Exploration of "Internet+" teaching mode for professional courses of civil engineering major based on online education

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Abstract: With the development of mobile communication technology and the emergence of different intelligent mobile terminals, mobile teaching has been widely recognized in domestic colleges and universities. With the aggravation of COVID-19, online education based on mobile terminals has become an important means of online and offline education methods, and has achieved a lot of results. Further improvement and reform of the implementation of online teaching will surely promote the further development of education.

1. Introduction

With the development of mobile communication technology and the emergence of different intelligent mobile terminals, mobile teaching has been widely recognized in domestic colleges and universities, and some schools have already tried different degrees of mobile teaching through the Internet and mobile phone applications. Using the new media communication characteristics that smart mobile terminals have, it is convenient for students to use fragmented time and make learning everywhere.

In recent years, the COVID-19 has had a great impact on the normal classroom teaching in colleges and universities, faced with the dilemma that offline teaching cannot be achieved, the Ministry of Education has released documents on the organization and management of online teaching. It is required to adopt a government-led, university-led and socially participatory approach to open the online resources of courses for free, and jointly implement and guarantee online teaching in universities during the epidemic prevention and control period, so as to realize "Suspension of classes without stopping teaching and learning"[1]. With the assistance of online teaching platforms, higher education institutions have used a large number of online teaching resources to carry out online teaching based on the Internet, which has successfully ensured the normal teaching sessions of higher education institutions. Online teaching is an emergency measure in extraordinary times, and it is a big challenge for most teachers and students.

2. Internet-assisted results-oriented education

The concept of outcome-oriented education is an education model based on learning output (Outcomes-based Education, abbreviated as OBE), its main educational ideology breaks away from traditional classroom teaching and focuses on the cultivation of students' multifaceted abilities and thinking in a student-centered manner. Under the influence of the COVID-19, the distance online teaching of courses is different from traditional classroom teaching and blended teaching because teachers and students rely on network connections. For teachers, it is worth thinking about how to make use of live streaming tools and learning platforms, how to design teaching contents, how to enhance students' participation in class, and how to ensure teaching effectiveness [2]. Therefore, the outcome-oriented concept is an effective teaching concept to ensure the effectiveness of distance online teaching under the influence of the COVID-19. Teachers set the expression of learning outcomes in advance and finalize the learning outcomes through teaching design and

implementation of teaching activities.

3. Online distance learning design of professional courses based on OBE concept

The distance online instructional design of professional courses based on the OBE concept is how to integrate the course knowledge system, design the teaching process, and conduct effective teaching evaluation under the premise of focusing on students' learning outcomes. The PDCA cycle is a method of total quality management that can be applied to teaching quality management to ensure teaching outcomes. Therefore, the PDCA cycle and the OBE concept can be combined to design the distance online teaching design activities. The teachers' activities are to analyze the learning situation, determine the learning outcomes, reverse design the teaching content, create realistic scenarios, create learning resources, concentrate on the important and difficult points, test in real time, summarize and adjust, assign the materials related to the learning outcomes, collect the outcomes, reflect and evaluate; the students' learning activities are to review the previous section, clarify the learning outcomes, understand the context of the scenarios, understand the learning outcomes, and understand the teaching process [3]. Students' learning activities are reviewing the previous section, clarifying the learning outcomes, understanding the context of the situation, understanding the teaching content, internalizing the important and difficult points, completing the assessment, exchanging and discussing, completing the learning outcomes, and summarizing and communicating.

4. Distance online teaching implementation of civil engineering courses under the influence of COVID-19

Civil engineering courses are all characterized by both theory and practice under the influence of COVID-19 and home learning, how to rely on the Internet to achieve online instant teaching and carry out effective organization of course instruction is the key to teaching each professional course, and the presentation of learning outcomes is an effective way to test the learning of the course.

Combining the characteristics of professional courses and different application methods of online teaching platforms, we choose to live-stream the distance online teaching activities of the courses, while combining interaction and communication to launch combined online and offline teaching activities [4].

4.1 Preparation stage before live broadcast -- determine learning outcomes and design teaching content.

Identify course learning outcomes based on the course instructional objectives and break down these learning outcomes into each course presentation. Before the live broadcast of each class, determine the learning objectives and learning outcomes of this class, corresponding to the P (plan) stage of the course remote teaching design process. Before the live broadcast, we check the students' learning outcomes of the last class, analyze the learning situation, determine the learning outcomes, reverse the design of teaching content, and then preferably select pre-class teaching resources for the teaching content, including micro-lessons, PPT, videos, pictures, pre-testing questions, etc., while pushing the electronic teaching materials to the students together. According to the students' feedback on the pre-study resources and then adjust the lecture content during the live broadcast, carefully design the teaching content and difficult knowledge explanation during the live broadcast, and develop the teaching design plan [5].

4.2 Implementation stage in live broadcast -- explain difficult knowledge and carry out classroom interaction.

The key is classroom interaction and motivating students to learn during each class live, corresponding to the D (implementation) and C (checking) phases of the course distance learning design process. The key to each lesson live is classroom interaction and motivating students to learn, corresponding to the D (implementation) and C (checking) stages of the course distance learning

design process. During the live broadcast, the teacher first uses the live broadcast platform to create the situation, clarify the important points of teaching and the important points of knowledge to be explained, and the students listen to the teacher with the questions from the pre-study. After the completion of a knowledge point learning, return to the online teaching platform for testing, discussion, brainstorming and other activities to see how well students have mastered the important and difficult knowledge. Teachers timely adjust the teaching content according to students' interaction with what they have learned to achieve the teaching objectives, while deepening teacher-student interaction and communication. At the end of each live broadcast, students are given 3 minutes to summarize and evaluate their knowledge of the course, view their comments on their knowledge, and understand their evaluation of their knowledge of important and difficult points [6].

4.3 Post-broadcast feedback stage -- learning results are displayed and personalized guidance is provided.

After the live broadcast of each class, personalized question and answer as well as guidance will be provided according to the situation of students, corresponding to the course distance teaching design process a (processing) stage. After understanding the learning situation of the whole class, the background resources required for the learning outcomes are pushed, students complete the learning outcomes and submit them, the teacher checks the completion of the learning outcomes one by one, reviews the learning outcomes, and uses the online platform to communicate and discuss with students to further strengthen the difficult knowledge, thus forming a complete PDCA teaching cycle. At the same time, teachers prepare resources for the next live session to enable targeted instruction.

5. Conclusion

Online distance learning is an effective measure to ensure students' learning under the influence of COVID-19, but it puts higher demands on both teachers and students, especially for courses with both theoretical lectures and practical exercises. Teachers and students carry out remote online teaching and learning with the help of live tools and interactive learning platforms, which not only improve teachers' teaching ability and information technology teaching literacy, but also greatly cultivate students' self-learning ability and ability to summarize, and at the same time bring rare opportunities for traditional classroom teaching reform. According to the characteristics of the curriculum, teachers establish the educational concept of centering on learning outcomes, carefully design the teaching live process, select rich teaching resources, carry out a variety of interactive modes, actively feedback the problems raised by students, and focus on student self-management. Staying at home while studying at home ensures the healthy development of efficient education and teaching.

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