

Discussion on Teaching Reform and Practice of “Electrotechnics”

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Abstract: Through the reform of the teaching methods of electronic information undergraduate course “Electrotechnics”, the students’ theoretical knowledge level of electrotechnics and practical ability of electrical experiment skills are improved, so that students can truly experience the importance of experimental operation and practical application while learning knowledge. At the same time, we grasp the students’ learning attitude through the form of questionnaires, and summarize timely in the daily teaching process. In order to realize the continuity between the knowledge of “Electrotechnics” course and the application of the knowledge learned by students, we introduce experimental teaching related to the knowledge learned and the specific examples closely related to daily life in the process of practical teaching, so that students can understand and apply the knowledge more intuitively, and improve the enthusiasm of students to learn “Electrotechnics” course.

Keywords: Online Course Learning; Teaching Interaction; Integrating Theory and Practice

The reform of classroom teaching methods is a key indicator to evaluate the overall teaching level of a college. While focusing on classroom theoretical teaching, it is also necessary to strengthen the teaching of practical application. At the same time, for students, the degree of mastery of the curriculum content directly determines their future job choice, self-positioning and development prospects. “Electrotechnics” is a core compulsory course for undergraduates majoring in electronic information, communication engineering and mechanical design and manufacturing. The content mainly involves the basic principles of electrician and electronic technology and circuit analysis methods, which provides the necessary theoretical foundation for students to go to work after graduation. At the same time, with the popularization of Internet and the gradual improvement of modern information level, online teaching and learning has gradually become the important new teaching mode in the daily teaching process. Online courses facilitate teaching interaction, realize the sharing of high-quality teaching resources. At the same time, it has the characteristics of strong knowledge pertinence, clear learning tasks, diversified evaluation methods and controllable rhythm, which makes online course learning more and more popular among teachers and students in colleges and universities. Especially in the context of the global spread of COVID-19, the importance and urgency of online course teaching are highlighted.

Through the teaching of “Electrotechnics” in recent years, some problems in the teaching process have been found while summarizing experience, which need to be further consummated and improved. The specific problems are as follows. ① The link between theoretical courses and experimental courses is not sufficient. In the early ten weeks, the theoretical courses are taught, and in the later 2-3 weeks, the experimental courses are concentrated. At this time, many students are not familiar with the knowledge they have learned before, resulting in students’ insufficient understanding of experimental principles. Teachers need to re-explain basic knowledge and principles related to experiments, which is

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time-consuming and laborious, and teaching effect is poor. ② The course of “Electrotechnics” emphasizes the combination of theory and experiment. The lack of demonstration and operation of specific examples in daily classroom, and students blindly listen to teachers’ explanation of theoretical knowledge, resulting in students’ insufficient perception of knowledge and low enthusiasm in class. Based on the shortcomings and deficiencies of the classroom teaching of “Electrotechnics” in the above reality, we have implemented specific programs to improve the reform of classroom teaching methods.

1. Adding online course learning and fully confirm online student preview results

In the daily teaching process, online course learning enables students to make use of online video resources to preview independently and have a preliminary understanding of knowledge points, so that teachers focus on answering students’ questions in class. Teachers can flexibly set up classroom teaching methods according to the online preview situation. If students have good preview effect, the classroom explanation time will be shortened and the classroom interaction will be increased. In addition, the evaluation of students’ online learning process is also an important part of the whole teaching activities. Online learning adjusts and controls the progress of each teaching activity on the whole, which ensures the diversification of teaching activities and avoids the monotony of teaching knowledge in class. The corresponding documents of the Ministry of Education also require colleges and universities to actively organize and carry out online teaching activities in various forms and flexible ways based on their own actual situation. At present, the online teaching platform mainly adopts Superstar Intelligent Teaching System and MOOC Network Teaching Platform of China University. Online teaching communication methods mainly include Superstar Learning, QQ group and WeChat group, and teaching forms mainly include recording, self-study and online answers. Students spend so much time studying online that the same proportion of classroom teaching should also be given as the standard of performance evaluation. According to the specific teaching requirements and teaching objectives of the course, we should establish diversified performance evaluation methods that take into account the commonness and highlight the individuality, and appropriately increase the proportion of online learning process in the overall performance evaluation.

2. Timely adjustment of classroom teaching methods through questionnaires

In the daily teaching process, teachers should discuss and explain with students many times to grasp the dynamics of students’ learning in time. The questionnaires can timely know whether students are interested in the knowledge points they have learned. Meanwhile, teachers can also find some shortcomings in the teaching process and make timely adjustments. For example, the voice and intonation in class should be changed according to the degree of difficulty of knowledge, the solving methods of after-school exercises should be summarized, and the specific examples in real life related to electrotechnics should be selected as much as possible. These opinions reflect the learning orientation and interest points of students. According to the opinions of students, the following courses should focus on explaining the practical application examples related to electrotechnics, the latest development trend of electrotechnics technology, the use of electricity in daily life, and historical interesting stories related to electrotechnics theory. Through timely teaching investigation and interaction, the classroom teaching effect has been significantly improved compared with previous years, which enables students to finish this course in a relaxed and pleasant classroom environment.

3. Increase classroom interactive discussion according to practical application

Communication methods in today’s society is becoming more and more convenient, which is reflected in the teaching process that the communication and interaction between teachers and students are not limited by time and space. If students raise questions about knowledge points, teachers can answer them at the first time, or classify the common questions raised by students, answer and discuss them face to face in class. This not only improves teaching efficiency, but also deepens the degree of interaction between teachers and students, and enables them to better understand each other. In addition, in order to arouse the students’ subjective initiative of learning, teachers should also combine the development trend of modern science and technology to arrange homework for students, let students consult the content related to the knowledge points of this course, explain in the classroom and share with other students, as much as possible to explain the specific application of knowledge in real production and life. At the same time, each student can also act as a role of teacher, giving students more autonomy and opportunities to show themselves. Through the exchange of roles between teachers and students, the listener can learn new knowledge, and the lecturer can consolidate

the knowledge. This not only exercises the students' oral expression ability and thinking ability, but also broadens the idea of teachers' lesson preparation, and truly realizes teaching and learning.

4. Classroom teaching is closely connected with experimental teaching, classroom knowledge is closely connected with specific examples in daily life

After completing the teaching of theoretical courses, timely explanation of experimental courses is helpful to deepen the understanding and application of knowledge of theoretical courses. In addition, "Electrotechnics" is also closely related to daily life, so it is necessary to combine theoretical knowledge with practical application to achieve the expected learning effect. Due to the lack of demonstration and operation of concrete specific examples in the teaching process, students' perception of knowledge is not enough while listening to teachers' explanation of theoretical knowledge, which requires us to prepare specific examples in life closely related to classroom knowledge as much as possible. This deepens the understanding of the knowledge points of the transient process of energy storage components. As mentioned in the fifth chapter of the three-phase circuit, remind everyone of electricity safety in daily life and safe operation methods, in the case of not knowing the impedance of each phase of the three-phase circuit, the application of three-phase four-wire connection is the safest way to connect the circuit. By explaining specific examples in daily life, students have a new understanding of the subject of electrotechnics, and realize the importance of applying what they have learned.

5. Conclusion

To sum up, under the guidance of the informational construction strategy of colleges, innovative reform and practice have been carried out on the teaching mode in the teaching process of "Electrotechnics". In the daily teaching process, we should make full use of existing online and offline resources, pay attention to the close combination of theoretical teaching and practice, improve students' practical ability, understand and master theoretical knowledge in practice, and lay a solid foundation for their future study and work. First, in the arrangement of teaching methods, we should increase the proportion of online courses in the overall evaluation, let students independently arrange the learning progress and complete the learning tasks according to their own situation, make learning tasks become easier and simpler, meet the needs of individual learning differences, and enhance the enthusiasm of students to learn knowledge of electrotechnics. At the same time, we should pay attention to the communication and discussion with students, combine theoretical teaching with practice closely, improve students' ability of connecting theory with practice and understanding and mastering theoretical knowledge, and lay a solid foundation for their future study and work.

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