Research on the Application Status of Generative AI Tools among College Students--Taking ChatGPT as an Example

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Abstract. In recent years, artificial intelligence has continuously overcome technological challenges and swept the world at a rapid pace of development. Generative AI tools represented by ChatGPT have undergone extensive language training and made a qualitative leap in capacity algorithms. Although the application status of ChatGPT has received widespread attention, there is still a limited amount of related research and shortcomings. This article takes ChatGPT as an example to analyze the current application status of generative AI tools among college students. Through the collection and organization of survey data, research, and analysis have found that college students have some problems with the actual use of ChatGPT, including insufficient familiarity, inconvenient use of ChatGPT, and lack of autonomy in using ChatGPT among college students. Based on this, this article proposes the following suggestions. Firstly, draw on mature experience and promote digital education. Secondly, offer artificial intelligence courses such as ChatGPT pilot courses. Thirdly, build and improve the digital moral education system and regulatory mechanism.

Keywords: College Students, Generative AI Tools, Research on Application Status, ChatGPT.

1. Introduction

The emergence of generative AI tools is based on large language models and is constantly improving in areas such as natural language understanding, computer vision, and intelligent speech. They have achieved significant improvements in model accuracy, versatility, and generalization ability. The emergence of generative AI tools has had a huge impact on human society, profoundly changing people's learning and lifestyle. Currently, the most influential and representative is ChatGPT.

College students are an important audience for generative AI tools. In January 2023, a survey of 1000 students aged 18 and above showed that over 89% of the surveyed students would use ChatGPT to complete homework [1]. The important role of ChatGPT is increasingly prominent in the daily learning and life of college students. ChatGPT has had a huge impact on higher education, challenging the traditional teacher-student relationship and placing higher demands on the professional competence of teachers. At the same time, it has also triggered a series of problems such as the loss of student subjectivity and academic integrity crisis.

This study used a questionnaire survey method to select college students of different grades, genders, majors, and age groups through random sampling. SPSS data analysis software was used to analyze the data of the survey results and draw relevant conclusions. College students are the main body of higher education. The purpose of this study is to clarify the application scenarios and problems encountered by college students in the use of ChatGPT through investigation and to prepare for the further integration of ChatGPT into higher education in the future.

2. Method

2.1. Research Design

Some scholars have conducted relevant research on the application of ChatGPT among college students. Based on the UTAUT model, Li Yixue surveyed college students and analyzed their acceptance of ChatGPT by distributing questionnaires. The conclusion was drawn that college students are generally in a state of acceptance of ChatGPT, and there is no significant difference in

different professional categories [2]. Li Yan surveyed 1190 undergraduate students from Zhejiang University. Through descriptive statistics, difference tests, and other methods, she analyzed the application and influencing factors of ChatGPT among college students. She explored the path of ChatGPT integration into higher education from the dimensions of university management departments, companies, universities, and teachers [3]. Tamara Al Shloul explores the advantages and disadvantages of ChatGPT as an educational tool from the perspective of student academic performance. The research findings indicate that ChatGPT interactive dialogue enhances students' learning outcomes and also innovates teaching methods [4]. Abu Elnasr E. Sobaih et al. used 520 college students as an example and conducted a quantitative study to investigate the acceptance and use of ChatGPT in higher education in Saudi Arabia. The study was based on the unified theory of technology acceptance and use, and the results showed that behavioral intention played a mediating role in the practical application of ChatGPT in higher education [5].

This study adopted a quantitative research approach, referring to existing scales, and designed and produced a questionnaire. 200 college students were randomly selected for the questionnaire survey, covering different grades, genders, and age groups. The questionnaire consists of four parts. The first part provides basic information about the respondents, including gender, age, grade, and major category, with a total of four questions. The second part is about the application of ChatGPT among college students, aiming to understand the application scenarios and problems that arise during the application process of ChatGPT among college students. There are a total of 6 questions. The third part is about the acceptance of ChatGPT among college students, with a total of 10 questions. The fourth part is an open question aimed at understanding which aspects of ChatGPT college students hope to apply in higher education and helping ChatGPT further integrate into higher education.

2.2. Distribution and Recycling

This questionnaire was distributed using an online platform. 223 questionnaires were actually collected, 21 invalid questionnaires were excluded (with a response time of less than 60 seconds), and 202 valid questionnaires were finally obtained, with an effective rate of 90.6%. The author conducted a reliability and validity analysis on the questionnaire, and the results showed that the Cronbach alpha coefficient was 0.849, with a reliability coefficient value higher than 0.8. This indicates that the data has high-reliability quality and can be used for further analysis. The KMO value obtained through validity analysis is 0.859, which is greater than 0.6, indicating that the data can effectively extract information. In summary, the data from this questionnaire is valid and can be used for subsequent research.

2.3. Result

This article obtains the basic information from 202 valid questionnaires collected through preliminary sorting, which mainly includes four dimensions: gender, age, grade, and major. In terms of gender, there are 177 female students, accounting for 87.62%. There are 25 males, accounting for 12.38%, with a higher number of females. In terms of age, one person under 18 years old accounts for 0.5%. 160 people aged 18-21, accounting for 79.21%. 41 people aged 21 and above, accounting for 20.3%. The age group is mainly concentrated between 18 and 21 years old. In terms of grade, there are 130 freshmen, accounting for 64.36%, the highest proportion. 60 students in their junior year, accounting for 29.7%. There are 8 sophomores, accounting for 3.96%. Four senior students account for 1.98%. In terms of expertise, there are 108 students in the Chinese language category, accounting for 53.47%, which is the highest proportion. The order is education, accounting for 21.29%. 41 people in the art category, accounting for 20.3%. There are 7 people in other majors, accounting for 3.47%. Three students in the business category accounted for 1.49%. The above data indicates that the survey covers a wide range of groups, covering multiple disciplines, different genders, and different professional grades. The selection of survey subjects is comprehensive, and the obtained data results can be effectively used.

3. Problem Analysis

3.1. College Students Lack Familiarity with ChatGPT

Regarding the familiarity level of college students with ChatGPT (as shown in Table 1), 56.44% of college students expressed general familiarity with ChatGPT, with the highest proportion. 25.25% of college students expressed unfamiliarity with ChatGPT, and 5.94% of college students expressed extreme unfamiliarity with ChatGPT, accounting for a total of 31.19%. 11.88% of college students are familiar with ChatGPT, accounting for 11.88%, while only 0.5% of college students are very familiar with ChatGPT, accounting for a total of 12.38%. In summary, some college students have not been exposed to or used ChatGPT and lack understanding of ChatGPT.

The data shows that ChatGPT has not been fully popularized among college students, which can be divided into the following three situations: firstly, some college students have never heard of ChatGPT; Secondly, some college students have only heard of ChatGPT but have never used it; Thirdly, some college students have heard of and used ChatGPT, but they have used it less frequently, so they are not familiar with ChatGPT. The familiarity and understanding of ChatGPT among college students are directly related to its application in higher education.

Table 1. Familiarity of college students with ChatGPT

Familiarity	Percentage
Very familiar	0.5%
familiar	11.88%
ordinary	56.44%
unfamiliar	25.25%
Very familiar	5.94%

3.2. The Use of ChatGPT

Regarding the attention paid to ChatGPT (as shown in Figure 1), 51% of college students are most concerned about ease of use, accounting for the highest proportion. 36% of college students are most concerned about learning outcomes, 9% are most concerned about learning costs, and 4% are concerned about other issues. In summary, the convenience of using ChatGPT is the most concerning aspect for college students, and it is also an important reason that affects their use of ChatGPT.

The data shows that the convenience of use is the most important reason for college students to use ChatGPT. The computing power of ChatGPT cannot be separated from the support of large language models. After a large amount of language training, ChatGPT's functionality in human-computer interaction has been significantly better than other AI tools. However, there is still room for improvement in terms of user convenience. Some ChatGPT pages are not concise enough, and specific language instructions need to be entered during human-computer interaction for ChatGPT to respond accordingly. The first step in using ChatGPT is to learn how to ask questions. For example, iFlytek Spark needs to input background, specific requirements, and output requirements to obtain satisfactory responses, which to some extent increases the difficulty for college students to use ChatGPT.

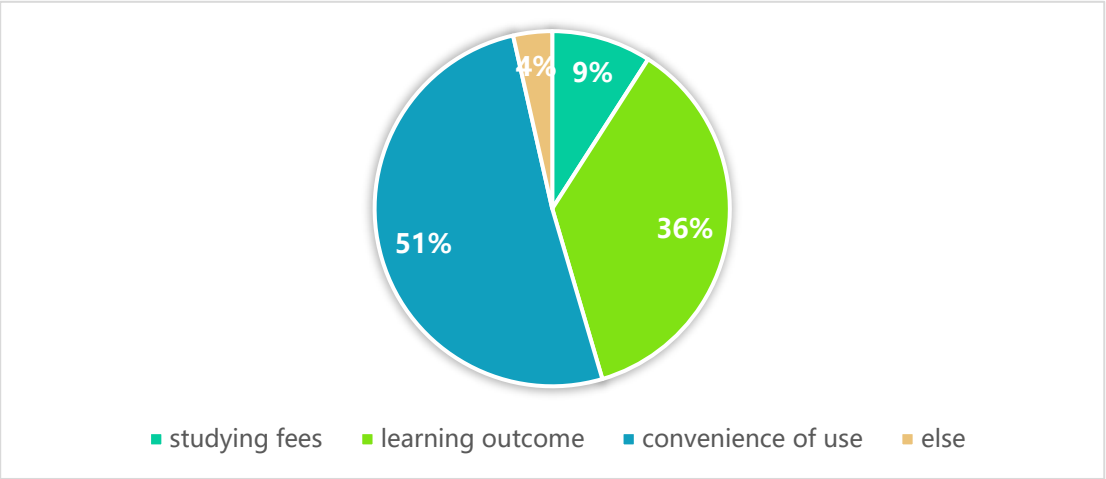

Figure 1. Attention of College Students to ChatGPT

3.3. College Students Lack Autonomy in Using ChatGPT

The degree of agreement among college students regarding the issue of excessive reliance on ChatGPT and loss of independent thinking ability (as shown in Figure 2). 51.98% of college students hold a neutral attitude towards this issue, 21.29% of college students agree, and 7.43% of college students strongly agree, accounting for a total of 28.72%. The proportion of college students who disagree is 15.84%, and the proportion of college students who strongly disagree is 3.47%, totaling 19.31%. In summary, some college students believe that they will become overly dependent on ChatGPT and lose the ability to think independently. Therefore, their autonomy in using ChatGPT needs to be improved.

The data shows that there is a hidden danger of excessive dependence and loss of independent thinking ability among college students when using ChatGPT, and some college students have already recognized this issue. On the one hand, the powerful functions of ChatGPT provide college students with assistance in literature reading, homework, and paper writing, improving their learning efficiency. On the other hand, it is also a test of the self-control of college students. Students with poor self-control are prone to excessive dependence on ChatGPT, habitually entrusting all learning-related tasks to ChatGPT, from course assignments to thesis writing, gradually losing the ability to think independently. This goes against the original intention of ChatGPT to empower higher education. Instrumental rationality usurps human rationality, causing self-management crises for college students and also hindering their growth and development.

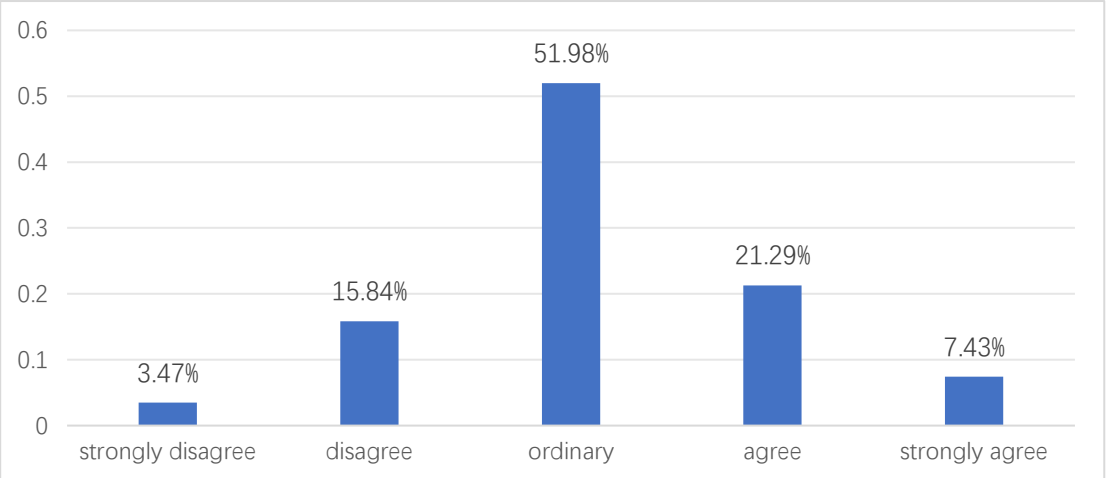

Figure 2. College students' agreement with the issue of excessive reliance on ChatGPT and loss of independent thinking ability

4. Suggestion

4.1. Drawing on Mature Experience and Promoting Digital Education

The emergence of ChatGPT means that artificial intelligence has made significant breakthroughs in the field of technology, and it also provides the possibility for artificial intelligence to be integrated into the daily teaching of college students, laying a technological foundation for promoting the digital transformation of higher education. The era of artificial intelligence has put forward higher goals and requirements for higher education traditional teaching, which focuses on lectures, cannot customize personalized plans and provide opportunities for personalized learning based on the diverse interests and learning habits of college students. Therefore, traditional teaching is difficult to achieve ideal teaching results, and its limitations are becoming increasingly prominent. It is no longer suitable for the requirements of the times. To achieve the goal of cultivating various advanced specialized talents, higher education must focus on the development of educational technology and be adept at using digital technology to empower the field of education.

In recent years, the wave of artificial intelligence has swept the world, and some countries have closely followed the development trend of artificial intelligence, successively introduced relevant policies, actively explored and attempted the application of artificial intelligence in the field of education, popularized the development possibility of artificial intelligence in education through various means, and vigorously promoted the digital transformation of education. Take Japan and Germany as examples. Japan was the first to propose the concept of "GIGA School", emphasizing the subjectivity of "people". Through a series of policy measures, it aims to cultivate "people" in the era of digital intelligence. Japan has enacted specialized legislation for the digitization of education, clearly defining the responsibilities and authorities of the central and local governments at the legal level, to assist in the digital transformation of education [6]. Germany has issued relevant legal opinions, requiring that when using generative artificial intelligence represented by ChatGPT to generate content, the source must be indicated. At the same time, Germany emphasizes educational equity, actively pays attention to the educational needs of disabled college students, advocates an accessible education ecosystem, emphasizes the emotional and experiential aspects of education, and actively uses digital technology to bring disabled college students closer to ordinary students, highlighting the inclusiveness of education [7]. At present, the exploration of digital education laws in China is still in its initial stage. In this regard, it should draw on successful experiences, accelerate the popularization of artificial intelligence in education, establish and improve the legal and regulatory system of digital education, and promote the digital transformation of higher education.

4.2. Offering Artificial Intelligence Courses

The emergence of generative artificial intelligence, represented by ChatGPT, has challenged traditional teacher-student relationships and overturned educational scenarios. Smart classrooms will become the mainstream form of teaching development. This change puts higher demands on teachers, who are facing role transformation. Teachers are no longer single instructors but are endowed with multiple identities. Rubach Charlotte pointed out that in the face of educational digitization, the primary issue for teachers is how to improve their digital abilities [8]. In addition to being responsible for daily teaching activities, teachers also need to possess information technology skills such as human-machine collaboration and resource integration, and undertake the task of helping students improve their information literacy.

In specific practical teaching, teachers can focus on considering teaching design and curriculum design. By offering artificial intelligence courses such as ChatGPT pilot courses, educational resources can be shared and the boundaries of educational resources in time and space can be broken. The course content can cover the development history of artificial intelligence technology, the basic knowledge and underlying logic of ChatGPT, the characteristics, and functions of ChatGPT, common ChatGPT tools and their respective characteristics, and the operation steps of general generative AI tools. The important function of the introductory course is to serve as a guide assistant for college

students to use ChatGPT, helping them familiarize themselves with the operating process of ChatGPT, assisting them in synchronous practical operations, engaging in immersive experiential learning, and answering common questions about using ChatGPT. This course can help college students master the Q&A and interactive skills of ChatGPT, thereby obtaining satisfactory answers provided by ChatGPT, improving learning efficiency, mobilizing college students' interest in ChatGPT learning, and thus improving their information literacy.

4.3. Building and Improving the Digital Moral Education System and Regulatory Mechanism

Butson Russell et al. explored the discourse power of artificial intelligence in the field of higher education by showcasing structured dialogue among different learners, revealing a profound reflection on the complex relationship between efficiency and ethical care, integrity, and innovation [9]. The excessive dependence of college students on ChatGPT and the loss of independent thinking ability essentially reflect the impact of the new generation of artificial intelligence technology on the moral education and traditional ethics of college students. Moral education, also known as moral education, aims to guide and regulate the daily behavior development of college students through moral education and improve their ability to distinguish right from wrong and judge right from wrong. At the same time, moral education is also an important way to cultivate the subject consciousness of college students, enhance their thinking ability, and guide them to establish correct values. It is the core standard for implementing national education policies and evaluating the comprehensive quality of students. Moral education helps to promote the quality education of college students, promote the comprehensive development of their morality, intelligence, physical fitness, aesthetics, and labor skills, and help them grow and become successful.

Against the backdrop of the impact of the new generation of artificial intelligence technology, it is particularly important to build and improve a digital moral education system. Dai Ling pointed out that the focus of digital moral education is on how to cultivate students' moral self-discipline and moral personality [10]. Unlike traditional moral education in the past, digital moral education specifically refers to the use of digital means to provide moral education to college students, which must rely on corresponding technological means as support. The implementation of digital moral education cannot be separated from artificial intelligence technology. One of the powerful functions of ChatGPT lies in its ability to be applied in various scenarios. It is important to fully utilize the advantages of ChatGPT, which is not limited by time and space, as well as its convenient human-computer interaction, to enable ChatGPT to deeply empower moral education, innovate moral education forms, and provide moral education to college students through multiple channels, integrating moral education concepts into all aspects of their learning and life. At the same time, it is necessary to establish and improve the evaluation system and regulatory mechanism for digital moral education, formulate and clarify the implementation rules for digital moral education evaluation, involving evaluation standards such as educational ethics, privacy and security, network literacy, subject consciousness, and academic integrity crisis. In addition, it is necessary to comprehensively consider the effects of process evaluation and outcome evaluation, dynamically monitor the implementation progress of digital moral education, comprehensively test the implementation effect of moral education among college students, activate their autonomy, stimulate their creativity, enhance their self-management ability and numerical literacy, and help them establish the correct digital ethics.

5. Conclusion

This study found that although generative AI tools represented by ChatGPT have had a huge impact on higher education, their popularity in the actual learning and life of college students is not high, and their influence needs to be further improved. Meanwhile, some issues need to be addressed in the application of ChatGPT among college students. This study first conducted a research design for the survey, which will contribute to the subsequent research. Secondly, the collected data was

tested to prove its validity, and the data was analyzed, which helps to understand the overall situation and identify potential problems and hidden dangers from the data. The main problems include insufficient familiarity of college students with ChatGPT, inconvenient use of ChatGPT, and lack of autonomy in using ChatGPT among college students. Finally, based on the above issues, targeted suggestions can be proposed, which can be addressed from three aspects: drawing on mature experience, popularizing digital education, offering artificial intelligence courses such as ChatGPT pilot courses, and building and improving a digital moral education system and regulatory mechanism. In the future, ChatGPT will be widely applied in various educational scenarios to empower digital transformation in education. But at the same time, it is necessary to develop and improve guidelines for the use of generative AI tools, guiding technology towards goodness.

References

[1] China Youth Network. Why is ChatGPT banned as it sweeps across campuses? 2023, Retrieved from https://baijiahao.baidu.com/s?id=1758056994345892085&wfr=spider&for=pc.

[2] Li Y X, Xu X H, Yu Y Q, Wang G X, Liu Z P. Questionnaire study on ChatGPT acceptance among college students. Fujian Computer, 2024, 40 (03): 30 - 33.

[3] Li Y, Xu J, Jia C Y, Zhai X S. Status and thinking of AI--Based on the survey of Zhejiang University. Open Education Research, 2024, 30 (01): 89 - 98.

[4] Al Shloul T, Mazhar T, Iqbal M, et al. Role of activity-based learning and ChatGPT on students' performance in education. Computers and Education: Artificial Intelligence, 2024: 100219.

[5] Sobaih A E, Elshaer I A, Hasanein A M. Examining students' acceptance and use of ChatGPT in Saudi Arabian higher education. European Journal of Investigation in Health, Psychology and Education, 2024, 14 (3): 709 - 721.

[6] Song W Q, Li Z F, Zhang Z X. An analysis of the digital transformation of Japanese education: Focusing on the cultivation of "people" in the era of digital wisdom. Journal of Comparative Education, 2024, (03): 35 - 45.

[7] Wang Z. Digital transformation of German higher education teaching: Historical evolution, practical exploration, and reality mirror. Foreign Education Research, 2023, 50 (05): 116 - 128.

[8] Rubach C, Backfisch I. Digitization in teacher education--quality enhancement, status quo, and professionalization approaches. Unterrichtswissenschaft, 2023, 51 (4): 479 - 487.

[9] Butson R, Spronken-Smith R. AI and its implications for research in higher education: a critical dialogue. Higher Education Research & Development, 2024, 43 (3): 563 - 577.

[10] Dai L, Hu J, Zhu Z T. ChatGPT A new strategy for the digital transformation of enabling education. Open Education Research, 2023, 29 (04): 41 - 48.