



Research on the Teaching Practice of Smart Classroom Teaching Mode Under the Background of “Internet+Education”

Xuedong Lin(✉)

School of Intelligent Manufacturing and Transportation, Chongqing Vocational
Institute of Engineering, Chongqing, People's Republic of China
181810052@qq.com

Abstract. Under the background of “Internet+Education”, the implementation of smart classroom is conducive to the interactive communication between teachers and students before, during and after class, and to increase students' interest and attention to classroom learning, so that the optimal educational effect can be realized. The development of smart classroom is the inevitable trend of information technology focusing on educational activities, and the teaching practice of smart classroom teaching mode is the continuous implementation of innovation and change of curriculum teaching on the platform of information technology.

Keywords: smart classroom teaching mode · teaching practice · Internet+Education

1 Introduction

With the advent of the “Internet+” era and the continuous integration of the Internet and education, the impact of information technology on education and teaching is receiving more and more attention from many scholars and front-line workers in education [1–3]. The “Internet+Education” has transformed the traditional physical classroom into an online classroom and network classroom using cell phones, computers and other mobile devices as media, and various online resources allow students to learn anytime and anywhere. Moreover, the emergence of new technologies such as big data statistics and learning effect analysis software (e.g. Rain Classroom) can better help teachers understand students' learning effects and timely adjust teaching plans, update teaching contents or develop personalized learning programs for students, making students' learning more personalized, adaptive and intelligent. Therefore, the smart classroom teaching mode can be summarized as a ubiquitous learning mode, which makes use of smart service platforms (smart campus APP, smart teaching software, etc.) and smart phones, computers and other devices, and uses new-generation information technology to tailor to students, with the characteristics of personalization, intelligence, adaptation, openness, democracy and efficiency, and runs before, during and after class. It will help promote students' independent learning behaviors and improve learning outcomes.

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2 Current Status of Classroom Teaching

2.1 Inability to Understand Students' Preview Before Class [4]

In the traditional teaching mode, although the importance of preview before class is emphasized, few students can really do it, and even if they do, the teacher cannot know the effect of their preview. In the process of teaching, I found that students basically do not have the habit of preview, but the reality of the teaching situation is that when teachers use computers for teaching, it is difficult for students to keep up with the rhythm of the teacher's thinking and operating speed, which not only affects the teacher's lesson plan and progress, but also makes it difficult to ensure the learning effect of students. Therefore, it is necessary to arrange students to preview before class. In addition, if teachers know the effect of students' preview in advance, they can adjust the classroom teaching content appropriately and give detailed explanations to the drawing knowledge points or operation steps that students do not know well, so that the teaching can be more targeted. Obviously, arranging students' preview before class and understanding the effectiveness of their preview can help improve the quality of classroom teaching and learning, as well as develop students' independent learning skills.

2.2 Lack of Interaction in Class

According to the research, almost all front-line teachers reflect that there are many teaching contents and classroom time is tight, they do not have enough time to interact with students in class, and classroom teaching is more about teachers demonstrating operation process, explaining principles and operation steps, while students passively receiving knowledge. Most of the time, the classroom learning is not effective because the students' minds can not keep up with the teachers' pace (due to the lack of preview sessions), and the teachers have to continue the lecture a second time and then walk off the podium to give one-on-one tutoring to some students so as to ensure the learning effect. Due to the lack of interaction in the classroom (students nowadays are not willing to actively communicate with the teacher), the teacher does not know how well the students have mastered the points taught, which makes the teaching less relevant and makes repetitive lectures less effective. Moreover, this teaching style will inevitably slow down the teaching progress. The classroom lacks interaction and is not energetic enough, which over time reduces students' motivation to learn and hurts teachers' motivation to teach.

2.3 Failure to Follow Up on Students' Review After Class

In traditional teaching, teachers usually have to wait until the next class to collect and correct the homework after assigning it, and then wait until the next class or longer to know the students' mastery in the last class. The time delay makes students' internalized absorption of knowledge through homework training after class less effective, and it is difficult for teachers to understand students' mastery of knowledge in the first place so as to make targeted tutoring, making it difficult to guarantee the effect of review and consolidation after class. With the continuous application of information-based

teaching methods, most of the after-school homework needs to be completed with the aid of computers, and it is then necessary to realize real-time communication between teachers and students online through the smart teaching platform, so as to realize one-to-one tutoring by teachers to students after school. So it seems that the traditional way of homework review makes it difficult for teachers to keep track of students' practice after class.

3 Classroom Teaching Practice of Smart Classroom Teaching Model

3.1 Preview Before Class

Students are guided through resource pushing for independent preview. Teachers release pre-prepared resources for preview to students through the smart classroom IT platforms (either through QQ platform, school's teaching resource library or smart teaching software such as Rain Classroom). The released resources are in various forms, including micro-videos, selected online web-based courses, courseware, links, pre-study questions, etc., which students can choose to study on their own. Take UG software teaching as an example: the preview resources can be some specific 3D model drawing operation process videos, resources that come with the textbook or self-recorded resources by teachers, or homemade videos that explain the usage of a certain instruction for the software. For a specific 3D model, the inner logical relationship of each part of the model should be analyzed before modeling, to figure out the sequence of superposition of each part of the model, what to draw first and what to draw later. The preview before class of smart classroom is controllable, whether students have previewed, the preview situation and the answer situation will be presented visually in the form of data at the teacher's end, and teachers can understand the preview situation of students in real time through the relevant software platform. At the same time, students can comment on the preview materials shared by the teacher or recommend to other students what they think is better, or communicate with the teacher on the learning platform to raise questions or comments, while the teacher can adjust the teaching content based on students' feedback and design the teaching content and teaching implementation plan more from the students' perspective, so as to be fully prepared for classroom teaching.

3.2 In-Class Interaction in Three Dimensions

The traditional classroom mainly consists of "teacher lectures - students listen", "teacher questions - students answer by name" and "step-by-step homework - homework after class", from which we can see that the traditional classroom model lacks interactivity and students are always in a passive position. In contrast, the key to smart classroom teaching lies in classroom interaction, the core of which is a three-dimensional interactive process that emphasizes the students' subjectivity in the teaching process, while the teacher plays the role of a guide and facilitator. For example, in the classroom, teachers use WeChat to automatically generate QR codes for the lesson through the "Rain Classroom" platform, while students scan the QR codes to enter the classroom and start the lesson. The teacher's

PPT for the lesson will be displayed on students' cell phones in real time, and students can use the "Don't Know" or "Favorites" buttons to mark important points for easy review after class. The "Favorites" or "Don't Know" markers are anonymous, so students can mark them according to their actual situation to help them learn better, and the teacher can only see the number of "Don't Know" students, and can adjust the lesson content according to the "Don't Know" situation, or focus on reviewing the "Don't Know" content in the next lesson. In the classroom, teachers can open "bullet-screen" to achieve real-time interaction, and students can post their views or opinions on the screen to share and discuss with others, thus promoting teacher-student and student-student interaction. Many students are shy and afraid to communicate with the teacher, but with the bullet-screen, these students can also present their views to the teacher, which makes more and more students participate in classroom interaction, making the classroom atmosphere more active and students more motivated to learn. Take UG drawing as an example. In the course of the lesson, the teacher can broadcast the multi-screen teaching of the drawing process to the students through the software of "Extreme E-Classroom". The purpose of the first operation is to let the students understand each knowledge point completely and clearly, and know the important and difficult places in the operation; then the teacher leads the students to carry out the specific drawing operation. Students can draw while giving feedback to the teacher and others on their computers through the "bullet-screen" function, and they can even "raise their hands" to make the teacher pause the lesson or repeat the previous points immediately. In this way, the learning effectiveness of each student, especially those who do not like to communicate, can be ensured. In addition, after the lecture is completed, teachers can set some practice questions for the current knowledge points and push them to students via cell phones using Rain Classroom to test students' mastery of the current knowledge points. The questions include single-choice, multiple-choice and subjective questions, mainly on drafting theory and application of software commands, such as: What is the concept of "constraint"? What is the concept of "closure"? What are Boolean operations? How to call a common command? In particular, the teacher should let students give their own drawing ideas and the commands to be used in the drawing process according to the specific 3D model... If the questions are generally answered unsatisfactorily, the teacher is able to see the list of students who answered the questions wrongly through the cell phone, at which time the teacher can ask the students who answered the questions wrongly to tell the ideas of doing the questions at that time and help them analyze and correct them, so as to deepen the students' impression of this problem and make them not make mistakes again when they encounter the relevant knowledge points in the future. It also helps teachers to reflect on how they should teach relevant points in the future to make them more understandable to students, thus greatly contributing to the quality of teaching and learning. At the end of the class, teachers can summarize the knowledge points covered in the class and push them to students via cell phones, so that students can review them in time after the class. The entire classroom implementation route is shown in Fig. 1 [5].

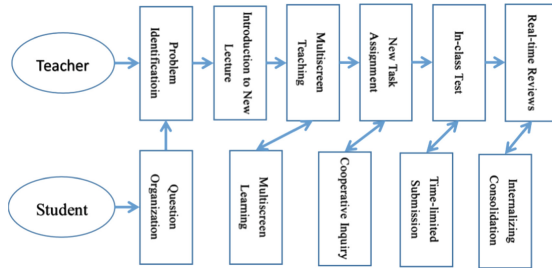


Fig. 1. Roadmap for the Implementation of Smart Classroom Teaching Model

3.3 After-School Personalized Tutoring Based on Smart Learning Platform

The main purpose of doing post-lesson exercises is to help students consolidate and review what they have learned in the previous chapter. Unlike traditional classroom assignments, smart classroom can push personalized review resources and issue targeted after-school exercises for individual students through the smart learning platform. Once students submit their after-school assignments completed within a certain deadline to the teacher, the teacher end platform receives the students' answers and can give feedback on the students' assignments in the shortest possible time. This personalized tutoring approach is more efficient, intuitive and fast, which helps to increase students' interest in learning and promote their independent learning behavior.

During the teaching process, considering the popularity of using computer-assisted completion for most of the post-class assignments, students' assignments can be fed back to the teacher for viewing through screenshots, or students can give timely feedback to the teacher through voice and text on the difficulties encountered in the drawing process, while the teacher will give corresponding guidance or solutions for specific process steps to guide students to complete the post-class exercises. Through the exchange, the teacher will also be able to know more about the students' mastery of the knowledge points, so that they can consolidate the explanation and practice in the next class. This teaching mode can help teachers summarize and improve teaching methods and adjust teaching plans on the one hand, and on the other hand, it can help teachers analyze the knowledge points with high error rates and then assign additional after-class exercises, thus helping students digest the knowledge points and consolidate and review them in a timely manner. During the review process after class, students can report any questions they don't understand to the teacher so that teaching and learning are always online.

4 Conclusion

By deeply integrating post-modern higher vocational education, the implementation of smart classroom teaching mode and making full use of modern information technology, Internet technology can change students' passive learning state into active ones. Based on the information technology platform, the intelligent teaching software enables interactive communication between teachers and students before, during and after class, so that students' ubiquitous learning is guided anytime and anywhere, thus enabling students to

acquire knowledge. This teaching mode achieves the consolidation and internalization of knowledge, increases students' interest and attention to cartography, optimizes the teaching effect, and also promotes students' independent learning behavior and improves their learning effect.

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References

1. Wang, X. (2015). Practice of “Internet+Random Learning” classroom model - taking Jiamusi Technician College as an example. *Logistics Technology*, 23, 211–213.
2. He, M. (2016). Exploration on the Big Data of college classroom teaching based on “Internet+.” *Modern Education Management*, 10, 103–107.
3. Chen, K., Zhu, Y., & Luo, Y. (2016). Exploration on the design of flipped classroom teaching under the background of “Internet+”—taking the teaching of international business documents as an example. *Foreign Economic and Trade*, 7, 153–155.
4. Xiao, D., Zheng, X., Huang, M., et al. (2018). Teaching practice of smart teaching mode in organic chemistry course in rain classroom in the context of “Internet+Education.” *Guangdong Chemical Industry*, 45(17), 224–228.
5. Chen, T. (2017). *Research on the design and application of smart classroom teaching mode in the context of “Internet+Education”* (pp. 42–50). School of Wisdom Education, Jiangsu Normal University.

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