Reform of Practical Teaching of Wheeled Armored Vehicle Theory Course Based on OBE Concept

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Abstract: Traditional classroom teaching focuses more on imparting theoretical knowledge and lacks opportunities for understanding and practical operation in actual work scenarios; After graduation, students face the problem of a gap between theoretical knowledge and practical work, making it difficult to smoothly enter the workforce. By building a practical teaching platform, designing practical training based on event driven training, and establishing a practical evaluation system based on the OBE concept, the aim is to improve students' learning enthusiasm and practical ability, and promote the teaching effectiveness and quality of wheeled armored vehicle theory courses.

Keywords: OBE Concept, Practical Teaching, Competition Driven, Wheeled Armored Vehicle

1. Introduction

With the development of the national economy and the advancement of military technology, the demand for armored vehicle professionals is also constantly increasing. The talent cultivation goal of armored vehicle engineering major is to require graduates of armored vehicle engineering to be advanced applied engineering and technical talents who can engage in product design, manufacturing, technology research and development, experimental testing, use and maintenance, technical management and other work in military and civilian fields such as armored vehicle engineering, vehicle engineering and mechanical engineering. From this perspective, the traditional theoretical teaching mode can no longer meet the needs of modern military. Therefore, it is necessary to improve students' practical ability and adaptability through teaching reform to better adapt to the development needs of society. Traditional classroom teaching often focuses on imparting theoretical knowledge and lacks opportunities for understanding practical work scenarios and practical operations[1]. This leads to students facing a gap between theoretical knowledge and practical work after graduation, making it difficult for them to smoothly enter the workforce. Therefore, teaching reform needs to focus on strengthening the practical teaching process, so that students can acquire skills and experience related to practical work in the classroom.

Modern students may become tired of traditional classroom teaching methods and lack positive learning motivation and interest. By introducing more active teaching methods, such as competition driven teaching mode, students' learning interest can be stimulated, their learning enthusiasm and initiative can be improved, and their practical ability and teamwork spirit can be enhanced. The teaching reform aims to improve the quality and effectiveness of teaching, enabling students to better grasp the knowledge they have learned and apply it to practical work, which can better meet the demand of society for armored vehicle engineering professionals.

2. Construction of a practical teaching platform for wheeled armored vehicles

2.1 Design and Construction of Practical Teaching Platform

The practical teaching platform is the core link of teaching reform. It not only provides a place for students to practice and operate, but also an important platform for students to cultivate practical abilities and improve comprehensive qualities. When designing and constructing a practical teaching platform, the following key aspects need to be considered.

2.1.1 Platform design concept

Set the page alignment to top alignment and the margins of the header and footer to:At the beginning of designing a practical teaching platform, it is necessary to clarify the design philosophy and objectives of the platform. For example, whether the platform needs to have simulation experiment functions, physical experiment functions, or provide real on-site training venues, the design concept of the platform will directly affect the subsequent facility layout and functional configuration.

2.1.2 Facility layout and functional configuration

According to the design philosophy and objectives of the platform, it is necessary to carry out reasonable facility layout and functional configuration. For example, if the platform needs to provide simulation experiment functionality, corresponding virtual simulation equipment and software need to be configured; If the platform needs to provide physical experimental functions, corresponding experimental instruments and equipment need to be configured; If the platform needs to provide on-site training functions, suitable training venues and facilities need to be selected.

2.1.3 Technical support and equipment procurement

In the construction process of the practical teaching platform, it is necessary to consider the issues of technical support and equipment procurement. It is necessary to contact relevant suppliers or manufacturers, select suitable equipment and facilities, and ensure that their quality and performance meet teaching requirements. At the same time, it is necessary to consider equipment maintenance and updates to ensure the continuous operation and teaching effectiveness of the platform.

2.1.4 Safety Management and Operating Standards

In the design and construction process of practical teaching platforms, safety management and operational norms are crucial. Corresponding safety management systems and operational standards need to be developed to ensure the safety of students and teachers during practical operations. At the same time, it is necessary to set up safety facilities and conduct safety training to enhance students' safety awareness and emergency response capabilities.

2.1.5 Teacher training and teaching support

Teachers are the core force of practical teaching platforms and need to possess rich practical experience and teaching skills. Therefore, it is necessary to provide relevant training and support for teachers to better utilize practical teaching platforms for teaching work, and to hire experienced enterprise mentors to guide students in practical teaching and experimental research.

2.2 Challenges and Solutions in the Platform Construction Process

The construction of a practical teaching platform is a complex project that involves various challenges and difficulties. Understanding and addressing these challenges is key to ensuring the smooth construction and effective operation of the platform. The following are potential challenges and corresponding solutions that may be encountered during the platform construction process.

2.2.1 Capital investment and fundraising

The construction of a practical teaching platform requires a large amount of capital investment, including equipment procurement, venue leasing, personnel training, and other expenses. However, the school's funding is limited, and how to raise sufficient funds has become a primary issue.

Funds can be raised through various channels, including applying for special funds from the government, seeking industry sponsorship, conducting school enterprise cooperation, and conducting public fundraising. Meanwhile, through meticulous budget and project management, existing funds can be allocated and utilized reasonably to reduce project costs.

2.2.2 Equipment procurement and technical support

Equipment procurement is an important part of the construction of practical teaching platforms, but it is often difficult to select suitable equipment and ensure its quality and performance. By collaborating with professional suppliers or manufacturers, one can choose cost-effective equipment and ensure that it meets teaching needs. In addition, for some high-tech equipment, professional technical support and maintenance may be required. Consider signing a maintenance contract with the manufacturer or purchasing extended warranty services to ensure the normal operation and maintenance of the equipment.

2.2.3 Teacher Training and Team Building

The quality and ability of the teaching staff directly affect the teaching quality and effectiveness of the practical teaching platform. However, currently some teachers may lack relevant practical experience and teaching abilities, and how to conduct teacher training and team building is an important issue.

By conducting relevant teacher training and training courses, teachers' practical ability and teaching level can be improved. Industry experts and senior teachers can be invited to give lectures and provide guidance, sharing practical experience and teaching methods. At the same time, a teaching team can be established to strengthen communication and cooperation between teachers and students, and jointly promote the development of practical teaching.

2.2.4 Safety Management and Standardization Construction

The practical teaching platform involves a large number of experimental operations and on-site training, and safety management and standardized construction are issues that cannot be ignored. How to ensure the safety of students and teachers in the practical process is a problem that needs to be seriously considered and solved.

Relevant safety management systems and operational norms can be established to clarify the responsibilities and obligations of students and teachers in the practical process. We can establish safety facilities and warning signs, strengthen safety training and emergency drills, and enhance the safety awareness and emergency response capabilities of students and teachers. At the same time, it is possible to strengthen security monitoring and inspection, timely discover and handle security risks, and ensure the safe operation of the practical teaching platform[2].

2.2.5 Teaching Management and Evaluation System

The construction of practical teaching platforms requires the establishment of a scientific and reasonable teaching management and evaluation system to supervise and evaluate the quality and effectiveness of teaching. However, designing and establishing a suitable teaching management and evaluation system is a complex and long-term task.

We can learn from advanced teaching management and evaluation models at home and abroad, and develop a management and evaluation system suitable for our school based on the actual situation. At the same time, it is possible to strengthen the student evaluation and feedback mechanism, listen to students' opinions and suggestions, continuously improve teaching work, and enhance teaching quality and effectiveness.

By implementing the above solutions, various challenges that may arise during the construction of the practical teaching platform can be effectively addressed, ensuring the smooth construction and effective operation of the platform, and improving the quality and effectiveness of teaching.

3. Practical training based on event driven approach

3.1 Theoretical basis of event driven teaching mode

The competition driven teaching mode is a teaching method that focuses on cultivating students' practical abilities, teamwork, and competitiveness. Its theoretical foundation covers theoretical support from multiple disciplines such as educational psychology, educational technology, and organizational behavior.

3.1.1 Educational Psychology Theory

The competition driven teaching model emphasizes student participation and initiative, which is in line with the "learner centered" concept in educational psychology. According to this theory, learning should be student-centered, stimulating their learning interest and motivation, and stimulating their intrinsic learning motivation. Event driven competitions and competition formats can stimulate students' competitive awareness and motivation, enhance their learning enthusiasm and initiative.

3.1.2 Task based Learning Theory

The competition driven teaching mode emphasizes task-based learning, which means achieving learning goals by completing specific tasks. According to the task-based learning theory, students accumulate experience and knowledge through practical operations and problem-solving processes, thereby improving their learning effectiveness and practical abilities[3]. Event driven teaching activities

are usually guided by specific competition tasks, and students need to complete tasks through teamwork and individual effort to achieve learning goals.

3.1.3 Incentive Theory

The competition driven teaching model utilizes the reward mechanism in motivation theory, by establishing awards and honors to stimulate students' interest and enthusiasm for learning. According to motivation theory, rewards are external stimuli that can enhance students' learning motivation and behavior. The competition and format driven by events provide students with opportunities to showcase their abilities and gain recognition, thereby stimulating their enthusiasm and initiative in learning.

3.1.4 Collaborative Learning Theory

The competition driven teaching model advocates cooperation and teamwork among students, which meets the requirements of collaborative learning theory. According to the theory of collaborative learning, students work together in groups or teams to complete tasks, improve learning outcomes and overall abilities through mutual communication and cooperation. The competition and format driven by events require students to collaborate in teams to complete tasks, thereby cultivating their teamwork and communication skills.

3.1.5 Situational Learning Theory

The competition driven teaching model emphasizes placing learning in specific contexts, which meets the requirements of situational learning theory. According to the theory of situational learning, students accumulate knowledge and experience through practical operations and problem-solving in specific contexts, thereby improving their learning effectiveness and practical abilities. The competition and format driven by events provide students with specific learning contexts, enabling them to master knowledge and skills through practice.

3.2 Design and Implementation of Practical Training Projects

3.2.1 Project theme determination

Ensure that the project theme matches the course content and teaching objectives. Practical topics related to wheeled armored vehicles can be selected based on the characteristics of the discipline and teaching requirements, such as vehicle maintenance and upkeep, driving skills training, tactical exercises, etc.

3.2.2 Development of project tasks and requirements

Develop specific project tasks and requirements, clarify the specific tasks and requirements that students need to complete and achieve. Tasks of different difficulty and complexity can be designed based on the practicality and challenge of the project to meet the learning needs and ability levels of different students.

3.2.3 Team building and division of labor arrangement

Before the implementation of the project, it is necessary to form a student team and arrange division of labor to ensure that each team member can play to their strengths and work together to complete the project tasks. Based on students' professional backgrounds and personal strengths, team members' roles and responsibilities can be reasonably arranged to promote teamwork and collaboration.

3.2.4 Team building and division of labor arrangement

Design specific practical activities and operational processes based on project tasks and requirements, providing students with opportunities and platforms for practical operations. By combining actual situations and practical equipment, different practical scenarios and operational requirements can be set up to enable students to master relevant skills and experience in practice.

3.2.5 Guidance and coaching support

During the project implementation process, it is necessary to provide necessary guidance and coaching support to help students successfully complete project tasks. Professional teachers or industry experts can be arranged to provide guidance and coaching, answer students' questions and confusion, and guide them in practical operations and problem-solving.

3.2.6 Exhibition and Evaluation of Practical Achievements

After the project implementation is completed, it is necessary to showcase and evaluate the students' practical achievements to test their learning effectiveness and practical abilities. Students can be organized to showcase and exchange their achievements, allowing them to share practical experience and results, while using evaluation indicators and methods to comprehensively evaluate students.

3.2.7 Summary of Achievements and Feedback on Experience

Summarize and provide experience feedback on the project implementation process, promptly identify problems, and propose improvement suggestions. Students and teachers can organize project summary meetings to discuss the advantages, disadvantages, and lessons learned during project implementation, providing reference and inspiration for future project design and implementation.

Through the detailed design and implementation of practical training projects mentioned above, we can fully leverage the advantages of the competition driven teaching model, stimulate students' learning interest and enthusiasm, improve their practical abilities and teamwork spirit, and achieve the maximization of teaching goals and effects.

4. Practice evaluation system based on OBE concept

4.1 Application of OBE Concept in Evaluation System

The OBE philosophy emphasizes outcome oriented education[4], which focuses on the learning outcomes and abilities achieved by students. In the practical teaching evaluation of wheeled armored vehicle theory courses, the application of OBE concept can effectively improve the scientificity and objectivity of evaluation, ensuring the matching degree between evaluation and teaching objectives and students' actual abilities.

4.1.1 Clearly define learning objectives and outcomes

In the design of the evaluation system, it is necessary to first clarify the learning objectives and outcomes. These goals and outcomes should be consistent with the course content and teaching requirements, and reflect the knowledge, skills, and abilities that students should possess. According to the OBE philosophy, evaluation should revolve around these learning objectives and outcomes to ensure the effectiveness and scientificity of the evaluation.

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4.1.2 Design diversified evaluation tools

In order to comprehensively evaluate students' learning outcomes and abilities, the evaluation system should adopt diversified evaluation tools and methods. In addition to traditional written and oral exams, student learning outcomes and abilities can also be evaluated through forms such as project reports, lab reports, work presentations, and team demonstrations from different perspectives and levels.

4.1.3 Emphasize engineering practice ability and application ability

According to the OBE concept, the evaluation system should focus on students' engineering practice and application abilities. Therefore, corresponding evaluation items and standards should be established in the design of the evaluation system to assess students' abilities in practical operation and problem-solving. Students' practical and application abilities can be evaluated through laboratory practice, simulation exercises, field visits, and other methods.

4.1.4 Focus on comprehensive literacy and core competencies

In addition to professional knowledge and skills, the evaluation system should also focus on students' comprehensive literacy and core competencies. This includes the evaluation of students' innovation ability, teamwork ability, communication ability, critical thinking ability, and other aspects. Students' comprehensive literacy and core competencies can be evaluated through case studies, group discussions, team projects, and other methods.

4.1.5 Provide timely feedback and guidance

The evaluation system should provide timely feedback and guidance to help students understand their academic performance and ability level, identify shortcomings, and make improvements. Based on the evaluation results, provide personalized guidance and coaching to students in a timely manner to promote their learning and growth. At the same time, the evaluation results should also provide guidance for teachers to adjust teaching methods and strategies, improve teaching quality and effectiveness.

Through the above expansion, we can comprehensively understand and apply the role of OBE concept in the evaluation system, effectively improve the scientificity and objectivity of evaluation, promote students' comprehensive development, and enhance teaching quality.

4.2 Establishment of learning objectives and evaluation indicators

Under the OBE concept, the formulation of learning objectives and the establishment of evaluation indicators are key steps in the design of the evaluation system. This section will further expand the formulation of learning objectives and the establishment of evaluation indicators to ensure a close fit between the evaluation system and teaching objectives, effectively assessing students' learning outcomes and abilities.

4.2.1 Clarity and measurability of learning objectives

The formulation of learning objectives should have clarity and measurability, that is, learning objectives should be clear, quantifiable, and measurable. When setting learning goals, the SMART principle can be adopted, which ensures that the goals are specific, measurable, achievable, relevant, and time bound.

4.2.2 Diversity and comprehensiveness of evaluation indicators

The establishment of evaluation indicators should have diversity and comprehensiveness, that is, evaluation indicators should cover all aspects and levels of learning objectives. Different types and forms of evaluation indicators can be designed based on the different characteristics and levels of learning objectives, including eval*uation* indicators for knowledge level, skill application, practical ability, comprehensive literacy, etc., to comprehensively evaluate students' learning outcomes and abilities.

4.2.3 Hierarchy and coherence of learning objectives

The formulation of learning objectives should have hierarchy and coherence, that is, learning objectives should be designed according to students' different levels and developmental stages, and maintain coherence and consistency throughout the entire teaching process. Different levels and difficulty levels of learning objectives can be formulated based on students' different learning levels, ensuring logical connections between learning objectives and smooth learning paths.

4.2.4 Scientificity and objectivity of evaluation indicators

The establishment of evaluation indicators should be scientific and objective, that is, evaluation indicators should be able to objectively reflect students' learning outcomes and abilities, and not be influenced by subjective factors[5]. When designing evaluation indicators, existing evaluation tools and methods can be referenced to ensure the scientific and objective nature of the evaluation indicators, and to improve the accuracy and reliability of the evaluation.

4.2.5 Dynamic adjustment and updating of learning objectives

The formulation of learning objectives should have the characteristics of dynamic adjustment and updating, that is, timely adjustment and updating of learning objectives based on teaching practice and students' actual situation, to ensure their close fit with teaching content and students' needs. In the establishment of evaluation indicators, the dynamic changes of learning objectives should also be taken into account, and evaluation indicators should be adjusted and updated in a timely manner to maintain the timeliness and effectiveness of the evaluation system.

Through the above expansion, we can have a more comprehensive understanding and application of the formulation of learning objectives and the establishment of evaluation indicators, ensuring the implementation and realization of teaching objectives in the design of the evaluation system, and effectively evaluating students' learning outcomes and abilities.

4.3 Establishment of learning objectives and evaluation indicators

Utilize evaluation results to provide feedback for teaching and adjust teaching strategies and methods in a timely manner [6]. By continuously improving and enhancing the quality of teaching, the effective achievement of educational and teaching goals can be achieved.

4.3.1 Timeliness and effectiveness of teaching feedback

Teaching feedback should be timely and effective, that is, teachers should collect students' feedback and suggestions in a timely manner, and effectively analyze and apply them. Feedback from students can be collected through classroom discussions, student surveys, group discussions, and other methods to identify and solve problems in a timely manner, ensuring the smooth progress of the teaching process and the improvement of teaching quality.

4.3.2 Flexibility and pertinence of teaching improvement

Teaching improvement should be flexible and targeted, that is, teachers should flexibly adjust and improve teaching methods and strategies based on students' feedback and teaching practice. Personalized teaching improvement measures can be designed and implemented based on the learning characteristics and needs of different students, to enhance the pertinence and effectiveness of teaching.

4.3.3 Sharing and Drawing on Teaching Experience

Teaching feedback and continuous improvement not only involve the teaching practice of individual teachers, but also involve the sharing and reference of teaching experience. Teachers can share their teaching experience and achievements in teaching improvement through forms such as teacher exchange meetings and teaching seminars, promote the exchange and collision of teaching ideas, and thus promote the continuous improvement and enhancement of teaching quality.

5. Conclusion

The teaching reform of the theory course of wheeled armored vehicles is to meet the needs of modern education development and better cultivate students' engineering practice ability and innovative spirit[7]. Starting from the OBE concept, this article proposes reform measures such as building a practical teaching platform for wheeled armored vehicles, implementing event driven practical training, and implementing a practical evaluation system based on the OBE concept to effectively improve teaching quality and effectiveness.

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