On the Integration of Generative Artificial Intelligence into the Teaching of Basic Computer Technology Courses in Chinese Universities Application Prospects, Challenges and Countermeasures

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Abstract: *With the rapid development of artificial intelligence technology, Artificial Intelligence Generated Content (AIGC) has been widely used in the field of higher education. Generative AI has the ability of self-learning and automatic content generation, which brings unprecedented changes to the teaching method of basic computer technology courses in universities. Starting from the basic concept of generative AI technology, this paper explores the potential application of its integration in basic computer technology courses in universities, analyses the application prospects of generative AI in the areas of teaching content generation, personalized teaching, and automated assessment, and also points out the challenges and problems that may be encountered in the practical application. Finally, this paper puts forward corresponding countermeasures and suggestions, aiming to provide reference and information for university teachers and educational technologists, and to promote the in-depth application of generative AI technology in the field of university computer education.*

Keywords: Generative artificial intelligence, Personalized education, Educational technology.

1. Introduction

Generative artificial intelligence (Artificial Intelligence Generated Content, AIGC) as an important branch of artificial intelligence, has made significant progress in recent years. By virtue of its powerful content generation, verbal interaction and logical reasoning capabilities, AIGC has broken through the limitations of traditional reactive and discriminative AI, and extended to the field of "intelligent creation", and has moved from "being able to understand" to "being able to think". It has moved from "being able to understand" to "being able to think", and can simulate and extend human intelligent behaviors, produce output with certain creativity, and open up a new intelligent society (Xiao Feng, 2024). In the field of education, the application of generative AI has brought innovations in course teaching methods, content generation and student evaluation, especially in the teaching of basic computer technology courses in universities, which has a unique application value. The Horizon Report 2023: Teaching and Learning Edition suggests that "AI technology is an inevitable trend for the future development of higher education" (EDUCAUSE, 2023).

As an introductory course for computer science majors in Chinese colleges and universities, the basic university computer technology course is mainly offered to junior university students, which involves a wide range of content and is highly basic, and in the current widespread application of AI technology, it even assumes the basic teaching function of leading students into AI. However, with the continuous development of artificial intelligence technology in education, the traditional teaching method of basic computer technology courses has been difficult to meet the requirements of the times, how to use emerging technology to improve the teaching effect, especially how to improve the teaching

quality of the course and the learning experience of students through generative artificial intelligence, which has become a hot issue in the current research of computer education in Chinese universities. The purpose of this paper is to discuss the application prospects of generative artificial intelligence in basic computer technology courses in colleges and universities, the problems and challenges that may be encountered, as well as coping strategies and suggestions, and to provide certain reference and reference for future innovations in the application of course teaching technology.

2. Overview of Generative Artificial Intelligence

Generative AI, also known as generative AI, is one of the most groundbreaking technologies in the field of artificial intelligence in recent years, the core of which lies in the generation of multimodal data such as text, images, audio, video, and so on, through deep learning models (Chunyan Liu,2025). It is an artificial intelligence technology that can learn from existing data and generate new data. Unlike traditional AI, generative AI is not only able to perform tasks such as prediction and classification, but also able to create new content such as text, images, audio, etc., and its emergence will bring revolutionary disruption to education and promote the development of a new paradigm of human-computer collaboration in the process of teaching and learning. The application of generative artificial intelligence in the field of education is mainly reflected in the following aspects:

2.1 Content Generation

Content generation is one of the most intuitive applications of

generative AI in education. In the teaching of basic computer technology courses, teachers not only need to prepare a large amount of textbook content for students, but also need to design a large number of practice problems, programming cases and experimental tasks. The generation of these contents not only consumes a lot of teachers' time and energy, but also is easily limited by teaching experience and knowledge reserves in the teaching process. Generative AI, on the other hand, can significantly improve the efficiency and quality of teaching by automatically generating content that meets the teaching objectives based on the topics, keywords, and requirements inputted by the teacher through Natural Language Processing (NLP) and machine learning technologies.

For example, more and more educators and scholars believe that ChatGPT has the profound potential to become an advanced educational tool. ChatGPT's powerful knowledge base and instant feedback function can provide educators with a flexible, real-time teaching assistant, as well as provide university students with rich and varied learning resources (ZHOU J, 2024). Teachers can input simple instructions (e.g., "Write a paragraph about teaching chain tables in data structures"), and the GPT model can automatically generate detailed explanations, and even programming questions and example code on this basis. Such automated content generation not only improves the efficiency of teachers, but also provides personalised learning materials for students. Similar technologies have been applied in some educational platforms, such as Coursera and Khan Academy, which automatically generate question banks through generative AI and adjust the difficulty and type of questions in real time according to students' learning.

2.2 Personalized Learning

Personalized learning is another important application of generative AI technology in education. Each student learns at a different pace and understands at a different depth in a basic computer technology course, so how to develop appropriate learning paths and resources according to the characteristics and needs of each student becomes an important challenge in personalizing education. The generative AI learning analytics function accurately analyses the learning situation, diagnoses the teaching effect, provides teaching feedback, and generates teaching solutions by collecting, analyzing, and modelling diversified data (Wang Yiyan et al.,2024). Moreover, it can be able to generate customized learning resources based on students' learning history, test scores, learning styles, and other data, and provide a unique learning process and experience for each student.

Take the "Adaptive Learning" platforms as an example, these platforms analyses students' learning data (e.g., time to complete assignments, correctness rate, etc.) to adjust the difficulty and type of teaching content. Generative AI can automatically generate practice questions related to a student's weaknesses in programming language learning, or recommend other learning aids that will help them understand a particular concept. For example, if a student encounters difficulties in learning the sorting algorithm in data structures, generative AI can automatically generate multi-level difficulty practice questions related to the sorting algorithm to

help the student gradually master the relevant concepts.

In addition, personalized learning can also be reflected in dynamically generated learning plans. According to the student's learning progress, generative AI can automatically plan the subsequent learning content, predict which content may be more helpful to the student, and ensure that the student continues to progress on the learning path that suits him or her.

2.3 Intelligent Tutoring

Intelligent tutoring is another innovative application of generative AI in education, especially in higher education, where students often face a variety of learning challenges and need timely help and feedback. Traditional tutoring often relies on the time and energy of teachers and teaching assistants and cannot meet the needs of all students. Generative AI can provide students with anytime, anywhere tutoring through real-time interactions, automated question answering and customized feedback.

For example, IBM's "Watson Tutor" is an intelligent tutoring system based on generative AI. In basic computer technology courses, students can get real-time answers to programming questions through dialogue with the intelligent tutoring system. The system understands the student's questions through natural language processing and generates specific answers or related resources according to their needs. What's more, the intelligent tutoring system is able to provide targeted learning advice based on the student's learning progress, knowledge mastery and error feedback. For example, if a student makes a common mistake (e.g., array out of bounds) in a programming assignment, the system will not only point out the error, but also generate an explanatory paragraph to help the student understand the root cause of the error and provide similar examples for further practice.

Another important application of smart tutoring is virtual learning assistants based on generative AI. For example, models like ChatGPT can provide detailed answers based on student input, not only answering simple factual questions, but also providing students with in-depth technical parsing and code optimization suggestions. In this way, generative AI can not only help students solve immediate learning challenges, but also guide them to think and self-correct during the learning process, thus enhancing their independent learning ability.

The advantage of this type of tutoring is that it can provide help anytime, anywhere, which greatly improves students' learning efficiency and helps them solve problems in a shorter period of time. In addition, the operation of the AI tutoring system does not depend on a specific time and place, and students can learn according to their actual needs, thus breaking the limitations of the traditional teaching mode and providing a more flexible way of learning.

3. Prospects for The Application of Generative AI in Basic Computer Technology Courses

3.1 Automated Generation of Teaching Content

The content of the basic computer technology courses in Chinese universities involves knowledge in many fields, including computer principles, data structures, operating systems, programming languages and so on. In the traditional teaching process, teachers need to invest a lot of time and energy in designing lesson plans, preparing course content, writing exercises and experimental tasks, etc. This process is not only cumbersome and labor-intensive, but also due to the rapid development of the technology field, teachers are often faced with the problem of lagging behind in the updating of the teaching content and the problem of repetition. The emergence of generative artificial intelligence technology makes it possible to automate the generation of teaching content, providing a new way to solve this problem.

Through deep learning and natural language processing technologies, generative AI can automatically generate content that meets the teaching objectives by analyzing the course syllabus, teaching materials and relevant literature, and optimize it according to the requirements of the course. Taking programming courses as an example, teachers can input simple topics or keywords (e.g. "sorting algorithm" or "chain table"), and the generative AI can automatically generate relevant lecture materials, example codes and programming exercises according to the requirements. This not only improves the efficiency of teachers, but also provides students with more personalized and diverse learning resources. In some Chinese universities, AI-based content generation systems have already been applied to assist teachers in course preparation. For example, Shanghai Jiao Tong University has piloted the use of generative AI to assist in the generation of programming and algorithmic questions in its courses, which can adjust the difficulty and variety of questions in real time according to the mastery of students, and help teachers automatically generate new teaching resources based on student feedback. Such practices not only reduce the time teachers spend on preparing teaching content, but also ensure that teaching resources are continuously updated and optimized.

Generative AI can also help teachers automatically generate case studies and lab guides based on different modules of the course. For example, in the course of "Data Structure and Algorithms", generative AI can automatically generate programming exercises according to the different knowledge points mastered by students, and automatically check for errors and give feedback based on the code submitted by students. This AI-based content generation not only improves teaching efficiency, but also helps teachers adjust their teaching strategies in a timely manner to meet the learning needs of different students, thus effectively improving the quality of teaching.

3.2 Personalized Teaching and Learning Path Planning

Throughout history and modern times, countless educators have promoted personalized education, advocating respect for students' individuality, attaching importance to the development of students' personality, taking students' interests as the guide, and focusing on students' practical ability. Personalized education can better meet the individual needs of students and help them better develop their potential so as to achieve the best learning effect (Jiao Jianli,2023).

Personalized learning is one of the most prominent applications of generative AI technology in the field of education, which can provide students with tailored learning content and teaching paths according to their individual needs and learning progress. In the basic computer technology course, due to the complexity and breadth of the course content, students' learning levels vary, and the traditional one-size-fits-all teaching mode is difficult to effectively meet the learning needs of all students. The biggest advantage of artificial intelligence is that it can quickly carry out repetitive work and statistical analysis, and collect data on student needs and process data on student learning through research, giving students a rich and personalized experience (Rui Guofen, 2024). Generative AI is able to analyses students' learning data and provide personalized learning suggestions and content for students based on their learning progress, knowledge mastery, thinking style and other information. For example, Tsinghua University's Programming Learning Platform combines AI technology to provide a personalized learning path for each student. The platform uses generative AI to automatically generate programming exercises tailored to a student's level based on his or her programming performance and problem-solving ability, and provides immediate feedback after the student completes the task. In this way, students can learn at their own pace while receiving real-time suggestions for improvement.

In addition, the generative AI system can identify students' strengths and weaknesses through real-time analysis of their learning behaviors, and then recommend targeted learning content. For example, if a student is found to be weak in algorithm design when studying a computer programming course, the generative AI can provide targeted algorithm training questions or recommend algorithm-related learning resources. In this way, generative AI not only optimizes traditional teaching methods, but also provides students with a more flexible and personalized learning path.

3.3 Automated Assessment and Instant Feedback

The traditional teaching assessment method usually adopts the form of paper test papers and lab reports, which is not only time-consuming and labor-intensive, but also has a strong subjective grading standard, making it difficult to be completely fair and objective. The application of generative artificial intelligence in automated assessment and instant feedback can effectively solve the problems of long assessment cycles and lagging feedback in traditional teaching. It makes educational assessment more efficient, accurate and personalized.

The basic computer technology courses in Chinese universities usually include programming, algorithms and data structures, etc. How to efficiently and objectively assess students' assignments and experiments is a major problem in current education. Generative AI is able to instantly assess students' programming assignments, project reports and experimental results with detailed feedback through an automated grading system at The AI system can quickly provide instant feedback in the form of automated corrections of programming assignments and assignment reports. At the same time, the AI system is also able to analyses the assignments submitted by the students, make a

comprehensive assessment from multiple dimensions such as code logic and algorithmic efficiency, and provide suggestions for improvement based on the students' performance. For example, AI is able to check for grammatical errors and logical errors in programming assignments and give suggestions for improvement. Through interaction with students, AI can also guide students to think about the root causes of errors and help them self-correct. In addition, the AI system is able to automatically generate evaluation content based on students' lab reports, analyses students' understanding of lab steps and principles, and provide personalized learning advice to students. For example, in the "Algorithms and Data Structures" course at China's South China University of Technology, the AI system was able to automatically correct students' code submissions and provide grades based on algorithm complexity and execution efficiency. Students receive feedback not only in the form of

grades, but also in the form of code optimization suggestions and better solutions, helping them to continuously improve their programming.

The automated assessment process of generative AI is based on explicit criteria and algorithms, thus avoiding the problem of bias in manual grading. This type of assessment not only enhances students' sense of trust, but also improves the fairness and transparency of teaching, motivating students to continuously optimize their learning methods and ways of thinking.

In summary, the comprehensive application cases of generative AI for content generation, personalized teaching and automated assessment in basic computer technology courses in Chinese universities are shown in Table 1.

Table 1: Application cases of AIGC in different basic computer technology courses

Application Courses	Application Case	Description
Introduction to Programming and Algorithms	Code Generation and Interpretation	Use AIGC tools (e.g. GitHub Copilot) to generate Python/Java code snippets and add comments to assist students in understanding syntax and logical structure.
	Automatic Critique and Error Diagnosis	Analyse logical errors (e.g. dead loops) in students' code via AIGC and provide suggestions for improvement (e.g. Code Whisperer's debugging feature).
Data Structures and Algorithms	Dynamic topic generation	Generate variants of questions (e.g. binary tree traversal variants) according to the student's level, e.g. LeetCode combined with AIGC to extend the question bank.
	Algorithm complexity analysis	After inputting the code, AIGC (e.g. ChatGPT) analyses the time/space complexity, but manual verification of the accuracy of the results is required.
Operating System	Experiment Report Framework Generation	AIGC assists in generating the template of the experiment report (e.g. the summary framework of the process scheduling experiment), and students need to fill in the data and conclusions by themselves.
Computer Network	Network Configuration Script Generation	Generate router basic configuration examples (such as OSPF protocol), but the actual deployment needs to be combined with Cisco Packet Tracer and other tools to verify.
Database	SQL statement optimisation	AIGC provides SQL optimization recommendations (e.g. index optimisation), but needs to be verified by actual execution plans (e.g. MySQL's EXPLAIN statement).
Software Engineering	Requirements Analysis Assistance	AIGC converts fuzzy requirements into preliminary use case diagrams (e.g., "online shopping system" function list), requiring manual refinement of requirements.
Principles of Computer Composition	Theoretical concepts can be visualised at	Generate CPU pipeline diagrams, combined with open source tools (e.g. Logisim) to dynamically demonstrate conflicts.
Compilation principles	Syntax error fixing suggestions	Analyse student-written compiler errors (e.g. missing semicolons) and provide examples of fixes that rely on compiler-specific implementation logic.
Foundations of Artificial Intelligence	Discussion of ethical issues	As a debate aid, generate arguments for and against AI ethical issues (e.g., privacy risks of face recognition), requiring instructor-led critical thinking.

4. Challenges and Problems

Although the application of generative AI in basic computer technology courses in colleges and universities is promising, it still faces many challenges and problems in the process of practical application. The technical bottleneck of generative AI, the acceptance of teachers, ethical issues, and the dependence of students may affect the effectiveness of its application in the field of education.

4.1 Technical Bottlenecks and Implementation Difficulties

The ability of generative AI to automatically generate teaching content is one of its major advantages, but there are still considerable technical challenges to ensure the quality and accuracy of the generated content. For example, if a teacher asks to generate a paragraph about "binary tree traversal", the GUI may give an overview, but the sample code may not be in line with the best programming practices, and may even contain errors. In addition, the GI may not be able to accurately express the difficulty of a topic in a programming question, or may generate a topic that is too simple and does not cover the depth of knowledge required in a basic computer technology course.

The reason for the above situation is that current generative AI has made significant progress in the field of Natural Language Processing (NLP), but it is still not able to achieve 100 per cent understanding of the complexity of the context and the depth of the content being taught. Particularly in the teaching of basic computer technology courses in higher education, where the course content often involves a great deal of technical detail and jargon, generative AI may produce content that does not meet the educational objectives. Therefore, generative AI still needs to continuously optimize its algorithms and data models in order to adapt to the demand for high-quality content in the educational field.

4.2 Teachers' Acceptance and Technology Adaptation

The application of generative artificial intelligence is not only a technological breakthrough, but also a major challenge to teachers' teaching concepts and teaching methods. In many colleges and universities, especially in some schools with a more rigorous traditional education system, there are large differences in teachers' acceptance of new technologies and their ability to apply them. Teachers of basic computer technology courses, in particular, often have solid professional knowledge but may not have the same skills in

artificial intelligence, data analysis and programming as technology developers. This makes some teachers may lack sufficient confidence when facing generative AI technology, or even be resistant to this new technology. Some teachers, especially older teachers, may have some misgivings about the application of generative AI, fearing that the addition of AI systems will generate more unpredictable teaching workloads or believing that these technologies are difficult to integrate into traditional teaching models.

In order to promote the effective application of generative AI in teaching, colleges and universities need to strengthen the training of teachers, not only to improve their ability to use the technology, but also to help them change their teaching concepts and use AI technology as a means to improve the quality of their teaching, rather than as a tool that threatens their teaching role. In addition, the education sector should provide appropriate policies and support to encourage teachers to learn in-depth about generative AI technologies in order to cope with the ever-changing development of education technology.

4.3 Ethical Privacy Issues

The application of generative AI inevitably involves ethical and privacy issues, especially in the field of education. When generative AI is used to process student data, how to ensure data security and privacy protection becomes an important issue. Generative AI usually requires a large amount of student behavioral data, homework grades, study habits and other information for personalized learning recommendations and tutoring. These data, if not properly handled, may lead to privacy and security issues such as data leakage and misuse.

How to ensure the security of teaching data and prevent data leakage and misuse has become an issue that needs to be jointly concerned by the education and technology communities. In some Chinese universities, data privacy issues have been widely discussed. For example, when Fudan University developed its intelligent learning platform, it put special emphasis on the protection of students' data, and the platform was designed with full consideration of data encryption and anonymization to ensure that students' personal information would not be leaked.

4.4 Student Dependency Issues

Although generative AI can provide great convenience in teaching, over-reliance on AI may lead to a decline in students' ability to learn independently. Students who are overly dependent on intelligent tutoring systems may reduce their initiative and creativity in problem solving. For example, in some programming courses, some students have gradually developed a dependency mentality because they are used to using AI assistive tools (e.g., AI programming assistants or automatic correction systems) to solve problems. These students often tend to rely on the solutions given by AI when facing more complex programming problems, and neglect the process of logical reasoning and algorithm optimization by themselves. In the long run, the programming ability of students can not be effectively improved, but fell into the strange circle of relying on AI.

Teachers need to use generative AI reasonably in the teaching process to ensure that it is used as an auxiliary tool rather than a replacement tool, and to avoid students' over-reliance on intelligent tutoring. For example, when Zhejiang University implemented the AI tutoring system, it emphasized that the tutoring system was only used as an auxiliary tool for teaching, and required students to still think and analyses independently when using AI help.

5. Countermeasures and Suggestions

The application of generative AI in basic computer technology courses in colleges and universities shows great potential and broad prospects. With the continuous development of technology and changes in teaching needs, generative AI can provide innovative solutions for teaching in a variety of aspects such as content generation, personalised learning, automated assessment, intelligent tutoring and so on. Through the application of generative AI, teaching methods can become more flexible and efficient, and can to a certain extent alleviate the work pressure of teachers and improve the learning effect of students.

However, despite the great potential of generative AI in education, there are still many challenges in the actual application process. These challenges include technical bottlenecks, teacher acceptance, ethical issues, student dependency, and many other aspects. In this context, this paper summarizes the current status of the application of generative AI in basic computer technology courses in universities, and puts forward corresponding countermeasures and suggestions based on the current challenges.

5.1 Suggestions on The Technical Level

The application of generative AI faces technical bottlenecks, especially in content generation, personalized learning recommendation and intelligent assessment in education. Existing AI technologies still have limitations in complex programming problems, generation of abstract concepts, and assessment of students' depth of thinking. Therefore, to promote the further application of generative AI in education, it is first necessary to strengthen the research and development and innovation of related technologies to improve the quality and accuracy of the educational application of generative AI.

In terms of content generation, generative AI systems need to more accurately understand the course content and the needs of teachers and students, and strengthen the interface with the actual syllabus, course objectives and teaching strategies. Educational technology developers and teachers should jointly participate in system design, to ensure that generative AI can generate personalized content according to the teaching objectives and actual needs of the course. In particular, it should have richer domain knowledge and flexibility in automatically generating complex content such as programming questions and algorithmic questions. In addition, with the further upgrading and improvement of the big AI model, it can further provide more accurate feedback and suggestions based on multi-dimensional data such as students' learning habits, learning efficiency, and

psychological state in terms of personalized learning and intelligent assessment, so as to enhance students' learning experience.

5.2 Suggestions at The Teacher Level

The role of teachers in generative AI applications remains indispensable, and teachers are still the core guides of student learning. Therefore, teachers' acceptance and ability to apply technology directly affect the effectiveness of generative AI.

5.2.1 Enhancing teacher training and support for generative AI.

Teachers' digital literacy and technology application ability are key factors in the successful application of generative AI. Universities should enhance the training of teachers' AI literacy and provide them with relevant technical support and ethical training on AI teaching and learning to help them understand and master how to effectively integrate generative AI into course teaching. Through regular seminars, workshops and online learning platforms, teachers' AI technical skills and application awareness will be enhanced.

5.2.2 Encourage teachers to play a leading role and establish a teaching model of teacher-AI collaboration.

Although generative AI can automatically generate content and tutorials, teachers should still guide and adjust them according to students' specific conditions. Teachers should screen and modify the AI-generated content to ensure that it meets the teaching objectives and make corresponding adjustments based on students' learning progress and feedback.AI systems can assist teachers rather than replace their teaching duties.

The application of educational technology should not replace the traditional teaching mode, but should form a collaboration with the teacher's teaching style. When using generative AI, teachers can use AI as a tool to assist in the design of course content and the automation of feedback to improve the efficiency of teaching, while teachers should still assume the responsibility of classroom management, guidance of students' thinking and in-depth discussion of problems.

5.3 Recommendations for Ethical and Privacy Issues

With the popularity of generative AI in the field of education, the privacy protection of student data and ethical issues have gradually become the focus of attention. Generative AI needs to collect and process a large amount of pedagogical data, including teachers' teaching profile data as well as students' learning progress, grades, and course interaction records, etc., which involves teachers' and students' personal privacy as well as the security of course data. In the educational application of generative AI technology, the

HEIs need to formulate data privacy protection policies, and education platforms and AI technology providers should comply with relevant laws and regulations and adopt means such as encryption and anonymization, while teachers and students should clearly know how their data will be used and obtain the appropriate informed consent to ensure that the

private data will not be misused or leaked. Universities and educational institutions should also establish a special ethical review mechanism to ethically assess the design and application of AI systems. The review mechanism should cover aspects such as bias issues in AI content generation and compliance in the use of student data to ensure that the application of AI is in line with educational ethics and social morality.

5.4 Recommendations for Student Dependency Issues

Although generative AI provides students with convenient learning tools, over-reliance on the AI tutoring system may lead to a decline in students' independent learning ability and may even affect the cultivation of their innovative thinking. Therefore, in the teaching process of the course, teachers need to take measures to avoid students' over-reliance on AI and to maintain their ability to think independently.

5.4.1 Rationally controlling the frequency and depth of AI use.

Teachers should guide students to use generative AI rationally, especially in programming assignments and experiments, where AI can be used as an aid to provide suggestions, but students must actively think and solve problems independently to ensure that students can enhance their problem-solving abilities when using AI rather than overly relying on AI-generated answers.

5.4.2 Promoting students' critical thinking and innovation skills.

Currently, the content generated by generative AI may appear as "hallucinations" and other false information, and students must have critical thinking and be able to analyses, judge and verify the reasonableness and authenticity of the content generated by AI. In the teaching process, teachers can guide students to discuss the advantages and disadvantages of AI-generated content, stimulate students' critical thinking, and promote their innovative ability when facing complex problems.

5.5 Comprehensive Suggestions

5.5.1 Strengthen the docking of technological innovation and educational needs.

In the future, the research and development of generative AI should be closely integrated with the actual needs of education, strengthen the interaction with teachers and students, and improve the accuracy and adaptability of the technology to ensure that it can provide high-quality services for education.

5.5.2 Promote policy support and industry standardization.

With the rapid development of generative AI, the development of relevant policies and industry standards is particularly important. The government and the education sector should actively introduce relevant policies to support the application of generative AI technology in the field of education, and establish corresponding industry norms to

ensure the fairness, safety and effectiveness of technology application.

6. Conclusion

Humanity has entered the era of "artificial intelligence + education", it is inevitable that artificial intelligence empowers teaching and learning, in order to achieve the leap from empowerment to innovation, we should not only learn to use artificial intelligence, but also try to learn with it, so that it is both a learning tool and an intelligent learning companion (Wu et al., 2023). The application of generative AI in basic computer technology courses in colleges and universities is promising, which can effectively improve teaching efficiency, personalized learning experience and students' independent learning ability. However, challenges such as technological bottlenecks, teacher acceptance, ethical and privacy issues, and student dependency still exist. In order to achieve the full application of generative AI in Chinese higher education, schools and educational institutions need to strengthen technological research and development, improve the technological literacy of teachers, pay attention to ethical and privacy protection, and avoid students' over-dependence on AI through reasonable guidance. Through these efforts, it is believed that generative AI will play a more and more important role in the future education reform, and promote the modernization of higher education.

References

[1] EDUCAUSE. (2023) EDUCAUSE Horizon Report TM (Teaching and Learning Edition) [EB/OL]. (2023-05-08) [2024-09-25].https://library.educause.edu//media/files/library/2023/4/2023hrteachinglearning.pdf?la=en&hash=195420BF5A2F09991379CBE68858EF10D7088AF5.

[2] Chun-Yan Liu (2025). Generative artificial intelligence empowered evidence-based education: evidence production and teaching practice[J]. Journal of Lanzhou University (Social Science Edition), (2): 143-151. doi:10.13885/j.issn.1000-2804.2025.02.012.

[3] Jian-Li Jiao (2023). ChatGPT boosts digital transformation of school education - what to learn and how to teach in the age of artificial intelligence[J]. China Distance Education,43(4):16-23. doi:10.13541/j.cnki.chinade.20230226.001.

[4] Guo-Fen Rui. (2024). Artificial intelligence empowers teaching change in applied colleges and universities: value, dilemma and path[J]. Vocational Education Newsletter, (11):105-111

[5] JI WU & LEI YANG (2023). What is possible for ChatGPT-enabled learning[J]. Research on Electrochemical Education,44(12):28-34. doi:10.13811/j.cnki.eer.2023.12.004.

[6] Yi-Yan Wang, Tao Zhu, Yang S. H. & Cheng Y. H. (2024). Human-computer co-teaching: Motivation, nature and challenges. Research on Electrochemical Education, 45(08), 51-57. doi:10.13811/j.cnki.eer .2024.08.007.

[7] Feng Xiao. (2024). Big Models and Intelligent Society: An Exploration Based on Historical Materialism. Chinese Social Science, (07), 71-89+205-206.

[8] ZHOU J, KE P, QIU XP (2024). ChatGPT: potential, prospects, and limitations[J]. Frontiers of Information Technology & Electronic Engineering, 25(1):6-11.

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