

Research on Teaching Reform of University Computer Fundamentals Based on the Blended Teaching Model

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Abstract: Firstly, the limitations and existing problems in the teaching process of traditional university computer foundation courses were analyzed; Secondly, the advantages and current development status of blended learning mode were introduced; Finally, the application strategies and achievements of blended learning mode in university computer foundation courses were discussed. The aim is to achieve a practical, interactive, and personalized learning experience by innovating teaching methods, optimizing teaching content, reforming evaluation systems, and reconstructing teaching objectives, in order to enhance students' learning effectiveness and teaching quality, and provide effective methods and measures for cultivating high-quality computer talents that meet the needs of the times.

Keywords: Blended Learning; Computer Fundamentals Course; Teaching Reform.

1. Introduction

The traditional teaching of computer foundation courses in universities often adopts the model of "teacher explanation+ student practice", which to some extent ignores the individual differences and self-learning abilities of students. With the development of Internet technology, there are more and more online education resources, and the ways for students to obtain knowledge are more diversified. The traditional teaching model has been unable to meet the flexible and personalized learning needs of students. In addition, the rapid updating of computer technology requires teaching content to keep up with the pace of the times, which poses new challenges to traditional teaching models. Blended learning can fully leverage the advantages of traditional classroom and online teaching, improve teaching effectiveness and enhance students' learning experience through online and offline interaction.

2. Overview of Blended Learning Mode

2.1. Definition of Blended Learning Mode

Compared with traditional teaching methods, blended learning is a new teaching model that combines traditional face-to-face teaching with online digital teaching. It fully utilizes the advantages of two teaching methods, through online and offline interaction and complementarity, combining online and offline, optimizing the allocation of teaching resources, and improving teaching effectiveness and quality. In blended learning mode, the roles of teachers and students undergo a transformation, with teachers becoming guides and facilitators, while students become active learners and collaborators, jointly building a dynamic, efficient, and personalized learning environment.

2.2. The Advantages of Blended Learning Mode

Firstly, it enhances teacher-student interaction, and online communication supplements the shortcomings of classroom communication; Secondly, it is conducive to resource sharing and optimization, as online platforms provide abundant teaching resources; Thirdly, it improves the flexibility and

convenience of learning, allowing students to study according to their own schedule; Fourthly, it promotes personalized learning, allowing students to choose learning content according to their own pace and interests; Fifth, through diversified teaching evaluation methods, students' learning outcomes[1] can be more comprehensively evaluated.

2.3. The Current Development Status of Blended Learning Mode

The blended learning model has rapidly developed globally and has become an important trend in education reform. In China, with the advancement of educational informatization, more and more schools and educational institutions are adopting blended learning, especially in the field of higher education. This model has shown significant effects in improving teaching quality and meeting students' personalized needs. However, in practice, teachers still face challenges such as insufficient information technology capabilities, uneven resource allocation, and imperfect evaluation systems. Further exploration and optimization are needed to maximize their educational value.

3. Analysis of the Current Situation of University Computer Fundamentals Courses

3.1. Curriculum Design and Teaching Content

The curriculum of university computer fundamentals usually includes basic knowledge such as computer hardware, software, network fundamentals, operating systems, and office software applications. The teaching content focuses on theoretical explanations and the cultivation of basic operational skills, but often neglects the integration with practical work scenarios, resulting in students finding it difficult to flexibly apply the knowledge they have learned to practical problems. In addition, the course content is not updated in a timely manner, making it difficult to keep up with the rapidly developing computer technology, which may pose a challenge [2] for students to have outdated skills after graduation. Therefore, the reform of curriculum design and teaching content is particularly important, in order to enhance the practicality and timeliness of the curriculum through the

reform of curriculum design and teaching content.

3.2. Teaching Methods and Tools

In the teaching of computer fundamentals courses in universities, the commonly used teaching method is still traditional lecture style teaching supplemented by a small amount of hands-on practice. In this mode, teachers dominate the classroom while students passively receive knowledge, lacking sufficient interaction and exploration. Although multimedia teaching has been introduced as a teaching method, it is often limited to PPT presentations and video playback, and information technology has not been fully utilized to improve teaching effectiveness. In addition, practical teaching often disconnects from theoretical teaching, making it difficult for students to effectively transform theoretical knowledge into practical operational skills. These problems urgently need to be solved through innovative teaching methods and means.

3.3. The Necessity of Reform

Faced with the rapid development of information technology and the high demand for computer skills in the job market, the reform of university computer foundation courses is particularly urgent. Traditional teaching content and methods are no longer able to meet the diverse learning needs of students, nor are they conducive to cultivating their innovative and practical abilities. Reforming computer basic courses can not only improve the timeliness and practicality of the curriculum, but also stimulate students' interest in learning, enhance their ability to learn independently, and better adapt to the development[3] of future society. Therefore, a comprehensive reform of course content and teaching methods has profound practical significance for improving the quality of education and cultivating high-quality talents.

4. Teaching Reform Strategies for University Computer Fundamentals Courses under Blended Teaching Mode

4.1. Refactoring Teaching Objectives

In the blended learning mode, the teaching objectives of university computer foundation courses should be restructured to meet the educational needs of the new era: firstly, to strengthen the combination of theoretical knowledge and practical skills, ensuring that students can apply what they have learned to practical situations; The second is to cultivate students' information literacy and digital thinking ability, so that they can adapt to the rapidly changing technological environment; Thirdly, through online and offline interaction, students' self-learning ability and teamwork ability can be improved; The fourth is to stimulate students' innovative consciousness and ability to solve complex problems through project-based and problem-solving teaching methods. This goal setting aims to provide students with more comprehensive and practical computer education.

4.2. Optimizing Teaching Content

In response to the characteristics of blended learning mode, it is necessary to optimize and upgrade the teaching content of university computer foundation courses. Firstly, textbooks and course resources should be updated to incorporate the latest computer technology and applications, ensuring the

forefront of teaching content; The second is to combine theoretical knowledge with practical cases, increase the proportion of practical operations, such as programming exercises, project development, etc., to improve students' hands-on ability; The third is to introduce interdisciplinary content, such as data analysis, artificial intelligence basics, etc., to broaden students' knowledge horizons; The fourth is to design modular and hierarchical teaching content based on students' professional backgrounds and differences in interests, to meet personalized learning needs and enhance the pertinence and practicality of teaching content.

4.3. Innovative Teaching Methods

In the blended learning mode, it is necessary to innovate the teaching methods of university computer basic courses to improve teaching effectiveness: firstly, adopt the flipped classroom mode, move the learning of basic knowledge to before class, and focus on discussion, answering questions, and practical operations in class; The second is to implement task driven teaching, guiding students to actively explore and solve problems by setting specific tasks and projects; Thirdly, utilizing online platforms for collaborative learning, encouraging students to engage in online discussions and team projects, and enhancing interactive communication; The fourth is to introduce case-based teaching method, which improves students' analytical and application abilities[4] by analyzing real cases; The fifth is to implement formative evaluation, continuously tracking students' learning progress and effectiveness through a combination of online and offline methods, and providing timely feedback and guidance.

4.4. Reforming the Teaching Evaluation System

The blended learning model requires a reform of the teaching evaluation system for university computer foundation courses. The new evaluation system should be more comprehensive and diverse to adapt to the teaching characteristics of combining online and offline teaching: firstly, combining process evaluation and summative evaluation, emphasizing students' performance and progress throughout the entire learning process; The second is to adopt a combination of quantitative and qualitative evaluation, which not only focuses on students' exam scores, but also evaluates their practical ability, innovative thinking, and teamwork ability; The third is to use online platforms to record students' learning behavior data, conduct data analysis, in order to more accurately evaluate students' learning effectiveness; The fourth is to encourage students to conduct self-evaluation and peer evaluation, promote students' self reflection and mutual learning, and thus form a more scientific and reasonable teaching evaluation system.

5. Effectiveness of Teaching Reform in University Computer Fundamentals Course under Blended Teaching Mode

5.1. Improving Students' Academic Performance

The implementation of blended learning mode has significantly improved the academic performance of computer foundation courses in universities. Firstly, the richness and convenience of online resources enable students

to independently arrange their learning time, repeatedly watch teaching videos, and deepen their understanding and memory of difficult knowledge. Secondly, offline classroom teaching places more emphasis on interaction and discussion. Teachers can provide targeted answers to questions based on students' online learning situations, thereby improving teaching efficiency. Thirdly, blended learning encourages students to participate in practical projects, deepen their application of theoretical knowledge through practical operations, and enhance the practicality and fun of learning. Practice has proven that this teaching model effectively improves students' participation and enthusiasm in the course, resulting in higher academic performance in the final assessment. Students' programming ability, problem-solving ability, and computer application level have all significantly improved.

5.2. Enhance Students' Practical Abilities

The blended learning model has achieved significant results in enhancing students' practical abilities. This model combines online theoretical learning with offline practical operations, providing students with more practical opportunities. The online platform provides resources such as simulation experiments and virtual projects, allowing students to practice repeatedly in a safe and controllable environment, deepening their understanding of computer operations. Offline classrooms focus on the implementation of physical projects, where students need to solve practical problems hands-on. This not only exercises their technical application abilities, but also enhances their innovative thinking and teamwork skills. In addition, blended learning encourages students to participate in extracurricular practical and competitive activities, such as programming competitions, hackathons, etc. These activities not only test students' theoretical knowledge, but also enhance their technical application and problem-solving abilities[5] in practice. The students' practical works and competition results indicate that blended learning effectively transforms theoretical knowledge into practical operational skills, laying a solid foundation for their future career development.

5.3. Improving Students' Comprehensive Quality

The blended learning model has played an important role in improving students' comprehensive quality. Firstly, this model promotes the improvement of students' self-learning ability. The utilization of online learning resources requires students to self manage their learning progress, cultivating their independent learning and thinking abilities. Secondly, the group collaboration and discussion sessions in blended learning have enhanced students' communication skills and teamwork spirit. Students learn listening, expression, and collaboration skills through interactions with peers, which are crucial for their future careers. Thirdly, blended learning stimulates students' innovative consciousness and critical thinking through project-based and problem-solving approaches. In the process of solving practical problems, students not only need to apply their learned knowledge, but also need innovative thinking to find solutions. The blended learning model helps students develop comprehensive qualities and lays the foundation for them to become versatile talents that meet the needs of society.

5.4. Enhance Teachers' Teaching Ability

The blended learning model has put forward new requirements for teachers' teaching abilities and significantly improved their teaching level in practice. Firstly, teachers need to master the operation and management of online teaching platforms, which encourages them to learn new educational technologies and enhance their technical literacy. Secondly, when designing online and offline teaching activities, teachers must have a deeper understanding of the course content and student needs, which promotes their research on teaching content and innovation of teaching methods. Thirdly, blended learning requires teachers to have stronger classroom management and organizational skills to coordinate online and offline teaching activities. Teachers have improved the quality and efficiency of classroom interaction by guiding students to engage in self-directed learning, group discussions, and project-based practice. Fourthly, the implementation of blended learning mode also promotes communication and cooperation among teachers. They share teaching resources and explore teaching methods through team teaching, research activities, and other means, thereby continuously improving their teaching abilities and professional level. These changes not only improve the quality of teaching, but also provide new paths for teachers' professional growth.

6. Conclusion

The application of blended learning mode in university computer foundation courses has effectively improved the quality of teaching and the learning effectiveness of students, and promoted the professional development of teachers. By restructuring teaching objectives, optimizing teaching content, innovating teaching methods, and reforming evaluation systems, blended learning has achieved personalized, interactive, and practical learning experiences. Despite the challenges, the continuous optimization and promotion of blended learning models are of great significance for cultivating high-quality computer talents that meet the needs of the times.

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