



Research on Teaching Innovation of Automobile Construction(II) under the Background of Professional Certification

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Abstract. Engineering education certification is a basic way of professional evaluation of higher education, which emphasizes the student-centered educational concept. Based on the goal of ensuring that the rights and interests of the educated target are better reflected, according to the teaching practice experience and reflection of the course of Automobile Construction, and in view of the practical problems highlighted in the teaching practice process of the course, the innovation of multiple teaching methods, the reconstruction of course content, the reform of teaching evaluation mechanism and the integration with information technology, the innovation and practice of teaching mode, teaching content and teaching method are conducted. To take full advantage of its educational function, and explore the teaching mode of leading value, knowledge education and ability training, a new type of "Internet + teaching" mode is established, which can promote the reform of learning methods, improve teaching efficiency and stimulate the vitality of teaching and learning.

Keywords: Professional Certification, Course Teaching, Teaching Model, Innovation.

1 Introduction

The Automobile Construction(II) is a compulsory course for automotive majors [1], the teaching objectives of the course include: having the ability to analyse the chassis construction scheme, mastering the main construction of each component of a typical automobile chassis, working principles; based on mechanical principles, mechanical design and other knowledge, with the ability to analyse and compare different types of automobile chassis construction, principles, working processes, and can objectively evaluate their advantages and disadvantages, the first with the awareness of choosing reasonable structural solutions according to conditions; awareness of understanding the development trends of the automotive industry and cutting-edge automotive technology through independent study [2]. In order to achieve the above teaching objectives and improve the teaching effectiveness of the course, the teachers of "Automobile construction" (II) course, based on the teaching experience of the course, focus on

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the concept of student-centred education and take the return to the essence of engineering as a guide, study in depth the problems and shortcomings in the teaching implementation of the course, and actively explore the innovation and effectiveness of the teaching of the course.

2 The Key Issues Should be Handled in Teaching Innovations

As a traditional core course in automotive engineering, the teaching process of Automobile Construction (II) inevitably has some problems, as the following shows:

2.1 The Teaching Method is Too Single

The main form of teaching in colleges and universities is classroom teaching. The traditional teaching process of "Automobile Construction" (II) course is mainly reflected in the content of the syllabus according to the teacher, to impart knowledge to students in one way, and the lack of effective interaction between teachers and students [3]. For a long time, the passive and single teaching mode of "the teacher speaks on the podium, the students sit down and listen" has caused the teachers' teaching content to be dull, the classroom atmosphere is not active, and the teaching effect is relatively low. Students' thinking and enthusiasm for knowledge are seriously constrained in classroom teaching.

2.2 The Teaching Content is Seriously Homogenized

Through researching the teaching situation of Automobile Construction (II) in different universities, it's found that the homogeneity of the course is obvious [4], specifically: First, the homogeneity of the course syllabus, with the implementation of general education, the time of professional courses in all undergraduate institutions is constantly compressed, compared with other professional courses, the teaching content of Automobile Construction (II) is not reduced, but due to the continuous emergence of new constructions and technologies of automobiles, the course content is constantly updated and increased. Second, the practical teaching link is weak, and the universities that offer the course generally have the problem of emphasizing theory rather than practice, resulting in the practical time is low compared to the total course, and students have too few opportunities to practice, and do not have enough perceptual understanding to fully understand the content being taught, which makes the teaching efficiency poor. Thirdly, the teaching mode mostly adopts the teacher-centered "spoon-feed" teaching method, which seriously contradicts the student-centered education concept of engineering professional certification, easily causing problems such as too fast teaching pace, too much information, and students' inability to keep up with the pace of passive listening, which affects students' listening effect. Finally, the design of the teaching content, in addition to emphasizing the basic construction and principles of automobiles, does not add or update the latest knowledge of automobile

construction and new automobile technology to the teaching content of the course, which is prone to repeated teaching of the course content.

2.3 Outdated Teaching Concepts

Teachers' teaching concept has not changed with the requirements of the times. Many teachers in colleges and universities do not design teaching goals, teaching contents, teaching projects, teaching evaluation, teaching methods and other teaching elements from the student-centred concept, and believe that their teaching tasks are completed after the detailed explanation of the contents specified in the syllabus is poured into students' brains [5]. In the teaching process, they focus only on what knowledge students have mastered, without considering the training of students' abilities, and pay no attention to the training of students' abilities and the cultivation of students' motivation, interest and attitude from the perspective of classroom thinking and politics, resulting in the loss of the value-led nurturing function of the Automobile Construction (II) course. Although this traditional concept of education can transfer knowledge to students in a systematic way, it cannot fully cultivate students' ability to create their own ideas and innovative thoughts.

2.4 Inadequate Teaching Evaluation Mechanism

The teaching evaluation of the Automobile Construction(II) should include two aspects, one is the evaluation of students' learning effect, although many colleges and universities have introduced various forms of student evaluation, but more or traditional written examinations, and do not focus on the evaluation of students' individual self-learning ability and the ability of solving practical problems alone, resulting in the cultivation of students who are "nerds" , rather than the practical talents needed by society, which has laid hidden dangers for future employment. Second, students' evaluation of teachers' teaching effectiveness, many universities use the same mechanical standard to evaluate different types of courses, which cannot reflect students' real feelings and demands, and also creates an unfair impression for teachers, who cannot take effective measures to improve teaching quality, and affects teachers' enthusiasm and effectiveness in teaching.

3 Innovative Design and Effectiveness of Course Teaching

3.1 Emphasis on the Construction of Ideology and Politics

The fierce economic and technological competition between countries in today's world is ultimately a competition of education and talent. Education determines the future of a country and a nation, and is the cornerstone of the national revival and social progress. Education not only bears the heavy responsibility of spreading ideas, disseminating truth and shaping the soul of the times, but also has the important mission of serving the great rejuvenation of the Chinese nation.

Nowadays, the pervasiveness of information on the Internet and the diversity of sources and channels, as well as the rapid, extensive and convenient transmission of information are very popular among university students. Students no longer receive one-way knowledge and information that filtered by teachers, they can independently collect and judge online information, and inevitably receive a lot of undesirable or negative information, which makes the ideas and values received by the university students in the Internet era complicated. Therefore, the teachers of the Automobile Construction(II) course group give full play to the nurturing function of the course, dig deep into the ideological and political education content contained in the course, actively cultivate students' national sentiment and pride, explain the national science and technology strategy in real time, and strive to cultivate students' awareness of science and technology and their responsibility for the country. The seeds of ideology and politics are sown in learning, and the seeds are allowed to take root and sprout in struggle, with the task as the driving force to train students becoming young people who will prosper the country in science and technology.

3.2 Active Expansion of Diverse and Effective Teaching Methods

The course is based on the concept of "student-centred". In addition to the traditional lecture-based teaching, teachers actively develop diversified and effective teaching methods and teaching design step by step, aiming to enhance students' learning effect and exercise their practical engineering ability to solve problems. Specific measures:

- i. Implementing course projects, setting up different course projects for the important and difficult aspects of the course and the problems that students focus on and reflect their interest, and having students freely combine into course project groups according to their own interests, with the number of students participating in each group generally controlled at around six. According to the topic chosen in advance, the group members will review literature and collate relevant information on new constructions, technologies, measures or technological frontiers to achieve a specific function, and come to the lectern to explain their understanding of the topic and answer questions from other students. This activity requires the course project team members to correctly analyse the construction and working principles of the subject matter, and to analyse and evaluate the impact of new automotive constructions and technologies on the environment and social sustainability in automotive engineering practice. The teacher in charge of the course will comment and mark each group's presentation and demonstration in a timely manner, and the marks will be calculated proportionally into the final assessment of the course. This teaching method can fully mobilise students' participation and creative thoughts, and develop students' expression and teamwork skills.
- Second, discussion-based teaching: by guiding students to discuss the core issues of the course, students' understanding of the issues is deepened and their active learning ability and ability to judge the issues is enhanced.
- Third, question-asking teaching: after each class, students are encouraged to preview what they will learn in the next class, and before the class, students are allowed to ask their own questions and the teacher answers them, through which students ask questions

and the teacher answers them in a targeted way to solve students' knowledge problems.

3.3 Change the Concept and Break the Conventional Teaching Model

Under the new teaching situation, teachers cannot just follow the curriculum and implement the teaching content and mode. In response to the contradiction between the reduction of teaching time and the increase of teaching content in Automobile Construction(II), the course team took the initiative to coordinate with the Academic Affairs Department to apply for an increase of part of the teaching time, and at the same time guided students to make full use of the existing online course resources and to take the initiative to learn online outside the course. In addition, to address the issue of the low proportion of practical hours, the course team actively increased the proportion of practical hours in Automobile Construction(II) study, which was fully reflected in the 2012 syllabus.

3.4 Implementation of Integrated Teaching and Learning

In order to make full use of modern information technology in teaching activities and learning assessment, and in accordance with the characteristics of students' learning in the new era, the teachers of the Automobile Construction(II) course team have built an online course on the Wisdom Tree platform in time to implement the integration of offline courses and online teaching. Students' learning is reinforced through offline courses and online teaching, and teachers can monitor students' mastery of knowledge through the chapter tests they take online. At the same time, teachers guide students to enhance their learning through virtual automotive simulation teaching software and virtual hands-on training software for automotive production and assembly lines.

The integrated teaching of the course is also reflected in the effective integration of teaching contents, i.e. the traditional teaching contents of the textbook Automobile Construction(II) are organically integrated with the knowledge of new energy vehicles, such as automotive construction and new automotive technology, which expands students' knowledge and increases their interest in learning.

Integrating the teacher-student relationship is an effective way to ensure the effectiveness of teaching and learning. Teachers should increase their affinity to liven up the classroom atmosphere, have a heart to learn and discuss with students, face the challenges of teaching and learning new knowledge together with a high enthusiasm for work and learning, and proactively establish a good relationship with students both inside and outside the classroom as both teacher and friend. Encourage students' enthusiasm for learning and make them feel that they are participants in classroom activities, that they are the subject of classroom teaching and that they remain curious about what is being taught. It is not suitable to blame students harshly when they are distracted in class, but rather to remind them by asking questions and other means to ensure that they do not become resistant to the course with respect.

3.5 Optimising the Form of Evaluation and Assessment

Apart from following the traditional course assessment methods, Automobile Construction(II) actively innovates assessment forms, such as scoring students' performance in course projects and class discussions and converting them into the final course grade by a certain percentage, which effectively motivates students to participate. The course also investigates students' evaluation of the course teaching through methods such as the WeChat questionnaire Star.

4 Focus on the Test and Radiation of Innovative Results

Innovations in student-centred teaching and learning allow more time for in-depth learning and develop students' capacity in independent learning. Students as the main subjects in the classroom are able to take the initiative in learning, collaborative inquiry and active thinking, focusing on the development of higher order thinking and research skills while mastering basic knowledge. The diversified teaching approach allows teachers to pay more attention to students' emotions and attitudes in the learning process, which significantly increases students' motivation in the classroom and is well received by most students.

5 Conclusions

Aiming at the problem existed in the process of Automobile Construction teaching, innovate the method of solving the problem from the aspects of improving the teaching way, changing the education concept, optimizing the examine mode and implementing fusional teaching, which brings the significant improvement in teaching outcome. Later, the new method and mode which has strong promotion value will be formed by the further research of the teaching and research project.

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