. Using ChatGPT to Test and Improve Self-Directed Learning**

ChatGPT can fully participate in the process of autonomous learning and conduct detailed data tracking of self-learners' learning behaviors. Through the Teaching integration platform's intelligent analytic tools, students can use CHATGPT to collect learning data, such as study time, content allocation, practice results, test scores, interactive participation, difficulty records, and more. CHATGPT's real-time update and intelligent analysis of these data can provide detailed data support for self-learners, so as to help self-learners understand self-learning mode and progress trajectory direction. At the end of the learning phase, CHATGPT can translate the data into specific intelligent feedback. For example, in-depth analysis of students' learning process, identification of students' strengths and weaknesses, reasonable evaluation of learning, encouragement of students to follow the direction of learning, prediction of potential learning disabilities, and guidance of learning suggestions.

### **4.3. Constructing an AI Autonomous Learning Evaluation System**

From the perspective of CHATGPT's participation in college students' autonomous learning process, a comprehensive and effective evaluation system of artificial intelligent autonomous learning ability can be built, including knowledge capacity expansion, learning strategy and method, intelligent interactive application, self-learning thinking improvement, and outcome evaluation feedback. The evaluation system scale can accurately evaluate the planning, organization and self-monitoring abilities of students in the process of independent learning, as well as all the indicators of the process of self-study, such as the setting of learning goals, time management, effective use of resources, and continuous reflection of learning progress [10]. The establishment of artificial

intelligent autonomous learning evaluation system is helpful for contemporary college students to get familiar with and master ChatGPT's participation in the process of autonomous learning, let students see the content and indicators of the improvement of autonomous learning ability, so as to use ChatGPT more effectively, and regard artificial intelligent autonomous learning as a standardized learning mode. Science plays a positive role in ChatGPT.

## 5. Conclusion

To sum up, in the context of the use of artificial intelligence technology represented by CHATGPT, the online independent learning methods of contemporary college students are more efficient, diverse and personalized, and also more in line with the learning needs of college students, which can improve their learning autonomy and academic creativity. The combination of CHATGPT and online autonomous learning is not only a reform of college students' autonomous learning mode, but also an innovation of traditional college teaching mode. In the long run, the application of artificial intelligence technology represented by CHATGPT in college students' online autonomous learning will bring many positive effects. In addition, the risks and problems that ChatGPT may pose in its use should not be ignored. It is necessary to correctly guide the use of CHATGPT in online autonomous learning for college students and ensure that artificial intelligence technology plays a correct role, so as to better improve the ability of online autonomous learning for contemporary college students. The wide use of CHATGPT in the process of college students' autonomous learning means the deep integration of artificial intelligence technology and education, and the ecological reform of education in the future will be gradually carried out from the students' autonomous learning mode. Of course, the application of CHATGPT in education will also face a series of challenges. The breakthrough of technical bottlenecks and the ethics in application are the problems that need to be solved at present, which requires the continuous development of artificial intelligence technology and effective management in the field of education.

This paper only interrogates the impact of ChatGPT on college students' online self-directed learning ability and analyzes the specific influencing factors, but does not discuss the specific impact on the results of self-directed learning. The future research directions may be directed at more concrete learning content to carry out the corresponding research.

## Authors Contribution

All the authors contributed equally and their names were listed in alphabetical order.

## References

- [1] Hou Yinglong, Zhu Mingqi, Song Qiyuan, Ma Liping & Gao Mei. ChatGPT for clinicians as an assistant rather than a substitute. *Medicine and Philosophy*, 2024, (14): 1-5.
- [2] Guo Yajun, Zhou Jiahua, Pang Yiwei, Li Tianxiang & Li Zefeng. ChatGPT enabling information retrieval: principles, evaluation, scenarios and approaches. *Information theory and practice*, 2024, 1-14.
- [3] Yunbo Jin, Pan Pan Gong, Yingying Bao & Mengjuan Wang. Opportunities and Challenges Facing the Development of College Students' Independent Learning Ability in the Era of Strong Artificial Intelligence - A Reflection Based on ChatGPT. *Journal of Xinyang Normal College (Philosophy and Social Science Edition)*, 2024, (01): 105-111.
- [4] Liu, B. L.. ChatGPT dialogic education: meaning value, risk challenge and practice approach. *Open Education Research*, 2024, (04): 53-61. doi:10.13966/j.cnki.kfjyyyj.2024.04.007.
- [5] Zhang, Yujuan, Li, Sifan & Zhang, Yu. An investigation on the application of ChatGPT in materials simulation course. *Chemistry Education (in English and Chinese)*, 2024, (16): 100-104. doi:10.13884/j.1003-3807hxjy.2023120099.
- [6] Lu Y., Yu J. L., Chen P. P., et al. The second chance: characteristics and mechanism of the influence of Internet learning on class acquisition [J]. *Chinese Journal of Distance Education*, 2023, 43(4): 24-31, 51.

- [7] Wang, R. & Yu, F.. A Study on the Effect of Generative Artificial Intelligence Perceived Interactivity on College Students' Autonomous Learning Ability. *Foreign Trade and Economics*, 2024, (07): 108-112. doi:CNKI:SUN:HLJW.0.2024-07-023.
- [8] Zhu W. J.. Exploration of students' independent learning methods under artificial intelligence. *Neijiang Science and Technology*, 2024, (02): 29-30+80. doi:CNKI:SUN:KJNJ.0.2024-02-015.
- [9] Wang, C. & Liu, Y. G.. An investigation of teacher self-directed learning model based on generative artificial intelligence - ChatGPT as an example. *Software Guide*, 2023, (11): 219-225.
- [10] Wang Han & Tong Yuying. Artificial Intelligence: A New Opportunity for Independent and Efficient Learning of College Students. *Journal of Qilu Normal College*, 2020, (06): 15-21.