

Implement the Teaching Concept into the Classroom and Improving the Ability of Teaching Reform

Fang HE^{a,*}, Dou JI^b

Electrical Engineering College, Naval University of Engineering, Wuhan, Hubei 430033, China

^a wskay1103@163.com, ^b jidou@gmail.com

corresponding author

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Abstract: With the development of higher education, high-quality innovative talent training framework should be built in the new classroom teaching mode. The views is put forward to teachers that recognize the value of classroom reform, improve teaching professional ability and participate in the construction of reform evaluation system. Taking specific course as an example, the implement is expounded that introduce the teaching concept of cultivating innovative ability into the classroom from four aspects: adjusting of teaching content system, designing curriculum teaching practice, setting teaching assessment methods and excavating curriculum ideological and political elements, as to promote the transformation from knowledge to ability.

1. Introduction

The Ministry of education plans to build about 10000 national first-class undergraduate majors and 10000 provincial first-class undergraduate majors from 2019 to 2021, namely the "double 10000 plan" ^[1]. Issued was the opinions on deepening undergraduate education reform and comprehensively improving talent training quality. A series of effective deployment requires students to be busy, teachers to be strong and management to be strict ^[2]. Under the guidance of relevant policies on talent training in higher education, domestic colleges and universities have vigorously carried out a series of reforms in teaching methods, learning methods and examination methods. Higher education practitioners closely follow the needs of the times, actively participate in teaching reform. Taking students as the center and the cultivation of innovative ability as the guidance, new teaching ideas is implied into the classroom, which improve the teaching professional level, improve the reform practical thinking ability, and promote the transformation of education and teaching reform.

2. Changing Teachers' Traditional Teaching Ideas

2.1 Understanding the Value of Classroom Reform

Teachers should actively understand the importance of classroom teaching reform, examine their own educational values, learn relevant theories, update educational ideas in time, and gradually make themselves become reform practitioners with new ideas. Classroom teaching is an important part of teachers' professional life, and the quality of classroom teaching is an important embodiment of teachers' value and significance. Teachers should pay attention to the value of classroom teaching quality and actively invest in classroom teaching reform. As the direct experience of classroom teaching reform, students' attitude and adaptability to the reform determine the fluency of teachers' ideas reform into teaching behavior. Under the background of curriculum reform, with student development as the center, cultivation of innovation ability as the guidance, and integration of curriculum ideological and political elements, we will build a quality and skill training framework, highlight the cultivation of basic learning ability, high-level thinking ability and practical ability, effectively help students establish problem awareness, master the methods of analyzing and solving problems.

2.2 Implying the Reform Concept into the Classroom

Teaching reform can not be simply completed by teachers' operation, it contains the cognition and understanding of reform. This cognition and understanding needs to run through the reform process and be constantly tested and corrected in the new situation. In the implementation stage, the concept of innovative ability training is integrated into the teaching design. The integration of basic theory and practice and the cross integration of multi-disciplinary knowledge system are established. Explored is the teaching method of depth learning before class - full discussion in class - active reflection after class, and created are the real learning scenes of problem inquiry, scientific research and engineering practice.

3. Improving Teachers' Teaching Reform Ability

3.1 Break Through the Limitations of Reform Thinking

According to traditional habits, teachers are good at teaching methods based on explanation, and teaching reform need to change to "student-centered". Teachers need to pay more attention to students' learning, pay attention to interaction with students, stimulate students' internal learning, and improve their comprehensive quality and innovation ability in cooperative exploration. This is also a great challenge to teachers' teaching ability. Teachers follow the law of students' growth, conduct teaching guidance, carry out teaching reflection, and build a ability target containing ideological and political connotation. According to different training stages and different types of curriculum contents, basic learning ability, high-level thinking ability, working ability is projected to basic courses, professional background courses and professional courses. Teachers adjust their teaching behavior according to the actual situation and effectively combine the reform concept with their own teaching practice.

3.2 Improving Teaching Professional Ability

Every teacher should take their own professional development as the internal driving force to participate in the reform, drive the changes in cognition and action, and take the development of their own potential and development as the purpose of participating in the teaching reform. Teachers' professional development needs to go through a stage from novice to expert. Teachers need to constantly learn, change, reflect, keep pace with the times, and constantly gather teaching wisdom and feelings ^[3] - ^[4]. As teachers, we need to learn to take advantage of various campus resources such as university classrooms and experts, participate in various forms of teaching discussion activities to urge ourselves to improve teaching level, such as research courses, competition courses, demonstration courses, etc., go deep into the course discussion among teachers of different subject groups, have face-to-face communication on problems in teaching, and use collective wisdom, to improve teaching ability. Also, teachers learn to rely on the University steering group, actively invite experts to guide their classroom teaching, find classroom teaching problems and improve the teaching quality.

3.3 Participate in the Construction of Reform Evaluation System □

As the executor of curriculum implementation, teachers do not impart knowledge mechanically, but carry out curriculum implementation with improved thinking. They gradually become curriculum decision-makers, participate in curriculum evaluation, and construct a set of evaluation system and standards different from the traditional ones. Teachers' personal participation in the reform of the evaluation system can pay more practical attention to the teaching reform process itself, the improvement of teachers' teaching ability, academic ability and classroom control ability, and the growth and development of students' learning ability and thinking quality, which reflects the test of the process of teaching and learning.

4. Examples of Classroom Teaching Reform

Taking the circuit course as an example, the teaching concept of “student-centered and cultivating innovative ability” is implemented into the classroom from the aspects of teaching content system, teaching practice design, teaching assessment methods and curriculum ideological and political elements.

4.1 Reconstructing Teaching Content of Module

The circuit classroom reform takes reconstructing and refining the teaching content by modules as the starting point. The original three theoretical modules of DC, AC and dynamic circuit are integrated into four experimental modules: circuit operation law, circuit simulation calculation, circuit basic experiment and circuit assembly design. Circuit operation law is relatively basic, and it mainly adopts a model of self-study of basic knowledge points, explanation of theoretical difficult points, and experiment to strengthen theoretical understanding. Circuit simulation calculation mainly involves circuit analysis methods. MATLAB software is used for simulation calculation to train students to apply matrix theory, mathematical thinking. The basic circuit experiment mainly involves the time-domain analysis of dynamic circuit and AC circuit analysis, focusing on the relevant knowledge points of applying experimental measurement to explain the process and results of circuit theory. Circuit assembly design mainly cultivate the application ability of students' theoretical knowledge and comprehensive practical ability.

4.2 Carrying out Teaching Practice Design at Different Levels

Research on teaching design in combination with syllabus and teaching objectives (including teaching design and teaching function analysis). During the implementation of circuit course, the knowledge points of the course are divided by levels, and the corresponding knowledge and skill requirements are put forward. The software simulation compilation and platform operation experiment have been cooperating with the explanation of circuit theory throughout the course. The simulation experiment mainly focuses on the circuit system analysis method, as well as the circuits with visual images such as phasor diagram and spectrum diagram. The operation platform carried out nine experiments, including the research on Kirchhoff's law, superposition theorem, Thevenin's theorem, the measurement of AC impedance parameters, improvement of power factor, the measurement of three-phase circuit and mutual inductance circuit. According to the organic combination of software simulation and hardware operation and the cross of basic experiment and comprehensive design, a layered practical teaching system of "two levels and four categories" is formed. Students' ability, such as basic experimental skills, practical ability and scientific research ability, are well developed, when comprehensive design experiments are systematically carried out.

4.3 Setting Teaching Assessment Method

The action is implemented that formulate the whole teaching assessment, refine the evaluation methods from single classroom teaching to the whole course, systematically and comprehensively understand the mastery of students' knowledge and skills, and analyze the gain and loss of teaching process, as to provide scientific evaluation methods and further improve teaching effective. Circuit course changes the previous evaluation mode of usual score (50%) and final score (50%), and sets the mode of formative assessment (50%) and summative assessment (50%). Formative assessment includes exercise assignment, software programming design and experimental platform operation. Summative assessment is the final assessment by written examination. The scoring standard is exercise assignment (15%) + software programming (20%) + experimental platform operation (15%) + final assessment (50%).

4.4 Introducing Political Elements to Curriculum

In the classroom reform, introducing the ideological and political elements to the course, students can understand the laws of nature, appreciate the beauty of knowledge, inspire learning interest, control scientific thinking methods. For example, why are Ohm's law and Kirchhoff's law called the two basic laws of circuits? What is the essential difference between DC circuit and AC circuit analysis? These problems can be summarized as a philosophical way of thinking about how

to grasp the essence of things through phenomena. For example, how to model circuit devices? How can a circuit use a variety of circuit analysis methods to achieve the same result? These problems can be summarized as the unity of “two points theory” and “focus theory” in Philosophy^[5]. For example, if the capacitance value is too large and reaches over compensation of power factor in circuit, why cause the change of the circuit property? The problem can be introduced to cultivate the divergent thinking in philosophy of transforming quantitative change into qualitative change.

5. Conclusion

In fact, teaching reform is a difficult and long-term exploration and has to go through various development stages. The tasks and objectives are different at each stage, and the problems encountered are also different. Those successful classroom teaching reforms also encounter complex problems and difficulties in their specific reform process. For teachers who dare to try teaching reform, please allow them to make mistakes, give them time to grow and change, and create a loose atmosphere for teaching reformers.

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