Research on Teaching Reform of Basic Electrical Courses under the Background of Applied Talents Training

Ai Liu[a,*], Xinling Wang[b], Bin Xue[c], Guiping Liu[d]

Qingdao Binhai University, Qingdao, Shandong, China

[a] 8831148@qq.com, [b] 447991452@qq.com, [c] 394527984@qq.com, [d] 465636746@qq.com

*Corresponding author

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Abstract: In response to the requirements of local colleges and universities for applied talent training, we actively reform the teaching mode, adopt project-based teaching, pay attention to “one subject-students”, implement “two modes-online and offline”, and use “three classes-classic class, flipped class and social class” to achieve “three changes- Follow me, Independent learning, and Going out". At the same time, we will deeply integrate ideological and political elements with professional knowledge to cultivate applied high-quality talents who serve the local economy.

1. Introduction

The educational philosophy of OBE emphasizes the result-oriented approach, focuses on cultivating students' abilities, and evaluates their learning outcomes. In the process of teaching, educators focus on guiding students to think independently and fostering their ability for independent learning. All instructional activities are designed and implemented with the aim of enabling students to achieve specific learning outcomes, with greater emphasis placed on the central role of students in instructional activities and their ultimate learning results.[1]

2. Teaching pain points and teaching reform strategies

2.1. The passive learning

Basic electrical courses include circuit analysis, analog electronic technology, digital electronic technology, electrical engineering and other courses. The knowledge system of these courses is highly theoretical, the study is boring, and the student attention is not enough, causing the classroom teaching effect not satisfactory. In response to this situation, we adopt the following reform strategies.

(1)Project-based teaching

The aim of adopting project-based teaching is to stick to the main position of the curriculum and improve students' learning effect and application ability in the classroom. The project selection is based on practice, which can be derived from production practice, various competitions and teachers' scientific research projects. At the same time, the theory, simulation and practice are integrated into one. Therefore, it is necessary to break down and reconstruct the knowledge points of the course, and make a task list with the goal of completing the project. Students work in teams to complete the project-related knowledge of learning, simulation circuit drawing, physical production, software programming or video recording. Finally, the team as a unit reports the learning results. Theoretical learning is presented through study notes and mind maps, simulation tasks are submitted online through the BB platform, and physical works are produced in groups.

In the process of project-based teaching, we adopt the teaching mode of “Online + offline”, “Classic Class + Flip Class” to cultivate students' ability of independent study.

(2)Establishing feedback mechanism to realize virtuous circle.

Students can provide feedback on doubts and difficulties through the self-learning platform, and teachers can adjust the teaching process in real time to answer, emphasize and supplement students' feedback questions. Students reflect on the learning process, and teachers reflect on the teaching

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process. This achieves two-way communication and collision, improves learning effectiveness and teaching quality, and realizes a virtuous cycle.[2]

(3) Adopting modern information-based teaching methods

In terms of teaching methods, we fully adopt information-based teaching, rely on online learning platforms such as Chaoxing Learning, collect and analyze students' learning data, carry out personalized teaching, and cultivate students' self-conscious and self-control ability.

2.2. Delink between classroom teaching and practice

Relying on various platforms of the school, we dig into various resources and use various channels to design practical projects and apply them to project-based teaching.

(1) Combination of virtuality and reality, integration of knowledge and practice, and extraction of simulation project.

(2) With various competitions as the goal, we rely on the school's artificial intelligence innovation laboratory, electrical association and other departments, design a variety of project cases to guide students to learn independently. And on this basis, we expand students' vision, cultivate students' innovative spirit, and guide students to participate in various competitions, such as Shandong Robot Competition.

(3) Relying on the school's practice centers, such as the Machining Practice Teaching Center or the World Animal Natural Ecology Museum, we design various maintenance and physical production projects, guide students to integrate theory and practice, exercise students' brain and hands-on ability, and cultivate students' excellent quality of being rigorous, realistic and responsible.

In the process of designing and implementing practical projects, the teaching model of "classic class (do it with me) + flipped class (independent learning) + social class(going out)" was adopted, so that students could fully appreciate the importance of theoretical knowledge and how to learn and apply it actively.

2.3. Lack of innovation ability

Construction of practical teaching system based on school "tutorial system". The project-based teaching method focuses on specific practical tasks, and sets up the model of double classes in class and after class, under the guidance of teachers and tutors. We construct a five-step training system of "research - practical operation - classroom display - self-analysis - teacher guidance".

To carry out practical tasks, we try to make students feel the charm of science and technology, the strength of the school and motherland, and train students how to stand on the shoulders of giants to create their own brilliance.

We create a classroom teaching activity competition to stimulate students' enthusiasm for innovation, cultivate students' sense of competition, and cultivate students' teamwork spirit. In addition, students are encouraged to participate in off-campus university science and technology innovation competitions to broaden their horizons.

3. Deep integration of ideological and political elements with professional knowledge

The school's service orientation is to focus on training applied engineering and technical talents for advanced manufacturing and modern service industries. The characteristics of electrical and electronic majors are to "serve the needs of regional economic development and the needs of talents in the service industry" as the goal. For the advanced manufacturing industry, applied engineering and technical talents with good professional quality, strong engineering practice ability and production site management ability are cultivated. In the course of ideological and political construction, the basic course of electricity will put the needs of enterprise talents in the first place, actively promote the "The 20th Spirit of the Communist Party of China into the classroom", set the following course ideological and political content.

The overall goal of the curriculum is to help students establish the world outlook and methodology of socialism with Chinese Characteristics Thought for a new era, to improve students' ability to analyze and solve problems, and comprehensively promote the great rejuvenation of the Chinese

nation with Chinese-style modernization. For example, in the course of analog electronic technology, the overall design of ideology and politics is shown in the figure1.

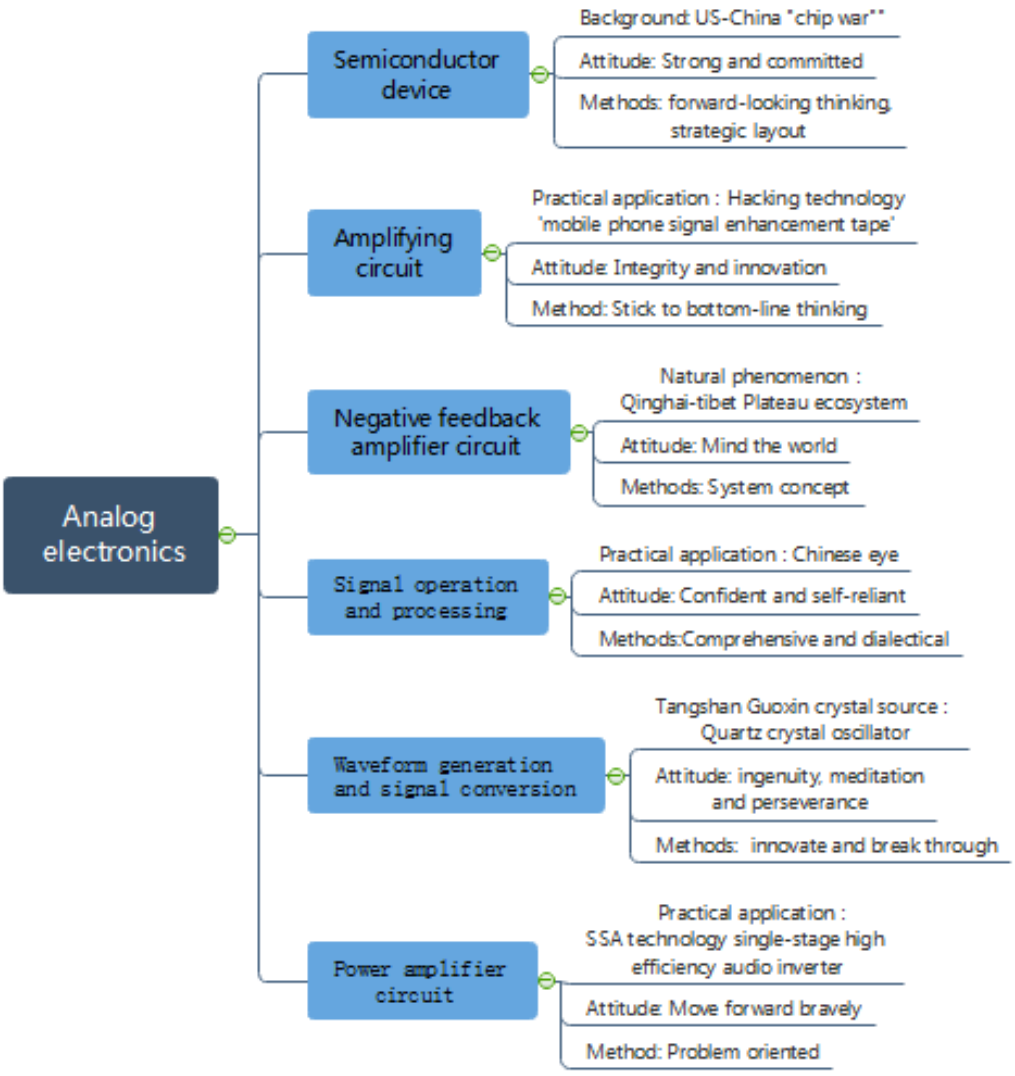

Figure 1 Ideological and political map.

Ideological and political elements are deeply integrated with professional knowledge and professional skills, mainly in the following ways.

(1) we have in-depth exploration of ideological and political elements, closely fit the domestic professional field of model figures and deeds, as well as the great technological achievements and social hot spots in recent years. Thus, the ideological and political education of students can be carried out explicitly.

When explaining the amplification circuit, it is introduced through the so-called black technology "mobile phone signal enhancement patch". we guide students to adhere to the right innovation, to look at the problem from a "scientific" perspective, and not to be misled .

(2)With the use of grade + flip, we innovate classroom teaching mode, implicitly introduce professional literacy and scientific literacy training. This kind of cultivation is not only carried out in the class, but also quietly extended to the extracurricular, and the values of students are subtly guided.

(3) The project teaching method is used to guide students to understand and learn professional frontier knowledge, use extracurricular time to cultivate students' scientific literacy and promote patriotic spirit.

(4) Relying on the practice platform of the school, we use project-based teaching method, professional practical training as a means, and campus culture construction as a carrier to promote

the craftsman spirit, train high-quality skilled talents for manufacturing in China. At the same time, we guide students to focus on their own career and expert national feelings education.

(5) Under the mode of industry-university-research cooperation, we make full use of enterprise resources to build the content system of extracurricular practice education, realize the organic integration of in-class knowledge and extra-curricular practice, encourage students to develop comprehensively, and cultivate students' professional quality. We guide students to establish a correct outlook on life and values, learn skills, and devote themselves to the construction of the motherland.[3]

4. Evaluation methods of course examination

4.1. Final papers

In order to broaden students' professional vision, cultivate students' innovative spirit and divergent thinking, and test the effect of ideological and political education, open test questions are added to the final paper. Open test questions are an inevitable requirement for promoting quality education and a major reform for local enterprises to train applied talents. In addition to examining students' mastery of professional knowledge, course assessment should also examine whether students have developed good moral character, correct values and good behavior habits in the learning process, which is also an important measure to test the implementation effect of ideological and political curriculum.

4.2. Final comprehensive score

The assessment mechanism of Extra-curricular practice (15%) + Extra-curricular innovation (5%) + in-class process (75%) are constructed. The whole process includes class performance, homework, unit tests, mid-term exams, lab courses and final exams, establish an open test set and integrate it into the final exam paper. In addition, the results of project-based teaching will be added to the evaluation in the form of practice and innovation, to solve the problem of the transformation of the results of ideological and political education, as well as the assessment and evaluation of curriculum ideology and politics.

5. Conclusion

Based on the concept of OBE, the task of setting project is used to drive teaching, design learning situations and carry out task-based teaching. We pay attention to students' main position, carry out the teaching mode of “online + offline" through flipped classroom, and give full play to the initiative of students' independent learning. Through "Classic class, Flipped class, Social class" "do with me, independent learning, going out" three changes are achieved imperceptibly. Professional literacy, scientific literacy and national feelings are deeply integrated with professional knowledge and skills, leading students' values, and cultivating excellent skilled talents for the country.

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