

Research on The Mixed Teaching Mode of Python Language Programming Course

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Abstract: With the development of the Internet era, big data, artificial intelligence (AI), and other fields of innovation and change, Python has become the most popular programming tool in the digital field because of its simple grammar and convenience for students to learn. It is also one of the important skills that college computer science students need to master in the face of market demand changes. The degree of mastery of the Python language programming course directly affects students' ability to use computers to analyze and solve problems. To improve the teaching effectiveness of the "Python Language Programming" course, this paper mainly explores the integrated and blended teaching mode of said course.

Keywords: Universities; Python language programming; Blended teaching mode

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1. Introduction

As for the traditional teaching mode of Python Language Programming for computer majors, most are faced with the weak knowledge foundations of students, insufficient teaching platforms, and teaching resources, which cannot meet the actual needs of students. This paper carries out mixed teaching of information technology (IT). The design of the blended teaching mode is optimized from the directions of teaching content, teaching path, and student body, and is integrated into the whole teaching process to achieve good teaching results TO enhance the student's learning interest and programming skills. With this, the expected teaching objectives of the Python Language Programming course can be achieved to provide a reference for similar courses to implement blended teaching^[6,7].

1.1. Concept and characteristics of blended teaching

1.1.1. The concept of blended teaching

Through innovation and reform, the blended teaching mode is different from the traditional teaching mode as it is often assisted by IT. Professional educators utilize a blended teaching approach, incorporating different kinds of educational resources to achieve the expected teaching objectives of the course. Educators give full

play to the auxiliary role of IT, rationally optimize the teaching plans, emphasize the efficiency of online and offline teaching, integrate teaching links, improve the effectiveness of classroom teaching to create customized teaching services for students, and achieve the teaching goals.

1.1.2. Characteristics of blended teaching

Blended teaching integrates the relevant advantages of IT, which help teachers in the actual teaching process. Rather than adhering to traditional methods, teachers take on the roles of guides and orchestrators. At the level of students' learning, more emphasis is placed on their autonomy, so that the learning experience is more conducive to the student's performance ^[1]. Fully understanding the characteristics of blended teaching allows help teachers to fully implement the role of blended teaching. As for the blended teaching mode, it should give full play to the application effect of IT in the process of assisting classroom teaching. However, the blended teaching mode is not equivalent to technology-based teaching. Students also play an important role and the fundamental purpose and essential attribute of teaching is to promote the healthy development of students.

2. Problems existing in the teaching process of Python language programming

Python language is a cross-platform, open-source interpreted programming language, which is characterized by simple code, beautiful language, and simple and studious characteristics. It may seem like a simple course, but it puts many students at a loss. Firstly, the course positioning is unclear. Not only is Python offered in computer-related fields but also in non-computer professional settings. It is a public elective course, which is equivalent to some universities positioning it as an introductory programming course. Nonetheless, the biggest feature of Python is that it has a strong third-party library, which makes it widely used in web development, scientific computing, automatic operation and maintenance, and multimedia applications. Teachers would need to explain the basic theoretical knowledge and grammatical structure of Python language to students in class, which does not meet the student's learning expectations and cannot enhance their learning interest. Hence, this teaching effect is not ideal ^[2].

The teaching task of Python is heavy. In addition to the detailed explanation of Python language programming, it also involves Chinese and English word segmentation, JSON library, regularization, web crawler, database programming, parallel processing, data visualization, etc. However, the class hours of this course are only more than 30, and the learning load is intense and onerous. As a result, professional teachers will teach at a faster speed to meet the teaching timelines. This increases the learning difficulty of students and eventually leads to poor classroom teaching results and poor learning quality, which produces certain obstacles for the subsequent development of various courses. Implementation of the blended teaching mode can effectively expand the classroom teaching time. Teachers can select simple content to participate in online teaching. Online self-study not only reduces the pressure on teachers in classroom teaching but also improves the student's self-information learning and further enhances their independent learning ability.

For non-computer major students, Python language programming is only an elective course, where the purpose of learning is only to obtain the corresponding credits. The underlying learning motivation is low and the learning enthusiasm is not ideal ^[3]. For computer major students who have already mastered C and Java languages in the early stage, learning a programming language again, especially re-learning basic grammar knowledge as required, is prone to learning inertia and low enthusiasm. How to mobilize the learning enthusiasm of students of different majors and different levels is a long-term problem that needs to be addressed.

3. The practice of mixed teaching mode of Python Language Programming courses in colleges and universities

3.1. Strengthen independent learning and interaction before class

Before the beginning of the course, the teaching syllabus can be uploaded to the cloud platform, including the release of relevant documents during the learning process. Teachers ought to reasonably demarcate the learning content and objectives of each course, as well as its specific knowledge, the relevant parts, and the supplement of PowerPoint software. In addition, instructions should be made before class to allow students to have a correct understanding of the teaching plan, and then meet the individual needs of students so that they have a strong independent learning ability.

3.2. Make great progress and improvements in the course

To improve the effectiveness of classroom teaching, online and offline teaching can be integrated by making full use of the Tencent conference and other platforms to participate in online training. WeChat, QQ, and other software can be used to send meeting IDs to students, using the form of screen sharing to complete synchronous teaching ^[4]. The course content mainly includes a pre-class introduction, a practical discussion, and a summary. According to the introduction of the course content, the previous course content should be discussed and the completion of students' homework after class should be analyzed. An in-depth analysis of the knowledge points where students make frequent mistakes can be conducted. Feedback on the preview of the course content can be analyzed to further explain the importance and challenging points of the course. For the explanation of knowledge, each knowledge point is divided into different parts delicately and capably, and each paragraph is controlled within 15 minutes of explanation, where contact and discussion are subsequently conducted. For the practical part, there are also various forms of application. For example, the students can be encouraged to raise their hands during classes or Tencent meetings ^[5,6]. Encouraging participation can fully stimulate the student's learning enthusiasm, guide them to internalize what they have learned, summarize problems, or apply knowledge guidance and other paths to integrate knowledge in books, clarify the logical relationship between different knowledge, synthesize their understanding and skills of knowledge application, and gradually answer the students' queries.

4. Teaching research of Python language programming course based on the blended teaching mode

4.1. Achieve the mix of the teacher's leading role and the student's main position

The Python language programming course can cover the whole process of teaching knowledge, synthesizing the basic program structure of Python, and integrating it into practical projects. These projects include simulating battles, determining game outcomes, animation for supplementary purposes, and crafting narrative scenarios tailored to the student's interest. This approach strengthens the smooth integration of teaching content with classroom objectives.

By completing the rational design of knowledge teaching links, we aim to instill in students that programming can be used to solve practical problems. To achieve the ideal teaching effect, teachers need to maintain students' interest in learning, enhance their initiative to participate in class and cultivate their independent exploration ability ^[8,9]. From a practical point of view of life, teachers should deepen students' classroom learning experience, allow them to have a deeper understanding of professional knowledge, and improve their learning interests. In the whole process of teaching, it is necessary to ensure students' main position, give full play to their subjective initiative, realize students' self-construction, and create good learning

conditions.

4.2. Promote the mix of classroom teaching and online learning

The Python Language Programming course has strong practicality and extensive teaching content. There are some differences in the basic knowledge of IT. Teachers who are not satisfied with the classroom teaching links should combine IT to create a new teaching environment for students. For example, the application of Internet technology provides a good environment for practical teaching activities. In this regard, a website named “Python language Program Blended Learning” can be developed to gather educational resources. It includes databases, practical teaching, teaching cases, and knowledge development for students’ independent learning. In the limited teaching activities, teachers can integrate all kinds of knowledge and use classic cases to emphasize the important and difficult points repeatedly. Under the guidance of teachers, students can complete practical operations through online learning, independent learning, or collaborative learning to deepen their understanding and mastery of the teaching content and expand the corresponding knowledge according to their abilities. In the mixed teaching mode of classroom teaching and online learning, the ratio of teacher-led class hours, the mixed time, and the mixed mode of classroom teaching and online learning are discussed^[10,11]. In the mixed teaching mode, teachers should focus on teaching and implementing practical activities. In classroom teaching, teachers should partially conduct systematic explanations and let students practice at the same time after the case demonstration. The organic combination of classroom teaching and network learning complement each other and can comprehensively cultivate students’ computer application ability, problem-solving ability, independent learning, and cooperative learning ability, hence being able to meet the learning requirements of students at different levels.

4.3. The mixture of diversified guidance and strategies

In classroom teaching, teachers should provide diversified guidance to students to improve their comprehensive ability. Implementing a variety of strategies and updating classroom teaching methods can enhance students’ awareness of IT, thus improving their comprehensive ability. For example, when teaching the basic knowledge of Python, teachers should guide students in a timely and appropriate manner. This includes not only students’ mastery of the knowledge points but also their thoughts on whether the new knowledge points can help solve practical problems in life^[12-15]. By applying these three program structures to classroom teaching, students can skillfully apply information technology knowledge in real life.

5. Conclusion

Amidst the rapid development of Internet technology, educational reforms have been increasingly apparent, with a set of network teaching modes based on information support being widely recognized. In particular, colleges and universities have started to actively implement online teaching forms, promote the reform and innovation of classroom teaching modes, and implement online and offline teaching. The blended teaching mode can effectively improve the shortcomings of traditional offline teaching mode, deepen students’ learning level, adapt to the requirements of students’ autonomy and personalized learning, and thus ensure the improvement of the learning effect. The Python language programming course is important to improve students’ information literacy. Therefore, it is necessary to study the application of the blended teaching method in the course of Python language programming.

Disclosure statement

The author declares no conflict of interest.

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