

# Construction and Application of Precise Teaching Mode Based on Cloud Classroom in the Context of Blended Teaching

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**ABSTRACT.** *In the context of the new curriculum reform driven by information technology, the hybrid teaching based on cloud classroom has achieved unprecedented development with its unique advantages. In order to evaluate the hybrid teaching effect based on cloud classroom and improve the quality of teaching, the article constructs a precise teaching mode based on cloud classroom based on constructivist theory and mastering learning theory. Then, taking the teaching of “Computer Basics and Information Literacy” as an example, the model was tested by group comparison experiment. Finally, the implementation effect of the model is explained by quantitative analysis, qualitative analysis and questionnaire survey of the experimental results.*

**KEYWORDS:** *Cloud Classroom; Precision Teaching; Blended Teaching; Teaching Mode*

## 1. Introduction

In recent years, the widespread application of cloud computing, big data and other technologies in the field of education has strongly promoted the teaching reform and integration innovation. Especially, the deep integration of online teaching and face-to-face teaching supported by information technology has created a new blended teaching mode which integrates online and offline[1]. Blended teaching is a model that attempts to complement the advantages of face-to-face teaching and online teaching in order to achieve effective teaching[2]. Amy Gutman[3], president of Pennsylvania University, believes that pure online teaching and face-to-face teaching can not maximize the teaching effect, and blended teaching will inevitably become the mainstream. Yonghai Zhu[4] research and analysis pointed out that blended teaching has an irreversible trend of development . Therefore, it is of great significance to optimize teaching organization, guide mixed teaching practice and improve teaching quality by using information technology to promote blended teaching reform, explore new precise teaching mode of online education, and apply it to classroom teaching practice.

## **2. Summary of related concepts**

### ***2.1 Blended teaching***

Kekang He [5] proposed that blended teaching is a kind of teaching method that combines online digital education with offline classroom teaching. It is necessary to combine the advantages of traditional learning methods with the advantages of digital online learning. Teachers should guide, inspire, and monitor the leading role of the teaching process, and fully reflect the initiative, enthusiasm, and creativity of students as the main body of the learning process to achieve more effective learning effects. Kedong Li [6] proposed that the blended teaching form is a mixture of online learning and face-to-face learning, but its deeper level includes a mixture of teaching modes based on different teaching theories, a mixture of teacher-led activities and student subject participation, classroom teaching and online. Learn a mix of different learning environments, a mix of different teaching media, a mix of classroom lectures with virtual classrooms or virtual communities. In short, blended learning combines the advantages of traditional teaching with the advantages of online learning, making full use of information technology to integrate into the “student-centered” teaching philosophy.

### ***2.2 Cloud classroom***

Cloud classroom is a network teaching and learning platform based on cloud service model real-name system, organization, control and manageability. Teachers can use the cloud classroom to carry out collaborative preparation and network training, and form an integrated collaborative communication mechanism such as joint preparation, teaching research and resource sharing. Students can use the digital resources of the cloud classroom, network operations, online self-test, extended reading, network electives, etc. to carry out independent learning.

### ***2.3 Precision teaching***

Precision teaching is a teaching method proposed by Ogden Lindsley in the 1960s according to Skinner's behavioral learning theory, which aims to track the performance of primary school students by designing measurement processes. Provide data decision support to “put science in the hands of students and teachers” [8]. The original intention of precision teaching is to turn traditional experience judgment teaching into data-driven teaching. That is to analyze and mine the data of the whole life cycle of students' learning, accurately grasp the learning situation of each student, and then help teachers implement precise teaching to realize personalized education. However, due to the lack of technical support in the traditional learning environment, it is difficult to record and measure the student's learning behavior, and the degree of data analysis and visualization is not high [9]. In the context of the new curriculum reform driven by information technology, the cloud classroom can record the students' learning behavior in detail, and create a

good environment and technical support for the implementation of precision teaching.

### 3. Construction of precise teaching mode based on cloud classroom

Based on the teaching characteristics of cloud classroom, this study builds a precise teaching model based on cloud classroom based on constructivist learning theory and mastering learning theory. As shown in Figure 1, the precise teaching mode based on cloud classroom is divided into three stages: pre-class, in-class and after-class, which correspond to accurate analysis of the situation, teaching implementation and effect evaluation.

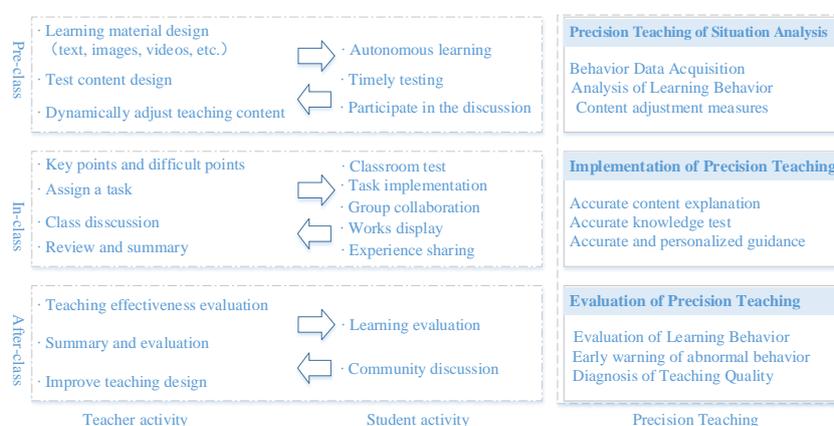


Figure.1 Based on the cloud classroom precision teaching mode

#### 3.1 Before class -Analysis of the academic situation of precision teaching

Before the class, in order to ensure that students use the cloud classroom for effective learning and understanding of knowledge points, teachers need to distribute the teaching focus, reference materials and tutorials to students for understanding and learning through the cloud classroom platform. Secondly, the knowledge points need to be structured and can be explained by means of micro video production. Then, for the learning of knowledge points, it is necessary to construct a corresponding learning community, so that students can participate in the discussion and questioning of knowledge in a targeted manner, thereby promoting the extensive and profound communication between teachers and students, and helping students to deepen the construction of knowledge. At the same time, the learning of each knowledge point also needs corresponding knowledge testing module, so that students can continuously strengthen and consolidate the knowledge they have learned through self-testing. Finally, the teacher will analyze the students according to their learning time, knowledge discussion and self-test results, find problems in time, optimize the layout of teaching resources and assist students to

correct the independent learning process in time, so as to provide a basis for the implementation of classroom precision teaching.

### ***3.2 In class-Implementation of precision teaching***

The teacher collects feedback based on the students' pre-class study and related questions to determine the starting point, key points and difficulties of the classroom teaching, and timely adjust the teaching design and teaching strategies. Secondly, the teacher conducts data display and knowledge review on the pre-class learning situation through the cloud classroom platform, and analyzes and explains the existing problems. Then, the teacher publishes advanced tasks through the cloud classroom platform, and asks and encourages students to work together in a group work. During the task implementation process, focus on students who may have difficulties, intervene in time, implement personalized guidance, and try to solve students' problems in the class. Finally, show the students' works or achievements, and share the experience in the task implementation process. Experience or encounter problems and solutions, and the teacher summarizes and evaluates the completion of the work, and then guides students to think deeply, expand their thinking, and solve students' doubts.

### ***3.3 After class-Evaluation of precision teaching***

Due to the knowledge test before the class and the task implementation in the class, the teaching purpose of strengthening, consolidating and applying the knowledge has been achieved. Excessive learning tasks will not only increase the student's learning burden, but also may play a teaching effect of "the extremes must be reversed". Therefore, based on the hybrid teaching of the cloud classroom, the assignment tasks are not released after the class to ensure that the students have enough time to complete the pre-class knowledge of the next unit. After the class, teachers need to evaluate the students' process learning and evaluate the teaching results according to the students' pre-class and class learning conditions, so as to realize the learning feedback to the students and provide the follow-up teaching design and optimization of teaching effects.

## **4. Implementation and Evaluation of Precise Teaching Model in Cloud Classroom**

In this study, a total of 68 college students from the 2018 level environmental art design major of Heyuan Polytechnic were selected as the research objects, and the hybrid teaching practice based on cloud classroom was carried out based on the "computer basic and information literacy" course. Class 1 was the experimental group and 2 classes were the control group. The control group mainly emphasized pre-class preparation, classroom explanation and practice, and the way of doing homework after class. The experimental group and the control group were taught by the same teacher who had five years of teaching experience in the course and who

had obtained the school-level excellent teaching quality award for three consecutive years. Finally, the results of the computer simulation test and project evaluation were used to quantitatively and qualitatively analyze the experimental results, and the results of the experimental group were investigated and analyzed by means of questionnaires.

#### ***4.1 Quantitative analysis***

At the end of the period, the National Computer Level 1 exam question structure was used for assessment. There were multiple choice questions (20 points), basic operation questions (10 points), text processing questions (25 points), electronic forms (20 points), presentations (15 points). and online operation (10 points) composed of six major questions. The scores of the experimental group were concentrated, and the scores between the students were not large. The average scores of each type of big questions reached an excellent level. And the results of text processing, spreadsheets and presentations were significantly better than the control group. The distribution of the results of the control group was relatively discrete, and the scores between students were large, especially in the four topics of multiple choice questions, text processing, spreadsheets and presentations. In addition, the score distribution of the online operation questions of the control group is better than that of the experimental group, mainly because the “mail sending and information retrieval” in the online operation problem can correspond to the knowledge or skills required for the homework assignment of the control group. Finally, the average scores of the experimental group and the control group were 86.517 points and 81.586 points respectively. The average score of the experimental group was 4.931 points higher than that of the control group. These two sets of experimental data show that precise teaching based on cloud classroom can significantly improve students' performance.

#### ***4.2 Qualitative analysis***

In order to further evaluate the results of the experiment and evaluate the training effect of students' high-level thinking ability, the research team organized three teachers with more than five years of teaching experience in the course to make a proposition for this project evaluation. According to the students' completion of the assessment of the project, the five dimensions of the students' innovative ability, evaluation ability, analytical ability, application ability and comprehension ability are evaluated in an anonymous way, and the quality of the project completion is evaluated and analyzed. The analysis results show that the quality of the projects completed by the experimental group is higher than that of the control group, especially the overall innovation ability and evaluation ability of the experimental group. Based on the blended teaching of cloud classrooms, it pays attention to the cultivation of students' self-learning ability and problem analysis ability, emphasizing evaluation throughout the whole teaching process, and is more conducive to cultivating and stimulating students' high-order thinking ability.

Qualitative analysis results are consistent with the results of quantitative analysis.

#### ***4.3 Analysis of the implementation effect of precision teaching***

After the course, the research team conducted a questionnaire survey on the students in the experimental group. The questionnaire was produced using the Likert scale. Combined with the characteristics of the cloud classroom, the survey includes: teaching resources, learning models, timely testing, teacher-student exchange and guidance, project practice and coaching, group discussion and collaboration, work display and teaching evaluation and feedback. Each item provides five options of “very satisfied, satisfied, average, dissatisfied and very dissatisfied” with a score of 5, 4, 3, 2 and 1 respectively. In order to ensure the objectivity and authenticity of the survey results, the questionnaire is anonymous and the students are informed in advance that the survey results are not related to the assessment of the grades. Finally, the results obtained by subdividing and calculating the average scores show that students have higher satisfaction with the cloud classroom to provide timely testing and display modules, and the project practice and coaching, learning model and teacher-student exchange and guidance modules are second. And the satisfaction with the learning resource module is low.

In order to further verify the results of the questionnaire survey, the research team invited the students of the experimental group to participate in the interview through interviews to listen to their opinions and suggestions. The results of the interviews show that 90% of the students expressed their willingness to accept this kind of learning, especially the timely test provided in the cloud-based video learning process and the project results display set in the classroom, which can get a larger Satisfaction and sense of accomplishment; 86.7% of the students believe that the project practice and coaching in the classroom has greatly improved their ability to apply knowledge, and the whole process has been completed by teachers, and the confidence in completing the project is many. . In addition, 26.7% of the students think that the curriculum resources provided by the cloud classroom are not rich enough, and some of the knowledge points are a little difficult to learn. Students with relatively weak foundations need to review them repeatedly to better understand.

### **5. Conclusion**

The precise teaching based on cloud classroom in the context of mixed teaching is a data-driven personalized teaching service and evaluation model. Under this model, rich teaching resources can meet the needs of students to learn before and after class; refined and fragmented micro-video design is more in line with the law of attention; large-scale discussion in the learning community can promote teachers and students to be broad and profound Communicate and help students to deepen knowledge construction; timely testing and personalized task release can strengthen and consolidate the knowledge that students learn; ultimately, through the application of big data technology, teachers can learn the situation before and during

class. Assessment of academic performance, etc.

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