Research on Optimization of Teaching Mode of Energy and Power Engineering Major Based on "MOOC + Flipped Classroom" under the Network Technology

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Abstract. There are still many problems in the current network teaching practice of energy and power engineering, which need to be innovated. The new teaching mode based on “MOOC + flipped classroom” is helpful to change the disadvantages of traditional teaching mode and improve students' application ability. This paper first introduces the teaching mode of “MOOC + flipped classroom”, then analyzes the problems existing in the construction of network courses of energy and power engineering major in colleges and finally gives a new teaching mode design based on “MOOC + flipped classroom” under the network technology.

Keywords: MOOC, Flipped Classroom, Energy and Power Engineering Major Specialty

1. Introduction

At present, colleges and universities are carrying out the reform of teaching mode, but there are still some problems, that is, the knowledge learned by students cannot match the actual engineering practice perfectly. Especially for the students of energy and power engineering who have high practical requirements, the students of energy and power engineering have problems that theoretical knowledge and practical work of energy and power engineering technicians cannot be used for each other, which need to be solved urgently. Therefore, colleges and universities need to increase practical teaching for students majoring in energy and power engineering[1]. With the change of Internet and multimedia technology, a new teaching mode of "MOOC + flipped classroom" has emerged, which brings new opportunities to the teaching of energy and power engineering major in colleges, and is more conducive to the realization of teaching objectives, while avoiding new problems. Therefore, it is of great practical significance to conduct in-depth research on this.

2. The teaching mode of “MOOC + flipped classroom”

As a new type of online course, MOOC provides the possibility for the spread and exchange of knowledge around the world. Its characteristics include large-scale, open and linear. Through the MOOC platform, all teaching and learning, teacher-student interaction, learning quality evaluation and other processes of the course can be realized[2]. The characteristics are shown in figure 1 below.
As a new teaching method, flipped classroom provides students with a good learning environment and promotes students to carry out active learning. The difference between flipped classroom and traditional classroom is shown in figure 2.

The biggest advantage of "MOOC + flipped classroom" teaching mode is online learning and offline communication and discussion. For students, this model helps to stimulate their interest and initiative in learning. For teachers, they need to make teaching videos, design classes, supervise and guide students' activities[3].

3. Problems in the teaching of energy and power engineering in colleges

3.1. Lack of education on students' practical ability
At present, in many colleges and universities, the teaching of energy and power engineering is still in accordance with the traditional teaching mode, and the teaching of theoretical knowledge is far greater than the training of practical ability. It could see that from the teaching arrangement of this major that the current teaching lacks the cultivation of practical awareness of students. Students are more passive to accept the school's practice teaching, in practice, students only contact with the report of practice and theoretical results[4].

3.2. Problems in the construction of network course of energy and power engineering major
At present, the main problems in the construction of network course of energy and power engineering major in colleges are the hard separation of course content, which is not conducive to students' understanding and mastering of important knowledge points. Secondly, the lack of interaction between teachers and students means that communication channels are not smooth. Third, bilingual MOOC courses are lacking, as shown in figure 3 below.
3.3. Teaching content and assessment methods are outdated
Most of the pediatric nursing teaching content of nursing specialty in higher vocational colleges is lack of clinical practice teaching, the proportion of theoretical courses is larger, the content of clinical practice teaching is less, the teaching content is out of line with clinical practice, and the distance from clinical practice is widened. These factors are not conducive to the cultivation of students' practical ability. In addition, at present, the examination paper is still the main part of paediatric nursing course assessment. The examination paper can only examine the theoretical knowledge and the degree of memorization of students, but not the clinical comprehensive ability, problem-solving ability, knowledge application ability, unity writing ability and nurse patient communication ability of students. In order to evaluate the teaching effect comprehensively, objectively and fairly, it is necessary to realize the diversification of examination forms[3].

4. Design of teaching mode based on "MOOC + flipped classroom"

4.1. Pre-class design
First of all, teachers of energy and power engineering divide the teaching content into knowledge units according to the key points and difficulties of the course. Integrate each knowledge unit according to the internal logic of the degree of connection, learning style requirements and teaching objectives. Then, the integrated resources will be based on the knowledge point unit, according to the content characteristics of each unit to develop the most suitable teaching method for the knowledge point of this unit, and make teaching video in the form of pictures, animation, text and so on. According to the characteristics of MOOC and students' learning habits, short and concise teaching video is the essence of MOOC video teaching, so the length of a single teaching video should not exceed 15 minutes. Finally, in order to ensure the enthusiasm and quality of students' autonomous learning, we should design a reasonable control mechanism to ensure the quality of autonomous learning. The mechanism should focus on the knowledge points in the video course, such as questions, tests, learning situations and unit assignments.

4.2. Design of classroom teaching
Teachers actively play the role of MOOC + flipped classroom, promote the interaction with students through flipped classroom, and actively feedback and explain various problems fed back by students in the classroom teaching of energy and power engineering, so that students can deeply understand the knowledge and improve the learning efficiency of students. In addition, in order to cultivate students'
practical ability, teachers should collect engineering examples or cases in advance, and guide students to use the theoretical knowledge and methods learned to solve practical engineering problems. This will not only help to deepen the students' mastery of relevant knowledge points, but also further stimulate their interest in learning and practical application ability, stimulate and cultivate their interest in learning and scientific research and innovation awareness.

4.3. After class design
The primary purpose of after-school link design of energy and power engineering is to test the learning effect and quality of students. In this part, we design the evaluation and assessment of the questions, tests, and unit self-examination and after-school assignments of knowledge points, so as to grasp the students' autonomous learning before class and the students' in-depth understanding and application of knowledge after MOOC teaching. Teachers should make full use of the discussion module provided by the online open course platform to realize interactive learning and timely reply to the difficult problems encountered in students' learning. The assessment method is closely related to teachers' teaching, students' learning, school teaching quality and the quality and ability of personnel training. Similarly, in order to improve the practical ability and level of students, teachers should set up corresponding practical tests in the purpose of the test, and increase the proportion of ability assessment in the test, so as to promote the overall development of students. In addition, we should change from single examination form to diversification, and use various means to investigate the comprehensive quality of students.

5. Conclusion
The teaching mode innovation of energy and power engineering specialty based on MOOC + flipped classroom is a complex system engineering, which requires the combination of work and learning, theory and practice[6]. MOOC + flipped class teaching mode is applied in the teaching of energy and power engineering, which not only improves the traditional way, but also exercises the teaching ability of teachers. That is to say, students' autonomy should be mobilized, their habit of self-study and ability of practice should be fostered under the network technology, teachers' creativity and innovation should be brought into full play, the significant teaching effect should be brought, and the teaching quality should be improved by leaps and bounds.

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