

# Exploration of the Project-Based Teaching Mode Combined with Micro-Video Resources

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**Abstract:** Project-based teaching has been widely promoted and applied in teaching classrooms in recent years, but there are still some problems found in teaching practice. Combining the informational teaching resources of the past with some problems in the classroom teaching application in the background of the mobile era, we combined micro-video resources to change the traditional project-based teaching mode and explored a project-based teaching model based on micro-video resources. Using the Internet and other technical means to carry out project-based teaching, using micro-video resources, apply it to project teaching, so that project teaching can be better used in the classroom, to help project-based teaching.

**Keywords:** Project-based teaching; Micro-video resources; Internet technology

## 1. Introduction

In the traditional teaching process, the teacher writes the teaching activities of the rescue case according to the syllabus, and the classroom becomes the activity place for teachers and students to transmit and exchange information. The online course teaching can integrate pictures, texts and audio and video, and can carry out teaching activities vividly. At the same time, there are very big differences in the teaching mode. The traditional teaching mode is generally a form of classroom teaching that uses traditional teaching methods to complete specific teaching content. It is characterized by teachers dictating, writing books, and listening to notes by students. In this teaching mode, teachers are the center of teaching activities, the teaching activity is the leader of knowledge, the students are the recipients of knowledge, the online course teaching is an open type, and students' active learning becomes an inevitable phenomenon [1]. Under the premise of meeting the overall teaching objectives, students can carry out targeted learning. The curriculum and progress are allowed to vary from person to person. Students can study repeatedly and focus on learning according to their individual circumstances. By finding, exploring and processing such a learning process, students can improve their cognitive and discerning abilities, help to achieve "individualized teaching", and help develop the intellectual potential of students [2]. Teachers are also inevitably transformed from the dominant position in the classroom to the instructor of student learning.

## 2. Project-based Teaching Mode Design of Micro Video Resources

### 2.1. Introduction of micro video resources

The micro-learning proposed by Lindner, an Austrian study and research expert, consists of various media forms such as text, audio or video. Micro-video-based learning can be regarded as the most popular form of micro-learning at present. Interactive micro-video generally refers to videos with a playing time of 5-20 minutes. As a kind of teaching media that can effectively present teaching content and teaching methods, video resources have advantages and characteristics that are not available in general media such as texts, pictures, animations, etc. Video teaching is more conducive to students' understanding and memory [3].

The teaching curriculum platform based on "micro-resources" can be understood as the form of Internet + teaching resources. In the daily teaching process, with the help of big data, cloud computing, Internet of Things, mobile internet and other technical means, the holographic teaching application scene of the current 1:50 overloaded vocational education classroom is designed. Teachers can design holographic teaching application scenarios according to the content of the course, including classroom teaching, practical teaching, textbook learning, and after-school learning. Each teaching carrier is built into a "learning contact" (specific learning content) that can sense student behavior. Students learn self-study according to their own learning interests and knowledge, so as to improve classroom learning effect and teaching management accuracy [4]. Here, there are not only the resources taught by the teachers, but also the handouts and extended resources for students to download. At the same time, they also provide applications

such as check-in, note-taking, quizzes, interactive quizzes and classroom evaluations. Through the linkage with the online course to track the learning behavior, the teacher can immediately grasp the individual student learning process, effect and feedback.

The video case should be the most effective for the training of normal skills. However, at any point in the video playback, learners must pay attention to a variety of aspects, such as voice, speech rate, intonation, posture, action, blackboard, interaction, explain content. Therefore, during video learning, thinking, and analysis, it is often the case that the learner may repeatedly play the video repeatedly, thus affecting the timeliness of learning. The content and purpose of micro video resource teaching are shown in Table 1.

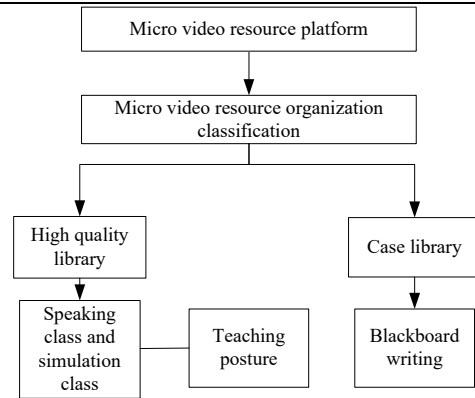
**Table 1. Contents and purposes of micro video resource teaching**

Contents	Purposes
Textbook	To understand the teaching materials comprehensively and correctly
Learning condition and strategy	To fully explain the students' existing academic situation, the current level of cognition and the learning methods already mastered.
Teaching method and means	To serve the purpose of teaching and teaching content, it is consistent with the practice in the teaching process to avoid mutual misplacement and unclear definition.
Teaching procedure	To systematically carry out teaching activities, reflecting teachers' teaching thoughts, teaching personality and teaching style

**2.2. Design of project-based teaching mode platform for micro video resources**

The teacher's training for students is mainly based on the five modules of lecture class, simulation class, blackboard book, teaching design and multimedia courseware production. However, if the training content is just in the classroom on the training platform, it will cause some skills to be repeated and time wasted. Therefore, the information specifically contained in the above five modules are analyzed, integrated and classified in this paper, and finally they are divided into three categories. That is, "speaking class and simulation class", "teaching posture" and "blackboard writing". Each category has a quality library and case database, as well as their respective subordinate indicators, as shown in Figure 1.

The classroom tasks of the project teaching are complete project content. The students simply do not have enough material to analyze the project situation according to the project objectives, contents and instructions, and it is difficult to make a feasible project implementation plan [5]. By adding auxiliary video resources for project information, students can get more information during the preparation phase of the implementation project.



**Figure 1. Micro video resource teaching platform**

At the same time, the auxiliary video resources are teachers who have been integrated and screened for a long time. They are valuable information for the implementation project and can be more prepared for the implementation project. In the classroom, the traditional teacher classroom lectures are replaced by watching the lecture videos, and the lecture time is moved from the classroom to the extracurricular, which breaks through the limitations of the project teaching only in the classroom. According to the different requirements and stages of each project, the corresponding teaching assistant videos are set up. Students can use their own terminal equipment to learn independently according to their own foundation and mastery of the situation [6]. The project teaching method is used to implement teaching, the corresponding teaching capacity of the unit time is very large, and it is difficult for students to reach the teaching goal within the prescribed time. Nowadays, by flipping the classroom and using micro-video resources, students can break through the limitations of time and space and learn outside the classroom. Undoubtedly, middle school students have more time for study. The use of micro-video resource-based flip classroom application in project teaching can effectively eliminate the phenomenon of "unbalanced" participation of students. Students are reluctant to participate, mainly because of the poor knowledge base. They do not know how to start with the project content, and micro video resources are used to give students more time and more humane learning methods. Students can easily pause, rewind, replay, and fast forward to learn. If they encounter an incomprehensible place, they can go back and look again until they understand. Moreover, video resources are more conducive to students' understanding and memory than simple pictures or documents. In the mode of flipping the classroom, appropriate and reasonable learning tasks will be set up for the actual knowledge level results of the team members and the different stages of project implementation. Students learn outside the classroom, by looking at the completion of individual and group learning tasks, from

which they can see the student's participation, effectively improve the student's participation, and prevent the "free rider" situation [7].

**2.3. The design of project-based teaching mode architecture of micro video resources**

The design of project-based teaching mode for micro-video resources is designed from two aspects: architecture and functional modules. The micro-video resource platform of project-based teaching mainly considers the display of the platform interface, the realization of functions and the user activities, as shown in Figure 2:

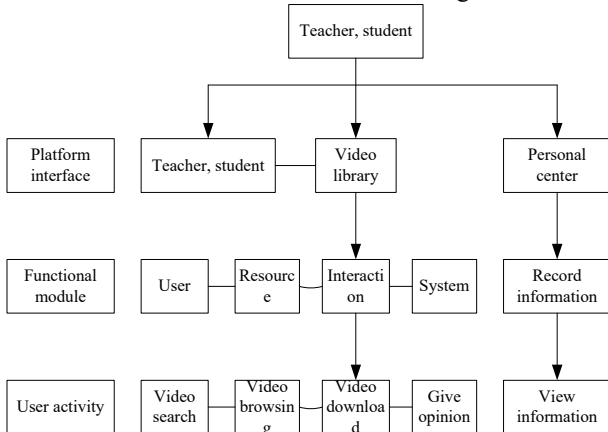


Figure 2. Architecture diagram of the platform

The interface of the project-based micro-video resource platform provided to the user includes: registration login, video library and personal center. Both teachers and learners can log in to the platform, and teachers and managers have the authority to enter the background for management; The resources provided by the platform are all presented in the form of micro-videos, which can be viewed by users through the video library, and personal information and activities can be recorded and viewed through the personal center module.

The functional modules include user modules, resource modules, interaction modules, and system modules. In which, the presentation of high-quality libraries and case bases in the resource module is the biggest feature of the platform. In project-based teaching, most of the teachers use language to explain and verbally conduct case analysis and elaboration. Through video presentation, teachers and students can be more intuitive and visually teaching and learning [8]. The interaction between teachers and students is mainly achieved through the evaluation function in the platform.

Since teachers, learners, and administrators use platforms as different identities, their privilege settings are different, and computers also enter activity data into different databases by receiving activity data from different people. For teachers, they can log in to the front desk to conduct corresponding teaching activities and observe the stu-

dents' dynamics. They also have the right to log in to the background and manage the collected data with reasonable planning and management. Such as video addition, upload, delete, update or improve material resources [9]. For learners, they can only be active at the front of the platform, namely video search, video browsing, video downloading, commenting and viewing information. If the learner has a case video to share, they can upload it in time by the manager.

**2.4. Functional design of project-based teaching mode for micro video resources**

The project-based teaching platform architecture of micro-video resources, the functional structure design of the platform (front and back-end) is shown in Figure 3. The background management is divided into video management, user management and system management.

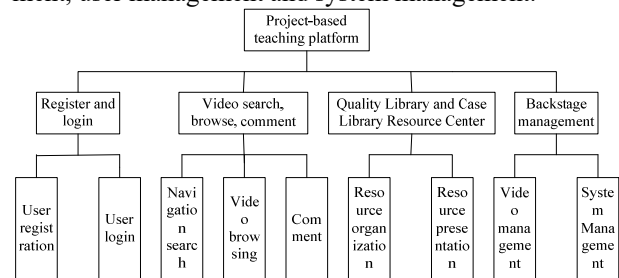


Figure 3. Functional framework

The function of the user registration login module includes two aspects: user registration and user login. The learner can input his own related information through the presentation of the information on the page and enter the platform [10]. Video search, review, and evaluation functions include searching for keywords and browsing videos for the videos you need, then you can evaluate the videos you are viewing, and you can also post your own questions. Learners can think through different questions and constantly seek questions to answer. Through this module, synchronous or asynchronous interaction between learners and learners, learners and teachers can be realized. The function of commenting can show the student's mastery of the knowledge he has learned, and can also show the students' thinking about the questions raised. This module, combined with the task management in the background, allows teachers to implement relevant teaching activities when implementing project-based teaching.

**2.5. Project-based teaching operating system design of micro video resources**

According to the design of the above project-based teaching mode, the platform was developed and implemented. The specific technology involves video resource processing, video resource search, hot video and latest video presentation, and interactive evaluation.

**2.5.1. Project-based instructional video resource processing**

The use of the platform for teaching is mainly through the presentation of video content in the platform, providing teachers with case materials and providing demonstrations for students. Therefore, a large number of video resources are required for users to view. These video resources can be high-quality video teaching cases (high-quality library video) or relatively non-standard examples (case library video). In order to conveniently and timely find the data in the platform, it is necessary to carry out scientific and effective design and integration of the video resources uploaded by the platform. Since the duration of the micro video in the platform is set within 40 seconds to 30 minutes, the uploaded micro video needs to be pre-edited. Each piece of micro video is sorted according to the specific index classification of the skill. For example, in the video of the blackboard and the chalk word, the video content can be presented only for the time period that the board book is about to be completed. In the course of teaching, teachers can select representative video clips to stimulate the viewers' interest in watching, which will attract more attention from students, and can help teachers to order and effectively teach in the classroom to some extent [11]. During the period of self-study, students will also play a certain role in promoting learning because of the unique characteristics and representativeness of the video content.

**2.5.2. Project-based teaching resource search**

Since the platform is based on micro-video as the main content, the design and implementation of the platform is also a form of video information service. In order to enable users to obtain the information provided in a timely and effective manner when using the platform, the design of information search and search functions is indispensable and extremely important. At the same time, in order to realize the user-friendly service of the user on the search information, a search function is provided on any page of the platform to improve the user's operation on the platform [12].

Each website has a search engine, and user/s can try to find information by keywords or sentences according to their own needs. The platform can query the information on the top of any page of the platform jump [13]. The main reason is the input of keywords as the main search method. These keywords are mainly based on the scoring standard to classify the specific skills of teaching skills. These keywords can be any of the classified indicators in the resource organization, such as: blackboard writing, chalk, and so on. The specific search process is shown in Figure 4.

**2.5.3. Project-based instructional video function presentation**

Teachers often use the demonstration cases to make students more specific image recognition in the teaching process of teacher skills. The presentation of “Bright Spots” videos can help students watch videos more attentively and provide students with better quality resources. Students directly enter the cognition and learning of “key” knowledge, and help teachers to improve the timeliness of teaching to a certain extent, so that students can obtain more good sources of knowledge in a short time [14].

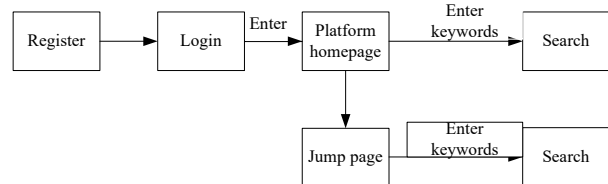


Figure 4. Using the platform to directly search for resource processes

**2.5.4. Project-based instructional video interactive evaluation**

In the whole process of teaching practice, no matter what kind of teaching is adopted, its teaching evaluation is indispensable. Similarly, in the whole process of autonomous learning, no matter what kind of learning is adopted, the corresponding learning evaluation is also very important. In order to give full play to the evaluation function, students can implement evaluation strategies in a virtual environment, maintain a relaxed state, and adopt a positive attitude. For networked microteaching, its teaching evaluation and corresponding learning evaluation can achieve the most realistic expression and comment of students, so that students can more clearly understand the problems of their own skills and understand the solutions to problems. Students can watch the video on the platform first, then use the theoretical knowledge already available to evaluate the video content and post comments through the comment function. Students can also view the comments already in the video details, have a preliminary judgment on the video content, then watch the video, and finally comment on the opinions of others and their own understanding [15]. Regardless of the form of evaluation used by the student, the teacher will review the comments and interact with the students in the evaluation area, summarize the comments, praise the correct views or correct the wrong views, so that the students' learning will continue smoothly. The evaluation flow chart is shown in Figure 5.

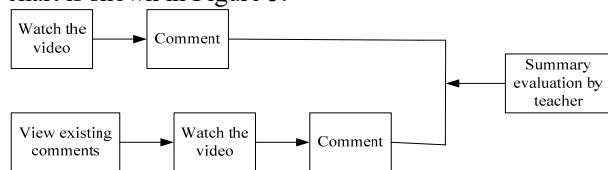


Figure 5. Evaluation flow chart

### 3. Test Analysis

In order to ensure the effectiveness of the project-based teaching mode proposed in this paper combined with micro-video resources, experimental analysis is performed. Students are used as test subjects to test the acceptance level of teaching content. To ensure the validity of the trial, we randomly selected 200 students from different classes to conduct tests.

In the course of the experiment, two different modes of project-based teaching were used to analyze the students' acceptance of the teaching content. In order to ensure the accuracy of data processing, only the learning state of different students, as well as their respective receiving abilities, are tested after learning, and the test results are obtained. The receiving degree curve is shown in Figure 6.

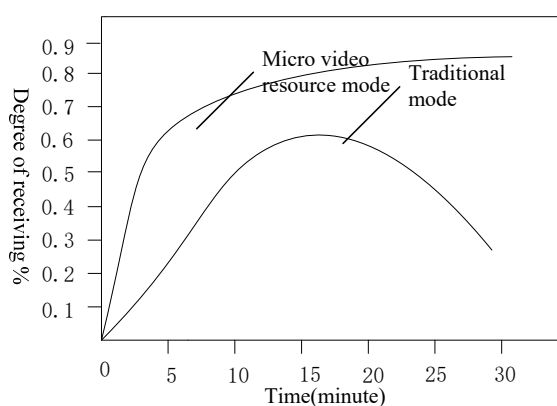


Figure 6. The degree of acceptance of the teaching content

As can be seen from the figure, before 15 minutes, in the project-based teaching in the two modes, the degree of acceptance of the teaching content by students is on the rise. But the project-based teaching under the micro-video resource mode is significantly higher than the project-based teaching under the traditional mode; However, after 15 minutes, the acceptance of teaching content by students in the traditional mode is gradually decreasing, and the project-based teaching in the micro-video resource mode is gradually increasing, which is suitable for project-based teaching.

### 4. Conclusion

The problems that arise in the teaching practice of project-based teaching and the advantages of micro-video resources are not limited to this. How to use the classroom application combined with micro-video resources to project teaching is worth exploring and practicing.

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