



Development and Application of an Interactive Teaching Model for the ‘Introduction to Environmental Protection’ Course Teaching based on the Student’s Personal Individual Needs

Junfeng Li*, Yucheng Ren, E Reaihan, Meng Wang

College of Water Conservancy and Architecture Engineering, Shihezi University, Shihezi 832000, Xinjiang, China.

E-mail: ljfshz@126.com

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Abstract: The interactive teaching model is a modern method that takes the students as a main body and promotes their innovative ability teaching and training. The object of this paper is to discuss the application of interactive teaching model for the course teaching of the ‘Introduction to Environmental Protection’ course for the students major in the architecture based on the student’s personal individual needs. The main reforms include five aspects: the diverse forms of the class, the feedback mechanism for homework, the encouragement of the students’ answering questions, the customized homework and the reform of the assessment mode. Through the feedback of the classroom and the questionnaire, it can be seen that after the classroom teaching reform, the classroom interaction was increased, the students’ participation and the classroom enthusiasm was improved, the knowledge points’ mastering became better and the students’ satisfaction was improved obviously. The mode of teaching reform has laid a solid foundation for the popularization and application of the introduction courses of other majors.

Keywords: Flipped class; Individual needs; Teaching reform; Classroom feedback

1. Background of the course introduction to environmental protection

The interactive teaching model is a modern method that takes the students as a main body[1]. In recent years, in order to adapt to the quick social development and cultivate a large number of applied composite specialist in our country[2], the training programs were redesigned frequently accompany with the teaching reforms, which increases the proportion of practical teaching in the teaching process. In the 2013 training program, there is only the major of water supply and drainage engineering setting the course for introduction to environmental science. Since 2015, we had carried out the teaching reform of flipped teaching mode for water supply and drainage science and engineering specialty. After the flipped teaching of introduction to environmental science had been practiced by the undergraduates of water supply and drainage science and engineering major from 2013 to 2015, the teaching effect has been significantly improved, and the students’ learning initiative has been significantly enhanced.

Therefore, in order to further deepen the promotion of the flipped teaching mode [3, 4], expand the achievements of teaching reform, carry out the research on the flipped teaching mode in the curriculum system, strive to expand the good effect of the flipped teaching mode in the course, and comprehensively influence the exploration of new teaching mode of other introduction courses[5].

2. Measures of flipped classroom teaching mode

Through classroom feedback, using the traditional teaching method, there are mainly the following problems: 80% of the students do not like to ask questions by roll call in class; 60% of the students think that the classroom form is single and there is not much interaction; 30% of the students think that the content of homework after class is overlapping

and repetitive, which does not reflect the professional characteristics.

Through careful consideration and exploration of teaching reform methods, we decided to adopt flipped classroom teaching mode. Mainly from the following aspects to improve:

2.1 Enrich classroom forms

It organically combines classroom teaching, classroom discussion, homework feedback, pre-class questions, thinking in class and other ways to fully mobilize the enthusiasm of students. In the course of classroom teaching, videos and slides are used to teach, which has been recognized and praised by students. In addition, teaching supplement extracurricular knowledge in the classroom can broaden the scope of students' knowledge.

2.2 Establish a feedback mechanism for homework

By means of classroom reform, the original feedback mechanism after the homework is corrected is changed into asking students to share their answers with other students in class, which not only reflects students' sense of participation in class, but also can improve the quality of students' homework.

2.3 Encourage students to take the initiative to answer questions

The classroom questioning session was changed from a passive call to a self-directed answer session, which significantly increased the enthusiasm of students and made the classroom atmosphere more active. In addition, from the original simple classroom teaching to each section in the way of "asking questions first -- group discussion -- recommending and answering -- complementing each other", let every student participate in class discussion and express their own opinions and opinions in the group discussion.

2.4 Integrate ideological and political elements into the classroom

In terms of professional knowledge, this course mainly teaches the development of environmental science and the evolution of environmental thought, the development trend of modern environmental science, the frontier of the discipline and environmental hot issues. In the teaching process of this course, attention is paid to the cultivation of students' environmental science research and thinking skills, the establishment of local and global environmental concepts, and the establishment of environmental codes of conduct.

The chapter on Air pollution and Prevention mainly focuses on the influence of air pollution, global atmospheric environmental problems, and comprehensive prevention and control technology of air pollution, etc. In addition, the policy of China will resolutely win the blue sky battle and goal and development philosophy of adhering to the "green, low-carbon, circular, sustainable" will be integrated into the classroom to improve students' sense of responsibility.

2.5 Customized homework

In order to avoid the students reaction of assignments, with the problems of weak professional knowledge correlation, too broad content and the overlapping answer, the author will focus on the content explained in the class and consider from the perspective of architecture how to combine the homework with the major and the real life as much as possible when preparing for each class. The reform makes homework more customized, professional and personalized, which is highly praised by students and stimulates their enthusiasm for learning and ability to explore problems. At the same time, take real life as a case for analysis and solutions, take the initiative to guide students to use advanced Internet means to find information after class, review and consolidate the knowledge points learned in a timely manner. The open homework also contributes a lot to the cultivation of students' innovative thinking and ability.

2.6 Improve the assessment method

The examination has various forms after the classroom reform, with the usual score accounting for 30% of the total score, including attendance accounting for 30% of the usual score, and performance accounting for 70% of the usual score. Class presentation accounts for 20% of your grade, course papers for 20%, and closing exams for 30%. In the class presentation, some students choose the theme related to the course content by grouping, and the group representatives will make presentations on the stage a few weeks before the end of the course. In order to reflect the fairness of grading, we adopt a grading system in which teachers' grading accounts for 60% of the grade of the class presentation and students' grading accounts for 40% of the grade of the class presentation. The improved assessment method cultivates and exercises students' innovative thinking and ability from many aspects and angles, improves students' comprehensive quality and ability, and makes the assessment content more comprehensive, objective and reasonable.

3. Analysis of the teaching effect of flipped classroom teaching mode

Through classroom feedback and questionnaires, it can be seen that students' participation in class has increased and their classroom enthusiasm has increased. The author makes a comparative analysis of the classroom feedback before and after the classroom reform through questionnaire survey.

3.1 Comparison of classroom interaction

Classroom interaction before and after classroom reform is significantly different. After adopting the classroom reform, 71.4 % of students think that the classroom interaction is more and the interaction effect is better.

3.2 Comparison of knowledge acquisition

Students' knowledge mastery after classroom reform is improved compared with that before classroom reform. 96.4 % of students are able to master the knowledge points from class after classroom reform.

3.3 Comparison of students' satisfaction

Students' satisfaction also increased significantly after classroom reform, and the proportion of satisfied and very satisfied students increased significantly. However, there are still some students who are not satisfied. Through investigation and communication, it is found that some students have been used to the traditional teaching mode, and it is difficult for them to accept this teaching mode. They think that the classroom teaching mode is too diversified, and there are too many kinds of assessment methods, which will increase the pressure on students. However, 82.1 % of students believe that this teaching method can improve students' enthusiasm and enliven the classroom atmosphere. Moreover, the enthusiasm of students to answer questions is obviously improved, and the learning efficiency in class is improved, so that there will be no distractions or sleepiness in class.

3.4 Effect evaluation of students' ideology and politics

In class, by digging out the ideological and political elements of the course, the theoretical knowledge is skillfully integrated with the ideological and political elements of the course, which is deeply loved by students. According to the questionnaire, 96% students like to learn ideological and political content in professional courses, and 93% students have a positive attitude towards ideological and political content entering the classroom. 90% of the students think it is very necessary for ideological and political education content integrating into the classroom, and 97% of the students think that the ideological and political education effect of teachers in the classroom is very obvious. Students can not only learn theoretical knowledge, but also set up patriotism, cultural confidence, innovative spirit, craftsman spirit and so on, so that the theoretical knowledge can be ideological sublimation.

4. Conclusion

This study has carried out the teaching reform of the course of 'Introduction of environmental protection' to the major of architecture. The flipped class teaching mode was adopted. Through the feedback of the classroom and the questionnaire, it can be seen that after the classroom teaching reform, the classroom interaction was increased, the students' participation improved, the students' classroom enthusiasm enhanced, the mastery of knowledge points better and the students' satisfaction improved obviously. This teaching reform model also laid a solid foundation for the promotion and application of this course in other majors of our college.

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