Design and Exploration of the Immersive Interactive Case Teaching Mode Based on Scene Driving in Higher Vocational Education

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Abstract. With the rapid development of educational technology, higher vocational education is facing unprecedented challenges and opportunities. In order to cultivate high-quality talents with practical skills and theoretical knowledge, immersive teaching mode based on new technological conditions has emerged in higher vocational education, and related theoretical research and practical applications have also experienced unprecedented development. However, current researches on this teaching mode often focus on concepts, characteristics or general methods, and there is a lack of detailed design for the specific implementation and application scenarios of the teaching mode, resulting in unsatisfactory practical application and promotion effects of immersive teaching mode. This article proposes a immersive interactive case teaching mode based on scene driving for higher vocational education. By constructing virtual job-practice scenarios, this mode enables students to fully immerse themselves in the teaching situation, thereby improving teaching effectiveness and students' comprehensive abilities. This article first analyzes the problems existing in the traditional teaching mode, then elaborates in detail on the design concept, implementation steps, and effectiveness evaluation methods of the teaching mode, and finally verifies the effectiveness and feasibility of this teaching mode through statistical data analysis of teaching application.

Keywords: Higher Vocational Education, Scene Driving, Immersive Interactive, Case Teaching Mode.

1 Introduction

As an important component of the education system, higher vocational education aims to cultivate high-quality talents with professional skills and theoretical knowledge for society. However, traditional teaching modes often focus on imparting theoretical knowledge and overlook the importance of practical operations and situational experiences. With the development of the times and the progress of society, the widespread application of information technology in education has promoted the continuous development of higher vocational education. Information-based classrooms such as micro

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courses, MOOCs, and flipped classrooms have emerged [1]. At the same time, the theoretical research and practical application of immersive teaching mode have also made unprecedented progress. Immersive teaching plays an important role in enhancing students' interest and improving classroom quality, and has had a positive impact on the development of higher vocational education [2].

However, current research on this teaching mode often focuses on concepts, characteristics, and general methods, and there is still a lack of detailed design for the specific implementation and application scenarios of the teaching mode. These issues have led to unsatisfactory practical application and promotion effects of immersive teaching modes. Therefore, how to refine and design an immersive teaching mode that can effectively enhance students' practical abilities and learning interests has become an urgent problem to be solved in current higher vocational education.

By constructing virtual job practice scenarios, the immersive interactive case teaching mode based on scenario driving can help students learn and practice in the context, thereby enhancing their participation and enthusiasm in learning, and continuously promoting the improvement of teaching effectiveness. This article will explore this mode in detail, in order to provide a new teaching approach and method for higher vocational education.

2 The Main Problems of Traditional Teaching Mode

Firstly, the theory is disconnected from practice. The traditional teaching mode often places too much emphasis on theoretical learning and neglects the importance of practice. Although students have mastered a large amount of theoretical knowledge, it is difficult for them to apply it in practical work.

Secondly, students' participation is relatively low. The traditional teaching mode is teacher centered, with students passively receiving knowledge and lacking opportunities for participation and interaction. Resulting in low interest and enthusiasm among students, making it difficult to create an effective learning atmosphere.

Thirdly, the immersion interaction is not strong. The traditional teaching mode often adopts a single teaching method, lacking realistic scenes and interactive methods. Resulting in students being unable to immerse themselves in the learning content, making it difficult to generate profound cognition and experience.

3 Design of Teaching Mode

The immersive interactive case teaching mode based on scene driving is a student-centered teaching mode that uses virtual scenes as carriers to enhance students' practical abilities and learning interests through case teaching and interactive learning. This mode emphasizes the authenticity and interactivity of the scene, enabling students to perceive and understand knowledge in the context, thereby enhancing the immersion and experiential learning. Meanwhile, through case teaching and interactive learning, students can actively participate in the learning process, enhancing their initiative and creativity in learning.

3.1 Design Philosophy

Highlight the Scene Driven Effect. The teaching process focuses on constructing scenarios, building immersive experiences based on the information carried by the scenarios, promoting case studies based on the key issues contained in the scenarios, and inspiring students to think independently based on the possible evolution of the scenarios.

Build Multi-dimensional Immersive Interactive Effects. Constructing immersive interactive effects from three dimensions: scene sense, experience sense, and interaction sense, to achieve the core goal of guiding students to "think". The multi-dimensional restoration of the case through "scene sense" aims to "construct"; The "experience sense" assists students in obtaining multidimensional information, with the aim of "perception"; The "interaction sense" is to enable students' relevant decisions to be responded to, with the purpose of "feedback".

Strengthen Immersive Interaction Depending on System. Immersion is reflected in fully utilizing the advantages of modern information technology, such as virtual reality, augmented reality, etc., to construct and analyze immersive scenes, and to restore the real job practice environment and task process as much as possible. Students can interact and communicate with elements in the virtual environment, perceive knowledge in the context, and stimulate their innovative thinking and problem-solving abilities [6].

3.2 Implementation Steps

Based on the teaching objectives and the characteristics of vocational college students, a teaching organization process has been designed in teaching, which includes 4 teaching stages. This process standardizes "4 teaching stages and 12 teaching activities", as shown in Figure 1.

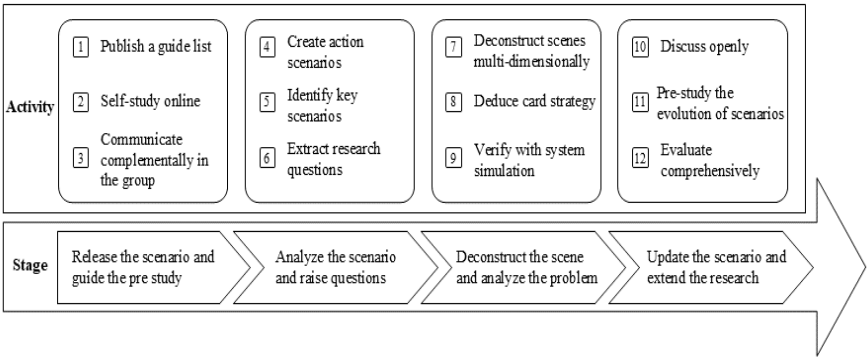

Fig. 1. The process of immersive interactive case teaching mode based on scene driving.

Release the Scenario and Guide the Pre Study Stage. Design learning tasks for case task background, prerequisite knowledge, and related knowledge, allowing students to independently learn and communicate around the knowledge required for case scenario analysis. The teaching activities in this section mainly include the following content.

Publish a guide list. The teacher relies on the vocational online course teaching assistance platform to publish a guide list through course announcements, provide case materials, clarify pre class learning content, standards, time, etc.

Self-study online. Students complete the learning of case related prerequisite knowledge, background and related knowledge through researching materials, online learning MOOCs, and other methods based on the guided learning checklist.

Communicate complementally in the group. Through mutual communication and collision of ideas among students, complementary knowledge structures are established to enhance their understanding and mastery of the real-life situation of the case.

Analyze the Scenario and Raise Questions Stage. Analyze the overall scenario of the case, identify the key scenarios that affect the direction of the event, and propose the key issues for research. This teaching session mainly includes three activities as follow.

Create action scenarios. Flexibly adopt methods such as role substitution reporting and system assisted presentation to construct case scenarios from different dimensions, guiding students to gradually enter the context.

Identify key scenarios. Through inspiring analysis, guiding discussions, and other methods, guide students to discover key and turning point elements and scenarios that affect the development of case events.

Extract research questions. Adopting an inductive and summary approach to extract and determine the theoretical and practical issues behind key scenarios.

Deconstruct the Scene and Analyze the Problem Stage. Decompose the overall scene into multiple dimensional scenes, use modern information technology to construct and present immersive linkage analysis scenes, and assist students in analyzing problems from different perspectives. This teaching session mainly includes three activities.

Deconstruct scenes multi-dimensionally. According to teaching needs, deconstruct key scenes that are difficult to present in a single scene diagram into different dimensions and conduct separate studies.

Deduce card strategy. The main objective is to design corresponding card strategy deduction for the case, with members of the group playing their respective roles for multiple simulations, familiarizing themselves with the possible action strategies of each role, and discovering key scenarios that affect the direction of the case event.

Verify with system simulation. In teaching, organize students to use virtual reality systems for intra group role-playing verification, analyze data from different dimensional scenarios, conduct intra group research and discussion, and propose solutions to corresponding problems. At the same time, conduct group discussions based on actual situations to lay the foundation for subsequent centralized exchanges and discussions.

Update the Scenario Extend the Research Stage. On the basis of proposing case solutions through research, present a scenario evolution concept that is visually appealing to real-world situations, complex conditions, and future developments, and inspire subsequent thinking. This teaching session mainly includes three activities.

Discuss openly. Organize through collective communication, with a focus on exchanging and discussing opinions among student groups to form different conclusions.

Pre-study the evolution of scenarios. The focus is on future development and current situations, adjusting relevant elements in the scene, and guiding the expansion of thinking and research.

Evaluate comprehensively. Conduct a comprehensive evaluation of online learning, onsite seminars, research reports, and other content for students.

3.3 Teaching Methods

To further promote the implementation of the teaching mode in relevant courses of higher vocational colleges, the following teaching methods are mainly adopted:

Blended Online and Offline Teaching. The focus of online teaching is on basic theoretical knowledge, relying on self-built or online course resources, designing targeted online learning content, and applying practical methods in offline teaching gathering positions. By constructing work scenarios, highlighting problem orientation, and focusing on extreme challenges, students are encouraged to master the current industry situation and personal ability base, and strengthen their thinking training [5].

Combining Strategy Deduction with System Simulation. According to the principle of "deducing analysis methods with card strategy, and analyzing mechanism with virtual simulation systems", we innovatively use a teaching mode that combines self-developed card strategy deduction with virtual reality scene systems in teaching. Card

strategy deduction, focusing on strategic issues, guiding students to familiarize themselves with work scenarios and professional basic theories, and improving their systematic thinking ability through strategic games [4]; The virtual reality scene system, as a fundamental tool, focuses on solving problems such as scene presentation and data analysis, assisting students in understanding the application of job practice methods [3].

4 Effect Evaluation

4.1 Evaluation Method

In order to evaluate the effectiveness of this teaching mode, a combination of various methods can be used, mainly including three methods as follow.

Questionnaire Survey. By collecting students' satisfaction and feedback on the teaching mode, we can understand their recognition and satisfaction with the teaching mode. Students with high learning satisfaction often express appreciation and recognition for the teaching mode, believing that it can enhance their interest and practical ability.

Interview. By conducting interviews to understand students' learning experiences and outcomes, the effectiveness and practicality of teaching modes can be evaluated. Students with good learning outcomes are often able to acquire more knowledge and skills, and apply what they have learned to practical work.

Observation. By observing students' learning engagement, we can understand their level of acceptance and engagement with the teaching mode. Students with high levels of learning engagement often exhibit greater enthusiasm and positivity, enabling them to better participate in the teaching process and complete tasks.

4.2 Evaluation Results

Through the application of this teaching mode in four teaching cycles, we have obtained data on student participation, learning effectiveness, and satisfaction. The following evaluation results have been analyzed: firstly, student participation has significantly increased, and their learning interest and enthusiasm have been greatly stimulated; Secondly, students' learning outcomes have been significantly improved, as they master theoretical knowledge and apply it to solve practical problems; Thirdly, students' comprehensive abilities have been cultivated, and their innovative thinking and practical skills have been exercised and enhanced. These results demonstrate the effectiveness and feasibility of this teaching mode. The relevant data statistics are shown in Figure 2.

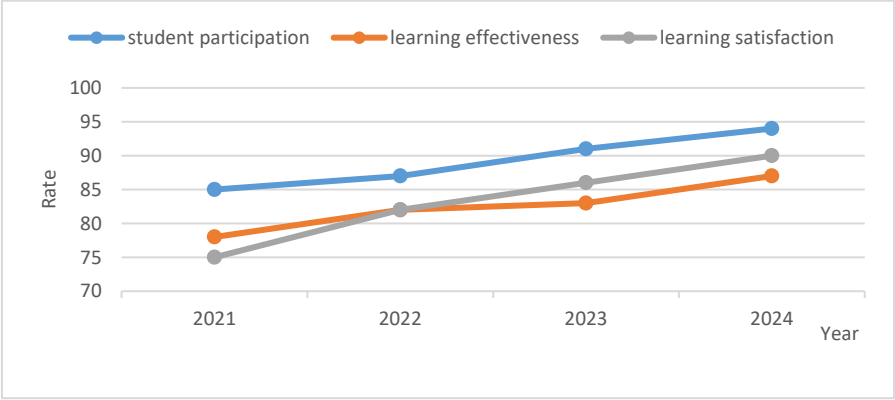

Fig. 2. A figure that shows changing trend of students' participation, learning effectiveness and learning satisfaction.

5 Conclusion

The immersive interactive case teaching mode based on scenario driving has broad application prospects in higher vocational education. This mode constructs virtual job practice scenarios, allowing students to learn and practice in the context, thereby enhancing their participation and enthusiasm for learning. Meanwhile, the specific implementation of "4 teaching stages and 12 teaching activities" can effectively improve students' learning efficiency and practical skills, thereby promoting the improvement of the quality of higher vocational education and further refining and enriching the theory of immersive teaching in higher vocational education. However, there are still some challenges and issues in the implementation process of this mode, such as the complexity of scene construction, the diversity of case design, and the adaptability of students. Therefore, in future research, we need to further explore and improve the design and implementation methods of this mode to adapt to constantly changing teaching needs and learning environments. Meanwhile, it is necessary to strengthen the integration and innovation with other teaching modes to make the higher vocational education system much more efficient and practical.

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