

Research on classroom teaching reform path of solar cell new technology under the background of new engineering

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Abstract: Under the background of new engineering, the teaching mode of solar cell new technology needs to adapt to the change of social demand for related professionals, provide more practical education content, and train students with innovative ability and practical ability. In order to further improve the effective improvement of the quality of classroom teaching of new solar cell technology, professional teachers in colleges and universities should adopt advanced teaching concepts and reform and innovate classroom teaching activities. Based on this, this paper starts from the significance of classroom teaching reform of solar cell new technology under the background of new engineering, analyzes the current situation of classroom teaching of solar cell new technology, and puts forward optimization strategies.

Key words: new engineering; New technology of solar cell; Teaching reform

At present, with the increasing demand for renewable energy in society, solar cells, as one of the important representatives of clean energy, are playing an increasingly prominent role in the energy industry. Therefore, cultivating talents with the application ability of new solar cell technology has become an urgent need of the social industry. Under the background of new engineering, the social industry has put forward higher requirements for the teaching of new solar cell technology in colleges and universities. Therefore, colleges and professional teachers should continue to innovate and reform the new solar cell technology classroom teaching mode and teaching methods, so as to cultivate more high-quality professionals with solid theoretical knowledge and application skills of new solar cell technology.

I. The significance of classroom teaching reform of new solar cell technology under the background of new engineering

With the rapid growth of energy consumption in China and the aggravation of environmental pollution problems, solar cells, as a clean and renewable energy source, have great development potential. Therefore, colleges and universities through the establishment of solar cell new technology courses, help to train with solar cell new technology application ability of professionals, for the development of China's solar energy industry to provide strong support. In addition, under the background of new engineering, the traditional teaching mode has been difficult to meet the demand for professional personnel training in the solar cell industry. It is necessary for professional teachers to constantly reform and innovate the teaching of new solar cell technology, and introduce teaching methods that keep pace with The Times, such as group cooperative teaching and mixed teaching, to further stimulate students' interest and enthusiasm in learning new solar cell technology. In order to cultivate innovative and application-oriented solar cell new technology professionals. At the same time, the solar cell industry has become one of the strategic emerging industries supported by the state, and the demand for new solar cell technology professionals in related industries is also increasing. Therefore, colleges and universities need to speed up the pace of solar cell new technology teaching reform, to provide students with professional knowledge and practical skills in line with the needs of the industry teaching resources and teaching content, in order to improve their employment competitiveness.

II. The status quo of new solar cell technology classroom teaching

1. The teaching content is highly theoretical

Solar cell New technology is a relatively theoretical course, the teaching content involves the general situation of the solar energy industry, the principle of solar cells, solar cell modules, and the corresponding design, application, installation and testing content. The specific content is not limited to professional technology, and closely related to materials, physics, chemistry, mathematics and other disciplines. Although students of this major have a certain knowledge base of mathematics, physics and chemistry, it is still difficult for them to understand the theoretical knowledge of solar cells. For example, "photoelectric conversion efficiency" is an important concept in the teaching content of new solar cell technology, but most of the students only memorized the calculation formula and were able to meet the exercise exam requirements. The connotation of the formula is not deeply understood, and it can not be flexibly applied to solve practical problems in the later practical training practice or when stepping into the workplace. There are many similar formulas in the solar cell new technology course, therefore, teachers need to train students to form a good science and technology thinking logic, in order to make them better learn and master the solar cell new technology teaching content.

2. Practical teaching needs to be improved

In the context of new engineering, there are still some problems in the practical teaching of new solar cell technology classroom teaching, which need to be improved and promoted. On the one hand, some colleges and universities still adopt the traditional practical teaching methods, that is, experiments are the main method. Students simply follow the steps written in the textbook to carry out the experimental operation related to the new solar cell technology, lacking flexible thinking and exploration consciousness. This single practical teaching method is also not conducive to stimulating students' initiative and creativity. In this regard, teachers should constantly optimize the content of practical teaching and strengthen the combination of theory and practice. On the other hand, solar cell is a kind of high and

new technology, which needs certain experimental equipment and experimental conditions to carry out research and practical operation. But at present, the laboratory equipment and conditions of some colleges and universities are relatively backward, and it is difficult to meet the practical needs of students. This requires teachers to innovate teaching methods, such as using the Internet and virtual laboratories and other technical means, to help students better understand and master the relevant experimental operation and skills of new solar cell technology.

3. The evaluation method is relatively single

The traditional evaluation method of new solar cell technology mainly evaluates the students' learning situation by the written test results, which can not comprehensively evaluate the students' practical ability and innovative thinking in the new solar cell technology. Solar cell new technology is a highly practical course, only through the written test, can not truly reflect the students for the production, installation and commissioning of solar cells and other practical operations of the master degree. The written test results are not the complete learning results of students, nor can they fully evaluate the ability of students to perform in practical operations. In addition, the traditional evaluation method often focuses on the examination of students' memory and understanding ability, and it is difficult to truly evaluate students' innovation ability and problem-solving ability. The study of new solar cell technology should focus on cultivating students' innovative thinking, but the traditional evaluation methods are often unable to accurately evaluate students' performance in this respect.

III. The path of classroom teaching reform of new solar cell technology under the background of new engineering

1. Optimize the teaching content of combining science and practice

The combination of theory and practice is an important principle in modern education. In the classroom teaching of new solar cell technology under the background of new engineering, teachers should pay attention to the organic combination of theory and practice, through the explanation of theoretical knowledge and case analysis, so that students can better understand the principle and application of new solar cell technology. At the same time, teachers should make full use of the laboratory and other practical environment, carry out practical operation and experimental training, let students hands-on, hands-on practice, improve their practical ability and problem-solving ability. In addition, teachers also need to constantly update the course content and pay close attention to the latest development and application of new solar cell technology. With the continuous progress and development of science and technology, the new technology of solar cells is also constantly updated and evolved. Therefore, teachers can not stay in the past knowledge system, but actively absorb new research results and application cases, timely update teaching materials and course content, so that students can have access to the latest technology and practice. For example, teachers can select outstanding students and absorb them into scientific research projects related to new solar cell technologies in universities. Let students directly participate in the actual solar cell new technology projects, starting from the basic preparation of solar cell materials, step by step to improve the practical difficulty to solar cell assembly, performance testing and other links. And guide the students in this process, consciously apply their theoretical knowledge to practical operation, in order to improve the students' hands-on ability and comprehensive literacy.

2. The use of group cooperation teaching method

In the background of new engineering, the use of group cooperative teaching method is a very effective teaching strategy in the classroom teaching reform of new solar cell technology. Group cooperative teaching method can not only stimulate students' learning interest, but also improve students' learning effect, and cultivate students' teamwork ability and innovative thinking. First of all, teachers need to divide students into study groups of 4 or 6 and ask them to work in groups to discuss, research and solve problems together in this semester's study. This kind of cooperative environment can stimulate students' thinking and enhance their sense of cooperation and team spirit. Secondly, in a group, students can freely communicate and share their ideas and insights, thus stimulating more innovative thinking. For example, when teaching "dye-sensitized solar cells" related teaching content, teachers need to explain the structure and principle of dye-sensitized solar cells, as well as the latest scientific research trends. In addition, students are required to study photoanode, sensitizer, electrolyte, electrode and other related knowledge concepts through literature review and group discussion in small groups. While helping students understand the relevant theoretical knowledge of memory, they also enhance their thinking logic and expression and communication ability through group discussion. At the same time, in the group cooperation, students can also learn from each other and jointly improve the learning effect.

3. Innovate blended teaching models

In the teaching of new solar cell technology, the mixed teaching mode combines the traditional face-to-face teaching and modern scientific and technological means, stimulating the students' learning interest through diversified teaching methods and improving the teaching effect. First of all, teachers can use the online teaching platform to publish teaching courseware, teaching videos, experiment guidance and other teaching resources. Students can also learn independently and interact with teachers or classmates through the online teaching platform. This method breaks the limitation of teaching time and space in traditional teaching mode, and effectively improves students' learning efficiency. Secondly, the experimental operation of the new technology of solar cells usually requires a lot of equipment and laboratory conditions. And through the virtual experiment platform, students can carry out simulation experiments on the computer to simulate the real experimental environment. This not only saves experimental resources, but also allows students to better understand the experimental principle and operation steps. Finally, teachers should make full use of flipped classroom. Turn the classroom over to students and let them realize that they are the subject of teaching. Teachers can post learning tasks through the class QQ group or online teaching platform before class, and let students learn the important and difficult knowledge in learning tasks by consulting materials or watching

relevant MOOCs videos in the preview, and then show them in class to complete the connection from online to offline. After students present the task, the teacher will make unified comments to help students consolidate the knowledge and skills learned in this class.

4. Improve the course assessment and evaluation mechanism

At present, the assessment and evaluation methods of solar cell classroom teaching are relatively single, mainly in the form of traditional written tests. However, it is difficult to comprehensively evaluate students' practical application ability and innovative thinking ability in new solar cell technology only through written examination. Therefore, teachers need to adopt diversified evaluation methods to improve the evaluation mechanism of curriculum assessment. The first is to introduce project practice evaluation, so that students can apply the new solar cell technology knowledge and skills they have learned in actual projects. By participating in projects, students are able to practice problem-solving skills, teamwork and innovation. When evaluating project practice, teachers can consider factors such as the completion of the project, the effect of technology application and teamwork ability. Second, the evaluation should be carried out in the form of group discussion and presentation. In classroom teaching, students can be divided into groups and let them discuss the problems related to the new technology of solar cells together and present them in class. Through group discussion and presentation, students can improve their expression skills, communication skills and teamwork skills. Factors such as student engagement, accuracy and clarity of content can be considered when evaluating group discussions and presentations. Third, combine experiment and practice assessment. In the solar cell laboratory, students can carry out experimental operation and practical operation, and test their understanding and application ability of new solar cell technology through practical operation. The teacher can evaluate the students' experimental design ability, experimental operation skills and practical application ability through the experiment and practice assessment.

IV. Conclusion

To sum up, under the background of new engineering, solar cell new technology teaching reform is imperative. Professional teachers in colleges and universities can further improve the classroom teaching quality of new solar cell technology and the learning effect of students, promote the all-round development of students and enhance their employment competitiveness by optimizing the teaching content of the combination of science and practice, using group cooperative teaching methods, innovating mixed teaching mode and improving the course assessment and evaluation mechanism and other feasible paths. In this way, more excellent solar cell new technology professionals can be trained to meet the needs of new engineering background, and make contributions to the development of China's solar cell industry.

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