

Research on Teaching Reform Strategy of New Engineering Education Based on OBE Concept

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Abstract: With the advancement of domestic teaching reform in Colleges and universities, the problems of insufficient investigation of students' learning results in traditional teaching mode, difficulty in keeping up with students' learning progress and the lack of classroom learning atmosphere have been criticized by teachers and students in Colleges and universities. Starting from the teaching idea which was once popular in foreign countries and was guided by teaching results, this paper tries to combine the two teaching concepts on the basis of analyzing the advantages and disadvantages of traditional teaching mode and OBE concept in teaching, and puts forward a new teaching reform strategy of engineering education which combines OBE concept.

1. Contrast between Traditional Engineering Education Model and OBE Concept

“Outcome-Based Education” (OBE) is to construct the teaching plan and evaluation system with the expected output of learning as the core, and ultimately enable students to achieve matching learning outcomes at all stages of teaching. Unlike the traditional engineering education, which constructs the teaching system with the guidance of teaching content, the teaching system under the OBE concept aims at what students have learned, centers on students, guides students to study actively, emphasizes the evaluation and feedback of learning results, and changes the learning mode into encouraging students to study in different majors. Academic and inter-school learning to achieve mutual recognition of credit between schools. Because the OBE concept is guided by teaching results, its assessment method is no longer simply based on examination and score evaluation criteria, but on the assessment of each knowledge and skill node, using a variety of ways to conduct periodic and continuous assessment. The advantage of this teaching method is that it gives students more free learning space. As long as students can achieve the expected teaching results, teachers need not interfere with students' learning process. The comparison between traditional education mode and OBE education mode is shown in Table 1.

Table 1 Comparison of Traditional Education Model and OBE Education Model

type	Traditional Education Model	OBE Education Model
Sense of worth	Pay attention to the learning process	Focus on learning outcomes
Core Ideas	Focusing on Teachers and Textbooks	Focusing on Students and Activities
Teaching methods	Passive learning	Active learning
Learning style	They can only study in specific places such as class teachers.	Allow students to study in different majors and schools
Teaching Evaluation	Take exams and scores as criteria	Take the learning achievement of each stage as the criterion

It should be noted that the OBE teaching mode has been abolished after being widely popularized in foreign countries such as South Africa and Australia. This teaching mode itself has some limitations. Unlike the traditional engineering education mode in China, which focuses on process teaching, the OBE teaching mode pays more attention to results, or results, and teachers tend to guide students' learning rather than actual participants as organizers of teaching. Therefore, although students probably know the use of certain knowledge, they can use these tools. To get the

right result, it is difficult to fully understand the process of knowledge generation, and ultimately it is difficult to deeply understand all kinds of knowledge. There are also some problems in the traditional education mode. Although the process-oriented teaching method can make students understand knowledge better, it is difficult for all students to achieve enough learning results because of the limited hours. In other words, few people can really master the corresponding professional knowledge in an all-round way, and many students need daily life. Only by reviewing and sorting out can we grasp the corresponding knowledge. Therefore, the teaching mode combining traditional engineering education mode with OBE concept is the reform direction suitable for engineering education teaching.

2. Problems in the Teaching of Traditional Engineering Education

2.1 Insufficient Investigation of Students' Learning Achievements

Because of the tight class hours and heavy tasks of teachers in traditional engineering education, it is difficult for teachers to supervise and inspect students' learning results in time in class. Students' learning situation can not be feedback to teachers in time, which leads to teachers' inability to adjust teaching programs accordingly, and it is difficult to guide students' questionable knowledge points. There are only three ways for teachers to inspect students' learning situation: after-class homework, mid-term examination and final examination. The assessment of after-class homework can not be fully implemented. It is not only insufficient for students' assessment, but also extremely lack of training for students' ability to use knowledge, which eventually leads to many students attending classes. However, it is difficult to acquire enough knowledge and skills to be competent for the corresponding positions in future work.

2.2 It is difficult to solve the problem that students can't keep up with the teaching progress.

The inadequate investigation of learning results also brings difficulties to students' further learning. Because modern higher education is systematic teaching, if the lack of pre-knowledge points, it will lead to follow-up learning difficult to maintain. For example, the study of the principle of automatic control needs three basic courses of mathematics: advanced mathematics, linear algebra, complex variable function and integral transformation as the support, and related experiments also need courses such as circuit, digital electronic technology, analog electronic technology, motor and drag, etc. The interdisciplinary correlation of specialty courses is very close, which makes students in. If the learning results of a basic course are not strong enough, it can be followed up. It is a serious problem that students can't keep up with the teaching progress. Although many teachers make some of these students pass the examination by lowering the examination standard, they are faced with several times more obstacles in their future study than the students who have achieved all the teaching results.

2.3 Classroom learning atmosphere is not strong

Because the traditional teaching mode pays more attention to the perfection of teaching process and system, and neglects the students' normal assessment, this leads some teachers to concentrate more on the completion of teaching tasks than on the mobilization of classroom learning atmosphere. Some teachers have little interaction with students, pay little attention to students' learning outcomes, and the classroom learning atmosphere is not strong, which ultimately leads to the poor learning effect of students. On the one hand, the lack of classroom learning atmosphere leads to the loss of students' interest in the major, on the other hand, the poor teaching experience of teachers. Therefore, the lack of classroom learning atmosphere is a serious problem in traditional college teaching, which has a great negative impact on students' learning experience and teachers' teaching experience.

3. Teaching Reform Strategy of New Engineering Education Based on OBE Concept

3.1 Design assessment plan based on teaching results

In colleges and universities, the traditional education mode pays more attention to the integrity of the teaching process and neglects the assessment of the integrity of students' learning results. As a result, some students do not know whether they have achieved qualified learning results in the previous stage of learning, and teachers can not fully understand the doubts and shortcomings of students in this stage of learning. . Therefore, according to the concept of OBE, the assessment scheme should be designed according to the teaching results in the new subject education and teaching reform, so that the assessment can be carried out normally in the teaching process, and students should not study in the next stage when they can not complete the assessment. Because the OBE teaching concept does not restrict the teaching scenario, this teaching mode is more suitable for priority promotion in network courses. In the next stage of network course learning, students must pass the time-limited network examination in each stage to continue learning. In addition, the examination process of students is monitored by face recognition and camera, so as to ensure the fairness and fairness of the assessment and ensure the authenticity and effectiveness of the assessment of students. In this way, students' learning progress will show some differences, but it can ensure that students can grasp all the learning results required by the curriculum more comprehensively.

As for classroom teaching, the design of assessment scheme should be biased towards the test of homework effect. Colleges and universities should regularly organize students of all classes to complete the examination papers consisting of course assignments in the form of closed-book assessment, requiring unqualified students to study late regularly and supervise their time consumption in learning so as to guarantee him. They can finish the homework on time, quality and quantity. This model of learning supervision based on curriculum assignments is still in the trial stage, but during the trial period, the average score of final examination of advanced mathematics courses in pilot classes is much higher than that of other classes, which is worth popularizing in other colleges and universities.

3.2 Guiding students to study independently after class according to learning evaluation

According to the OBE teaching concept, teachers no longer restrict students' learning methods, students can choose the learning methods of network courses or cooperate with follow-up learning. Teachers regularly answer questions in the classroom in combination with online teaching feedback. The premise of guiding students to study independently after class according to learning evaluation is that students need the credits of corresponding courses to follow-up course learning without interfering with the learning order of the level courses. This kind of teaching mode will enable students to adopt a specific learning strategy of learning only one course for a period of time, making students more coherent in knowledge system learning, but there are also problems of forgetting curve. Although students can pass the course examination through centralized learning, because of the centralized learning time, the overall time spent is shorter, and the speed and probability of students' forgetting knowledge are higher. Therefore, before learning the post-curriculum, teachers should organize a comprehensive assessment of basic knowledge, and students can continue to study the professional curriculum only after the assessment has passed. For students who fail to pass the examination, teachers or systems will prompt students about the lack of knowledge, and give students three assessment opportunities. If students fail to pass the three examinations, they must re-learn some basic courses. This teaching method will ensure that students can achieve the corresponding learning results while ensuring the integrity of the knowledge system as far as possible, so as to avoid students studying for exams.

For the guidance of students' after-class learning, we also need to plan certain learning space and learning scenarios for students, help students to make reservations for after-class collective learning classrooms, teachers and teaching supervisors inspect the learning situation of their own learning classrooms irregularly, and implement key supervision for students' autonomous students to the

classes with low after-class attendance rate. In order to ensure that students spend their time on study when they study independently.

3.3 Optimizing Learning Experience by Combining Multiple Learning Styles

Traditional teaching mode in Colleges and universities can not bring good experience to both teachers and students, which leads to teachers' unwillingness to hand in and students' unwillingness to learn. To change this situation, we must start with the interaction between teachers and students, so that teachers and students have more communication in the classroom. Introducing the teaching model of bullet curtain in class, students can ask teachers questions about a certain knowledge point by sending bullet curtain by mobile phone, and students can also answer other students' questions on a certain knowledge point in the bullet curtain, so as to avoid the embarrassment of direct communication between teachers and students. For example, the establishment of a learning competition group, the assessment of students' learning effectiveness is no longer for individuals, but for each learning group, so if the overall performance of the group is not up to the standard, the whole group needs to re-learn the course, the group has three opportunities for each stage of learning assessment. Promote the construction of students' collective learning atmosphere in the form of groups, and group learning can make members of the group “advanced” pull “backward”, and ultimately achieve the construction of small group learning atmosphere, while avoiding the drawbacks of poor overall learning effect caused by poor class collective learning atmosphere.

4. Conclusion

In the implementation of OBE teaching concept in foreign countries, there are also some problems, such as the low standard of assessment of teaching results and the students' preference for passing the assessment rather than mastering the origin and development of knowledge, which makes this teaching concept abolished once abroad. Therefore, only by combining the actual teaching needs of our country with the advantages of the traditional education model and formulating a teaching reform program that is in line with the actual situation of students' learning, can we achieve rich results in the teaching reform.

References

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