Research on the Integration Path of Generative Artificial Intelligence into General Computer Education

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Abstract: The rapidly developing generative artificial intelligence (GenAI) provides new supporting impetus for the reform of general computer education. Its characteristics of personalization and interactivity are highly aligned with the core goals of this education, which are popularizing knowledge and cultivating literacy. Based on the current situation of general computer education, this paper analyzes the compatibility between GenAI and general computer education, deeply explores the dilemmas in the integration process such as faculty resources, teaching models and educational equity, and puts forward specific implementation paths from the dimensions of teacher training, teaching innovation and equity guarantee in combination with the requirements of educational digitalization. It provides a reference for the deep integration of the two and the improvement of education quality, so as to help cultivate compound talents in the intelligent era.

Keywords: Generative Artificial Intelligence; General Computer Education; Faculty Literacy; Teaching Model; Educational Equity

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Against the backdrop of the digital economy, general computer education has become an important part of higher education, with its core being to popularize computer knowledge and cultivate digital literacy among students. By virtue of its advantages in content generation and intelligent interaction, generative artificial intelligence breaks the temporal and spatial constraints of traditional education, offering new possibilities for improving the quality and efficiency of general computer education. Both domestic and international communities are promoting the integration of AI and educational digitalization. However, the current integration of GenAI and general computer education is still in the preliminary stage and faces numerous obstacles. Therefore, systematically exploring the integration path is of great theoretical and practical significance.

1.Analysis of the Compatibility between Generative Artificial Intelligence and General Computer Education

Generative artificial intelligence and general computer education demonstrate high compatibility in terms of goals, content and forms. General computer education takes popularizing basic theories, cultivating digital application capabilities and fostering innovative thinking as its core content, which is consistent with the application-oriented nature of generative artificial intelligence. GenAI can transform abstract principles into concrete and vivid content, generate teaching materials tailored to students' learning situations, adapt to the needs of students from different majors through personalized recommendation, and stimulate students' interest in exploration by virtue of its interactive characteristics, which helps to achieve the dual goals of knowledge imparting and ability cultivation.

2.Practical Dilemmas in the Integration of Generative Artificial Intelligence into General Computer Education

2.1 Insufficient AI Application Capabilities of General Education Faculty

Most teachers engaged in general computer education do not come from AI-related majors. They lack systematic knowledge reserves and application training in generative artificial intelligence, making it difficult for them to proficiently apply AI tools in teaching activities. The majority of teachers can only initially use AI to

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generate simple teaching materials, but fail to accurately screen, optimize and innovate the content generated by AI according to curriculum objectives. They even have deficiencies in judging the accuracy of AI-generated content. Influenced by traditional teaching concepts, some teachers have insufficient understanding of the educational value of generative artificial intelligence and lack the awareness of active exploration and application, thus failing to deeply integrate AI technology with teaching content and teaching links. Existing training programs mostly focus on theoretical explanation, lacking targeted practical training and case guidance, which cannot effectively improve teachers' AI application capabilities. This has become a core factor hindering the integration process.

2.2 Single Teaching Model of AI Integration

At this stage, the application of generative artificial intelligence in general computer education is mostly at a superficial level, with a relatively single teaching model, failing to give full play to the core advantages of AI technology. Most classrooms adopt the model of "teacher-centered lecture + AI-assisted demonstration". AI tools only serve as carriers for generating teaching materials, rather than participating in the optimization and innovation of the teaching process. There is a lack of design of inquiry-based and project-based teaching models based on generative artificial intelligence. Students are mostly in a state of passively receiving knowledge, and it is difficult for them to carry out independent inquiry and collaborative learning through AI tools. The application of AI technology is mostly concentrated in the classroom teaching link, with less application in pre-class preview, post-class review, homework correction and personalized tutoring, failing to establish a full-process AI-assisted teaching model and thus being unable to meet the diversified learning needs of students.

2.3 Hidden Risks of Educational Equity in AI Application

The application of generative artificial intelligence relies on sound hardware equipment, network environment and digital terminals. However, there are differences in the allocation of educational resources among different regions and institutions, which gives rise to new hidden risks of educational equity. Due to fund shortages, some universities in remote areas and grassroots institutions cannot provide sufficient intelligent terminals for students, and the network environment is also poor, making it impossible for students to normally use AI teaching tools and enjoy high-quality educational resources supported by AI. Meanwhile, there are differences in the economic conditions of different families. Some students lack personal intelligent terminals and cannot use AI tools for independent learning after class, which further widens the learning gap. In addition, the problem of AI algorithm bias may lead to unbalanced push of teaching content, exacerbating the learning gap between students with different foundations, which runs counter to the inclusive principle of general computer education.

3.Implementation Paths for the Integration of Generative Artificial Intelligence into General Computer Education

3.1 Optimizing AI Literacy Training for General Education Faculty

It is necessary to establish a hierarchical and classified faculty AI literacy training model, and improve teachers' AI application capabilities and conceptual cognition in a targeted manner in combination with the teaching needs of general computer education. The core content of the training should be clearly defined, including the basic principles of generative artificial intelligence, the operation of common teaching tools, the design and optimization of AI teaching materials, and the case practice of AI integration with teaching, so as to prevent the disconnection between theory and practice. The training model should adopt the combination of "online + offline" and "theory + practice". Online learning relies on high-quality training platforms for regular study, while offline activities include thematic seminars, case exchanges and practical drills, with experts in the AI field and outstanding frontline teachers invited to provide guidance. An evaluation mechanism for teachers' AI application capabilities should be established, and the application of AI in teaching should be included in teacher assessment to stimulate teachers' enthusiasm for active application of AI technology. A faculty exchange platform should be built to encourage teachers to share AI teaching experience and achievements, form a good atmosphere of mutual assistance and common progress, and gradually

build a team of general computer education faculty with high AI literacy.

3.2 Innovating Diverse AI-empowered Teaching Models

Based on the characteristics of general computer education courses, it is necessary to innovatively build diverse teaching models to give full play to the key advantages of generative artificial intelligence. Implement AI-assisted inquiry-based teaching methods, carefully design inquiry tasks according to curriculum knowledge points, provide students with inquiry ideas, reference materials and practical guidance through AI tools, and guide students to independently explore computer principles and application methods. Carry out AI-assisted project-based teaching, plan project tasks around practical application scenarios, enable students to complete project planning, content generation and achievement optimization through AI tools, and cultivate students' practical abilities and innovative thinking. Build a full-process AI-assisted teaching model: use AI tools to push preview materials and personalized learning tasks before class; use AI interactive functions to conduct classroom interaction and real-time Q&A during class; rely on AI tools for homework correction, personalized tutoring and learning effect analysis after class. In combination with the needs of students from different majors, use AI tools to customize differentiated teaching content, realize the organic integration of general education and professional needs, and improve the pertinence and effectiveness of teaching.

3.3 Establishing a Guarantee Mechanism for Educational Equity in AI Application

Based on the principle of educational equity, it is necessary to establish a comprehensive AI application guarantee mechanism to address the equity risks caused by unbalanced resource allocation. Increase policy support and capital investment for universities in remote areas and grassroots institutions, improve the construction of campus intelligent hardware facilities, optimize the network environment, provide students with sufficient AI teaching equipment and usage conditions, and ensure that every student can equally access AI teaching resources. Establish an AI teaching resource sharing platform, integrate high-quality AI teaching materials, teaching cases and tool resources, realize cross-regional and cross-institutional resource sharing, and narrow the educational gap between different universities. For students from economically disadvantaged families, provide subsidies for intelligent terminals and preferential policies for network fees, so as to guarantee their right to independent learning with AI tools after class. Strengthen the review and optimization of AI algorithms, establish an algorithm bias monitoring mechanism to prevent unbalanced push of teaching content due to algorithm problems. At the same time, guide students to correctly use AI tools and cultivate their digital literacy, ensuring that the application of generative artificial intelligence in general computer education balances efficiency and equity.

4.Conclusion

The deep integration of generative artificial intelligence and general computer education is an inevitable choice for the digital transformation of education and the improvement of general education quality, as well as a key to cultivating compound talents in the intelligent era. The high compatibility between the two lays a foundation for integration, but there are still dilemmas such as faculty resources, teaching models and educational equity. The integration problems can be solved by optimizing teacher training, innovating teaching models and establishing an equity guarantee mechanism. In the future, it is necessary to continuously explore suitable integration paths, improve the guarantee system, give play to the educational value of AI, promote the high-quality development of general computer education, and provide talent support for the digital economy.

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