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Research Article

Research on Personalized Teaching in Middle School Based on Big Data Era

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Abstract

Big data has brought great influence to the education industry, and secondary education plays a very important role in the education stage of the whole life. Based on the accurate diagnosis and analysis of students' personality such as students' learning situation by big data, personalized teaching in the era of big data is realized. In this paper, the existence of personalized teaching in middle school education and teaching is as follows: Starting from the three problems of teachers' insufficient ability to integrate information technology, single teaching mode and imperfect construction of big data system in middle schools, In view of this problem, this paper puts forward some countermeasures: to cultivate middle school teachers' ability to apply big data, to innovate middle school education and teaching methods by using big data, and to strengthen the construction of education big data system and mechanism in middle schools.

Keywords: Big Data, Personalized Teaching, Middle School Education

1. Introduction

Big data is a large-capacity data set whose capacity exceeds the storage capacity of traditional data and can directly obtain new value from large-scale information through intelligent statistical means. It has the characteristics of large data capacity, fast processing speed, diversified types and large total value. Nowadays, the impact and role of big data on all walks of life, especially education, are becoming more and more prominent. In 2015, the "Outline for Promoting the Development of Big Data Action" issued by the State Council pointed out: "Explore the supporting role of big data in reforming education methods, promoting education fairness and improving education quality." (Li Yufeng, 2019). However, classroom education for middle school students plays an irreplaceable role in cultivating teenagers' outlook on life, world outlook and values (Hu Pan, 2016). Under the background of the big data era, the education and teaching of traditional middle school students need to be improved and innovated. In this era of publicity and liberation of personality, how do we need to operate in order to make the education and teaching of middle school students better play their unique charm and role is a topic that all our middle school educators need to think about.

2. Literature review

As early as more than 2,000 years ago, Confucius, a famous thinker and educator in China, discovered the individual differences between students and actively advocated the choice of teaching contents and teaching methods according to different people (Chen Yuexia, 2010). Zhu Xi summed it up as "Confucius teaches students according to their talents". Both the "New Generation of Artificial Intelligence Development Plan" and the "Education Informatization 2.0 Action Plan" emphasize that through big data collection and analysis,

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artificial intelligence can be effectively integrated into the actual teaching environment to realize individualized teaching and individualized teaching. (EB/OL, 2013)

2.1 Big Data Provides Favorable Conditions for Personalized Teaching in Secondary Education

2.1.1 Big Data Can Profound Change Educational Ideas and Thinking

With the advent of the era of big data, educational big data has a profound impact on the innovation of educational concepts and thinking. In the new era, the field of education, especially secondary education, is full of big data, such as what students and teachers say, do and do, and everything in the school can be converted into big data (Xu Jing, Li Qiyong, 2019). When every student uses the Internet, including classes, reading books, taking notes, doing homework, conducting experiments, discussing problems, participating in various activities, making changes, etc., including the students' examination results each time, these will become the sources of education big data (Zhao Shuchun, Sun Shuhui, 2014). In the era of big data, education is no longer a social science inherited by ideas and experiences. Education in the era of big data will enter an empirical era and become a real empirical science based on data. Big data has brought about profound changes in educators' way of thinking. In the traditional middle school education, most of them are carried out by the education authorities and educators through the study, summary and inheritance of teaching experience, but some of these experiences are not scientific, and educators' subjective consciousness will affect their own judgment. In the era of big data, through the analysis of educational data, we can dig out some situations that conform to the actual situation of students and teaching, such as teaching, learning and evaluation, so that we can effectively formulate and implement educational policies and formulate more realistic educational and teaching strategies (Hu Shuxiang, Xie Yujin, 2013).

2.1.2 Big Data Can Collect All-round and Accurate Information of Educational Objects

The traditional ways to collect students' information include questionnaire, interview, observation, etc. These methods have the characteristics of intuition, concreteness and reality to reflect the thoughts and behaviors of middle school students (Zhou Shumin, 2014). However, influenced by some objective factors such as the immediate psychological changes of the interviewees and their recent life and study experiences, there may be certain errors in the authenticity and representativeness of the collected information itself. However, information collection using big data relies on precision and high-end intelligent equipment and mathematical algorithm analysis to find the root of the problem. The collection, induction, integration and analysis of problems are all calculated and processed by machines. As long as students leave traces of browsing on Internet devices such as the Internet, It can collect accurate and comprehensive information, analyze students' lifestyle, study habits, interests and hobbies and other personal information, help teachers to understand students' situation and needs in a more targeted way, and find out the main reasons affecting students' development, so as to realize accurate service and intelligent management and meet students' personalized development requirements (Zhou Liangfa, 2018).

2.1.3 Big data can provide scientific predictions based on information analysis.

The rapid development of big data not only means that it generates and contains huge amounts of information, but also, more importantly, it can discover the internal correlation between seemingly accidental and unrelated things through accurate calculation and analysis of huge information, foresee the possible trend of the development of things, and predict the possibility of occurrence (Xiang Ogawa, 2015). Forecast function is the embodiment of the core value of big data. Using big data technology, we can pay attention to the micro-performance of each individual student, for example, when he opens the textbook, what words he hears are smiling and nodding, how long he stays on a topic, how many times he asks questions in classes of different subjects, how many times he deserts, etc. When these personal data accumulate to a certain amount, they can reveal the personal living habits, mental status, behavior rules, personality characteristics, etc. through data analysis. Big data technology will provide teachers with the most real and personalized information on students' characteristics, Teachers can teach students in accordance with their aptitude in the teaching process, stimulate the potential of each student, and better provide personalized education, thus improving the scientificity and effectiveness of education and teaching, reducing the burden on students, and being more conducive to the cultivation of new people of the times.

3. Research methodology

This paper adopts the literature method and collects the relevant literature on the implementation of personalized teaching in Chinese universities and primary and secondary schools under the background of big data in recent years. Through reading the literature, we can fully and correctly understand and master the situation and current situation of personalized teaching in middle schools under the background of big data,

which provides a basis for the exploration of measures to realize personalized teaching in middle schools under the era of big data.

4.Results and findings

4.1Problems Faced by Middle School Education in Realizing Personalized Teaching in the Era of Big Data

4.1.1 Insufficient mastery of information technology integration ability by secondary school teachers

At present, in the process of training primary and secondary school teachers in various normal colleges and universities in our country, more emphasis is still placed on the study of professional knowledge, especially in some literature and history majors. There is not much learning and contact with science and engineering professional knowledge such as statistics, computer, communication technology, etc. Even some middle school teachers have relatively old educational concepts and even do not know what the integration of information technology and education and teaching is (Wang Yanzheng, 2017). However, only by using big data to predict students' relevant information and give timely and effective feedback can middle school teachers adopt personalized teaching methods according to the characteristics of different students.

4.1.2 The current teaching mode of secondary education is still relatively single.

At present, most middle school classrooms use multimedia teaching methods. Compared with traditional blackboard writing teaching, it uses PPT electronic demonstration to vividly and intuitively display book knowledge by inserting pictures, videos and other contents. At the same time, it also enriches teaching methods and enhances students' interest in learning. However, this teaching mode still has the defects of single classroom teaching mode, insufficient interaction with students, and inability to analyze teaching behaviors. The subjectivity of students cannot be brought into full play. The state of students' listening to lectures is entirely judged subjectively, and the degree of classroom participation is relatively low (Zhang Yongquan, 2016). Teachers cannot use big data to collect students' learning information and ideas, and cannot obtain the analysis data of each student. They can only continue to use unified teaching contents and methods, unified testing and evaluation standards to guide students. This situation cannot meet the requirements of students' personalized development, nor does it meet the realistic requirements of educational innovation in the era of big data.

4.1.3 The construction of big data system for secondary school education and teaching is not perfect enough.

Teachers need big data systems to provide scientific and accurate prediction and analysis to implement personalized teaching for students. The landing application of big data must be inseparable from the support of big data platform (Zhang Yaodong, 2018), and the application scenario needs to be continuously improved, so as to further give full play to the advantages of big data technology. However, at this stage, first of all, most primary and secondary schools do not have high-end information equipment, the proportion of financial investment is not large, and the hardware equipment and technical conditions for applying big data to education are relatively limited. Secondly, the talent team that can master information processing and analysis as well as professional knowledge at the same time is still relatively weak. Therefore, for small schools, it is also difficult to build a professional big data technology team. Finally, due to the open nature of big data, the personal privacy of students and families may also be touched when it is used, while primary and secondary schools and even local education authorities still lack clear and detailed rules and regulations and supervision mechanisms in this regard.

4.2. Exploration of Measures to Realize Personalized Teaching in Middle Schools in the Era of Big Data

4.2.1 Vigorously develop the ability of secondary school teachers to integrate information technology.

Middle school teachers should establish the concept of integrating information technology into subject classroom teaching, cultivate modern thinking, establish modern educational concepts and big data awareness, and cultivate insight into data (Fan Shanni, 2016). Therefore, compared with the traditional education and teaching work in secondary schools, The era of big data requires contemporary middle school teachers to learn the integration of information technology and curriculum, learn to use information resources on the Internet, be good at capturing information hidden behind data, grasp the relevance of data, attach importance to quantitative analysis and the use of data, and apply it deeply to personalized teaching in middle school education. There are many kinds of data and a large amount of data in big data, which requires educators to fully mine valuable data from massive data resources for analysis, and to scientifically sort out and process them, so as to make a personalized teaching mode suitable for students' needs.

4.2.2 Innovating Education Model with Big Data

Big data can objectively reflect the realistic state of students. Therefore, by collecting and sorting out big data on education and teaching and making accurate calculation and analysis, we can judge and master the future behaviors of teachers and students, and then objectively and correctly master the internal needs of students (Wang Jujie, 2016). On this basis, the teaching process can be planned in a targeted way to promote the innovation of teaching mode and realize personalized teaching (Li Mingzhu, 2014). For example, the data in traditional teaching mainly include homework, examination and test, etc., but these do not objectively reflect the learning effect of students (Mark, Du Liqun, 2014), teachers' teaching process, etc. However, in the era of big data, We can explore the internal relationship between educational results and teaching activities. And find out the weak classroom in teaching, the progress trend or deficiency of students, To help teachers better understand each student's learning ability and mastery situation, further adjustments can be made in time for the important and difficult points of the curriculum or the parts that still need improvement, so as to provide personalized training programs for students, enhance the affinity of classroom teaching, enhance students' sense of acquisition of learning knowledge, and thus improve the teaching quality (Cao Wenzhuo, 2016).

4.2.3 Schools Should Strengthen the Construction of Education Big Data System and Mechanism

In view of the deficiencies in the construction of big data system in middle school education and teaching, it can be improved from the following aspects: First,increase investment in big data laboratories, establish an educational big data center with its own characteristics, and regard big data technology as a basic and strategic project for the sustainable development of schools (Wang Jue, 2019). And then create an intelligent intelligent classroom. Second, the introduction of talents with computer, statistics and other professional backgrounds, at the same time regular teachers to carry out big data training work, improve teachers' ability to master big data. Third, in view of the privacy issues involved in the application of big data technology, schools should formulate relevant big data management rules and regulations to protect students' right to know, respect students' right to privacy, and safeguard the personal information security of students and teachers (Zhang Ting, Jiang Yi, 2019). Through the above measures, improve the big data platform and related safeguard measures, so that teachers can better apply big data technology, analyze the characteristics of each student, realize personalized teaching, and provide personalized services for students (Liu Yang, 2019).

5.Conclusions and Discussions

To sum up, with the continuous development of information technology, the application of big data in secondary education is still in the development stage. Middle school teachers still have a long way to go before they can truly make use of the advantages of personalized service of big data and realize the beautiful vision of carrying out personalized teaching mode for each student. Therefore, in order to realize educational innovation and give full play to the advantages and functions of big data, it is necessary to correctly understand big data and strengthen its construction and utilization, so as to effectively promote the development of secondary education and provide us with better education.

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