

Exploration and Practice of the Construction of Intelligent Classroom in Colleges and Universities under the Background of Education Informationization

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Abstract

At present, modern information technology has entered the classroom comprehensively, and its advantages are prominent in education. However, the traditional classroom is still the main mode of classroom in colleges and universities, which leads to the slow development of the new classroom model and becomes one of the factors restricting the teaching reform. This paper discusses the construction of smart classroom from the current situation of classroom mode in colleges and universities, and expounds that smart classroom is the inevitable trend of modern teaching construction reform. Under the background of education informationization, college education and teaching practice should fully rely on information technology means, while continuously expanding the teaching content, effectively optimize and reform and innovate its teaching methods, better improve the overall quality of students, and further promote their growth and development.

Keywords

Educational informatization; Higher education; Smart classroom; Explore; Practice; Results.

1. Introduction

Under the background of the changing tide of information technology, how to promote the construction and development of education informatization and realize the transition from traditional education to information education is not only the goal of talent training and education in the new era, but also the key to narrow the gap between urban and rural education as well as the gap between international education. The realization of education informatization is one of the key goals to promote the reform and development of education and teaching in China. In this process, the emergence of smart classroom has brought new challenges and opportunities to college classroom. For example, deep interaction based on smart classroom is an effective way to achieve high-quality classroom teaching, and its value is reflected in the realization of multiple integration and interaction of teaching structure elements, deep learning in smart classroom environment, and deep integration of information technology and classroom teaching [1]. Interactive participation, effective interaction and accurate interaction are the key points to realize in-depth classroom interaction in vocational colleges. The way for intelligent classroom to enable deep interaction in university classroom is to make interactive decision-making scientific, improve interactive participation by relying on intelligent environment, improve interactive effectiveness by relying on high-quality interaction, and improve interactive accuracy by relying on learning analysis.

The ultimate goal of education is no longer the traditional knowledge of the company can to impart the educatees, but to teach educatee learn to use all the useful resources to achieve the goal of lifelong learning, "to teach fishing is better than teach them to fish", this also reversed

transmission as the education of the ontology of all kinds of education institutions at various levels in China continued to deepen information literacy of teaching and learning, Continuously cultivate the information literacy of teachers and students [2].

2. Status Quo of Classroom Mode in Colleges and Universities

Over the years, "teachers teach, students receive" of the traditional teaching mode, teachers occupied most of the class, while in this mode, students in the class just passively receiving transmission of knowledge, the teacher and the teacher interaction between rarely, this leads to the enthusiasm of student participation, interactive, and is difficult to get promoted, is not conducive to the development of education in colleges and universities, It is also detrimental to the development of students themselves.

Some intelligent equipment and multimedia equipment introduced by colleges and universities are mostly multimedia classrooms based on "central control + computer + physical projector", which are built early, prone to equipment failures, incompatibilities, flicker screens, high maintenance costs, no response of touch screens and other faults that may seriously affect teaching. In this teaching mode with traditional equipment, teachers mainly use PPT to teach, and the teaching form is single, lacking teaching interaction with students. Multimedia teaching is difficult to effectively improve the quality of teaching, and is not well connected with the school's educational affairs and multimedia management, so it cannot integrate the school's teaching management and service work, resulting in a series of problems such as large capital investment, strong efficiency limitations, business coordination, and difficulties in daily management and service [3]. The classroom also raises the following questions:

2.1. Lack of Innovation in Classroom Teaching Concept

The development of educational informatization is an important means of educational reform, and the improvement of teachers' teaching ability is the most important part of the development of educational informatization. But from the education informatization under the background of the problems existing in the traditional classroom teaching, individual teachers' information technology application idea lack of innovation, while at the request of the school can carry on the study and research of education informationization, can carry on the certain application in classroom teaching, but not from improving the teaching quality and strengthen the students' comprehensive quality point of in-depth study, The quality of classroom teaching is directly affected. Some teachers in the process of computer professional teaching, and also no combines education informatization and effective classroom teaching, especially in the process of organizing the implementation of the lack of in-depth investigation and analysis, does not pay attention to understand the "learning", the use of information technology and the lack of attractive, such as multimedia PPT courseware just repetition of teaching content, There is no scientific design in terms of inspiration, guidance and "problem orientation", and multimedia PPT plays a limited role [4].

2.2. Single Classroom Teaching Platform

For the application of information technology in local university classroom teaching, it is very important to build a diversified classroom teaching platform. However, individual teachers still lack in-depth research in this aspect, and the lack of diversified classroom teaching platform is relatively prominent, which directly leads to the failure of educational informatization to play a positive role. For example: some teachers in the process of computer professional multimedia teaching, although able to lead and guide the students on the machine, but also has carried on the theoretical explanation, but the corresponding teaching software application is relatively small, especially in information technology course design is not will be exploratory, heuristic, discussion-based, project type, application experience, and other forms. Under the background

of education informatization, the classroom teaching platform in colleges and universities lacks diversification, which is also reflected in the fact that some teachers do not pay attention to the construction of resource sharing platform of "teaching" and "learning", and there are relatively few information courseware for computer courses, which will also restrict the improvement of classroom teaching quality.

2.3. The Classroom Teaching Model Is More Traditional

Technical support of classroom instant generation resources has not been effective application, dynamically generated teaching technology advantage is not to be, in some places the university computer professional teachers is relatively high, despite their information literacy in the application of information technology and also has a certain advantage, but not in the process of organizing the implementation of the "student-centered" up to a higher level, The awareness of guiding students to participate in information teaching is not strong, and the information literacy of students has not been significantly improved. Information under the background of some of the more traditional classroom teaching pattern in colleges and universities, is characterized by some teachers don't pay attention to the diversity in the process of using information technology design, such as "micro" flip "classroom" "artificial intelligence" is not enough widely applied, some emerging technologies such as though a lot of teachers as a teaching aid, but to the students' autonomous learning, interactive inquiry is relatively small, It is difficult to improve students' ability of independent exploration and logical thinking.

2.4. Lack of Expansion in the Field of Classroom Teaching

The narrowing of teachers' questioning space limits students' explicit thinking and leads to the lack of depth of teacher-student interaction. Don't pay attention to use information technology to carry out the "expand" teaching, classroom teaching design lack of expansibility, haven't blend in the forefront of the computer technology in classroom teaching, guides the student to utilize the information technology, network technology at the same time on autonomous learning also is relatively weak, students' ability of combining theory and practice of remains to be strengthened. Classroom teaching in higher vocational colleges under the background of education informatization places the lack of development, is characterized by individual teachers don't pay attention to strengthening the management of classroom teaching and evaluation, the effective combination, such as big data technology is used to "learning" in the investigation and analysis of consciousness is not strong, this will also to a great extent, restricts the classroom teaching of computer professional pertinence, "Problem - oriented" teaching method can not be effectively used.

3. The Current Situation of Classroom Research in the Smart Classroom Environment

In recent years, the construction of smarter classrooms has followed the research context from theoretical research to practical exploration, mainly focusing on theoretical research on the conceptual characteristics of smarter classrooms, practical research on construction cases, and empirical research on interactive behavior analysis [5]. Many researchers also believe that interaction is an important feature of smarter classrooms. Some scholars have constructed the SMART conceptual model of smart classrooms from the perspective of wisdom, and believe that smart classrooms should include dimensions such as timely interaction, content presentation, situational awareness, resource acquisition, and environmental management [6]. Some scholars have constructed the ISMART model from the perspective of the system view, and believe that the classroom response subsystem in the real-time recording system can support the deep interaction of classroom teaching [7]. Smart classroom is the product of the development of emerging information technologies such as big data, artificial intelligence, and

virtual reality, and its core is deep interaction. In addition, interaction design has also been considered in the construction case study, and some scholars have proposed the concept of smart interactive classroom [8].

To sum up, many scholars have reached a consensus on the importance of interaction in the construction of smarter classrooms. In-class interaction is an important way to achieve in-depth learning, an important starting point for improving the quality of classroom teaching in colleges and universities, and an ideal form of classroom teaching in colleges and universities under the smart classroom environment. However, the hardware construction of smart classrooms remains at a shallow level in the actual classroom teaching in colleges and universities, and its technical advantages and educational significance have not been truly reflected. At present, only a few studies have involved in-depth classroom interaction, and systematic research that explicitly focuses on the realization of in-depth classroom interaction in colleges and universities is rare. At the same time, some scholars believe that, from a formal point of view, the hardware level of the smart classroom has indeed been greatly upgraded, but the education and teaching activities have not undergone fundamental changes, and they are doubtful about the effect of teaching interaction [9]. Therefore, how to make full use of the smart classroom environment, coordinate the interaction between the elements of the teaching structure, and make them echo each other to achieve deep interaction in college classrooms is one of the important trends in research.

4. The Significance and Importance of Smarter Classroom Construction

As early as the promulgation of the Outline of the National Medium- and Long-Term Educational Reform and Development Plan, the state clearly pointed out that it is necessary to speed up the construction of educational information infrastructure. In recent years, with the advancement of the construction of smart campuses in various colleges and universities, smart classrooms, as an important part of the informatization infrastructure, are of great significance for promoting the development of education informatization to intelligence and innovation. The importance of smart classrooms is mainly reflected in many aspects such as society, schools, teachers and students. For teachers, they can give full play to their teaching initiative and apply various teaching resources more flexibly, thereby changing teaching methods and improving teaching quality. For students, improving the intelligent teaching environment and using rich media teaching methods is conducive to stimulating students' learning initiative and creativity, optimizing learning, and achieving learning goals.

5. The Construction of Smart Classrooms under the Background of Educational Informatization

5.1. The Construction Concept of Smart Classroom

Smarter classroom supports classroom interaction of collaborative learning through flexible scientific layout, so as to create a sense of equality between students and teachers. The teaching mode based on exploration and research creates a learning atmosphere that helps students develop their imagination and creativity. The large-screen display devices between teachers and students in each group can be freely switched according to actual needs, which is convenient for students in each group to share video or text materials during the seminar to create a flexible and convenient communication environment for teachers and students. Realize the interaction between teachers and students, group discussions, mobile attendance, mobile learning, cloud evaluation and other functions.

The construction of smart classrooms uses advanced cloud computing, big data, mobile Internet and other technical means to solve the interactive problems in the current teaching process.

Follow the principles of unified planning and overall design. The intelligent effect is added to the teaching activities, the three-dimensional communication and exchange of teaching and learning are realized, and the traditional classroom has undergone structural changes to realize the borderless classroom.

5.2. Smart Classroom Construction System

At present, the construction systems of smart classrooms are diverse, and their construction systems are also different for different scenarios and applications. Generally, the intelligent integration mode of "86-inch LCD touch all-in-one machine + push-pull blackboard + intelligent control central control + scene acquisition system" is adopted.

5.2.1. Classroom Layout

In the smart classroom, the original multimedia classroom construction environment can be transformed, adding projection equipment, monitoring equipment, classroom lighting, curtains, movable tables and chairs, and intelligent integration, centralized control and flexible management of them. The central console is changed to a smart cloud and terminal operation interface to achieve integrated control. According to the requirements of different courses in colleges and universities, the number of split screens can be appropriately increased, which can be used for discussions between groups and to pick up and drop off questions from teachers for discussion. At the same time, it also carried out the transformation of the classroom network hardware environment and the construction of the supporting software platform for teaching resources, so as to realize a new teaching mode integrating preparation and teaching.

5.2.2. Interactive Display System

In smart classrooms, existing multimedia equipment can be used for upgrading. Common interactive display devices include projectors, screens, electronic whiteboards, and touch all-in-one machines. The smart interactive display system—smart blackboard uses nano-coating and touch display technology to The interactive display device combined with the blackboard has the characteristics of anti-riot, waterproof, dustproof, durable, etc. It meets the needs of high dust, high frequency of use, and high security protection in the teaching environment, and integrates with the modern teaching scene. The smart interactive display system can be connected to the control function of the classroom central control network. Through the construction of the teacher terminal, the cloud platform and the smart teaching management service center, it can realize the visual management of equipment, the linkage of intelligent classrooms and the intelligent maintenance of the cloud, and provide services for future development.

5.2.3. HD Recording and Broadcasting System

Build and develop high-quality teaching resources, and realize the interaction and sharing of high-quality teaching resources. The automatic high-definition recording and broadcasting system is mainly used for interactive classroom teaching in innovative class teaching and group discussion teaching mode. And the high-precision tracking system realizes the intelligent director switching function of the scene. Automatically track and shoot the frontal close-up pictures of the teacher and each student answering the question. It can also track and shoot the active pictures of teachers and students in multiple blackboard areas and screen areas in the classroom at the same time. The recording and broadcasting host will collect high-definition video and audio data streams through the network. Live broadcast, synchronous recording and storage, and provide live broadcast and resource on-demand through the cloud server platform.

5.2.4. Remote Interactive Teaching System

Through the interactive teaching client, teachers can achieve synchronous teaching with remote students and face-to-face communication in real-time classrooms. The teaching teacher can ask questions to the students in the remote listening classroom at any time, and the

students in the listening classroom can also ask questions to the main classroom. The broadcast system realizes remote face-to-face communication. The recording and broadcasting system of the lecturer classroom already has the function of interactive teaching, which can interact with the remote classroom without installing other software. The interactive teaching function of the recording and broadcasting host is directly completed on the main interface of the recording and broadcasting, and there is no need to switch the software interface of the recording and broadcasting. There is no need to call other software programs, and the interactive teaching function with remote can be realized while recording the live broadcast normally.

6. The Effect of Smart Classroom Construction under the Background of Education Informatization

6.1. Interactive Teaching

"What you see is what you get, what you touch is what you think" is a real-time interactive experience presented by smarter classrooms, which arouses the participation and enthusiasm of teachers and students, and improves classroom efficiency. Scientific interactive teaching is crucial to the realization of high-quality classroom in-depth interaction in colleges and universities. Scientific interaction should be built on the basis of covering all kinds of process data and result data with deep classroom interaction significance. It includes not only explicit learning behavior data such as the correct rate of each student's classroom answers, homework completion rate, and interactive participation, but also the implicit learning effects of each student's learning concentration, understanding, and learning thinking based on technologies such as facial expression recognition. data. It is helpful for college teachers to evaluate the individual characteristics of students, determine the students' progressive development zone, and make scientific interactions in terms of interaction objects, interaction timing, interaction content, and interaction forms (who to interact with, when to interact, what to interact with, how to interact), etc. Decision-making provides an objective, comprehensive and real basis, and provides scientific support for college teachers to complete interactive behaviors such as learning status monitoring, learning level assessment, learning task assignment, and learning content push. The single evaluation of learning results in the traditional classroom is expanded to a process-oriented evaluation of diversified comprehensive literacy, and even predictive multi-dimensional evaluation of student development can be realized. Students use accurate feedback based on data evaluation to improve their own learning motivation and self-efficacy, optimize learning strategies and self-cognition, etc., to maximize the effect of in-depth classroom interaction.

In the smart classroom environment, college teachers can monitor and record students' learning status, learning needs, learning difficulties and other process and result data from multiple perspectives using situational awareness technology and smart teaching systems that can sense students' needs and provide personalized feedback. , in order to make interactive behaviors that should create learning conditions to help them complete tasks, or encourage students to continue to work hard to solve problems independently, to achieve functions that are difficult to achieve in traditional classrooms: it can accurately grasp students' learning progress, students' learning habits, cognition Preferences, etc. can also be judged through the whole-process monitoring data of the smart classroom, so as to provide students with precise learning assistance and recommend personalized learning resources.

6.1.1. Diversified Lesson Preparation Before Class

Teachers prepare lessons, and generally design teaching according to students' pre-class preview, in-class learning and after-class practice. Teachers can open the teaching platform at

home or in the classroom, check the students' pre-class preview and after-class homework, and plan lessons according to the problems encountered by the students.

6.1.2. Classroom Interactive Teaching

The realization of the smart classroom teaching all-in-one machine has subverted the traditional teaching environment of the multimedia console for many years. When teaching, teachers can use a variety of media materials such as virtual simulation to complete various teaching scenarios such as demonstration, in-class quiz, interactive answering, and 3D model demonstration to enrich teaching content and forms.

6.1.3. Mobile Interactive Teaching

Accurate interaction is a necessary way to achieve deep classroom interaction. Smarter classrooms provide a guarantee for the achievement of precise interaction. In the context of smart education, the core mechanism to achieve precise teaching lies in measurement, recording and decision-making [10], and the learning analysis technology integrated in smart classrooms fits exactly with it. The smart classroom has the characteristics of recording the learning process, identifying the learning situation, and connecting the learning community [11], and can collect the interactive behavior data of teachers and students in the classroom. Based on the wireless same-screen technology, teachers can control the playback speed of courseware, synchronize teaching, manage audio broadcasts, answer questions and other mobile teaching interactive scenarios through the teaching app on the mobile phone during teaching.

6.1.4. Real-time Interaction Management

In the class, call the students and sign in on the spot by touching the "Chaoxing Fanya Classroom" on the all-in-one computer in the classroom. Teachers can set classroom behavior management according to their needs, such as: classroom speech, classroom performance, etc. In the teaching process, ensure the smooth progress of teaching, interaction and test content, and complete the teaching objectives of the course.

6.2. Live Recording and Broadcasting Teaching

In the teaching plan of colleges and universities, there are often situations in which the same grade and the same course are taken, such as "Computer Information Fundamentals" and "College English". Live recording and broadcasting of the same class as the previous class is an extended application of smart classrooms [12]. Only one teacher can teach hundreds of students in a grade in the same time period, which not only saves teachers' resources but also saves time. resource. Live classes are taught live by teachers in smart classrooms, and students can watch the live broadcasts on-site and online. For recorded courses, students can watch the recorded courses at any free time.

6.3. Centralized Teaching Management

The smart classroom integrates the access control system, monitoring system and teaching control system into a centralized control management mode to realize remote management of smart classroom equipment. Centralized teaching management makes teaching management visible and teaching quality can be monitored.

7. Conclusion

In the context of educational informatization, smarter classrooms bring a new teaching experience to teachers and students, improve the effectiveness of course teaching, and improve the quality and level of teaching. With the construction of smarter classrooms, more and more majors and teachers have begun a new round of information-based teaching reform and exploration, focusing on the development of new digital teaching resources, in order to

comprehensively promote Information-based teaching reform. What smarter classrooms change is not just the perception of technology by college teachers, but more importantly, the transformation of an interactive way of thinking and the resulting innovation in interactive practice.

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