Research of Smart Classroom Design based on Big Data

Quanhai Zhang, Jiping Li

Modern Education Technical Center of Hainan Medical College, Haikou, Hainan, 571199, China

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Abstract: Smart classroom is a hot issue in current educational information research. The core of the smart classroom is to use the latest information technology to transform and improve classroom teaching to create intelligent and efficient classrooms. With the rapid development and wide application of modern information technology, new educational technology has emerged, and classroom teaching models are constantly changing. Today's society has entered the era of big data, and the emergence of big data will have a profound impact on the field of school education. This paper discusses the smart classroom based on big data learning and analysis and provides reference for the construction and application of college smart classroom.

1. Introduction

Traditional teaching has become a past tense. The integration of technology and classroom has brought about major changes in education. Nowadays, it has entered the era of big data. As a means of extracting valuable knowledge and providing decision support, data mining has been widely used in various industries. industry. This technology has also gradually integrated into the field of education, opening up a new world for the development of smart classrooms. Scientific and technological progress and multimedia applications have brought opportunities for the transformation of traditional classroom teaching. The rapid development of educational informationization has provided an opportunity for in-depth study of wisdom education and smart classrooms. Smart education has become a hot topic in the development of educational information. The concept of quality education requires students to cultivate good information literacy, pay attention to the generation of ability and wisdom, and carry out teaching activities in the smart classroom environment to greatly adjust the classroom atmosphere, add lubricants for students to cultivate individualized ability, and the emergence of smart classrooms It highlights the difficulties in teaching, making the original boring classroom become intuitive and easy to understand and master through the integration of technology and wisdom, strengthening classroom interaction, and students have increased their interest in classroom learning. The wisdom classroom incorporates big data technology, which makes teachers use technology to collect, count, process and analyze student learning data, improve and improve the individual learning behavior of students in classrooms, which has become a development trend.

2. Big data environment support

Big data is the enhancer of education informationization, and wisdom education based on big data environment will become a sword in the field of education. The intelligent interactive system collects educational big data through data mining technology, analyzes the problems encountered by the learners in the learning process and the individual's mastery of the knowledge points, and then provides the learners with reliable learning results analysis data. At present, many systems and platforms collect a large amount of learning process data from learners through the background, analyze the application effects of specific examples in the classroom, and track the effects of test teaching. The big data environment architecture analysis is divided into two levels. The first level includes big data analysis and decision analysis services. On this basis, the distributed collaborative processing function is implemented. The system uses Hadoop technology, which is developed by Apache. The distributed system infrastructure developed is very simple and easy to develop

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distributed programs. Hadoop supports reliable and efficient distributed processing of large amounts of data. Hadoop uses a large number of system clusters to store large-scale data, form a unified storage layer and a unified interface layer, collect and store teacher teaching resources and student learning data generated during the education and teaching process, and store them in MySQL. The database can store data. Generate a personalized database of students on different servers, collect, clean, and filter the personalized data of all students to form a personalized learning diagnosis report, so that students can change their learning behaviors on a basis, change their learning focus, and achieve personalization. Learn. The second level is reflected in the data source, including a large number of student learning resources and teacher teaching resources. Through the big data analysis technology, the process of collecting, storing, analyzing and processing the teacher data, student data and activity data generated in the classroom activities is completed. .

3. Characteristics analysis of wisdom and wisdom classroom

Data decision making. Building a data-based classroom is the core concept of a smart classroom. The traditional classroom mainly relies on the teacher's personal teaching experience to judge the learning behavior of students in the classroom and make teaching decisions. The smart classroom all rely on data to speak, based on the integration and sharing of massive teaching data resources, based on the learning behavior of students' big data mining analysis and decision-making. Use intuitive data to understand the level of students' knowledge, to grasp the first-hand information of students from the students in an instant and accurate manner, adjust the teaching strategies in time, and realize the classroom-based teaching mode based on data. Interactive intelligence. Smart classrooms focus more on interactive functions and artificial intelligence, using intelligent information technology to create a smart learning environment and build an efficient interactive classroom. According to the Internet of Things, big data and artificial intelligence technologies, the potential learning needs of learners can be predicted in advance through methods such as situational awareness and data mining. It has the function of collecting and analyzing real-time learning data, timely understanding the needs of learners, and subscribing through resources. And the smart push method to push the latest learning resources for the first time, using the intelligent mobile learning terminal and application support platform to realize the three-dimensional communication and communication between teachers and students, students and students, greatly improving the classroom interaction ability. Dynamic openness. The Smart Classroom is a dynamic and open system. Its main components, technologies, resources, mechanisms and other key elements are flexible and dynamic. With the help of emerging information technologies such as cloud computing and mobile internet and the application of various intelligent terminals, the classroom system has surpassed the limitations of time and space. Achieve more open classrooms and more open classroom activities. Smart classroom teaching is an open, compatible and dynamic development process. It integrates before, during and after class, and single classroom teaching develops into a diversified open teaching. Smart classroom encourages innovation and openness, encourages students to participate in expressing their own opinions, and actively provides favorable conditions for students to stimulate their potential and develop their wisdom.

Witty teaching. The classroom teaching process is ever-changing, and the pre-class instructional design plan cannot foresee all the situations that may arise in the classroom. The smart classroom must require teachers to have the ability to support the data under the support of the data, according to various new situations in the teaching process, using dynamic learning analysis and immediate feedback, relying on massive teaching data analysis for real-time and accurate decision-making, taking tactful actions Timely adjustment of pre-class teaching design, targeted teaching, optimization and improvement of classroom teaching process, fully embody the teaching wisdom and teaching art of smart classroom teachers.

The ultimate goal of the smart classroom is to achieve personalized learning, so that each student's wisdom is fully developed. The Wisdom Classroom analyzes the analysis and the on-the-spot quiz in the class to accurately grasp the status of each learner's knowledge, and realize the objective evaluation of the students' individualized learning ability, so that the teacher can

recognize each student. Clearer, targeted development of personalized teaching programs, production of "micro-courses" for one person, individualized "micro-course" counseling, truly achieve student-centered, "one-on-one" personalization teaching.

4. Smart classroom architecture

Smart classroom teaching process. The teaching process is the application form of the smart classroom, which consists of a closed loop of spiraling up before, during and after class. Usually, the pre-course links include academic analysis, pre-test evaluation, and instructional design. The course links include subject introduction, inquiry learning, real-time testing, and summary improvement. After-school activities include after-school assignments, micro-course counseling, and reflective evaluation.

Teacher and student intelligent mobile terminal. The teacher-student intelligent mobile terminal is the application terminal of the smart classroom. It provides the application tools of the teacher's “teaching” and the student's “learning” to realize the communication and information service support means before, during and after class. Teaching application support system. The system is a teaching application support platform for smart classrooms, providing learning, management and application service functions for intelligent terminals, including micro-class production, micro-class application, learning resource push, communication tools, and third-party APP applications. Big data evaluation and analysis system. The system is the core subsystem of the Smart Classroom. Based on big data learning analysis, it provides formative evaluation, summative evaluation and diagnostic evaluation services for learning and teaching quality, including test system, teaching quality evaluation system and dynamic learning evaluation analysis system. Subsystems. Teaching resource management and service system. The system is a teaching content basic service system of the smart classroom. It provides management and service support for learning resources based on curriculum standards, general electronic textbooks, various question bank systems, teaching dynamic data and educational management information subsystems.

5. The main application of college smart classroom

Realize dynamic learning analysis and evaluation. Using big data learning and analysis technology to provide dynamic assessment and feedback, teachers can quickly make dynamic diagnostic evaluations of students' learning process. For example, the teacher pre-study homework and assessment, diagnose the students' existing knowledge level, optimize the teaching design plan; conduct real-time detection, statistics, quick analysis and feedback to the students' classroom learning effect through the classroom practice and detection system, timely Adjust the progress and content of the classroom teaching; through the after-school homework data analysis and reflective evaluation, it is convenient for individualized counseling for students to achieve continuous improvement of teaching.

Build new classroom forms and learning environments. The in-depth application of modern information technology in smart classroom teaching has brought about major changes in the classroom form. New technologies, new media and smart terminals provide learners with a rich cognitive tools and support environment, creating more open classrooms and more open classroom activities for teachers and students. For example, there is no traditional podium and blackboard in the wisdom classroom. The desks are arranged in group discussions. In the process of teaching, multiple interactions are adopted. Teachers are teaching students and directly into group discussions. Teachers can use mobile terminals in their hands (Mobile phones, PAD) realize writing and project to the large screen in the classroom. The PPT commonly used by teachers can carry out any handwriting, labeling, deduction, etc. The traditional classroom has become a digital “experience hall” and “experimental field”. Optimize cognitive goals and instructional design. In the classification of Bloom's educational goals, the knowledge dimension is divided into factual knowledge, conceptual knowledge, procedural knowledge, and metacognitive knowledge. In the process of teaching, the intelligent classroom, which is combined with information technology, can

explicitize the tacit knowledge that is difficult to describe and convey in the traditional classroom. The cognitive goals have changed from low to high. In the way of determining the teaching objectives, based on the intelligent classroom of big data learning and analysis, based on the feedback of the pre-study digital preview and preview evaluation, the data of the learning situation from the frontline students can be grasped instantly and accurately, and the teaching objectives are set accordingly. It is to be based on the student's "recent development zone" design issues, to be targeted, and to teach students in accordance with their aptitude.

6. Conclusion

Smart classroom is a hot issue in current educational information research. The core of the smart classroom is to use the latest information technology to transform and improve classroom teaching to create intelligent and efficient classrooms. With the rapid development and wide application of modern information technology, new educational technology has emerged, and classroom teaching models are constantly changing. Today's society has entered the era of big data, and the emergence of big data will have a profound impact on the field of school education. This paper discusses the smart classroom based on big data learning and analysis, and provides reference for the construction and application of college smart classroom.

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