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Research on Teaching Reform of Vue Framework Based on Smart Classroom

Ren Zheng[1], Hao Wu[1,*]

[1]School of Computer Science, Guangdong University of Science and Technology, Dongguan 523000, China

[*]Corresponding author

Abstract

Considering the current situation where college students exhibit disparities in knowledge absorption efficiency and learning interest levels regarding Vue framework courses, this study leverages multiple online education platforms to promote the deep integration of information technology with teaching and implement blended teaching reforms, aiming to enhance course teaching efficiency. The teaching scenario breaks through the limitations of the traditional 90-minute offline classroom. With the help of information technology, it achieves the extension of time and space, emphasizing the collaboration between teachers providing structured teaching resources and students' autonomous learning. The course construction focuses on the concept of "student-centeredness", and through the reconstruction of teaching content and the reshaping of the teacher-student relationship, builds a teaching paradigm that adaps to the cultivation of front-end technical talents in the new era.

Keywords

Blended teaching; Vue framework; Online education platform.

1. Introduction

As an integrated model combining traditional face-to-face instruction and online teaching, blended teaching has garnered significant attention in China’s educational sector since 2003. Its "ubiquitous learning" feature meets the learning needs of students in the new era[1]. With the popularization of teaching forms such as flipped classrooms and MOOCs, platforms like China University MOOC have become important carriers for the supply of teaching resources in colleges and universities. Take the Vue framework courses as an example. The China University MOOC platform alone gathers hundreds of related courses, fully demonstrating the educational concept of "student-centered and open sharing"[2]. As a core technology in modern front-end development, the Vue framework serves as the cornerstone for computer science students to advance their learning of full-stack technologies, while for non-computer science students, it is a tool to understand the logic of front-end development and empower digital innovation in their professional fields. The course content covers core modules such as Vue basic syntax, component-based development, responsive systems, route management, state management, and ecological toolchains. In view of its strong practical characteristics, a large number of extracurricular project development and training are needed to help students achieve the ability leap from knowledge understanding to engineering practice[3].

2. The Key Problems That Blended Teaching Should Solve

Blended teaching involves two links: online self-study and offline classroom lectures and discussions. How to effectively integrate these two links to ensure that students can fully preview and review online and have in-depth discussions and practices offline is the primary

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issue that blended teaching needs to solve[4]. In addition, blended teaching also needs to provide online learning resources of different difficulty levels to facilitate students of all levels to carry out autonomous learning and stimulate their interest and enthusiasm for learning. In blended teaching, the role of teachers has shifted from traditional knowledge transmitters to guides and facilitators of learning. Teachers need to be good at extracting important differentiated data from the large amount of student learning data on online teaching platforms and conducting analysis, scientifically evaluating students' online learning effects, so as to adjust teaching methods in a timely manner[5]. When implementing blended teaching, teachers need to design their teaching in combination with students' learning conditions, such as scientifically stratifying teaching content based on its difficulty level, effectively building online and offline teaching resources, and organizing and analyzing students' personalized learning data, etc.

2.1. Teaching Objectives

This course sets teaching objectives from four aspects: knowledge, ability, quality and value.

1) Knowledge objective: Master the reactive programming principles, component-based development ideas and core syntax of the Vue framework; Understand and proficiently apply core knowledge points such as component lifecycle, custom instructions, Vue Router route management, and Vuex state management.

2) Competency Objectives: Be capable of designing and developing reusable Vue components based on the requirements of front-end projects, possess the ability to implement front-end page layout and interaction logic, master the skills of project setup and debugging based on the Vue ecosystem (such as Vue CLI, Vite), and have practical development capabilities for small and medium-sized Vue projects.

3) Quality Objectives: Cultivate structured thinking and problem breakdown skills. Through online self-study and offline team collaboration, enhance the ability to independently solve technical problems and the habit of continuous learning. Strengthen the awareness of code standards and team communication and collaboration skills.

4) Value Objectives: Through the infiltration of engineering ethics through industry cases, guide students to establish the professional concept of "technology serving society", enhance their sense of responsibility for the development of the domestic front-end technology ecosystem, and stimulate their sense of mission to promote information technology innovation and the upgrading of the software industry. Construction of the curriculum teaching system

2.2. Teaching thought

In order to better achieve the teaching objectives, offline teaching is reconstructed on the basis of online teaching, and the online course content is designed as compulsory content and non-compulsory content. The online resources for compulsory content are mainly in the form of videos. Fifteen videos have been set up from four dimensions: course introduction, basic Vue syntax, fundamentals of componentized development, and advanced Vue features, for students to preview online before class. For students who have spare capacity for study, a total of six videos are provided for their learning in two dimensions: specialized applications (such as practical Vue Router, Vuex state management) and advanced sections (such as Vue3 Composite API, SSR technology application). Meanwhile, teachers will irregularly release cutting-edge technology information from professional forums on front-end technology (such as the official Vue community and SegmentFault) on online education platforms to enhance the advanced nature of the courses.

Teachers check the online previewing effect of students by setting up chapter quizzes on online education platforms and requiring offline submission of Vue component design plans, etc., to enhance students' consciousness and completion degree of online previewing. The offline classes mainly focus on students' practical operations in Vue projects and in-depth discussions

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between teachers and students on core topics such as "The Application of Responsive Principles in Component Development" and "Design of Complex Routing Scenarios", ensuring that students can transform the knowledge they have learned online into practical development capabilities and deepen their understanding of the relevant content.

Due to the possible problems such as homework plagiarism and fast-forwarding viewing of teaching videos in online learning, teachers need to manually analyze the platform data (such as video viewing duration, code submission records, and test accuracy rates) after class, promptly identify students with abnormal data and communicate with them to ensure the effectiveness of online learning and the fairness of assessment data.

2.3. Teaching methods

The six-step teaching method runs through the entire process of blended online and offline teaching. The six steps are: watch (watch the teacher write the source code), learn (learn the relevant grammar), imitate (imitate the example writing), evaluate (comments from the teacher or classmates), practice (practice writing a similar source code), and fight (participate in actual projects). Meanwhile, when adopting the six-step teaching method, methods such as gamified learning, project-based practice, and autonomous learning of cutting-edge technologies are interspersed. The combination of various teaching methods has fully reflected the dominant position of students.

3. Summary

The blended online and offline teaching mode plays a key role in the stratified teaching reform of the Vue framework course. By integrating the flexibility of online resources and the in-depth interaction of offline teaching, this mode not only enhances the mastery efficiency of core knowledge such as Vue component development and the responsive principle, but also precisely matches the learning needs of students with different foundations. For instance, tiered grammar analysis videos are provided for beginner students, while Vue3 source code reading and enterprise-level technology practice modules are offered to advanced learners, effectively stimulating the learning initiative of students across all proficiency levels. Under the framework of blended teaching, students can choose a personalized path of "foundation consolidation - component practice - project breakthrough" based on their own progress. Through the closed loop of online pre-study, offline code review and team collaborative development, their front-end engineering practice ability can be significantly improved.

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