Research on Blended Teaching Mode of Higher Vocational Computer Education under the Background of Information Technology

Shengtao Zhou*

Heilongjiang Ecological Engineering Vocational College, Harbin 150025, Heilongjiang Province, China

***Corresponding author:** Shengtao Zhou, 95821212@qq.com

Abstract: With the rapid development of information technology, higher vocational computer education is facing an unprecedented change. Under the background of information technology, this paper discusses the construction and practice of blended teaching mode of higher vocational computer education. By analyzing the theoretical basis of the blended teaching mode and combining the actual needs of higher vocational computer education, a blended teaching mode combining online and offline is proposed, aiming at enhancing students' independent learning ability, practical operation skills, and teamwork spirit, and providing new ideas and methods for the development of higher vocational computer education.

Keywords: Information technology; Computer education; Blended teaching

1. Introduction

Blended teaching mode, which combines traditional classroom teaching with online learning, has become a key direction for advancing the future of higher vocational computer education. In the era of booming information technology, to adapt to the fast-changing technological environment, blended teaching as an integration mode of traditional and online teaching has attracted much attention. Under this trend, it is necessary to think about how to make full use of the advantages of information technology in higher vocational computer education, break the limitations of time and space in traditional teaching, and provide a more flexible and personalized learning experience.

2. Theoretical basis of the blended teaching mode

The theoretical basis of blended teaching mode is rooted in the continuous development of educational technology, and integrates the essence of a variety of teaching theories, aiming to break the constraints of traditional teaching to create a more flexible and personalized learning environment. The blended learning model draws on elements of behaviorist theory, emphasizing that learning is a response to external stimuli. By providing diverse learning

resources, guided learning activities, and real-time feedback mechanisms, blended teaching stimulates students' learning interests and prompts them to participate more actively in the learning process. Constructivist theory plays an important role in blended teaching, emphasizing that students achieve deep learning through the process of constructing knowledge [1]. Blended teaching creates a student-driven learning environment that fosters problem-solving skills and critical thinking through online collaboration, discussion, and hands-on projects. Through the organic combination of inverted classroom, online courses, and face-to-face teaching, teachers can choose the most suitable form of blended teaching based on specific teaching objectives and subject characteristics, which is characterized by personalized learning and increased student engagement, creating a more autonomous and flexible learning experience for students. Overall, the theoretical basis of the blended teaching model is eclectic, integrating tradition and modernity as well as theory and practice, providing an innovative teaching paradigm for education, and is expected to better meet the diverse learning needs of today's students.

3. Impacts of information technology on higher vocational computer education

3.1. Providing rich educational resources

Information technology utilizes the convenience of the Internet to enable teachers and students to easily access a large number of online learning resources, such as rich digital textbooks, open-source courses, and practical cases, injecting new subject knowledge and the latest developments into higher vocational computer education. Through tools such as online learning platforms and virtual laboratories, students can study more flexibly and are no longer constrained by traditional course schedules and location limitations, this flexibility enables students to study according to their own interests and learning pace and improves their learning results. At the same time, the progress of information technology also provides teachers with more teaching tools, such as the use of multimedia teaching, virtual reality technology, etc., to more vividly present abstract computer concepts, and stimulate students' interest in learning. Information technology also brings a more open and interactive learning environment for higher vocational computer education. Through discussion forums, collaboration tools, and social media of online platforms, students can communicate and interact in real time, share learning experiences, and solve problems. This open learning environment helps to cultivate students' teamwork and communication skills, better adapting to the future needs of teamwork in the workplace [2].

3.2. Promoting the transformation of teaching methods

Online teaching provides convenient distance learning opportunities for higher vocational computer science majors, and students can access online courses anytime and anywhere via the Internet, overcoming the time and space limitations of traditional face-to-face teaching. This flexibility makes learning no longer constrained by geographic location, especially for students who are off-site or work-study students, providing more choices and convenience. The introduction of online teaching tools has promoted the transformation of traditional face-to-face teaching methods. Teachers can interact with students in virtual spaces with the help of tools such as video conferencing and online discussions, which improves teaching effectiveness and promotes better communication between teachers and students. At the same time, through online quizzes and assignments, teachers can keep abreast of students' learning and provide data support for personalized teaching. The use of virtual labs, simulation projects, and other online tools enables students to practice in simulated real-life scenarios and develop practical problem-solving skills, and this hands-on learning approach not only improves the practicality of the subject but also better caters to the ever-changing needs of the computer field. Additionally, the integration of online and offline teaching methods can also prompt students to actively participate in learning. Through online discussions, teamwork projects, and other forms, students actively communicate in the virtual space and share experiences and

opinions, which helps to cultivate their teamwork spirit and innovative consciousness [3].

3.3. Expanded practical operation space

The introduction of virtual laboratories provides students with a broader field of practical operation, enabling them to conduct simulated experiments in a virtual environment without being restricted by the limitations of actual equipment, which can improve students' practical operation skills and make up for the problem of limited resources in traditional laboratories. The wide application of online projects and programming practice platforms creates richer practical opportunities for students. Students can gain more real project experience and develop the ability to solve practical problems by participating in open-source projects and online programming challenges. This expansion of practical operation space not only enables students to better adapt to the industry's needs but also promotes the cultivation of practical skills in computer science. Information technology has also promoted the development of interdisciplinary practice in higher vocational computer education. Through the integration of information technology with other fields, such as artificial intelligence and big data, students can participate in more interdisciplinary practice projects. This interdisciplinary practice not only broadens students' horizons but also develops their comprehensive ability to solve complex problems, providing a solid foundation for future comprehensive tasks in computer-related fields. In addition, the development of information technology makes remote internships possible, and students can participate in remote practical projects and experience the real work scene through online methods, which enhances their employment competitiveness and lays a practical foundation for their future career development [4].

4. Establishment of a blended teaching mode of higher vocational computer education under the background of information technology

4.1. Determining the teaching objectives

The determination of the learning objectives should take full account of the core knowledge system of computer specialties, skill requirements, and the need to cultivate students' innovative thinking and problem-solving skills. By setting clear objectives, students can be provided with a defined learning direction, so that they can learn more purposefully in the blended teaching environment. First of all, the teaching objectives should cover the core knowledge of computer majors. With the assistance of information technology, online courses and digital teaching materials can be used to ensure that students systematically learn the core theories of computer science and technology. This includes the body of knowledge in important areas such as computer networks, database management, programming languages, etc., aiming at cultivating students' professional foundations. Secondly, teaching objectives should focus on practical applications and hands-on skills. By designing online projects, virtual labs, and other practical sessions, students can apply what they have learned in simulated real-life scenarios and develop practical problem-solving and hands-on skills. This helps to better equip students to meet the demands of real employment after graduation. In addition, the teaching objectives should also include the cultivation of students' innovative thinking and teamwork skills. Utilizing online collaboration tools and team projects, students can work with their classmates in the virtual environment to solve practical problems and promote communication and cooperation among themselves. This helps to cultivate students with a sense of innovation and teamwork spirit. Lastly, the teaching objectives should also focus on students' comprehensive literacy and career development. Through the introduction of interdisciplinary content and the learning of cutting-edge technology in the industry, students can develop interdisciplinary thinking and sensitivity to emerging technologies, equipping them with the skills needed for continuous learning [5].

4.2. Adequate preparation before class

To ensure the smooth progress of the practice of blended teaching mode, the key lies in adequate preparation, especially in the pre-course preparation. Teachers should carefully design the online course structure, reasonably divide the teaching content into modules, and clarify the teaching objectives of each module. Through a clear course structure, students can better understand the overall learning framework and improve their learning effect. Preparing online teaching resources is a crucial part of the process. Teachers should collect and prepare rich learning resources such as digital teaching materials, online materials, multimedia courseware, etc. in advance to meet the different learning styles and needs of students, provide more subject knowledge, and stimulate students' interest in learning. In addition, rational planning of online practical sessions is also an essential preparation. By designing practical sessions such as virtual experiments and project tasks, teachers can guide students to apply theoretical knowledge in simulated environments and cultivate practical problem-solving skills. Meanwhile, preparing online interactive sessions is also key [6]. Through the reasonable use of online discussion and collaboration tools, teachers can promote communication and cooperation between students and their peers and stimulate students' enthusiasm for learning. Lastly, considering that technical problems may affect the smooth running of online teaching, teachers also need to familiarize themselves with the teaching platform in advance to ensure the normal operation of online tools. At the same time, students are provided with clear technical support and operational guidance to minimize the impact of technical barriers on learning. Through such comprehensive preparation, teachers can better guide students in blended teaching, improve teaching effectiveness, and promote the overall development of students [7].

4.3. Developing classroom teaching

In blended teaching, it is necessary to pay attention to the interactivity and personalization of classroom teaching. Teachers can establish two-way communication between teachers and students through online discussion and real-time feedback, to timely understand students' learning, solve problems, and adjust teaching strategies. In addition, personalized teaching is a key component of the theory. By utilizing online platforms to track students' learning progress and provide reinforcement training, teachers can gain deeper insights into students' needs and offer targeted guidance. Taking Computer Network Fundamentals as an example, the application of blended teaching mode in classroom teaching is reflected in various aspects. First of all, teachers can pre-set the learning materials of relevant knowledge points through the online platform, and students can study independently before class to master the basic concepts in advance. Subsequently, in the classroom, interaction can be carried out through questions, group discussions, and other ways to test students' mastery of the pre-class content. At the same time, through the introduction of actual cases and the latest technological developments, teachers can make abstract theoretical knowledge more vivid and visual, triggering students' interest. In blended teaching, teachers can also carry out virtual experiments and simulation projects using the real-time interactive tools of the online platform, so that students can apply theory to practice in the virtual environment. For example, in the course Computer Network Fundamentals, by simulating network topology and network faults, students can carry out practical operations in the virtual laboratory to cultivate practical problem-solving skills. This classroom teaching design not only enriches students' learning experience but also improves their depth of understanding of computer network concepts [8].

4.4. Summarizing problems encountered

Teachers can collect the questions raised by students in the classroom through the online platform, as well as the difficulties they encounter in the learning process. Through the sorting and summarizing of these problems, teachers can better understand the learning needs and cognitive status of students and provide a basis for

subsequent teaching adjustments. Secondly, for questions that cannot be fully answered in the classroom, students can be encouraged to actively participate in solving their doubts through online discussions and Q&A boards. This interactive learning environment not only enhances students' engagement in the subject but also motivates them to understand the course content more deeply. Meanwhile, for common issues, teachers can identify and summarize essential knowledge points to enhance students' understanding of key concepts. Lastly, through the test and quiz functions of the online platform, teachers can consolidate and assess students' knowledge promptly. This not only helps students' self-assessment but also provides teachers with feedback information to guide the direction of subsequent teaching. Taking Computer Network Fundamentals as an example, in the process of summarizing students' questions, teachers can focus on the problems encountered by students in network topology design, troubleshooting, and other practical aspects, and provide targeted answers and guidance. Therefore, teachers can better identify and solve students' learning difficulties, optimize the blended teaching mode, and improve the teaching effect. Meanwhile, students can understand the course content more comprehensively and improve their subject level by participating in the problem summarization and answering. This two-way, multi-level problem summarizing and answering process will deeply promote the development of blended teaching and provide a more flexible and personalized learning experience for higher vocational computer education [9].

5. Conclusion

In summary, the blended teaching mode is characterized by flexibility and personalization, which enables students to acquire knowledge more autonomously. Compared with traditional teaching, blended teaching pays more attention to student participation, practice, and teamwork, which promotes the cultivation of students' comprehensive skills. At the same time, the application of information technology provides rich resources and tools for teaching, enriches the teaching means, and improves the teaching effect. However, the smooth implementation of blended teaching cannot rely solely on technology and instructional design but also requires the continuous improvement of teachers' teaching ability to guide students to better utilize blended learning resources [10].

Disclosure statement

The author declares no conflict of interest.

References

[1] Liu Q, 2023, Problems and Countermeasures in the Practice of Blended Teaching Mode of Higher Vocational Computer Specialties. China Management Informatization, 26(15): 237–240.

[2] Feng L, 2022, Research on the Strategy of Improving Online and Offline Hybrid Teaching Ability of Senior Computer Teachers. China New Communication, 24(21): 3.

[3] Yang L, 2022, Discussion on Blended Teaching Mode of Higher Vocational Computer Education under Information Technology. Avant-Garde, 2022(21): 100–102.

[4] Han L, 2022, Research on Blended Teaching Mode of Higher Vocational Computer Class Based on "Internet+." China New Communication, 24(22): 96–98.

[5] Wang Q, 2022, Exploration of the Reform Practice of Online and Offline Hybrid Teaching Mode of Higher Vocational Computer Network Course. Computer Knowledge and Technology: Academic Edition, 18(32): 3.

[6] Wang Y, 2023, Research on the Design and Application of Blended Teaching Models for Higher Vocational Education to Promote Deep Learning. Computer Education, 2023(5): 116–120.

[7] Hao J, Liu X, Sun H, et al., 2022, Construction of SPOC Blended Teaching Mode for Computer Majors under the Background of Big Data. Computer Knowledge and Technology, 2022(12): 108–110.

[8] Sui Y, 2022, Research on Blended Teaching Mode of Computer Education Based on Information Technology. Computer Application Digest, 2022(7): 38.

[9] Liu Y, 2023, Research on Teaching Strategies Related to Smart Classroom Blended Teaching Mode. Times People, 2023(1): 230–232.

[10] Song X, Wang X, 2022, A Preliminary Study on the Reform of Basic Computer Course under Mixed Teaching Mode. Century Star-Communication Edition, 2022(20): 82–84.