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Research on the Improvement of Practical Teaching Plan for Transportation Major in Colleges and Universities

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Abstract

Practical teaching is an important part of higher education and plays a certain ability oriented role in teaching in ordinary universities. At present, there are corresponding problems in the teaching design and arrangement of practical teaching in most universities. This article first focuses on exploring the connotation and significance of practical teaching. Secondly, it mainly analyzes the main problems in practical teaching in transportation majors, and proposes countermeasures for the teaching reform of transportation majors in universities based on practical teaching.

Keywords

Transportation; Practical teaching; Reform in education; Countermeasure measures.

1. Introduction

In recent years, with the development needs of society, for college students, in addition to their learning ability, their independent innovation ability and practical ability have also become a key part of employers' assessment. Although universities across the country continue to innovate the teaching system of transportation majors, there are still many weak links in practical teaching, which to some extent restricts the practical innovation ability of college students. According to statistics, there are more than 110 universities in China that offer transportation majors, with a student population of approximately 36000. Therefore, under fierce competition, in addition to theory, practical and innovative abilities are the basic qualities that college students should possess. To improve students' practical and independent innovation abilities, universities should first make corresponding changes in teaching methods and content. In terms of teaching methods, they should focus on practical teaching that corresponds to theoretical teaching. In terms of teaching content, they should pay attention to developing practical teaching content, so that students' knowledge and theory can keep up with the social situation and scientific and technological development, and ultimately cultivate applied and innovative talents.

2. The Connotation and Significance of Practical Teaching

2.1. The connotation of practical teaching

At present, the division of majors in universities mainly includes majors related to science and engineering as well as majors with a focus on humanities. For science and engineering majors, practical teaching is generally aimed at meeting the needs of experiments, internships, design, and production tasks. Under the guidance of teachers, it is a teaching method that focuses on students and improves their comprehensive practical abilities through learning and operation. For many liberal arts majors that do not need to do experiments or designs in the classroom, it is also necessary to use practical teaching to guide students. For example, the ideological and political course mentioned often, in addition to classroom theoretical knowledge, combined with the teaching method of practical teaching, can effectively implement the concept of

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practice, guide students to further deepen their grasp of the essence of Marxism from theory, so as to constantly improve the comprehensive quality of students.

2.2. The Importance of Practical Teaching

As the saying goes, 'It's better to teach someone how to fish than to teach them how to fish.' Our teaching also means the same thing. Nowadays, university teaching is no longer just about teachers constantly outputting or simply imparting knowledge. Instead, teachers need to teach students the ability to actively learn, the awareness of initiative, and the ability to innovate. They need to involve students in the classroom and make them the main body of the class. Therefore, the significance of practical teaching is as follows:

One of the important meanings is that practical teaching is the best way to help students understand abstract knowledge. For many difficult to understand professional terms and easily confused concepts, adopting practical teaching is much more convenient than traditional teaching. Not only is it easy for students to understand, but teachers can also speak more easily. For example, in the field of transportation, in addition to learning basic theoretical concepts, students can also understand the structure and function of railway internal facilities and equipment through practical operations when studying related knowledge such as track numbers, switch structures, and gate structures. This is because in general, doing and listening is more likely to deepen people's impression.

Significance 2: The transformation from a single teaching model to a teaching model that combines teaching and practice can better adapt to social development and meet the needs of employers. On the one hand, for enterprises, with the development of society, many enterprises and companies need high-quality composite talents, rather than simply those who have good theoretical knowledge. For example, in railway related enterprises, there is a large demand for personnel who can work on the front line. Front line workers must be familiar with and able to operate relevant machinery and equipment. The specific way to cultivate students' ability to operate machinery and equipment is related to the teaching methods of universities. On the other hand, for students, practical teaching, in addition to deepening theoretical knowledge, mainly cultivates their learning and innovation abilities. Whether they have certain innovation abilities is crucial for students to find jobs after graduation. High quality and innovative talents have a great advantage in employment.

3. The Main Problems in Practical Teaching of Transportation Major

For a long time, practical teaching in Chinese universities has been influenced by exam oriented education, resulting in a phenomenon of emphasizing theory over practice, and emphasizing in class and out of class teaching. This has led to practical teaching being in a subordinate position, and students' practical abilities being relatively weak, making it difficult to meet their career development needs after graduation. With the rapid development of society, in recent years, various universities have taken multiple educational reform measures to enhance practical teaching, so as to exercise students' practical and hands-on abilities, analytical and problem-solving abilities, innovation abilities, etc[1]. The practical teaching of transportation major mainly includes professional training, course design, professional internships, and innovative project competitions. Although the combination of theoretical teaching and practical teaching in the general direction has been recognized by students, employers, and society, it cannot be denied that there are still many problems and shortcomings in practical teaching in universities

(1) The professional training course module has a weak emphasis on practical experience and an unreasonable setting of professional courses. Under the influence of traditional exam oriented education ideas, some schools have single and outdated practical teaching methods. The common practical teaching method is classroom teaching, and teachers teach students

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practical content, steps, etc. through lectures, blackboard writing, etc. Students often complete experimental tasks step by step and passively, without giving them enough time and space to think, lacking enthusiasm, exploratory spirit, and innovative consciousnes[2]. And in the formulation of teaching content and plans, it is always believed that theoretical teaching is superior to practical teaching, without giving practical teaching courses a certain degree of freedom and importance; Some experimental teaching and training programs and experimental techniques in universities are outdated and difficult to adapt to the development needs of the industry.

(2) The professional practical training assessment module has a situation where the student practical assessment system is not sound. For practical projects that do not require hands-on operation, many universities mainly test students' practical abilities by testing their memorization of relevant practical steps and results. This method is relatively one-sided and cannot truly reflect students' comprehensive abilities; For operational experiments, the final focus is mainly on the practical training reports submitted by students, while neglecting the actual process of students' operations. If the procedural content is not reflected, it may lead to phenomena such as students plagiarizing experimental reports.

(3) The course design module has issues with unreasonable question settings and low proficiency in practical skills. Firstly, for transportation majors, data is crucial in course design. However, most of the questions given by teachers are based on past years and lack innovation. Students also have a limited range of questions to choose from, and they may assume some data on their own, resulting in course design outcomes that are not applicable to practical production. In addition, in many university training rooms, the training equipment is far from the actual environment of the enterprise, the teaching content is single, and most course students cannot personally perceive and control it, making it difficult to ensure the development of future technical talents.

(4) The professional internship module has issues such as inadequate teaching equipment and poor internship results. The professional internships for transportation majors include familiarization internships and graduation internships. familiarization internships mainly involve visiting and operating relevant facilities and equipment in the station to strengthen the consolidation of theoretical knowledge. However, most of the existing university training rooms have relatively single equipment, and the large number of students and the lack of equipment will result in many students not having the opportunity to truly practice. In addition, graduation internships mainly involve senior students participating in certain work at the internship unit. The main problem during the internship process is the lack of management, and teachers cannot grasp the students' internship situation in real time, making it difficult to optimize and guide the internship process, ultimately failing to achieve the desired internship results.

(5) The teaching staff is weak and lacks "dual qualified" teachers. The university faculty is mainly composed of young people, who mainly receive theoretical knowledge learning during their university and graduate studies. They have not entered social enterprises for training, resulting in a lack of sufficient experience and high theoretical level in practical teaching. There is also a severe shortage of "dual teacher" talents who are proficient in practical operation ability and professional theoretical knowledge in universities, which to some extent affects students' mastery and improvement of practical skills. In addition, the incentive mechanism and teaching quality monitoring system for practical teaching in many universities are not sound, and there are no professional departments or teams responsible for the unified coordination and refined management of practical teaching. There is a lack of effective incentive systems for teachers engaged in practical teaching; Some universities have numerous problems in dealing with the relationship between teaching and research, and under the existing assessment model and promotion conditions, teachers' main focus is on research,

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lacking a certain degree of enthusiasm and initiative for practice. Although teachers' theoretical level may have improved, their actual practical level may not have improved accordingly.

4. Countermeasures for Improving Practical Teaching in Transportation Major

In response to the problems in the reform of practical teaching mentioned above, and based on my own thoughts on improving practical teaching, the following countermeasures for improving the teaching of transportation majors in universities based on practical teaching are proposed.

4.1. Supplement and improve the practical teaching syllabus, optimize professional practical courses.

In teaching reform, the traditional idea of theory over practice should be changed, and the proportion of practical teaching hours should be increased. For example, for compulsory courses in transportation majors, in addition to theory, corresponding practical training courses should be specially offered, and the proportion of practical training courses such as passenger transport organization training, driving organization training, and freight organization training should be increased. In the teaching plan, emphasis should be placed on the combination of theory and practice, in order to enable students to possess basic practical operation abilities. Firstly, a comprehensive and reasonable teaching plan and training objectives should be formulated based on the development of society and the actual situation of school students. Secondly, a targeted and feasible practical teaching outline should be determined, and a talent training plan based on cultivating students' experimental abilities should be revised.

In addition, in terms of professional course design, advanced experimental teaching equipment should be introduced first, and practical training courses with weak applicability should be abandoned. It is not the same for every student, and the practical training courses and content should be changed in real time according to the progress of the times, adding cutting-edge practical training and allowing students to be exposed to the cutting-edge knowledge of the subject they are learning in advance. Secondly, comprehensive innovative experiments should be added to practical training courses to provide students with space for independent thinking and to cultivate their hands-on and innovative abilities. Finally, based on social demand, practical teaching courses related to tool software can be offered. As the basic needs of society now are technical talents, schools should cultivate students' ability to operate various software, such as MATLAB, AutoCAD, Python, Origin and other programming and drawing software. Proficiently using these software will have great advantages in both later graduation projects and employment.

4.2. Establish a sound practical assessment system.

To truly test students' mastery of knowledge and practical abilities, universities can set different assessment rules for each class in the course assessment, not only focusing on final results such as practical training reports, but also emphasizing process based assessment, achieving a combination of process based assessment and outcome based assessment. For example, each practical training course should be graded based on students' pre class preparation, classroom question answering, experimental operation process, and writing of training reports. The procedural scores should be recorded in a timely manner, and finally combined with the final practical assessment to test students' comprehensive abilities. This assessment system can avoid phenomena such as students plagiarizing practical training reports, while also strengthening students' emphasis on practical courses and increasing their interest in attending practical courses.

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4.3. Innovative classroom teaching and curriculum design teaching.

Utilize new teaching methods such as multimedia, flipped classroom, situational teaching, and visual demonstration[3]to bring the classroom to life; Teaching is conducted through a combination of online and offline methods. Outside of the classroom, learning tasks can be posted on platforms such as Trojan Classroom, Chaoxing Learning Platform, and Rain Classroom to monitor students' learning progress in real-time.

The premise of course design is that there is relevant basic data, so teachers should organize students to visit and learn from corresponding enterprises. For example, in order to predict passenger flow, students first need to conduct on-site investigations at subway stations or high-speed railway stations to obtain corresponding data. To design a freight yard for a certain station, they must conduct relevant investigations at the actual freight station and design courses based on the actual situation. Students should be encouraged to practice with questions and thinking. In addition, the topic selection for lesson design should be innovative and practical, and cannot continue to use the questions from previous sessions. The authenticity of the course design should be ensured.

4.4. Strengthen practical conditions and base construction.

In response to the problems of outdated training equipment and poor training environment on campus, schools and colleges should increase funding to build training or experimental teaching centers. Different majors should have their own corresponding training rooms, rather than one training room for multiple majors to use. This is difficult to achieve the desired training effect. For example, transportation majors should have a specific virtual simulation laboratory for students to experience the work of railway related departments. In addition, a dedicated engineering drawing room should be provided for students to use CAD and other drawing software to draw train operation diagrams and other graphics. Secondly, it is necessary to ensure that the relevant facilities and equipment can be used normally, introduce advanced teaching equipment in a timely manner, and ensure the hardware conditions in the training room.

4.5. Build a high-level faculty team and form a professional team.

Building a high-level teaching staff is an important way to meet the requirements of the times, promote curriculum education and teaching reform, and enhance teachers' own research ability and level[4]. Schools should regularly offer courses to cultivate teachers' professional skills, especially for newly appointed teachers. In addition to the courses, relevant skill training should also be conducted, and the professional skill level of teachers should be tested through assessment. Secondly, evaluating a teacher's ability to rely solely on their theoretical knowledge is not enough. In addition to theoretical knowledge, teachers should at least be able to take on the responsibility of imparting relevant professional skills and experience to students. They should continuously improve their overall quality and explore better teaching methods in their profession. In addition, some universities have already started implementing practical teaching in terms of teaching reform, but there are still problems such as management confusion or incomplete systems in the process of practical teaching. Therefore, when theoretical teaching has a professional organizational system, corresponding practical teaching should also establish a professional teacher team, such as setting up a dedicated practical teaching and research room. Firstly, the practical teaching and research room should include famous teachers, subject teachers, and practical training teachers. Secondly, professional departments should be responsible for the unified coordination and refined management of practical teaching. When formulating practical teaching plans, internal team members can jointly discuss and review the plan, unify practical teaching hours and assessment standards, and ensure the quality of practical teaching, which is of great benefit.

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5. Conclusion

Practical teaching is an indispensable part of cultivating qualified talents in universities. Due to the continuous progress of the times, practical teaching should also keep pace with the times and cannot remain unchanged. Currently, there are many weak links in the plans and contents of practical teaching in various universities. This article proposes corresponding countermeasures based on the current situation and problems of practical teaching in transportation majors. These measures have systematic and comprehensive characteristics, which can help universities improve practical teaching in transportation majors, thereby enhancing students' professional practical and innovative abilities, and further cultivating high-quality composite talents needed by society.

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