

University Students' Attitudes Toward Impacts by ChatGPT: Taking Guangdong Province as an Example

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Received: 8 November 2025; **Accepted:** 12 December 2025; **Published:** 30 December 2025

Abstract:

Since the launch of ChatGPT in late 2022, generative AI has sparked global interest, with research evolving from technical explanations to attitudinal studies. This paper investigates university students' attitudes toward ChatGPT in Guangdong Province, China, focusing on its impacts on education. Using a mixed-method approach, the study collected 300 valid questionnaires from students across diverse academic backgrounds and conducted in-depth interviews. Descriptive results revealed that most students learned about ChatGPT through news networks (86%) and peers (78%). Primary uses included academic assignments (86.67%) and research (76%). Positive impacts highlighted enhanced learning efficiency and critical thinking stimulation, while concerns involved over-dependency, knowledge accuracy issues, and academic integrity risks. Future expectations prioritized education (78.2%) as the most influenced sector, with strong support for AI development. Interviews emphasized the need for balanced integration-leveraging ChatGPT's benefits while fostering digital literacy and independent thinking. ChatGPT serves as a double-edged sword, necessitating strategic educational reforms to harness its potential and address challenges.

Keywords:

University Students, Attitudes, ChatGPT

1. Introduction

Since the introduction of ChatGPT by OpenAI to the world close to the end of the year of 2022, generative artificial intelligence has changed the world to a large extent. People are both hopeful and worried with regard to what influences Generative artificial intelligence would bring to human being. Experts and professors from leading research institutions and universities have conducted studies and published papers to help academia and industries understand the core principles, impacts, and

future directions of generative AI. The technology has sparked widespread interest across industries worldwide, with mixed reactions to GPT-4's applications. From the advent of 2023 till now, there is a thread of logic in research on Generative AI. The first tide of research around GenAI has mainly focused on explaining what it is. Next, some experts from universities started testing various types of GenAI tools. More recently, researchers and scholars became more and more interested in people's attitudinal aspects when using GenAI tools or toward how GenAI will develop.

In the first half of 2023, authoritative research institutions and higher education institutions, including university professors and researchers, conducted studies to elaborate what GenAI really is and how GenAI functions. Shen, Chen, Backes, and Zhang (2023) questioned the reliability of ChatGPT's answers. The researchers used questions that can fall into different fields to test the reliability of ChatGPT, and found that ChatGPT did a relatively poor job in answering questions in the fields of law and science, using the LLMs that Shen et al. used. Shen et al. suggested that reliability and security of LLMs should be improved. Another study by Kim. et al. (2023) [2] examined the choice overload in ChatGPT's responses as recommendations. Tyson (2023) [6] worked on finding out the use of ChatGPT in the field of chemical education to be ineffective in such aspects as reliable mathematical operations, conceptual accuracy, correct citations and so on. In China, Professor Jiao (2023) [1] analyzed GPT-4 as a tool, dissected ChatGPT's features, discussed its widespread applications, and offered practical recommendations.

Subsequently, some university researchers began testing GPT-4 from unique and practical perspectives, analyzing its usage through case studies. In 2024, more and more researchers are interested in how people feel about the use of ChatGPT. Babu, et al. (2024) [4] conducted a study with public university students in Bangladesh, specifically a group of "Z" generation college students. Babu and team conducted a survey and collected 307 valid questionnaire responses. Using a structural equation model, their study found out that the three variables of students' views, the demographic feature of being Generation Z's, and adoption tendencies, all functioned as positive factors on the usage rates of ChatGPT. Litvin, and Tan (2024) [3] carried out an empirical research to examine whether people can distinguish ChatGPT generated responses, from that by human beings, to customers' questions regarding their staying in a hotel, namely in the field of hospitality. It was found that ChatGPT generated responses were as effective as responses by human beings.

More recently, scholars and researchers started investigating public opinions on the adoption of GPT-based tools among diverse demographic groups. Zhang, et al. (2025) [7] used mixed-method approach to delve into university students' attitudes towards ChatGPT. They invited participation from 850 Chinese university students. Through latent profile analysis and thematic analysis, they found out the participating students' attitudes and intentions toward ChatGPT. They established a few user profiles for ChatGPT users from universities. This is one of the most recent attitudinal studies on people's intention on using ChatGPT.

2. Research Methods

2.1. Research participants

This study primarily focuses on college students in Guangdong Province, with samples drawn from undergraduate and college students. The participants' educational backgrounds and academic disciplines vary significantly, resulting in

distinct approaches to engaging with and utilizing ChatGPT. This diversity of outcomes makes the study's findings more reflective of real-world scenarios. The research aims to analyze college students' awareness of ChatGPT technology, their usage patterns, influencing factors, and expectations for digital-intelligent technology development within the context of educational digitalization.

2.2. Survey

This study developed a questionnaire consisting of four sections, investigating participants' feelings and attitudes toward the use of GenAI from different perspectives. The first section contains three questions about respondents' demographic information, such as their academic institutions, educational stages, and majors. The second section includes five questions to assess college students' initial understanding and usage habits of ChatGPT. The third section evaluates the impact of ChatGPT on university students through five questions, providing data to analyze its influence and support future research strategies. The fourth section collects five questions about students' expectations for ChatGPT's future applications in education and other industries, gathering their perspectives on technological innovation directions and potential transformations in various sectors. This data will serve as a reference for exploring ChatGPT's long-term impact and formulating corresponding strategies.

2.3. Data collection

This study utilized the Wenjuanxing platform for questionnaire distribution, with data collection concluding in April, 2024. A total of 300 valid questionnaires were collected. All dimensions of the questionnaire demonstrated Cronbach's alpha coefficients exceeding 0.7, indicating high reliability. The KMO value was 0.828, the Bartlett's test value was 3444.074, and the P-value was less than 0.05. These statistical results confirm the suitability of the questionnaire for data analysis.

2.4. Interview with a Senior User of Digital and Intelligent Tools

In this study, the research team not only collected primary data through questionnaires targeting college students, but also conducted in-depth interviews with experienced users of digital and intelligent tools. The interviews focused on ChatGPT's multidimensional impacts on students, strategies for coping with its effects, and forward-looking analyses of its future development trends. These interviews aimed to provide richer perspectives and deeper insights for comprehensively understanding ChatGPT's influence and guiding future research directions.

3. Result Analysis

3.1. Reliability testing

Cronbach's α reliability coefficient is currently the most widely used reliability measure, with the following formula:

$$\alpha = \frac{k}{k-1} \left(1 - \frac{\sum S_i^2}{S_T^2} \right)$$

The scale consists of k items with n observations, where S_i denotes the variance of the score for item i and S_x represents the variance of the total test score. For

computational convenience, the researchers pre-assigned all item scores to align in the same direction.

This study primarily employs the Alpha reliability coefficient method to analyze the questionnaire. Using SPSS statistical software, the Cronbach's alpha coefficients for all survey items across respondents were calculated, with the results as follows:

As shown in Table 1, all Cronbach's coefficients across all levels exceed 0.7, indicating that this questionnaire demonstrates high reliability in assessing the impact of AI on college education.

Table 1. Reliability Test Coefficient Table.

Cronbach's α coefficient	Standardized Cronbach's α coefficient	Number of terms	Sample number
0.739	0.846	45	376

3.2. Validity test

Validity refers to the degree of correspondence between measurement results and the intended content; the higher the agreement, the greater the validity, and conversely, the lower the validity. The suitability of factor analysis for validity assessment was evaluated using KMO and Bartlett's test for sphericity, with the results presented below.

As shown in Table 2, the KMO value is 0.828, the Bartlett's test statistic is 3444.074, and the P-value is less than 0.05. These results indicate that the data are suitable for analysis.

Table 2. Bartlett's test for the validity of sphericity.

KMO test and Bartlett's test		
Bartlett sphericity test	KMO price	0.828
	Approximate Chi-square	3444.074
	df	861
	P	0.000***

Note: ***, **, and * represent significance levels of 1%, 5%, and 10%, respectively.

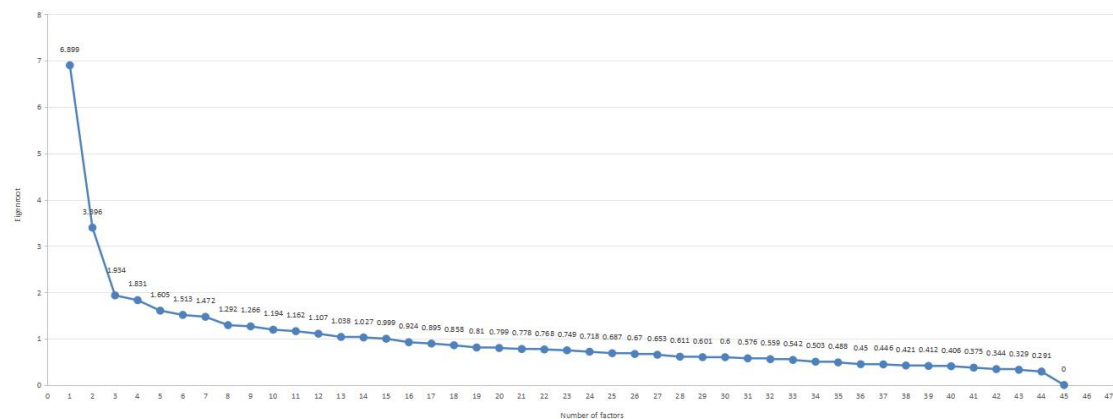


Figure 1. Stone fragmentation image.

A principal component plot illustrates how each principal component explains data variation. It determines the number of principal components to retain by analyzing the slope of the eigenvalue decline, which can be validated or adjusted using the variance explanation table. Each principal component is represented as a point, and the optimal number is identified by observing when the slope flattens.

As shown in Figure 1, the data after the third principal component shows a flattening trend. Therefore, the researchers concluded that the top two principal components could be retained for further analysis.

The reliability and validity analysis confirmed that the questionnaire data was suitable for the research in this paper.

3.3. Descriptive statistical analysis

(1) Basic Information of Respondents

The respondents in this sample were mainly composed of ordinary undergraduate students (accounting for 87%). The second largest group was college students from vocational colleges (accounting for 10%). This proportion closely matches the current structure of highly educated students in Chinese mainland society. Figure 2 reveals that the study's survey participants span diverse educational tiers: 2% from 985 institutions, 1% from 211 institutions, 87% from undergraduate colleges, and 10% from vocational colleges.

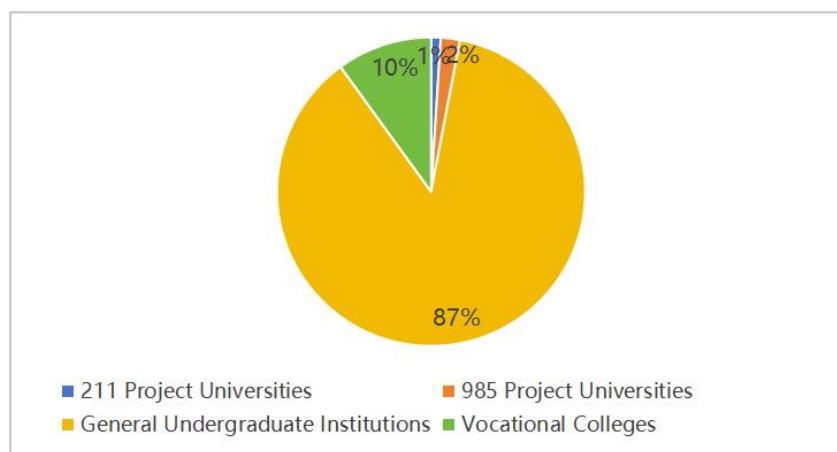


Figure 2. Distribution of Institution Types.

Figure 3 shows varying academic stages: 1% master's students, 2% doctoral candidates, 4% seniors, 17% freshmen, 38% sophomores, and 38% juniors. The survey covers multiple disciplines including literature, science, and engineering, ensuring the collected data is representative and unbiased toward any specific demographic features.

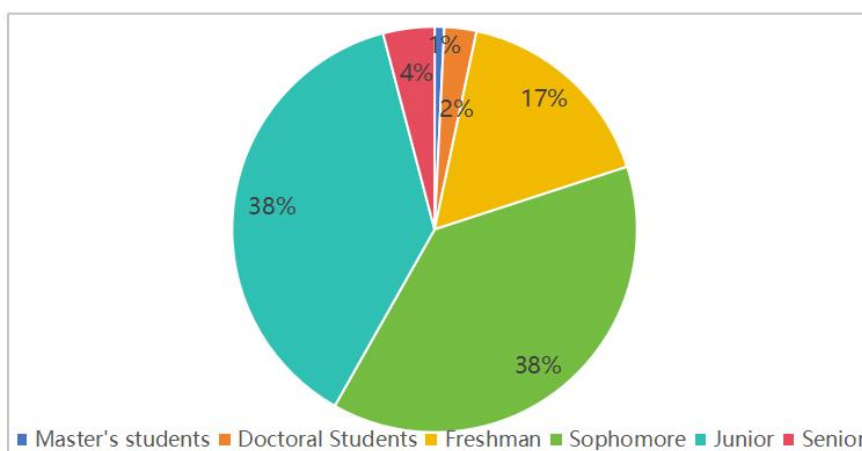


Figure 3. Distribution of Educational Stages of participants.

(2) Understanding pathways and usage routes

Figure 4 reveals that the majority of respondents (258 participants, taking up 86%) learned about GPT-4 through news networks, while 78% (234 participants) were introduced by friends or classmates. This demonstrates the significant role of news networks in promoting GPT-4. Notably, peers play a more influential role in word-of-mouth dissemination than educators (e.g., teachers or family members, 70.33%). These findings align with the widespread media coverage of GPT-4's development by major newspapers.

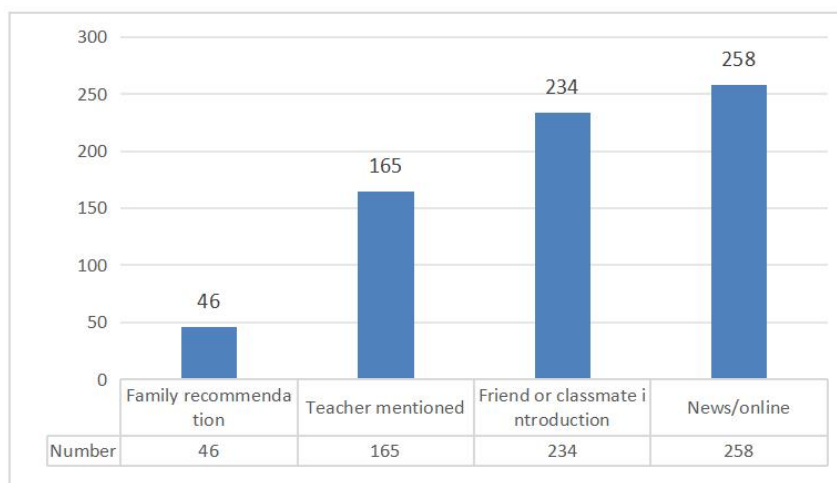


Figure 4. Summary of how participants first got to know ChatGPT.

Figure 5 reveals that the majority of respondents (260 participants, 86.67%) primarily use GPT for homework or academic papers, while 228 (76%) utilize it for research and 211 (70.33%) for seeking answers. Notably, only 96 participant, roughly 32%, of this group admitted that they employ GPT through human-computer dialogue for learning purposes.

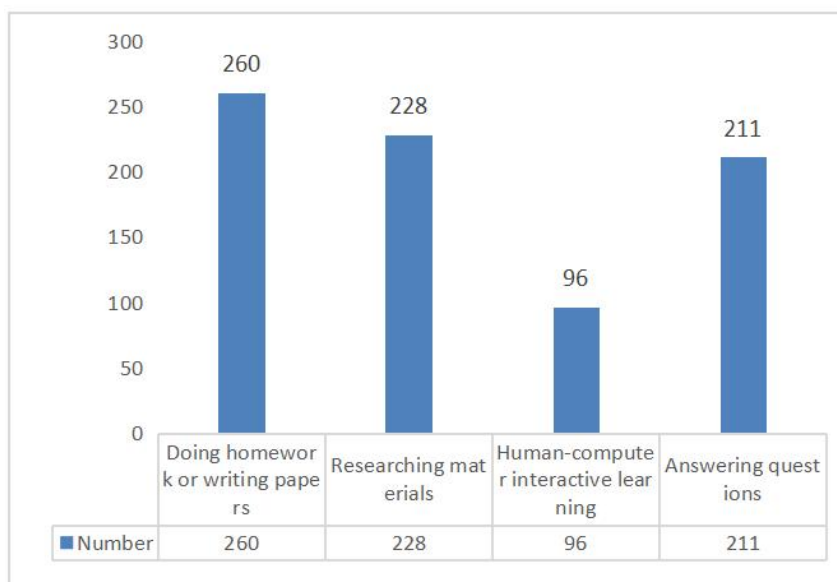


Figure 5. Summary of AI's main functions for participants.

(3) Development and Prospects

Question 9 of the survey asks, "Which field do you think ChatGPT will have the greatest impact on in the future?" As shown in Figure 6, the majority of respondents (78.2%) believe its development will significantly affect the education sector, while

54.4% expect it to impact finance. The education sector is currently the most relevant field for college students. In contrast, only 31.3% and 31.8% of the respondents in this sample group thought ChatGPT would have a major impact on medicine and industry, respectively.

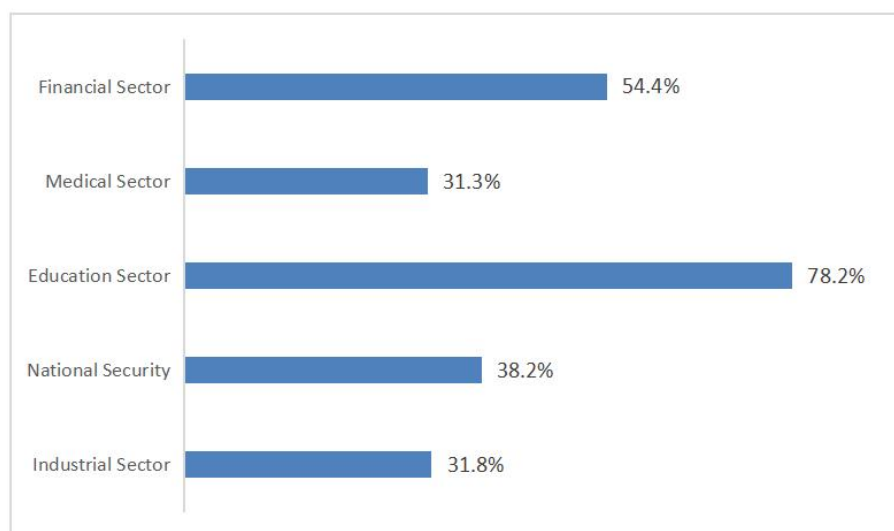


Figure 6. Summary of Expected Growth Industries with the assistance from AI.

Figure 7 further reveals that a significant majority (65.9%) of respondents hope GPT will expand its database to assist human decision-making, while 65.6% envision it as a tool to replace humans in simple or repetitive manual tasks. Only 4.9% of respondents oppose the continued development of GPT technology. This indicates that the surveyed population maintains a positive attitude toward the emergence and evolution of GPT technology.

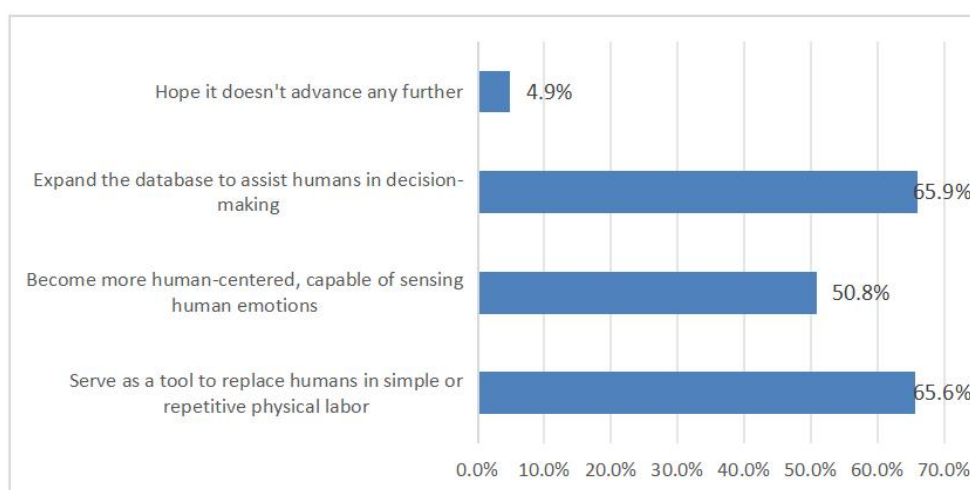


Figure 7. Expected Future Outlook of ChatGPT

4. Results and Discussion

This study conducted interviews with several university faculty members possessing extensive experience in educational digitalization. Among the interviewees, we selected two as representatives for in-depth discussions. In the conversation with Teacher A, the discussion on GPT technology revealed his cautious approach: while expressing optimism about its future development, he explicitly maintained that

human decision-making would remain paramount even in a world where GPT technology becomes ubiquitous.

In the dialogue with Teacher C, a recurring theme emphasized that leveraging artificial intelligence to drive educational reform has become an indispensable strategy in the wave of digital education. With the introduction of ChatGPT, the education system is poised to undergo unprecedented transformation. While benefiting from the technological advantages of ChatGPT, learners must also confront its risks, which will inevitably permeate the education sector. These risks include, but are not limited to, challenges in assessing students' ability to identify knowledge and independent thinking, as well as testing their initiative and the authenticity of knowledge. To effectively address the potential risks posed by ChatGPT, educators should transcend traditional knowledge transmission in curriculum design, focusing instead on cultivating students' comprehensive abilities. During course implementation, teachers should fully utilize ChatGPT's advantages. In terms of course evaluation, schools should prioritize enhancing students' digital literacy.

With the country's increasing emphasis on the application of large language models represented by ChatGPT in the field of education, the digitalization of education is advancing rapidly. However, against the backdrop of education undergoing its third transformation and the reform of traditional learning methods, although China's traditional education is facing severe challenges, this also brings tremendous opportunities for the development of China's innovation and entrepreneurship education. Therefore, deepening the understanding of ChatGPT has become particularly important. The results of this study can be summarized as follows:

4.1. "High Efficiency": The Positive Impact of ChatGPT on College Education

(1) Broaden the way of learning and improve the efficiency of learning

With its exceptional information processing capabilities, ChatGPT has significantly expanded the channels for college students to acquire knowledge. In today's fast-paced digital era, ChatGPT can swiftly and accurately address students' questions across various fields, whether they pertain to academic disciplines or extracurricular knowledge. For instance, in computer science, ChatGPT can promptly respond to complex data structure and algorithm design challenges while providing insights into current research hotspots and industry trends. Furthermore, ChatGPT facilitates in-depth knowledge expansion and interdisciplinary learning, helping students build a comprehensive knowledge system and cultivate integrated and innovative thinking patterns.

(2) Stimulate thinking ability

The interaction between ChatGPT and college students has created new opportunities for developing their thinking abilities. By presenting diverse and innovative perspectives and solutions, it stimulates students' creative thinking, helping them break through conventional mindsets and cultivate innovative awareness and capabilities. Meanwhile, as students filter, evaluate, and analyze the materials provided by ChatGPT, their critical thinking skills are effectively honed. This holds profound significance for students' in-depth exploration in academic research, rational decision-making in daily life, and comprehensive skill enhancement in future career development.

4.2. "Dependence": Limitations and Challenges of ChatGPT

(1) The Potential Crisis of Learning Dependence and Autonomous Learning Ability

In the interview, Teacher C emphasized, “The real challenge lies in mastering ChatGPT’s proper use—avoiding over-reliance, cultivating critical thinking, and refining information filtering skills.” While ChatGPT offers convenience, it also comes with notable limitations. Some students’ excessive dependence on this tool may hinder the development of self-directed learning abilities. Over-reliance on ChatGPT could deprive students of the drive to explore and solve problems independently, ultimately affecting their professional growth and career competitiveness.

(2) Limitations of Knowledge Depth and Accuracy

While ChatGPT provides vast information resources, it still has limitations in depth and accuracy of knowledge. For complex knowledge requiring in-depth understanding, it may not deliver thorough theoretical analysis or professional research guidance.

(3) The Challenge of Academic Integrity and Moral Hazard

The emergence of ChatGPT has raised a series of issues concerning academic integrity and ethical standards, such as plagiarism. Academic fraud not only violates the fundamental principles of academic integrity but may also hinder the construction of students’ knowledge systems and the enhancement of their academic capabilities.

5. Conclusions

In summary, the impact of ChatGPT on college education is a double-edged sword. On the positive side, it provides students with new avenues to acquire and expand knowledge, significantly enhances learning efficiency, and effectively stimulates their thinking. However, its potential limitations should not be overlooked, such as the risk of fostering learning dependency, compromising the accuracy of knowledge, and potentially triggering academic integrity and ethical issues.

In the face of these challenges, modern college students should remain objective, correctly view these limitations, and establish appropriate concepts to contribute their wisdom and strength to social progress. The emergence of ChatGPT marks humanity’s entry into a new era of symbolic explosion, where both education and humanity need to be redefined. Education is undergoing its third transformation, advancing toward a new era of digital and intelligent education.

Conflicts of Interest

The authors declare that there is no conflict of interest regarding the publication of this article.

Funding

This research received no specific grant from any funding agency in the public, commercial or not-for-profit sectors.

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