

Current Status of Artificial Intelligence Academic Assistance Tools-Based on the Classification of Liberal Arts and Science Subjects of College Students in China

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Abstract:

With the rapid development of artificial intelligence technology, the application of Artificial Intelligence (AI) academic assistance tools in the field of higher education is becoming increasingly popular and has gradually become an important assistant in college students' daily learning and scientific research. However, college students from different academic backgrounds may show different usage habits and acceptance levels when using AI academic assistance tools. Therefore, this study starts from the perspective of liberal arts and science classification, adopts a questionnaire survey method, and takes Chinese college students as the research subjects to investigate and analyze their current status and acceptance of using AI academic assistance tools. The results of the study show that most college students rely on the use of academic auxiliary tools. At the same time, this study aims to promote the scientific, reasonable and efficient application of AI technology in academic research in higher education. Future research may explore the application and ethical issues of generative AI in college students' learning based on the current status of the use of AI academic assistance tools.

Keywords: Chinese college students; AI academic assistance tools; questionnaire; acceptance; liberal arts and science.

1. Introduction

Generative AI tools such as ChatGPT, DeepSeek, and Wenxinyiyan are increasingly expanding their all-round impact on academic writing and research. In China, more and more college students are beginning

to use AI academic assistance tools in their studies. Generative AI can provide college students with unique perspectives and novel ideas, thereby improving their ability to explore and innovate, and get more inspiration and stimulate their innovative thinking [1]. Combined with the interactive advantages of gen-

erative AI, it makes autonomous learning and ubiquitous learning possible for college students [2]. As AI becomes more prominent in societal careers and social networks, instructors and students are finding that they will need to adapt to technological advancements and artificial intelligence [3]. Some relevant scholars also pointed out that the efficient information processing ability of artificial intelligence is based on its powerful data mining and knowledge integration algorithms [4]. But at the same time, AI academic assistance tools also bring many problems. Some scholars have pointed out that the rapid development of technology is often accompanied by the urgency of ethical considerations. The application of generative AI in education is no exception. A series of problems it has caused needs to be deeply analyzed and solved [5]. While AI academic assistance tools improve the learning efficiency of college students, they also cause many college students to become overly dependent on them. When AI deeply intervenes in the core links of knowledge production, the potential risks it causes have also attracted widespread attention from scholars [6]. Major universities have fallen into collective anxiety and have introduced various measures to regulate or restrict students' use of AI.

Relevant research at home and abroad has mostly focused on theoretical discussions and teaching practices of AI technology applications, while empirical research on college students is still insufficient [7]. In view of this, this study uses questionnaire surveys and offline interviews to focus on the differences in the use of AI academic assistance in liberal arts and science, and surveys on the current status and acceptance of AI academic assistance tools among college students. Explore whether there are differences in the use of AI academic assistance tools among students of different grades and in the liberal arts and science categories and collect usage suggestions.

This study aims to reveal the significant differences between liberal arts and science in the use and acceptance of AI academic assistance tools among Chinese college students, and to show, through an acceptance survey, that the blurred boundaries of academic integrity have become a universal challenge.

2. Research Design

2.1 Research Methods

This study focuses on the group of liberal arts and science students in my country's universities as the research subjects. Based on the differences in the nature of the disciplines, the liberal arts and sciences are completely different in knowledge systems, research methods, and learning tasks. Liberal arts students may rely more on literature and writing, while science students are more exposed to data and experiments. This fundamental difference will also affect how they need and use AI tools.

In order to systematically collect relevant data, this study designed and implemented a questionnaire to obtain the actual situation of different types of students in the process of using AI in a quantitative way. The questionnaire structure is divided into four parts, which is highly targeted and comparable.

2.2 Research Conclusions

After data collection using the above survey methods, subjective feedback from some students was obtained through questionnaire surveys and interviews with 120 college students, covering 60 samples each from liberal arts and science. Combining quantitative statistics with qualitative analysis, the study draws the following main conclusions:

The study found that college students as a whole have a high level of awareness of AI academic assistance tools, and more than 80% of the respondents said they had used at least one AI tool to participate in learning tasks (Figure 1) Among them, liberal arts students generally use it more frequently than science students. Specifically, liberal arts students mainly use AI for text writing, data sorting, and language polishing, commonly used tools include ChatGPT, DeepSeek, Doubao, etc. Science students are more inclined to use AI tools in code generation, data analysis, formula derivation, etc., such as DeepSeek, Kimi, Notion AI, etc. This difference in usage purpose is highly correlated with the knowledge characteristics of the subject itself, confirming the influence of subject attributes on tool usage preferences.

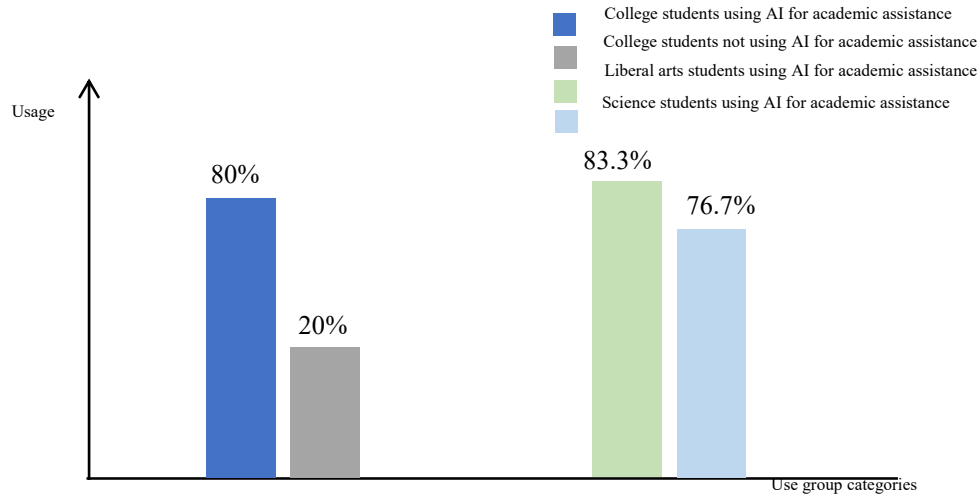


Fig. 1 The use of AI academic assistance tools by college students

In the four typical academic scenarios covered in the questionnaire, the use of AI tools showed a clear “task orientation”. Regardless of whether they are science or liberal arts students, the usage rate in writing and language expression is the highest, accounting for about 72% of the total sample, among which the usage rate of arts students is as high as 86% (Figure 2). In comparison, the frequency of use in scenarios such as scientific research project design, chart generation and advanced data analysis

is relatively low, especially among liberal arts students who show a high degree of unfamiliarity and discomfort in these areas. It also shows that college students’ current application of AI tools is still at the level of “assisted writing” and “language polishing”, lacking systematic integrated thinking and in-depth scenario exploration, and failing to fully tap the diverse potential of AI in academic research.

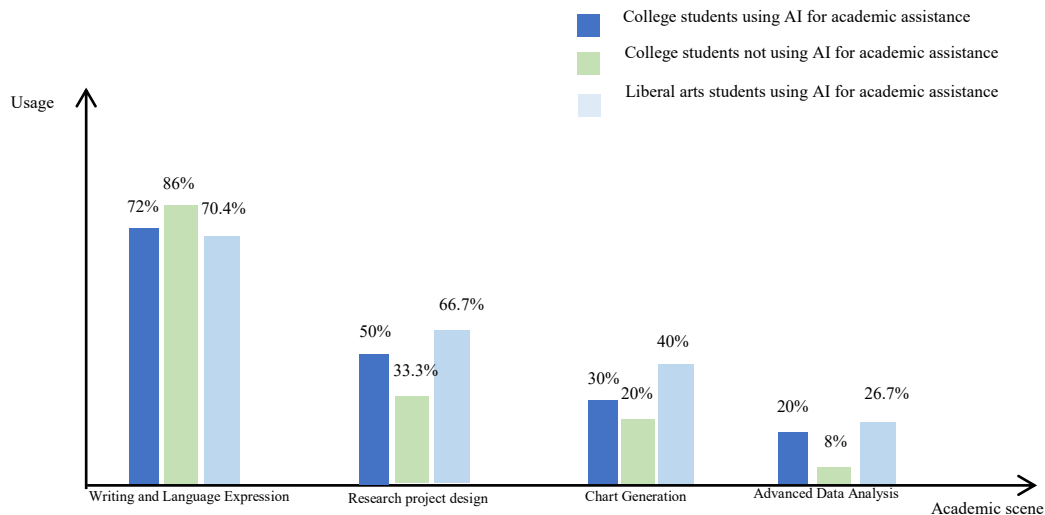


Fig. 2 College students use AI in different academic scenarios

From the attitude survey can see that there are certain differences in the recognition and acceptance of AI use among liberal arts and science students(Figure 3).Liberal arts students generally have a positive attitude towards AI tools, recognize their role in improving writing efficiency and expression quality, and are more inclined to contin-

ue using or even rely on AI as an auxiliary tool in future studies. On the other hand, science students are relatively cautious and are more concerned with the accuracy, logic, and explainability of the content generated by the tools. They are also reserved about AI completely replacing traditional learning methods.

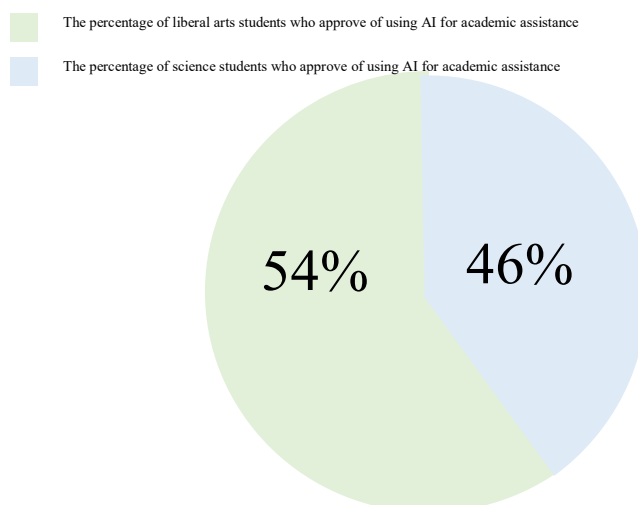


Fig.3 Differences in attitudes toward AI academic tools among liberal arts and science students

In addition, on the ethical issue of “whether the use of AI-generated content is considered academic misconduct”, science students showed higher sensitivity and normative awareness, believing that unlabeled AI-generated content should be strictly restricted in academics. However, some liberal arts students are more concerned about the convenience brought by the tools and do not fully understand the ownership of AI-generated content. This difference reflects the impact of subject training goals and thinking methods on students’ AI ethical judgments.

Although AI tools are widely used in learning practice, research has also found that some students tend to over-rely on and use them blindly. Especially in liberal arts writing tasks, some students use AI as an “automatic writing tool” and neglect their own language expression and critical thinking training. In addition, AI-generated content still has limitations in terms of logical rigor and factual accuracy. Some science students fail to fully verify it during use, which may affect the quality of learning and the reliability of research results.

What is more noteworthy is that most universities have not yet established clear regulations or education mechanisms for the use of AI tools, resulting in students lacking basic AI literacy and ethical judgment, unclear boundaries of technology-assisted learning activities, and potential risks of academic misconduct and misuse.

3. Problems and Solutions

3.1 Problem Analysis

Liberal arts students rely heavily on literature reading, theoretical analysis and written expression during the learning process, so they prefer to use AI academic auxil-

iary tools for functions such as text generation, language polishing, data organization and literature retrieval. Taking ChatGPT, deepseek, Doubao, etc. as examples, these tools can help students with paper structure, paragraph polishing, abstract writing, etc.

According to the questionnaire data of this study, in the question of “Do you often use AI for writing assistance?”, more than 68% of liberal arts students said they “often” or “occasionally” use it, which is much higher than the 52% of science students. According to interview data, some students majoring in Chinese and journalism and communication mentioned that when writing course papers or review assignments, they would use ChatGPT to generate first drafts or expand inspiration.

Compared with liberal arts students, science students use AI tools in a more instrumental and practical way. They mainly use AI for code generation, data analysis, modeling, formula derivation, and auxiliary writing of lab reports. According to the survey data of this study, more than 60% of science students gave positive feedback on “using AI to assist programming/formula derivation”, but the feedback on “using it for writing tasks” was significantly lower, with only about 35% of students saying they would try to use AI for paper writing or expression assistance. On the one hand, this reflects the actual dependence of science students on AI tools in professional tasks, and on the other hand, it also shows that their acceptance of language expression is relatively conservative.

However, problems also arise. First, the phenomenon of “over-reliance” is more obvious. For example, some liberal arts students tend to let AI generate long paragraphs of text and then make simple modifications, which leads to the risk of declining their own writing and thinking abilities. At the same time, the problem faced by science

students is mainly reflected in their blind trust in AI calculation results. And because generative AI has a massive database and uses a large amount of data as its computing basis, its powerful computing power makes it impossible for technology providers to determine whether the data they use contains infringing content [8]. Some scholars also believe that generative AI is a “double-edged sword”. Although generative AI has brought many benefits to college students’ learning and greatly facilitated their learning, it has also brought unprecedented crises and challenges. There are also many ethical issues that people need to face [9].

3.2 Solution

In the data collection of the survey, this article found that liberal arts and science students encountered different problems when using AI academic assistance tools (Table 1) In response to different problems, the following sub-disciplinary countermeasures are proposed.

The main problems of liberal arts students using AI academic auxiliary tools are concentrated in over-reliance, reduced originality, and insufficient information judgment. Therefore, the countermeasures should focus on standardized use and the cultivation of critical thinking. Universities should clearly define the boundary between the auxiliary and dominant roles of AI in academic writing, and issue “AI-assisted writing standard guidelines” to guide liberal arts students to reasonably use AI academic auxiliary tools for preliminary conception, language polishing, framework suggestions, etc., and avoid directly applying generated content; introduce AI tool teaching modules in liberal arts general education courses or writing courses to teach how to use AI as an auxiliary tool for inspiration, writing training and style imitation, and improve students’ ability to control tools rather than rely on them; through

case teaching, practical writing and other forms, cultivate students’ ability to identify logical loopholes, factual errors and empty language in AI-generated content, and enhance content judgment and academic sensitivity; organize special lectures or set up “AI writing ethics workshops” to enhance liberal arts students’ awareness of the risks of academic misconduct, guide them to understand that “assistance is not equivalent to “replacement”, and maintain independence and responsibility in academic expression.

The main problems faced by science students when using AI academic assistance tools include blindly trusting calculation results and lack of verification awareness, so the countermeasures should start with deepening technical understanding and improving application thinking. Add AI tool operation and result verification modules to professional courses (such as data analysis, algorithm modeling, and experimental design) to guide students to use AI results as a reference rather than the only answer, and improve their ability to identify and optimize output results; combine actual cases to teach the limitations of AI in dealing with high-order mathematical modeling and complex logical deduction, and train students to use a variety of methods to cross-validate and evaluate the errors of AI-generated results; use AI tools to assist in scientific research design, paper structure combing, visual analysis and other links, and improve the ability of science students to use AI to assist the “entire scientific research process”, rather than just formula derivation or programming generation; encourage science students to try to use AI for logical structure optimization and language polishing in the writing of technical reports, graduation theses, etc., and at the same time offer basic “Academic Expression and AI-Assisted Writing” courses to improve their interdisciplinary expression skills.

Table 1. Problems encountered by liberal arts and science students when using AI academic assistance tools

problem	Proportion%	Proportion of liberal arts students%	Proportion of science students%	Significance of subject differences
Concerns about content accuracy	68.3	73.6	63.0	p<0.05
Fear of violating academic norms	62.5	78.3	46.7	p<0.01
Not familiar with related tools	35.8	43.3	28.3	p<0.01
The generated content does not meet the requirements	57.1	65.0	49.2	p<0.05
False data	39.2	28.3	50.0	p<0.01
Blindly trust AI results	41.7	35.0	48.3	p<0.05
Low originality	53.3	71.7	35.0	p<0.01

In summary, colleges and universities should teach students in accordance with their aptitude and build a more

targeted and systematic AI education system. In addition, the government should give full support to the advantages

of generative AI in collaborative education, encourage the research and development of related technologies, gradually improve the institutional system that adapts to the integrated development of generative AI and education, and consider using an evidence-based “pilot promotion” education popularization model [10].

4. Conclusion

While AI academic assistance tools improve college students’ learning efficiency and scientific research capabilities, they also bring challenges such as increased dependence and academic ethical risks. This study analyzed the use of AI academic assistance tools in liberal arts and science by collecting questionnaires and integrating data, and further understood the differences between disciplines, which can help developers optimize tools and enable colleges and universities to formulate more targeted training policies.

The core of AI academic assistance in the future should focus on how to use AI correctly, how to make AI execute efficiently, and better serve academic research. In the future development of higher education, AI academic assistance tools will play an increasingly critical role, and its evolution trend is not only reflected in the continuous improvement of technical functions, but also in the deep integration with teaching practice. People should pay close attention to the application dynamics of generative AI in the field of academic support and adjust educational strategies and management norms in a timely manner to ensure its positive value in improving learning efficiency, promoting knowledge acquisition and scientific research innovation. At the same time, universities should strengthen the cultivation of students’ AI literacy, strengthen their critical thinking and ethical awareness in the process of using AI tools, and guide students to develop autonomous learning ability, innovation ability and sense of responsibility with the assistance of technology, so as to achieve a virtuous interaction between artificial intelligence technology and higher education, and help cultivate new-era talents with comprehensive qualities and sustainable development capabilities.

Although this study attempts to conduct a preliminary discussion on the behavioral differences and acceptance attitudes of Chinese college students in the process of using AI academic assistance tools from the perspective of liberal arts and science classification, and collects some data through questionnaires and interviews, it still has certain limitations and needs to be further improved and expanded in future research.

Due to resource and time constraints, this study actual-

ly surveyed a total sample of 120 people. Although the numbers were balanced between liberal arts and science, the overall sample size was small and could not fully represent the overall situation of college students in colleges and universities across the country. Therefore, future research should further expand sample size and regional diversity and adopt a wider range of random sampling methods to enhance the universality and extrapolation of research results. It also deepens the research in many aspects, including sample expansion, subject segmentation, method diversification and ethical construction, in order to provide a more complete and scientific research foundation for the academic community, and provide a reference path with practical value for university teaching management and AI tool developers.

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