Research on Current Status of Academic Applications of Generative Artificial Intelligence for College Students

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Abstract: The rapid development of generative artificial intelligence technology is profoundly restructuring the ecology of higher education, and its application in university students' academic research is characterised by the dual features of tool popularity and cognitive lag. This technology significantly improves academic efficiency through multi-modal content generation, research process imitation and human-computer collaborative innovation. Meanwhile, it triggers ethical risks, such as obtuse thinking and academic integrity crisis. This research stresses the need to establish a dynamic balance between technological empowerment and value leadership, and to avoid the risk of subjectivity dissolution through collaborative governance between universities, teachers and students, so as to ultimately achieve the dialectical unity of instrumental rationality and academic authenticity.

Keywords: Generative artificial intelligence; College students; Ideological and political education

1. Background of the development of generative artificial intelligence

Generative AI is an AI technology capable of automatically generating content based on prompts from a natural language dialogue interface.[1] In the context of accelerated digital transformation, this technology has become an important technological variable in re-configuring the ecology of higher education by virtue of its multi-modal content generation capability and knowledge reconstruction advantages. In November 2022, ChatGPT released by OpenAI marked an important breakthrough in generative AI technology, which accelerated the process of AI penetration in education, and moreover prompted us to think about the deep integration between AI and education. Chinese companies such as Baidu, Alibaba, Huawei, and iFLYTEK have also released a number of generative AI products similar to ChatGPT.[2] As they gradually penetrate into all aspects of social life, the discussion of generative AI in the academic field has become more frequent. However, with the rapid progress of generative AI, it is also important to face up to the various challenges it brings. On the one hand, through semantic understanding and knowledge graph construction, this technology can achieve intelligent analysis of research background, structured generation of literature review and automated embellishment of academic text; on the other hand, it also brings potential academic ethical risks, resulting in corresponding academic misconduct. Therefore, under the premise of studying the current status of the use of generative AI in the college student population, it is also more crucial to explore the strategy of standardizing academic ethics.

2. The current status of generative AI application in college students' academic practice

2.1 Elevated familiarity, acceptance, and educational demand: college students' engagement with generative artificial intelligence

Generative artificial intelligence has deeply penetrated into the academic research field of university students, with dialogue tools as the main carrier, widely used in literature retrieval, manuscript writing and data analysis. According to the survey, nearly half of the students use it at least once a week, but there is a significant division in technical cognition: only 14.35% of them understand the basic

principles, and 56.75% of them assess their proficiency in using it as average, forming a stark contradiction between the popularity of the tool and the lagging cognition. More than 70% of the students used the tool more than once a week, and the application scenarios covered the whole process of data collection, function retrieval, text generation, etc. In particular, in assisting the selection of research questions, more than 70% of the students used the tool as a dialogue learning tool, which highlights that it has become an important support for academic research. However, the high-frequency use of technical tools and the lack of basic cognition reflect the urgent need for college students to systematically learn generative AI knowledge and skills.

2.2 Notable positive feedback mechanisms: generative AI in facilitating academic research

Most students believe that generative AI significantly improves the efficiency of academic research in terms of accelerating data processing, expanding research areas, and optimizing text output. Research confirms that it can promote research innovation by broadening information channels and replacing repetitive work [3]. From the functional dimension, its positive value can be summarized in three aspects: firstly, it supports personalized learning by generating multi-modal materials (text/picture/video/audio) to meet differentiated needs; secondly, it dynamically optimizes the research process by providing real-time feedback on the feasibility of research based on the interaction of literature analysis and instructions and by amending the research path; thirdly, it builds an autonomous research environment by breaking through the temporal and spatial constraints of the device on the physical level and expanding the boundary of thinking through the logic model on the virtual level. These features not only enhance the research efficiency, but also reshape the academic research mode through human-computer collaboration.

2.3 Coexistence of risk and opportunity: dual dimensions of generative artificial intelligence tools

The dangers of the current usage focus on three aspects. Firstly, over-reliance can degrade thinking, such as relying completely on a machine to summarize literature, which weakens reading depth and the ability to internalize knowledge. Secondly, the crisis of academic integrity involves direct copying of AI-generated content, which easily triggers plagiarism. Replacing the act of writing deprives one of the opportunity to train writing skills and inhibits the development of innovative thinking. Thirdly, the bluntness of the research ability. Outsourcing the entire process, from problem formulation to argument analysis, may weaken the critical thinking ability at the core of academic research. At the same time, generative AI opens new paths for academic research. Through massive corpora and logical reasoning models, it can enhance the depth of argumentation and knowledge extension. Its language optimization function balances professionalism and readability and enhances the effectiveness of disseminating academic expression. More importantly, its technological characteristics can accelerate knowledge production innovation and promote the transformation of the scientific research paradigm. According to the survey, most students are positive about its future development. However, they need to establish a risk prevention and control mechanism and find a balance between improving efficiency and maintaining academic value.

3. Governance framework and strategy optimization for the academic application of generative AI

3.1 Improvement of academic norms curriculum system and establishment of academic ethics assessment mechanism

The widespread application of generative artificial intelligence has profoundly reconfigured the paradigm of academic research. Ideological and political education, as a core field for shaping values and normative awareness, urgently needs to deeply integrate technological ethics into the academic normative education system. In this regard, the ideological education needs to strengthen two-fold intervention: firstly, add a module of "AI technology ethics" in the curriculum system, and reveal the lack of "labour attributes" of AI-generated content through case study teaching. For example, comparing AI-generated literature reviews with texts written by students on their own, students are guided to analyse the boundary between "tool assistance" and "plagiarism", and deepen their recognition of the value of academic originality. Secondly, we will promote the upgrading of academic norms from "static rules" to "dynamic ethics", and join hands with relevant industry experts to formulate guidelines for the academic use of generative AI tools, clarifying the specific requirements for data citation and model authorization, and incorporating the "technology for the good" into these guidelines. The concept of "technology for good" is embedded in the specification. Through the two-way path of ethical internalization and institutional constraints, civic and political education can help students stick to their academic beginnings in the wave of AI, and realize the dialectical unity of technological progress and academic integrity.

3.2 Strengthening critical thinking training and building a "human-computer collaborative" research model

Add content related to artificial intelligence and the subjectivity of academic research in the professional curriculum, and design a critical analysis of texts generated by artificial intelligence. For example, by comparing fragments of classic Marxist writings with AI-generated texts on similar topics, students will be led to analyse the limitations of AI in the restoration of historical contexts and the expression of value stances, and will be guided to develop critical academic thinking, and to come up with innovative academic research results through the accumulation of personal knowledge, experience, value stances, and other factors. At the same time, we rely on social practice and scientific research projects to design practical contents such as "AI assistance + manual verification", so that students can have a clear understanding of the limitations of AI and maintain critical and innovative thinking in the application of technology.

3.3 Enhancing students' technological literacy and innovating the vehicle of ideological and political education

On the one hand, there is an urgent need to deepen the cognitive education of AI technology. Currently, students' cognition of AI mostly stays at the application level, ideological and political education can jointly offer courses on AI and social development in computer, information and other disciplines, and guide students to use the historical materialist method to look at the power relations and ideological infiltration behind the technology by parsing the Western-centred tendency in the training data of ChatGPT, the ethical controversy of the face recognition technology and other cases, at the same time, to improve their ability for technological innovation. On the other hand, artificial intelligence can be a breakthrough for ideological innovation. The use of artificial intelligence big data to analyse students' ideological dynamics and establish a whole-chain ideological education model of "problem identification - precise intervention - effect evaluation". Only by incorporating technological empowerment into the strategic framework of ideological and political education can we cultivate a new generation that understands both "technological logic" and "value orientation".

Conclusion

To construct a benign ecosystem of generative AI academic applications, it is necessary to establish a tripartite collaborative governance mechanism: improve the traceability and labelling system of AI results at the technical level, strengthen the training of critical thinking at the educational level, and formulate a dynamic code of practice at the ethical level, so as to avoid the risk of subjectivity dissolution and innovation decay caused by technological dependence. This is to avoid the risk of subjectivity dissolution and innovation decay caused by technological dependence. In particular, we need to be alert to the erosion of instrumental rationality on academic authenticity - when technology is reduced to cognitive shortcuts, the unique human ability to construct problems and the value of in-depth discourse may be dissolved.

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