Innovation and Effect Analysis of Practical Teaching Mode of Vocational Undergraduate Based on Project-driven

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Abstract: This paper is devoted to discussing the innovation and implementation effect of project-driven practical teaching mode for vocational undergraduates. The introduction combs the present situation and development trend of vocational undergraduate education; This paper expounds the concept, unique attributes and application potential of project-driven teaching mode in vocational education. At the level of research methods, the strategy of combining quantitative analysis with qualitative analysis is adopted, and the practical teaching mode of project-driven vocational undergraduate is systematically designed and explored. After the implementation of this model, the multi-dimensional indicators such as the improvement of students' ability, the optimization of teaching quality and the deepening of school-enterprise cooperation were comprehensively evaluated. The research results show that this model has achieved remarkable results in enhancing students' practical ability, improving teaching quality and promoting school-enterprise cooperation. Students' professional quality and employment competitiveness have been significantly improved, teachers' teaching methods and means tend to be diversified, and teaching resources have been more efficiently allocated. This study provides valuable reference and enlightenment for the reform of practical teaching for vocational undergraduates, and strongly promotes the teaching innovation and quality leap in the field of vocational education.

1. Introduction

In China's higher education system, vocational undergraduate education is rapidly rising and becoming an indispensable part [1]. With the continuous optimization of industrial structure and the rapid development of technology, the demand for highly skilled talents in society is increasingly strong [2]. Vocational undergraduate education undertakes the important mission of cultivating high-quality applied talents with practical ability and innovative spirit [3]. In this educational model, practical teaching is very important. It plays an irreplaceable role in improving students' professional skills and solving practical problems [4]. This link urges students to apply theoretical knowledge to practical work, stimulates innovative thinking, and cultivates teamwork spirit and professionalism.

As an innovative teaching method, project-driven teaching mode is gradually being paid attention to in the field of vocational education. This method takes the project as the core, and realizes the learning of knowledge and the mastery of skills by allowing students to participate in actual or simulated project tasks [5]. Project-driven teaching mode emphasizes students' central position, focuses on cultivating autonomous learning ability and problem-solving ability, promotes the integration of theory and practice, and enhances students' comprehensive quality and employability [6]. In the field of vocational education, this model has a broad application prospect and is expected to inject new impetus into educational reform and innovation.

Although the project-driven teaching mode shows great potential in vocational education, how to effectively apply it in practical teaching of vocational undergraduate and evaluate its effect still needs further discussion [7]. The purpose of this study is to explore the innovation of practical teaching mode for vocational undergraduates based on project-driven, and analyze its effectiveness.

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This is helpful to enrich the teaching theory of vocational education and provide reference for the reform of practical teaching.

2. Theoretical basis

From the initial embryonic stage, to the gradual application in educational practice, and then to the hot topic of vocational education reform in recent years, the project-driven teaching model has experienced continuous exploration and improvement [8]. Its main point of view emphasizes taking projects as the carrier and promoting students' learning and growth through practice. This concept has achieved remarkable results in practice, such as improving students' interest in learning, enhancing their practical ability and promoting the deep integration of theory and practice. By deeply analyzing the adaptability and advantages of project-driven teaching mode in vocational education, it is not difficult to find that it is highly consistent with the training objectives of vocational education. Vocational education is committed to cultivating high-quality applied talents with practical ability and professional accomplishment [9]. Project-driven teaching mode enables students to master vocational skills and improve their ability to solve practical problems by engaging in real or simulated project tasks. Compared with other teaching modes, project-driven teaching mode highlights students' dominant position and emphasizes autonomous learning and inquiry learning. This is conducive to cultivating students' innovative thinking and teamwork spirit. Project-driven teaching mode can also promote school-enterprise cooperation and provide more practical opportunities and employment channels for students.

Based on the above analysis, a corresponding theoretical framework can be constructed. In this framework, this paper defines the core elements of project-driven teaching mode in practical teaching for vocational undergraduates. This includes key links such as project selection, project implementation and project evaluation. This paper also puts forward the implementation path of project-driven teaching mode in vocational undergraduate practice teaching-through the reform and innovation of school-enterprise cooperation, the construction of teaching staff and the allocation of teaching resources, it provides a strong guarantee for the implementation of project-driven teaching mode.

3. Innovation of practical teaching mode for vocational undergraduates based on project-driven

In vocational undergraduate education, this section proposes a project-driven practical teaching mode. This model shows its unique innovation in goal setting, course content, teaching methods and evaluation system. In terms of teaching objectives, we are no longer just satisfied with imparting knowledge, but pay more attention to cultivating students' practical ability and innovative thinking. In this way, they can turn what they have learned into the ability to solve practical problems in the process of completing the project. The teaching content closely revolves around the needs of the industry and career development, and selects practical and forward-looking projects as teaching carriers to ensure that students can learn really useful skills. The teaching method adopts new teaching methods such as project-based learning and flipping the classroom, which encourages students to explore in practice and learn in cooperation, and fully stimulates their learning enthusiasm and initiative. And this paper constructs a diversified evaluation standard. This not only considers students' academic performance, but also pays attention to students' performance and ability improvement during the project.

To successfully implement this model, the key lies in the accurate grasp of key points such as project selection, teacher construction, school-enterprise cooperation and resource allocation. Project selection needs to be closely related to the industry to ensure its practicality and challenge. Teachers should have rich practical experience and teaching ability, and can provide effective guidance and support for students. School-enterprise cooperation should be deep and lasting, and provide more practical opportunities and employment channels for students. The allocation of resources should be sufficient and reasonable to ensure the smooth implementation of the teaching

model. In order to ensure the effective operation of these links, this paper has formulated a series of safeguard measures: establishing project library, strengthening teacher training, deepening school-enterprise cooperation mechanism, optimizing resource allocation scheme and so on.

4. Case display

Taking the electronic information engineering major of a vocational college as an example, this paper makes a practical exploration. See Table 1 for an overview of the achievements of the practical project of intelligent Internet of Things system in electronic information engineering:

Table 1: Achievement Table of Practical Projects

Category	Overview of Content
Project Name	Smart IoT System Design and Implementation
Project Background	Rapid development of IoT technology, cultivating application capabilities in the smart IoT field
Practical Content	Project initiation, knowledge preparation, team formation, scheme design, project implementation, results presentation
Project Initiation	Teachers select the project, introduce background, goals, and expected outcomes
Knowledge Preparation	Study IoT basics, sensor technology, embedded system design, network communication principles, etc.
Team Formation	Students are grouped based on interest and ability, select application scenarios
Scheme Design	Teams design system architecture, hardware selection, software programming, functional module division, etc.
Project Implementation	Hardware setup, software programming, system debugging, close collaboration to solve problems
Results Presentation	System function demonstration, project summary report
Practical Outcomes	
Professional Skills	Master skills in sensor application, embedded programming, network communication, etc.
Team Collaboration	Significant improvement in team collaboration abilities
Problem Solving	Exercise problem-solving skills
Hands-on Ability	Noticeable enhancement in hands-on and practical operation skills
Employment Competitiveness	Gain competitive advantage in job seeking, some students successfully enter IoT-related companies

In the process of promoting the project, many challenges and problems gradually emerged. The difficulty and applicability of the project require continuous adjustment and improvement; The construction and cultivation of teachers' team need to be strengthened urgently; The level and scope of cooperation between schools and enterprises need to be deepened; The efficiency and rationality of resource allocation also need to be continuously improved. In view of these problems, this paper puts forward corresponding solutions. Strategies include: (1) Establish a dynamic adjustment mechanism of the project to ensure the timeliness and practicality of the project. (2) Strengthen the introduction and training of teachers and improve the overall quality of teachers. (3) Deepen the connotation of school-enterprise cooperation and broaden the fields and channels of cooperation. (4) Optimize the resource allocation process and improve the efficiency of resource use. Through the implementation of these measures, this paper believes that the project-driven practical teaching mode of undergraduate vocational education can be further improved and contribute more to the reform and innovation of vocational education.

5. Effectiveness analysis

This section uses quantitative and qualitative analysis methods to comprehensively evaluate the effectiveness of the project-driven practical teaching mode for vocational undergraduates. In the aspect of improving students' ability, by comparing the skills test scores, project completion quality and employment competitiveness before and after the experiment, it is observed that students' practical operation ability, problem solving ability and teamwork ability have been significantly

improved. As far as the improvement of teaching quality is concerned, the feedback of students' satisfaction with the course, teachers' teaching effect and the utilization rate of teaching resources shows that this model makes teaching more suitable for the needs of the industry, enriches teachers' teaching methods and improves the utilization efficiency of teaching resources. On the level of school-enterprise cooperation, by counting the number of cooperative enterprises, the number of projects and the evaluation of students' internship by enterprises, this paper finds that this model promotes the close cooperation between schools and enterprises and creates more practice and employment opportunities for students. Table 2 shows the comprehensive evaluation results of the practical teaching mode of vocational undergraduate based on project-driven:

Table 2: Comprehensive Evaluation of Teaching Mode Effectiveness

Evaluation Dimension	Specific Indicator	Pre-Experiment Value/Situation	Post-Experiment Value/Situation	Improvement/Enhancement
Student Ability Enhancement	Average Skill Test Score	72 points	85 points	Increased by 13 points
	Project Completion Quality Pass Rate	80%	92%	Increased by 12 percentage points
	Employment Competitiveness Index	65 (out of 100)	80 (out of 100)	Increased by 15 points
Teaching Quality Improvement	Student Course Satisfaction (%)	75%	90%	Increased by 15 percentage points
	Teacher Teaching Effectiveness Rating (out of 5)	3.8 points	4.6 points	Increased by 0.8 points
	Teaching Resource Utilization Rate (%)	60%	80%	Increased by 20 percentage points
Deepening School-enterprise Cooperation	Number of Cooperating Enterprises	20	35	Increased by 15
	Number of Cooperation Projects	40	70	Increased by 30
	Enterprise Evaluation of Student Internships (out of 5)	4.0 points	4.7 points	Increased by 0.7 points

By analyzing the causes and influencing factors of the effectiveness of this model, we can conclude that its success is mainly attributed to the project-based teaching concept, the close combination of theory and practice, and the teaching methods that attach importance to students' subjectivity, advocate autonomous learning and inquiry learning. The strengthening of school-enterprise cooperation, the construction of teaching staff and the optimal allocation of teaching resources also provide solid support for the implementation of the model. However, the effectiveness of the model is also influenced by factors such as project selection and quality, students' foundation and ability, teachers' teaching level and experience.

6. Conclusions

After systematic research and practice, the following summarizes the main findings and contributions of the project-driven practical teaching mode for vocational undergraduates. It is found that this model has achieved remarkable results in improving students' practical ability, improving teaching quality and deepening school-enterprise cooperation. It takes students as the

center, closely combines theoretical knowledge with practical application through project practice, and effectively improves students' professional quality and employment competitiveness. This model also promotes the innovation of teachers' teaching methods and the optimal allocation of teaching resources, and provides a new method for the teaching reform of vocational education. These achievements confirm the effectiveness of the project-driven teaching mode and provide valuable reference for the reform of practical teaching for vocational undergraduates.

Regarding the sustainability and popularization value of the model, this paper holds that the model conforms to the development trend of vocational education and has broad application potential. Through continuous practice and improvement, this model is expected to further enhance students' professional ability and employment competitiveness, and provide reference for vocational education reform and innovation. This model also provides reference for other types and levels of education and promotes the overall development of education. Therefore, it is necessary to further study this model, explore its potential application, and contribute wisdom and strength to the future development of vocational education. In the future, we can explore more diversified evaluation methods to comprehensively and objectively measure students' learning achievements and ability improvement.

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