

Research on Students' Personalized Learning Method based on the Construction of Big Data Curriculum Resources

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Abstract: Big data technology provides new possibilities for data that could not be collected and analyzed in the past. In particular, big data mining based on learning behavior and personal preference opens a door for education reform and innovation. The traditional education method based on experience has begun to evolve to the precision education based on data. This paper mainly explores the use of education big data technology for curriculum resources construction, and then to achieve personalized learning objectives.

Keywords: Big Data; Personalized Learning; Inquiry; Curriculum Resource Construction

In the era of big data, colleges and universities can easily know the learning records of each student and the teaching process data of teachers^[1]. Big data technology is used to collect and record the learners' learning behavior and personal preference data to form a large amount of data, which provides scientific basis for personalized learning strategies through mining and processing. In modern education, curriculum resources are widely shared and curriculum construction is gradually improved. The teaching methods of teachers will be changed from empirical to precise, and the learning situation of students will be transferred from unified pace learning to personalized learning.

1. Questions raised

With the continuous promotion of education informatization and the vigorous development of online education, massive educational data has been generated. How to mine and analyze education big data has become an urgent problem to be solved in the field of education and big data knowledge engineering^[2]. Applying big data to education is an important means of education reform. In the construction of curriculum resources in colleges and universities, especially in the general basic courses, such as university computer foundation, multimedia technology and application, the learning data set is huge and diverse, and it is impossible to process and analyze data in the traditional way. How to use big data technology to design, process and integrate curriculum resources construction, so as to realize students' personalized learning will become more and more important.

2. Characteristics of education big data

2.1 Large scale

Big data research expert Victor Myer Schoenberg said: "The essence of the world is data". Big data experts Peng Zuowen

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said: “big data is a data engineering system with massive multidimensional data as assets, value mining as guidance, and data thinking, data ability and data application.” With the further development of educational informatization and digital resources, colleges and universities will create and record a large number of educational data. The huge amount of data does not necessarily lead to the improvement of value. On the contrary, for specific learners, a large amount of data redundancy makes it more and more difficult for us to find valuable resources.

2.2 Diversity

“Scale is not the most important difference between traditional data and big data,” Deloitte expert Robert said, “the important attributes of big data should be complexity and diversity.” Traditional education data has obvious structural characteristics. Education is originally a conservative industry, but with the rapid development of big data technology, education informatization and artificial intelligence technology, teaching methods and means are becoming more and more diversified, various educational data are increasing, and the data structure is becoming more and more complex. In the era of big data, educators must learn how to use and analyze diversified information resources to redraw learners’ learning map, so as to establish learning models, train learning data and discover learning value.

2.3 Dynamism

The basic reason is that big data technology has the ability to dynamically track every learner, such as the length of students’ attention and the number of questions they answer, the distribution of learning time and the characteristics of interaction. These data are dynamic and change rapidly. Through the real-time monitoring of teaching data, intelligent system analysis, visualization of a series of information means. The system can dynamically evaluate students’ learning effect and present it to teachers to make modification plans. The system, teachers and students maintain the balance of teaching in the dynamic adjustment.

3. Building personalized learning based on educational big data

Individualized learning model emphasizes one person, one policy and teaching students according to their aptitude. In order to meet the learning needs of a large number of learners, it is necessary to create larger learning resources, record and analyze each learner’s learning data, and through big data, knowledge can be transmitted and shared between teachers and students in the most effective way and in the best form.

3.1 Student learning database

Personalized learning model emphasizes “big data driven”. By digitizing the knowledge and skills, teaching videos, knowledge expansion, independent testing, game interaction and other links in the course, the learning behavior data are recorded through the learning database, such as check-in, learning, answering questions, testing, logs, interaction and homework. The data in the learning interaction process are recorded in real-time in the cloud, and these data are analyzed intelligently to support digital learning of big data capture and analysis. Students’ learning behavior and teachers’ teaching behavior will be recorded in detail to help schools, teachers and students to make decisions and research and analysis. The value of big data does not lie in the data itself, but in the value released by the data application. Tens of thousands of learning data are treasures. Establishing student learning database is to build mine for treasure, and send it to analysis system vertically to support personalized learning decision.

3.2 Basic student database

The student basic database contains all kinds of basic student information (name, age, major, interests, etc.) and student learning information (scores, courses, questionnaire information, etc.). In order to develop the most suitable learning path for learners, we need to refer to the data of past learning and the data about students’ learning behavior. These data comprehensively reflect students’ knowledge retention, learning preference, effort and other information^[3].

3.3 Analysis system

The analysis system processes and analyzes a large number of data in the learning database to track and judge the learning trajectory of students. The data source of data analysis often has a large number of difficult to identify redundant data. The

purpose of data analysis is to eliminate interference and find learners' learning weaknesses. For example, although students do not learn binary related videos, but can easily solve related problems in the interaction, there is no need to push meaningless binary learning materials to him. In data analysis, we must attach importance to teaching logic, combine teaching theory with curriculum practice, and comprehensively profoundly understand the value of data, as well as conduct data analysis scientifically, so as to construct visual personalized learning report.

3.4 Adaptive system

The adaptive system adjusts and manages the learning process by analyzing the feedback of the system. Students adjust their learning path according to the visual conclusion of data analysis. The system design should consider the user's experience as much as possible. Some unnecessary troubles should be handed over to the system. The system can be done by the system as much as possible. Teachers should devote their energy to curriculum design and teaching service, and students should devote their energy to learning ^[4].

3.5 Individualized teaching intervention

Personalized teaching intervention based on big data refers to the intervention measures to correct and improve learners' learning behavior based on a large amount of data formed in the learning process, combined with educational theory and experience. Through the interactive platform, it provides timely help and intervention for students with poor learning effect. The method is to predict learners' future learning behavior, modify teaching plans, and intelligently provide personalized resources for learners. Its purpose is to improve learners' learning efficiency. Personalized teaching intervention measures emphasize the role of teaching resources in the learning process, pay more attention to and guide learners to think and solve problems, and provide guidance and support needed to get a more comprehensive and accurate evaluation.

3.6 Personalized learning model

In the design stage, the big data technology is used to analyze the collected learning data systematically, and the visual learning behavior and learning report are generated. At the same time, we use teaching logic and curriculum practice experience to judge the effectiveness of the report, evaluate the personalized learning model, and optimize the model until it is reasonable.

In the application stage, the personalized learning model is applied to the course teaching, and the system cooperates with people to re integrate the personalized teaching resources and customize the teaching behavior

4. Conclusion

Adhering to the concept of "effectively carrying digital content, teaching material content can be updated at any time, students can carry out personalized self-learning anytime and anywhere, and promote personalized teaching reform practice", we implement mixed teaching in "multimedia technology and application", "university computer foundation" and other courses, and use big data technology to build excellent online open courses. The project resources are designed and constructed in an all-round, multi-level and systematic way. As of December 2020, 110000 person times of "university computer foundation" courses have been selected, 63 universities have participated, and 113100 times of interaction have been conducted. "Multimedia technology and application" course wisdom tree online open course has accumulated 55 colleges and universities, interacted 61200 times, and served 17800 students in total, and achieved good teaching effect.

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