

# Research and practice of blended teaching mode based on smart classroom

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**Abstract.** With the further development of education informatization, the integration of smart classroom and blended teaching has become an important direction of educational innovation. With the help of smart classroom and Super Star Learning teaching platform, this paper explores the online and offline mixed teaching mode based on smart classroom, and builds a classroom teaching system of "one point, two lines and three stages". The model is applied to the course "Android Mobile Application Development". The results show that the blended teaching under the smart classroom improves students' academic performance, with high satisfaction and enhanced students' hands-on ability. The online learning behavior is proportional to the final score. This proves to a certain extent that the integration of smart classroom into blended teaching can promote teaching reform and innovation and improve teaching quality.

## 1 Introduction

The "Education Informatization 2.0 Action Plan" issued by the Ministry of Education proposed that "smart education innovation and development Action" "rely on all kinds of smart devices and networks, actively carry out innovative research and demonstration of smart education, and actively promote the reform of education mode and ecological reconstruction supported by new technologies." The traditional teacher-centered classroom has been unable to meet the needs of students growing up in the information age. Educators have begun to think about how to rely on the organic integration of modern information technology and teaching to improve the teaching effect to meet the learning needs of students. This paper takes "Android Mobile Application Development" as an example to analyze the construction status of the course, explore the deep mix of online and offline teaching methods, seek the seamless connection between theoretical cognition and practical operation, and build an interactive teaching system of software courses.

## 2 Research background

The online and offline hybrid teaching mode based on smart classroom aims to use the information technology platform to integrate the advantages of face-to-face teaching in offline classroom and online smart platform teaching, so as to better meet the requirements

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of intelligent, convenient and personalized learning in student education and teaching, build a student-centered knowledge construction system, and emphasize the initiative of learning. In the teaching process, students learn a diversified knowledge system through the smart teaching platform. With the help of the teacher's guidance, they discuss and communicate online and offline with classmates, strengthen the cultivation of communication consciousness, expand ways to improve learning ability, and achieve the goal of building a knowledge system independently.

Blended teaching is based on modern information technology means to integrate traditional teaching and online teaching two forms of teaching. In teaching practice, combining teaching theories and smart classroom teaching platform to reform education and teaching methods, integrating resources in the existing mainstream smart teaching platform of the school, providing personalized teaching guidance to students, achieving management and feedback of the whole process of education and teaching, promoting the cultivation of students' ability to build independent knowledge, and forming good learning behaviors and cognitive laws. It makes teachers and students interact better and improves the teaching effect. Through the intelligent teaching platform, combined with the information-based teaching terminal, we can give full play to the whole process of education before, during and after class, build a hybrid teaching model with tracking learning data, more effective communication and feedback, and more efficient resource services, so as to promote students' personalized learning and wisdom growth.

### **3 Construction of blended teaching mode based on smart classroom**

#### **3.1 Analysis of learning situation**

"Android Mobile Application Development" is a professional course in the fall semester of the junior year of software engineering major of Shandong Union College, with 32 theoretical hours and 32 experimental hours, totaling 64 hours. It has strong technology, practicality and practicability. The students of this course are undergraduates with certain knowledge reserves and learning habits, excellent online learning ability, and have completed the basic courses of their major, and have a certain understanding of the curriculum system and training objectives of their major. However, the students do not have a deep understanding of the technology and few application scenarios, resulting in their weak practical ability. The students only follow the teacher to learn code writing in class. Lack of learning carrier before and after class. Under such circumstances, the course "Android Mobile Application Development" focuses on the output of learning results, comprehensively analyzes the current situation of course construction and implementation, and puts forward two problems that must be solved in the teaching of software development courses. First, the integration of teaching implementation is not enough, teaching materials, teaching platforms and teaching methods are not enough to support talent training, and students can not build learning carriers. The curriculum lacks MOOCs and information resources, and simple offline classes can not stimulate students' enthusiasm for learning. Second, the matching degree of teaching evaluation is not high, and the assessment index takes general consideration of talent training, which can not weigh the learning results of students.

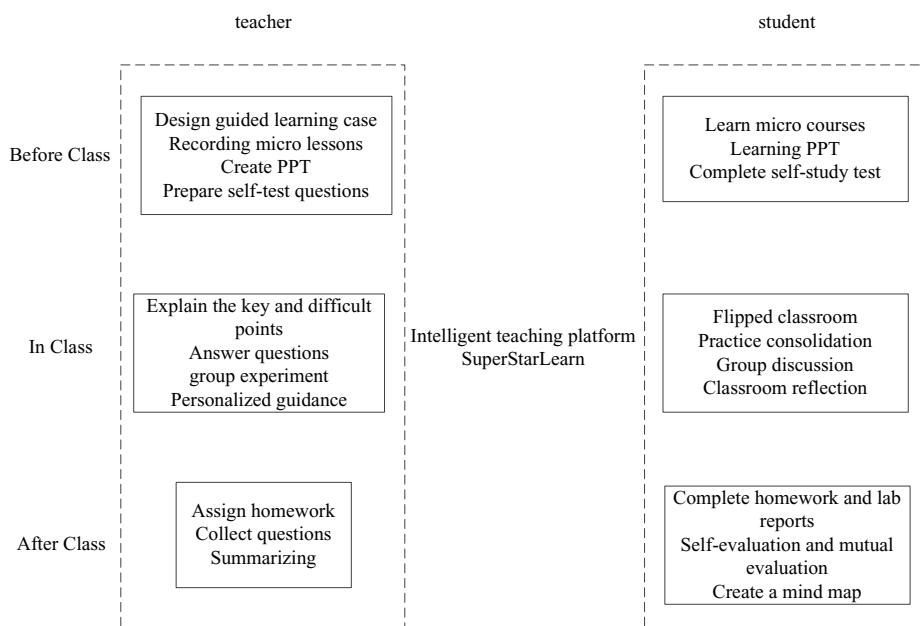
#### **3.2 Research on blended teaching mode in smart classroom environment**

Based on the above problems, this paper explores a new teaching path, starting from the following three aspects: First, implement the concept of three-in-one education, focus on the

three aspects of curriculum objectives, teaching implementation and teaching evaluation, use OBE concept, define learning outcome goals, create ways to achieve learning goals, and evaluate learning effectiveness and output. The second is to integrate learning resources inside and outside the class, set up an interactive platform, enrich multiple practical carriers, and form an effective link of interaction. The third is the construction of "one point, two lines and three stages" interactive curriculum teaching system. "One point" means taking the learning effect of students as the starting point; "Two lines" refers to the two lines of activities of teachers and students in the environment of both online and offline carriers extended from the starting point; "Three stages" refers to "before class, during class and after class" three periods of execution, "foundation, application and innovation" three levels of output.<sup>[1]</sup> Through the curriculum objective content, teaching implementation, teaching evaluation, based on mastering basic knowledge, challenge practical application ability, enhance innovative thinking ability, and establish a good teaching ecological environment.

Relying on the teaching management platform of Super Star Learning APP, the blended teaching model based on smart classroom is constructed. Before class, teachers use Learning to build lessons online, send the two-dimensional code or course code of the course to students, and publish learning tasks. In the class, multimedia teaching machine combined with infrared touch technology, iFlytek intelligent office teaching software, multimedia network communication technology, integration of computers, touch screens and other devices, easy interpretation of wonderful interactive intelligent classroom. After class, based on the collection and analysis of big data information, the whole process of recording and tracking the teaching of teachers and students' learning process, content and feedback, comprehensively grasp the personality characteristics and learning behaviors of each student, and promote individualized teaching and accurate teaching.

The course teaching is guided by the modern education and teaching concept, and uses modern information technology to create teaching situation and form intelligent teaching ecology. The teaching mode of interactive integration of software courses in three periods and three levels under the environment of online and offline dual carriers and teacher-student dual routes has been gradually constructed<sup>[2]</sup>, as shown in Fig. 1.



**Fig. 1.** Blended teaching mode based on smart classroom.

Before class, teachers assign learning tasks to students and collect students' questions. Students practice by themselves and summarize their learning questions. In the class, the teacher quizzed the basic knowledge, taught the key points, solved the difficulties, and sorted out the knowledge points of this class. Students discuss the problems, teach their own innovative solutions, and then work together according to the division of labor, hands-on practice. After class, teachers set up thematic discussions according to the class situation, and students can ask questions about learning and ask for help. The curriculum is implemented at the three levels of "foundation, application and innovation" to realize the deep integration of information technology and classroom teaching, and effectively promote the improvement of students' application ability and the cultivation of innovative talents.<sup>[3]</sup>

### 3.3 Evaluation and assessment

Curriculum teaching evaluation follows the principles of development, collectiveness and multi-subject, and process evaluation with result evaluation, teacher evaluation, self-evaluation and other evaluation to ensure that curriculum objectives can be measured and evaluated. According to the distribution ratio of "30% online learning + 30% classroom teaching + 40% comprehensive task", the specific assessment form, content, method and score are shown in Table 1 to comprehensively evaluate the course learning effect of students.

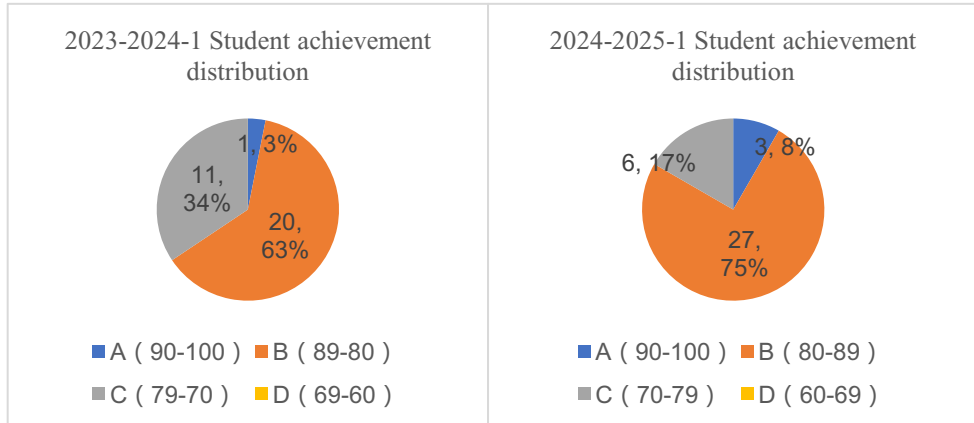
**Table 1.** Assessment of the course "android mobile application development".

Examination Form		Assessment Content	Assessment Method	Score %
Process evaluation	On-line assessment	Learning progress	Platform learning record	10
		Topic discussion	Platform interaction	10
		Theoretical knowledge	homework	10
	Classroom assessment	Classroom performance	Classroom test	10
		experiment	Experimental report	10
		Mid-term examination	Mid-term examination	10
Outcome evaluation		Final examination	Defense, final work	40

## 4 Course teaching effectiveness

After two years of reform and practice, the curriculum team applied the OBE results-oriented concept, based on Bloom's cognitive behavior classification, and referred to the learning pyramid theory, and the curriculum objectives of Android Mobile Application Development were progressively advanced, teaching resources were linked, teaching methods were well-guided, and teaching evaluation was one-to-one corresponding, and students' scores were significantly improved, as shown in Figure 2. In addition, based on the learning ecology of

"one point, two lines and three levels" of the course, students returned with great success in various activities.



**Fig. 2.** Distribution of student achievement.

## 5 Closing remarks

Aiming at the problems of classroom teaching in colleges and universities, this study designs and implements the blended teaching mode based on intelligent classroom. The practical results show that this model not only improves the academic performance, but also increases the interaction between teachers and students, and realizes the student-centered teaching principle.

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