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Exploration on AIGC Technology Empowering Practical Teaching of Computer Fundamentals in Higher Vocational Education

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Abstract: With the rapid development of information technology, emerging technologies such as artificial intelligence, big data, and cloud computing have been widely applied in various fields. As an important way to cultivate students' operational and innovative abilities, practical teaching of computer fundamentals in higher vocational education needs to keep up with the tide of the times, continuously strengthen educational reforms, and innovate teaching methods. Based on this, this paper analyzes and studies how AIGC technology empowers the practical teaching of computer fundamentals in higher vocational education for reference.

Keywords: AIGC; Higher vocational education; Computer fundamentals; Big data

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1. Introduction

Computer fundamentals teaching in higher vocational colleges holds significant value for cultivating students' computational basic practical abilities. However, traditional teaching models fail to meet students' actual needs. Against the backdrop of the artificial intelligence era, introducing AIGC technology helps achieve educational reforms and solve key problems in practical teaching. Currently, the application of AIGC technology contributes to creating a favorable interactive learning environment, stimulating students' comprehensive practical abilities, and further cultivating their interdisciplinary thinking skills.

2. The necessity of practical teaching reform for computer fundamentals in higher vocational education

Against the backdrop of rapid information technology development, the application of technologies such as artificial intelligence has transformed the development models of traditional industries and continuously shifted talent demands. These changes are reflected not only in the cultivation of high-skilled talent but also in the

enhancement of comprehensive quality and capabilities. In this context, practical teaching reform is particularly critical for higher vocational education, which aims to cultivate technical and skilled personnel. The application and development of AIGC technology have expanded computer programming beyond traditional code writing, requiring higher vocational computer students to master basic programming skills and effectively apply their knowledge and skills to solve practical problems, thereby better implementing innovative education. As AIGC technology is applied across multiple fields such as healthcare, education, finance, and entertainment, practical teaching of computer fundamentals in higher vocational colleges must focus on cultivating students' professional quality and skills, strengthening teaching practice reforms, and stimulating their learning motivation [1,2].

3. Matching fields between AIGC technology and computer fundamentals teaching

3.1. AIGC's intelligence meets personalized teaching

Computer basics practice is highly practical, focusing on cultivating students' practical abilities and innovative qualities, thus promoting their personalized development. Traditional teaching methods are difficult to meet students' basic needs, resulting in poor teaching effectiveness. However, the effective utilization of AIGC technology can innovate teaching methods, enabling teaching work to meet students' learning needs. Its specific characteristics are as follows: First, AIGC technology enables teachers to develop targeted learning plans according to students' actual situations. Second, AIGC technology helps to deeply analyze and understand students' learning behaviors, fully identify the problems students encounter during the learning process, and enhance their learning enthusiasm. Finally, the application of AIGC technology, based on an understanding of students' learning status, can push personalized learning resources to students, enabling them to study in a targeted manner and improve their comprehensive quality and capabilities [3].

3.2. AIGC's interactivity matches practical teaching interaction

AIGC technology has interactive features that are closely linked to the interactivity of computer fundamentals practical teaching. The interactivity of AIGC helps provide students with a good learning experience, enabling them to better engage in practical learning and enhancing their enthusiasm. AIGC's interactivity can also accurately evaluate students' learning situations, fully understand their learning patterns and characteristics, and adjust corresponding learning plans. This interactive feature also helps improve teaching quality and effectiveness: teachers can interact with students online, address their questions, provide targeted guidance, and carry out teaching more effectively.

3.3. AIGC's innovativeness matches practical teaching innovation

As a technology born in the era of artificial intelligence, AIGC has strong innovativeness, which provides more opportunities for teaching innovation. AIGC technology helps empower computer fundamentals teaching to improve teaching quality and effectiveness, particularly in students' learning of computer foundation courses. AIGC can generate powerful text-based content, automatically grade students' assignments, and provide targeted evaluations, allowing students to receive precise feedback and learn new content. The application of AIGC technology promotes innovations in intelligent teaching, strengthens teaching management, and provides learning support for all students by dynamically adjusting teaching based on their learning status and performance [4].

4. Innovative applications of AIGC technology empowering computer fundamentals practical teaching

4.1. Intelligent assignment grading and feedback to correct student issues

The application of AIGC technology helps develop an intelligent homework grading system. By effectively utilizing algorithms of natural language processing and computer processing, it can correct the errors that students make during the learning process, thus providing more assistance and guidance for students' personalized learning. Students can fully understand their learning situation and continuously optimize and rectify the problems in their studies. Moreover, the application of this technology also facilitates teachers' work. In the Basic Java Programming course, teachers can use AIGC technology to develop an intelligent grading system to review students' homework. This system can automatically detect students' homework, identify existing problems, offer improvement suggestions, and supplement learning materials related to grammar points. It helps students deepen their understanding of the fundamentals of Java programming and further improves the quality of their code [5].

4.2. Recommending personalized learning paths to improve learning outcomes

The application of AIGC technology helps to fully understand students' learning situations and characteristics, and then adjust the teaching progress to ensure that all students can learn effectively and participate better in learning practice activities. For example, in the design of the Basic Java Programming course, AIGC technology can be effectively used to provide personalized guidance to students. Based on the evaluation results of students' grammar knowledge and their interaction situations, the recommendation system can suggest corresponding learning modules and programming practice projects. In this way, students can identify and address their weaknesses, study in a targeted manner, and improve the quality and effectiveness of their learning [6,7].

4.3. Creating virtual training environments to facilitate learning

The application of AIGC technology can create a simulated virtual training environment for basic computer courses, enabling students to acquire more knowledge without relying on physical devices. The virtual training environment can replicate real-world computer scenarios, allowing students to identify their problems in the virtual environment and continuously make improvements. For example, in the practical training teaching of integrated layout technology in the Computer Network Principles course, a virtual laboratory driven by AIGC technology for networks can be developed. In this context, students can simulate the topology of computer networks to effectively allocate data resources. Through the application of routers, students can gain a deeper understanding of data transmission in networks, thereby enhancing their comprehension and learning of computer network knowledge [8–10].

4.4. Reforming teaching content and methods to keep pace with technological development

Teaching content should keep pace with the development of the times and continuously update and improve educational concepts. Under the guidance of AIGC technology, teachers should apply new programming languages, algorithms, and tools in the teaching process, enabling students to stay abreast of industry developments during their studies. By selecting appropriate teaching cases based on students' future career plans, the practical application ability of teaching can be further enhanced. Teaching methods also need to be reformed. Traditional practical teaching is teacher-centered, leaving students in a passive learning state. However, the application of AIGC technology can also make practical teaching focus on the dominant position of students. Adopting teaching models such as project-based learning and flipped classrooms helps solve practical problems,

creates a favorable environment for students' learning and development, and improves their learning enthusiasm. The reform of teaching content needs to be fully integrated with the reform of teaching methods. Teachers should impart relevant knowledge, guide students' learning and development, and thus cultivate their innovative and practical abilities, enhancing their comprehensive qualities and market competitiveness. AIGC technology can provide more support for the practical teaching of basic computer courses in higher vocational education, thereby cultivating high-quality talents needed by society [11].

4.5. Developing diverse teaching resources to support teaching

The application of AIGC technology can automate the teaching process. By entrusting various teaching tasks set in the teaching process to the AIGC system, it can further save teachers' time and energy and provide personalized guidance to students. The AIGC system also helps strengthen the monitoring of students' progress and grades, thereby providing teachers with more feedback and guidance, and continuously optimizing and rectifying problems in teaching. The application of AIGC technology enables the effective sharing of teaching resources. By establishing an online teaching platform, teachers can share their teaching resources with other teachers and students, thus achieving effective resource sharing. Additionally, the application of AIGC technology facilitates cooperation among teachers to solve problems existing in teaching [12].

4.6. Strengthening the construction of school teaching teams to improve education quality

During the process of AIGC technology empowering practical computer teaching in higher vocational education, the construction of the teaching staff is a crucial aspect. This requires an overall assessment of the existing teaching staff to fully understand their professional backgrounds, educational experiences, and technical capabilities. Different training programs should be provided for teachers at various levels to enhance the pertinence of the training, enabling them to improve their ability to apply information technology, and develop educational and teaching concepts, as well as innovative thinking.

Firstly, regularly organize teachers to participate in various educational and teaching training programs. Interpret the requirements of the new curriculum standards and conduct information technology application training, so that teachers can master various teaching concepts and methods, thereby improving their individual comprehensive qualities. Secondly, establish a teacher communication platform to encourage teachers to share their teaching experiences and achievements, which can better assist teachers in learning and promote their development. Thirdly, for teachers with a certain foundation in information technology, they can develop online teaching resources to further enhance the quality and effectiveness of teaching. Finally, actively mobilize teachers to participate in various teaching and research projects to further enhance their research capabilities and better promote teaching reform [13].

4.7. Constructing diversified learning evaluation methods to improve evaluation effectiveness

In the practical teaching of basic computer courses in higher vocational education, it is particularly crucial to effectively utilize AIGC technology to innovate learning evaluation methods. In the traditional teaching mode, the evaluation of students' learning often relies on a single computer assessment, which is difficult to comprehensively reflect students' learning characteristics. However, the use of AIGC technology can build a comprehensive and accurate teaching evaluation system. By using an intelligent teaching assistance system, it is possible to comprehensively track the teaching process, thereby understanding students' homework completion,

classroom participation, etc., and recording students' practical operation abilities, thus fully reflecting students' learning situations and characteristics. With the help of big data analysis and artificial intelligence technology, teachers can fully understand the learning behaviors and situations of all students, accurately analyze students' states, and provide personalized assistance and guidance for their learning. This teaching form helps to mobilize students' enthusiasm for learning and promotes their all-round development. Moreover, schools can introduce diversified evaluation subjects. In addition to traditional teacher evaluations, it is necessary to introduce diversified evaluation subjects such as student self-evaluations, peer evaluations, and enterprise evaluations, to evaluate students' learning from different aspects. Empowering teaching work with AIGC technology helps to improve practical teaching abilities, carry out comprehensive reforms, build a more scientific and reasonable teaching evaluation system, and ensure the effective implementation of teaching work [14,15].

5. Conclusion

In summary, against the backdrop of the digital technology era, AIGC technology demonstrates enormous potential in the field of practical teaching of computer fundamentals in higher vocational education. It can break through the limitations of traditional teaching, continuously improve teaching methods, and construct an immersive learning environment. Through the establishment of intelligent feedback mechanisms, personalized teaching is achieved. With the support of AIGC, students can master key computer basics, enhance their practical operation capabilities, and better solve real-world problems.

Disclosure statement

The author declares no conflict of interest.

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