

Teaching Thinking About Driving Unit and Driving Circuit

Xueting Liu

College of Electrical and Electronic Engineering, Shandong University of Technology, Zibo, China

Abstract

In view of the problems existing in the study of electric students and the thinking and understanding of the driving unit and driving circuit in the course of electrical specialty, this paper puts forward the training mode of learning habits based on LBL, the teaching mode of classification and grouping, and finally points out that it is necessary to cultivate the students' self-learning ability.

Keywords

Driving unit, Driving circuit, LBL learning model, Classifying and grouping teaching model, Autonomous learning

I. Introduction

In the face of the rapid development of electrical science and engineering and the change of students' skills training mode, it is the goal to cultivate high-quality composite electric talents with innovative consciousness and comprehensive ability.

It is a difficult problem to improve the ability to analyze and solve practical problems of electrical students, to expand their knowledge, to truly integrate the theory of electricity and to improve the teaching effect, so as to improve the teaching effect.

In April 2018, our school promulgated the guiding opinions on the post and assessment of teachers at Shandong University of Technology (Trial). The establishment of teachers' post tasks and assessment methods make the annual tasks and appointment goals of teachers more detailed and clear, and also put forward higher requirements for teachers' posts. The development task of the school is divided into the task of each college, and then the task of every faculty and staff is refined. Through the examination and supervision, the pressure is transformed into motivation and the motivation is transformed into self-consciousness. While increasing the pressure of teachers, we also tap the potential of teachers to a greater extent, enabling every teacher to become a "driving unit".^[1]

What is the driving unit? What is its function?

In electrical engineering, servo drivers are widely used to control the power of AC PMSM. At present, the main power devices of the mainstream servo drive generally use the intelligent power module (IPM) as the core of the driving circuit. The power drive unit rectifies the input three phase electricity or the city electricity through the three-phase full bridge rectifier circuit, and then gets the corresponding DC power, and then drives through the three phase sinusoidal PWM voltage inverter to drive. Three phase permanent magnet synchronous AC servo motor. Therefore, the driving unit is the core of the effective operation of AC PMSM. The driving circuit (Drive Circuit), between the main circuit and the control circuit, is used to amplify the signal of the control circuit (that is, the signal of the amplifying control circuit so that it can drive the power transistor). Its function is to amplify the output PWM pulse of the control circuit enough to drive the power transistor - switching power amplification.

In order to ensure the stable and efficient operation of the students' learning power system, what kind of "driving circuit" should be designed for this student's power system as a "driving unit"? Next we will analyze the main modules of the driving circuit.

II. Learning Habit Training Module Based on LBL

In order to optimize the learning effect of students, first of all, let them develop good study habits. With good learning habits, the improvement of students' learning efficiency can be realized, the

development of students' individual potential, the promotion of students' active learning and learning, the organic integration of the power system with emotion, wisdom and behavior system, so as to improve the core quality of the students.

Because of the great difference between the way of learning and the way of learning in primary and middle schools, the college students in the electrical profession should adjust their learning habits in time so that they are in good agreement with the law of learning and get better results.

Therefore, this paper proposes a literature based learning mode (Literature-Based Learning, LBL).

In 1969, Barrows, a professor of Neurology in the United States, founded a group teaching method combining self-study with tutor guidance in Mike maester, Canada: PBL teaching model [2-5] □ And gradually recognized and applied by other specialties ([6]).

With the rapid development of science and technology, university education pays more and more attention to innovative education, and more and more papers are published by the first author of university students ([7]-[21]) □ Combining this new phenomenon with the PBL teaching model, the LBL learning model proposed in this paper is a learning model based on Literature-Based Learning (LBL), which is related to the content of the teaching. "Taking literature as the guide and based on Problems" to provide students with innovative environment and help students to form innovative thinking as soon as possible. "Taking students as the main body, taking teachers as the leading" can improve the initiative of students' learning, give full play to the students' main role, and cultivate the students' self learning ability and innovation ability.

For example, in the analog electronics course, when it comes to the part of the negative feedback amplifying circuit, we can download some references related to this part, such as [22][23]. To guide the students to find out the relation and difference between the contents of the literature and the relevant contents in the teaching materials, and to dig out the essence of the difference, and on this basis, enlighten the students to connect the relevant knowledge together, get further results, and then form a paper.

The advantage of LBL learning model is to find out the connection between the knowledge of the teaching material and the literature, to combine the knowledge in the textbook, to find the combination and breakthrough point of the new knowledge, and to make the students change from the emphasis on the examination to the understanding, from the lack of creativity to the creation, the training of the students' thinking ability, the creative ability, the space imagination ability and the specialty. Ability to communicate.

Those who know are not as good as those who are good. The LBL learning model has greatly cultivated the professional thinking ability of the electric students. Compared with the traditional

teaching mode, the LBL learning model can arouse the enthusiasm and initiative of the modern college students, thus effectively improve the teaching quality.

The driving circuit sub module based on LBL learning mode is designed to focus on teaching materials and focus on innovation and practice. The practice shows that this is a highly efficient way of learning, which is very popular with students. It enhances the motivation and ability of students' learning, and can improve the subject literacy of electrical students in an all-round way.

III. Classifying and Grouping Teaching Model

Because of the differences in the students' foundation and the different ways of thinking, we should vary in the process of training LBL, and teach students in accordance with their aptitude, and adopt the teaching mode of grouping and grading.

On the premise of full understanding of the students, the teacher arranges appropriate teaching tasks and references for students at the same level and the same requirement, so as to stimulate students' interest in learning and develop good learning habits, so that students at different levels can raise their professional knowledge level and complete their knowledge. Teaching tasks and goals.

The classifying and grouping teaching mode breaks the old framework of the traditional requirements of the unified professional class, and truly considers the academic goals of each student. It is the embodiment of the basic and primitive function of the society for the basic and primitive society.

Class grouping teaching can optimize the teaching process. The teaching of classification and grouping fully mobilizes the initiative and enthusiasm of college students at different levels to learn basic and professional courses, so that the students of different levels and different needs have more gains. With the satisfaction of success, students also have strong interest in learning, so that they have the motivation to learn and make learning difficulties no longer difficult. Grading group teaching can also enhance the awareness and atmosphere of competition, and help form a good atmosphere for self-conscious learning. In the course of teaching, we can consider the level and needs of all students from the overall situation to determine the content of teaching, teach students in accordance with their aptitude, carry out teaching activities in a definite direction, and thus improve the quality of teaching.

IV. Cultivating Students' Self-Learning Ability

The program of basic education curriculum reform (Trial) puts forward the task of changing the way of students' learning, and advocates "independent, cooperative and inquiring way of learning", and the real cooperative learning and inquiry learning must be autonomous learning. A course in a university is usually only one semester or half a semester, so the time for a teacher to contact with the students is limited. It is better to teach people to fish than the fish. On the basis of the above measures, we should finally cultivate the students' self-learning ability.

To cultivate students' autonomous learning ability, we should follow the constructivism education concept of "teacher led and students as the main body". Teachers adopt the "three point two line" teaching process, namely, three time nodes in pre class, course and after class, and two forms of teaching in line and line. Teachers and students do different tasks each. Before class begins, the teacher understands the students' situation, designs the teaching plan, and releases the curriculum resources. Students form a 4 person learning group, composed of small group of

curriculum assistant. Course assistants assist teachers in teaching organization and formative assessment. For example, the teaching flow of digital electronic technology course is shown in Table 1.

Table 1 : Teaching process of digital electricity course

node	form	teacher	student
pre-class	Under line	Prepare lessons carefully, design teaching plan.	The group learned the relevant literature published in advance.
	On-line	Publish a preview list and a preview.	According to the preview list, preview the contents of the new course, read the micro lesson online, PPT, discuss with students, prepare for the preview test.
mid-class	Under line	Elaborate on the basic concepts, principles, key points and difficulties; organize and guide students to discuss and share. In class, teachers adopt various teaching methods, such as heuristic, problem oriented, flipped classroom and task driven.	Listen carefully, discuss together, show independently, answer questions, and simulate.
	On-line	Analysis of students submit design circuits, online testing, summary Comments.	Make full use of mobile phones or computers to access the information online, submit online design circuits and online tests according to the group.
aft-class	Under line	Summarizing teaching, accumulating teaching materials, marking students' homework, etc.	Carry out autonomous learning and group activities, complete the examples, comprehensive training and creative design in the course.
	On-line	Release students' autonomous learning content, organize discussion, answer questions online, correct homework, and timely feedback problems to students.	Do online tests, do homework online, read documents, and discuss with students and teachers and students online.

With the concept of “students as the main body and teachers as the leading”, teachers should combine the characteristics of teaching content and the basis of students’ learning situation in teaching. Through the teaching methods of “speaking and doing, learning and thinking, watching and practicing”, the teachers and students will be constructed and trained [24] under the teaching mode of “speaking and doing, learning and thinking, watching and practicing”. To cultivate students’ self-awareness and innovative spirit, to cultivate the students’ self-learning and the good habit of exploring, to stimulate the students’ internal learning motivation and to promote the students to master the methods of self-study, so that they have a great development in their self-study ability, thinking quality, and creative consciousness. We should explore the scientific way of learning, improve the passive situation in the learning process of electrical subjects, and improve students’ initiative in active learning.

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