

The Construction and Internal Logic of the Intelligent Classroom of Vocational Education under the Background of New Engineering

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Abstract: the Focus of Higher Education Teaching Research is to Improve the Quality of Undergraduate Teaching. under the Background of New Engineering, the Intelligent Classroom Teaching Mode is an Innovative Teaching Mode. This Paper Analyzes the Internal Relationship between the Construction of New Engineering and the Construction of Smart Classroom, and Applies the Smart Classroom Teaching Mode to Practical Teaching under the Background of New Engineering. Compared with the Traditional Classroom Teaching Mode, the Smart Classroom Teaching Mode Has Six Advantages: Learning Initiative, Learning Mode Efficiency, Teaching Mode Mobility, Data Analysis Intelligence, Learning Trajectory Dynamics and Evaluation Feedback Timeliness. These Advantages Prove That the Smart Classroom Teaching Mode is an Effective Teaching Mode for Building High-Level Undergraduate Education and Comprehensively Improving the Ability of Talent Cultivation.

1. Introduction

The Ministry of Education Has Actively Promoted the Construction of New Engineering [1], Formed “Fudan Consensus”, “Tianda Action” and “Beijing Guide”, and Issued “Notice on Carrying out Research and Practice of New Engineering” and “Notice on Promoting Research and Practice Projects of New Engineering”[1]. New Engineering Has Become a Hot Topic of Education Reform. the Traditional Training Knowledge of Engineering Talents is Single, Focusing on the Shaping of Theoretical Knowledge, and the Cultivation of Humanistic Quality and Emotional Intelligence is Basically Zero. in the Future, New Industries and New Economy Define New Engineering Talents as High-Quality Compound Talents with Strong Engineering Practice Ability, Strong Innovation Ability and International Competitiveness.

2. New Engineering and Smart Classroom

The construction of new engineering is to train high-quality compound talents with sustainable competitiveness with new specialty and new education mode. The smart classroom itself is a kind of innovative teaching mode. It uses a variety of teaching methods to break the limitation of learning time, broaden the learning space, expand the influence of education, use the latest information technology to improve the training mode of innovative and entrepreneurial talents, and strengthen the transformation of technology and achievements. These are the objectives of new engineering construction - to cultivate diversified and innovative excellent engineering talents for the future Providing intellectual and talent support provides a way to implement[2]. The teaching mode of smart classroom is to create a pleasant learning situation with teachers and students as the main body, with the goal of cultivating students' learning initiative and the guidance of innovative thinking, so as to provide specific implementation steps for the construction of new engineering. The construction of new engineering subjects sets up a banner for the teaching mode of smart classroom, and smart classroom contributes to the construction of new engineering subjects. The two complement each other, promote each other and develop together.

3. Design of Intelligent Classroom Teaching Mode

In the traditional classroom, the roles of teachers and students are distinct. Teachers take the three foot platform as the stage to “fill the room”, which makes teaching activities more like the monologue of teachers alone[3]. Students are the spectators of the theater, and there is no interaction between teachers and students. With the development of science and technology, smart classroom emerges as the times require. The smart classroom teaching mode proposed in this paper consists of five parts: smart classroom, teachers, students, information technology and teaching process. The smart classroom provides a pleasant learning environment for teachers and students, such as lighting system, temperature control system, table and chair layout, WiFi full coverage, multi position camera and follow-up equipment, electronic display equipment and other basic hardware elements; teachers and students are the main body of learning, and they complete the transfer and interaction of knowledge[4]; information technology is the bridge of knowledge transfer in the smart classroom, with “interconnection” The thinking mode of “network +” and the new generation of information technology, such as big data, cloud computing, Internet of things, artificial intelligence, construct smart classroom.

Table 1 Design of Pre Class and in Class Teaching Mode in Smart Classroom

Wisdom classroom	teaching process	Teacher	Information technology	Student
Lighting	Before class	Integrated resources		Perceived learning content
Temperature control system		Design problem situations	Internet plus	Stimulate active learning
Layout of tables and chairs	In class	Case demonstration	Big data	Multi channel access to knowledge
WiFi coverage		Organization team	cloud computing	Multi way cooperation

3.1 Trinity of Teaching Process

In the traditional teaching process, teachers only consider the organization and management of the classroom for 50 minutes. There is no interaction with students before and after class. Teachers only focus on what knowledge points have been told to students, and there is no other way to supervise students' learning except for the final test[5]. Smart classroom teaching extends the teaching activities of traditional classroom classes to pre class, class and post class, each stage has a specific task. Did you watch the self-study video before class. There is a record of how many times I have seen it. Whether to actively participate in class teaching activities and whether the team cooperation is smooth can be monitored. After class knowledge point summary and knowledge transfer can be reflected in app. The trinity of pre class, class and after class serves for teaching, and the visualization degree of teaching process is very high.

Table 2 Design of Intelligent Classroom after Class Teaching Mode

Wisdom classroom	teaching process	Teacher	Information technology	Student
Multi position camera	After class	Task driven	Internet of things	Multi angle thinking summary
Beat equipment				
Electronic display equipment		Summary of knowledge	Artificial intelligence	Combination of online and offline
Data storage device		Knowledge transfer		

3.2 Main Body of Teaching Activities

The traditional classroom takes teachers as the center, is the main body of teaching activities, and students are in a passive subordinate position. In the process of intelligent classroom teaching, teachers take on more roles, such as the production of video before class, the planning of activities in class, and the interaction after class[6]. In the smart classroom activities, the teachers and students are the main body of the teaching activities, and jointly promote the teaching activities. The specific description is as follows: first of all, teachers in the video recording and classroom

teaching should first understand students' interests, closely link the course content with students' actual life, start from the things students are familiar with, rise to the theoretical summary, and at the same time, describe and express the course content as much as possible funny and humorous, so as to attract students' interests. Secondly, teachers should organize team learning mode, with team size of 3-6 people, assign roles to each student, undertake corresponding tasks, and supervise and motivate in the process of completing tasks.

3.3 Multi Information Technology Integration

The traditional classroom teaching model is often out of touch with the times and new technology. The smart classroom makes full use of modern information technology, hardware is connected and controlled by the Internet of things, pre class teaching resources recording and pushing rely on Internet technology, analyze students' learning process, master students' learning habits, rely on big data and cloud computing to analyze a large number of data, and provide intelligent early warning for students' learning effect. Therefore, in the smart classroom teaching mode, the Internet of things, big data, cloud computing and artificial intelligence technology blend with each other, and are indispensable.

4. Advantages of Smart Classroom Teaching Mode

In the design of intelligent classroom guidance mode, the integration of education activities and modern information technology is a complex process. Compared with the previous classroom education mode, it has the advantages of active learning, high efficiency learning mode, mobile teaching method and data analysis[8]. Intelligent, dynamic learning trajectory and timely evaluation feedback.

4.1 Learning Initiative

In the smart classroom, students are the main body of learning. Before class, students need to learn the video pushed by the teacher within the specified time, so as to complete the learning task and self-learning test in advance. The cross guidance mode is adopted in the course. Students are the main body of educational activities. Form a group with classmates to complete the tasks assigned by teachers. After the class, the team's learning results are shared, problems in the learning process are summarized, and constructive suggestions are put forward[9]. The completion of each task requires students to make their own learning plans. How to learn, how to learn, what method to learn, all of the problems that students need to consider. Teachers use Dake style method to teach knowledge, and this is a trap learning mode. Instead, they use personalized teaching methods to let students learn independently, from video, from teachers, from classmates, from life, using mobile monitors. Learn content and use what you have learned to solve practical problems.

4.2 Efficient Learning

The teaching mode of smart classroom is an efficient learning mode, which is embodied in two aspects: the key points and difficulties in the traditional classroom are made in the pre class video, the teachers are freed from the repetitive and tedious work, and more time is spent on the design and innovation of teaching activities; the learning mode of team organization can improve the learning efficiency. The research results of learning pyramid of national training laboratory in Maine show that: passive learning efficiency and learning effect can reach 30% at most, while active learning can reach more than 90%, and team organizational learning can make students learn faster and remember better.

4.3 Mobile Teaching Methods

With the development of network technology and communication technology, mobile phone has become a necessity for the public, and more and more teachers realize the education method based on mobile Internet. Raw. These educational tools have the functions of resource push, student signature, assignment / group task, voting / questionnaire, brainstorming, Q & A / discussion,

testing, etc. On the application platform, teachers have resource push platform, students can learn anytime and anywhere, expanding their research time and space.

4.4 Intelligent Data Analysis

Most mobile education platforms have data analysis function. As shown in Figure 2, at the blue ink cloud level, you can calculate attendance and analyze test results. The smart classroom can collect more data by using recording and playing system. For example, after the teacher asks a question, he can check the response data of the students. By analyzing these data, we can understand the learning situation of students, change their learning attitude in time, and help the students with learning difficulties. At the same time, it can match the resources needed by students intelligently, and realize the personalized service and the personalized push of information resources.

4.5 Dynamic Learning Track

The results of this chapter's self-test take measures to deal with the time and space of a chapter's learning process, and record that each time point is a learning series. These series learn the learning habits of the responders, forming a in-line connection. The learning efficiency is also reflected in the learning sequence. Analyze these sequences, identify defects, improve defects, dynamically adjust the learning trajectory, and approach the efficient learning sequence.

4.6 Timely Evaluation Feedback

In traditional educational activities, teachers and students are one to many relationships. The teacher is not paying enough attention to individual students. Even teachers can't name 10 students every semester. The students mix their emotions with performances. The smart classroom uses multiple screens to monitor each student's learning. Online questions can be answered in a timely manner. Offline learning is also recorded through big data systems. Provide one-to-one VIP service. Students can feel that “all progressive teachers and company students can see it.

5. Conclusion

There are two problems in the realization of smart classroom education mode. To a great extent, the design of education mode of smart classroom depends on students' awareness in learning. Interactive teaching needs the cooperation and participation of students. Teachers' response to educational activities, therefore, the participation of students, the learning efficiency of the teaching mode of the smart classroom directly affect the high smart classroom, hardware conditions, often functional smart phones and WiFi networks need a good signal. At the same time, the corresponding data processing and analysis system needs a strong server, and the hardware input is the basis of the development of intelligent classroom. Wisdom classroom, teaching in fun, teaching in fun, improve learning efficiency. The research and popularization of smart classroom provides a new method for education reform, which is of great practical significance for the smooth development of new engineering construction.

References

- [1] Shanchun, Gao. (2018). Research on Engineering Teaching Mode of “Introduction” Course in Engineering Colleges under the Background of Big Data// 2018 10th International Conference on Measuring Technology and Mechatronics Automation.
- [2] Zhao, Hua-ping., JI Ying-dong. (2017). Study on the Transformation of the Innovative Talents Training Mode for Engineering Management Specialty in the Age of Big Data. Journal of Higher Education Finance.
- [3] Meena, Jha., Sanjay, Jha., Liam, O'Brien. (2019). Re-engineering Higher Education Learning and Teaching Business Processes for Big Data Analytics// Business Information Systems.

- [4] Zhaoli, Zhang., Taihe, Cao., Jiangbo, Shu. (2017). Exploration of Blended Teaching Pattern Based on Hstar and Smart Classroom// 2017 International Symposium on Educational Technology. IEEE.
- [5] Cunli, Duan., Wangyun, Liu., Yuhong, Zhang. (2017). Exploration of teaching mode aiming at engineering training// 14th Conference on Education and Training in Optics and Photonics, ETOP.
- [6] Hairong, Li. (2017). Teaching Digital Analytics with Google's AEK. Advertising & Society Quarterly, vol. 18, no. 1.
- [7] Fabio, A. Schreiber., Flora, Amato., Francesco, Colace. (2017). Big Data Meets Digital Cultural Heritage: Design and Implementation of SCRABS, A Smart Context-awaRe Browsing Assistant for Cultural EnvironmentS. Journal on Computing & Cultural Heritage, vol. 10, no. 1, pp. 6.1-6.23.
- [8] Jessica, Watkins., Mary, McCormick., Kristen, Bethke, Wendell. (2018). Data-based conjectures for supporting responsive teaching in engineering design with elementary teachers. Science Education, vol. 102, no. 1.
- [9] Yufei, Tang., Jun, Yang. (2017). Dynamic event monitoring using unsupervised feature learning towards smart grid big data// 2017 International Joint Conference on Neural Networks.