

The Reform and Analysis of the Education System in the Age of Big Data

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Abstract: With the rapid development of modern information technology and the accelerating process of education system reform, how to rationally use big data for analysis, promote personalized teaching, and promote teaching reform are of great significance to enhance China's educational core competitiveness. The traditional education system can no longer meet the development requirements of education, and there are many problems and deficiencies. Therefore, the reconstruction of the education system must conform to the trend of the times and keep pace with the times. Based on this paper, this paper analyzes the impact of the big data era on education reform and its influence on education mode, learning analysis and education evaluation methods to explore the changes brought about by the big data era.

1. Introduction

In September 2008, the US magazine "Nature" published "Big Data: Science in the Petabyte Era" and officially proposed the term "Big Data". As another disruptive technological revolution after cloud computing and the Internet of Things, the concept of big data quickly penetrated into the field of education. On the one hand, big data helps to better grasp the individual learning behavior and learning level of students, and can provide students with individuality. The content, support and guidance of teaching; on the other hand, the scale effect of big data also makes the storage, management and analysis of educational data face great challenges. Learning analysis techniques that focus on "measuring, collecting, analyzing, and reporting data that is relevant to students and their learning environment to understand and improve learning and its environment" can help to make the value of learning process data so that data becomes prudent, The core basis for process optimization. Therefore, it is of great practical significance to explore how the education system analysis technology in the era of big data will promote the reform of higher vocational education.

The application of big data in education mainly focuses on educational data mining and learning analysis. [1] Among them, learning analysis technology has provided strong support for the promotion of independent and individualized learning methods, and promoted the evolution of personalized learning from luxury talk to reality. With the advancement of education informatization and the penetration of online learning methods, the importance of learning and analysis technology in the practice of vocational education and teaching reform has become increasingly prominent. The National Medium- and Long-Term Education Reform and Development Plan (2010-2020) mentions that macroeconomic integration of heterogeneous informational education resources, improvement of education management information systems, application of information technology, and encouragement of teachers to apply information technology are emphasized. Encourage students to use active means to learn and learn independently. When education informatization becomes the development goal of education, it is a major task for colleges and universities to promote education reform with information technology. The importance of learning analysis is self-evident. If we can effectively combine learning analysis technology with other teaching reform practices, it will inevitably create unlimited possibilities for higher vocational education

Chen Shuangye et al [2] pointed out: The formulation of traditional education policies usually does not fully consider the reality, but the decision makers use the limited understanding of themselves or groups to speculate on the reality of education, and the methods of surveying are often designated as “sampling” and discussion. The sample makes the randomization of more human intervention, so the education policy formulated is prone to failure. With the support of big data, the era of big data will be able to analyze the education data, and to dig out the teaching, learning, evaluation and other conditions that are in line with the actual situation of the students and the actual teaching conditions, so that the education policy can be formulated and implemented in a targeted manner. Develop a more realistic education strategy for students. Establish a decision support model for big data education. Through the analysis of educational data, we can explore the universal law of teaching and learning, management and evaluation. We can formulate and implement education policies in a targeted manner, and allocate and manage educational resources reasonably.

2. Method

2.1 The Demand for Education Reform in the Era of Big Data.

Since the implementation of education informatization, multimedia computers, distance learning, and digital teaching resources have begun to enter the field of education. Learning carriers are no longer confined to paper textbooks. Teaching tools are no longer confined to blackboards. The learning environment is also simple from "blackboard + chalk." "Step into the digital age. However, most teaching activities do not really change the traditional way of knowledge transfer, but simply digitize paper teaching knowledge. Teachers' teaching methods rely too much on multimedia, and classroom teaching knowledge transitions from “human irrigation” to “electric irrigation”. In general, the reform of college education and teaching is still at a low level, limited to the low-level cognitive goals of “remembering, understanding and applying” of college students. Since the existing learning environment cannot achieve the high-level cognitive goals of learners' “analysis, evaluation and creation”, it is necessary to consider reconfiguring the learning environment to meet the needs of learners' individualized learning in the era of big data, and to make it a university with big data era. The educational goals are adapted. The learning environment evolves with the occurrence of teaching activities. Building a learning environment is the basis for realizing the transformation of learning and teaching methods. [3] In the new learning environment, technology and derivatives are reshaping the way modern people think. Technology is no longer an aid to education, but an integral part of educational activities. In the era of big data, the speed at which higher vocational college students absorb new knowledge is accelerated, and the knowledge learned by learners outside the classroom far exceeds the amount of knowledge taught by teachers in the classroom. Under the impact of the external environment, the learner's view of learning, knowledge and ability will inevitably change, and the refined learning style will transition to a breakthrough. [4] The "teacher-oriented" teaching paradigm is completely Student-oriented transition. Therefore, creating an independent learning environment and promoting individualized learning of students has become the development trend of higher education reform. Personalized education is one of the important signs of contemporary international educational reform. [5-6] In the UNESCO report “Learning to Survive” published in 1972, the basic purpose of contemporary education is to promote the harmonious and comprehensive development of individuality.

2.2 Second, the Education Model from the Traditional Classroom Teaching to the Development of Digital Personality Teaching.

Big data can provide teaching content and tutoring forms that demonstrate the individual qualities of teachers for the individualized educational needs of students. Personalized teaching in the era of big data is that the teacher aggregates the information of each student (including the individual performance of the classmates and the situation of the whole class), and then finds the students who need help, the students who lack study time, and other students in different situations,

and then takes A teaching strategy suitable for students in different situations. This overcomes the shortcomings of classroom teaching in traditional education, and is more conducive to teaching students in accordance with their aptitude and promoting the overall development of all students. Under the era of big data, educators can truly understand each student, and can promote the traditional "teacher-centered" to "student-centered" transformation, so that students become masters in the classroom, students learn independently, and truly participate in teaching practice. in the process of. In the era of big data, online online learning courses have developed rapidly. In the process of online learning, students can choose to learn more about their interests, or they can choose to re-learn their knowledge points that they have not understood. Teachers and programs can also rationally intervene learners' learning behaviors through big data, so as to better improve students' academic performance. For example, the online learning system designed by Khan Academy spent a lot of time on each student to watch the video, which chapter spent more time, which topics were wrong, and which chapters easily completed 10 topics and successfully promoted to the next unit. The learning, etc., these data have been recorded, and through the analysis of these data as the basis and basis for supplementary teaching.

2.3 Educational Reform Supported by Learning and Analysis Technology.

Learning and analysis takes education big data as the analysis object, and constantly upgrades in the context of big data. It integrates the knowledge of artificial intelligence, expert systems and teachers, provides support services for teaching and learning, completes supervision and tracking of teaching and learning processes, and evaluates teaching. And the learning effect, in order to promote the personalized vocational education support system, and provide the driving force for the in-depth reform of higher vocational college education in the new era. In the 2012 Horizon Report: 2012 Vocational Education Edition, the New Media Alliance pointed out that in the next 2-3 years, learning analysis will become mainstream technology and play an important role in promoting education development and reform. In the aspect of education management reform, learning analysis can provide relevant data for guiding teaching management activities for all aspects of the education management system of higher vocational colleges. Based on these data, the management departments of higher vocational colleges can improve the inadequacies in a targeted manner, revise the education management plan, optimize the allocation of teaching resources, and finally evaluate the revision plan and resource allocation. In terms of teaching reform, learning and analysis technology can truly create an information-based teaching environment, ensuring that the learning services provided by teachers meet the needs of learners' individualized learning and collaborative learning. In the traditional teaching mode, teachers can't guarantee that the learning resources provided can truly meet the learning needs of students, can not adjust and allocate resources in a timely manner, can not provide personalized academic guidance, and can not timely understand the obstacles and doubts in the learning process. These problems limit the depth of education reform, and learning analysis techniques can just make up for these shortcomings. By applying relevant tools and techniques for learning analysis, teachers can obtain students' learning behavior data in a timely manner, thereby supporting a new teaching method that not only reflects the teacher's leading role, but also takes into account the student's dominant position, in order to maximize the potential of students. To cultivate innovative talents for the new century. In the aspect of learning mode reform, the role of learning analysis technology is: Automatically identify learning situations, automatically analyze the learner's characteristic information from a large amount of data, push the adapted target resources according to their needs, and provide learning suggestions to assist learning. Revise their own learning tasks; learners can adjust their learning plans in real time, and make appointments to answer learning doubts; in specific cases, they can also be divided into learning groups by locking the learner's geographical area, learning characteristics and other factors to meet individual Learner's collaborative learning needs. In addition, learning analytics can provide students with personalized learning guidance advice to help students plan their school path and clarify their expectations for academic achievement.

2.4 Innovation in the Evaluation Model of Education.

In the evaluation of education, big data is used for analysis, and the technical level is used to evaluate and analyze, so as to improve the comprehensive quality of education, and shift from the traditional evaluation mode to the quantitative evaluation model based on basic data. The way of evaluation of education is no longer a discussion of experience or subjective judgment. Instead, it can find out the rules of education and optimize and improve the education process through the “induction” of large amounts of data. For example, the new generation of online learning platform has more behavioral analysis and learning induction. By recording the number of clicks of the learner's mouse, the learner's activity trajectory is studied, and it is found out how different people react to different knowledge points, how long it takes, and which knowledge points need to be repeated or emphasized [7]. In addition, big data records the entire process of education and teaching through technical means, and has realized a transition from a result evaluation to a process evaluation. In the process of educational evaluation, the target of evaluation is not only the learner, but also the teachers can use the information provided by big data to analyze their teaching behavior. The data reflected by the teaching process can discover their own teaching expertise and teaching inadequacies. Educational evaluation is a very important part of the education process. Only by adopting scientific evaluation methods can teachers and learners be able to face up to and accept objective problems, reflect on the process and methods of teaching and learning, and improve their behaviors to improve Teaching quality [8-9].

2.5 The Reform and Development Trend of Education in the Era of Big Data.

With the advent of the era of big data, although personal privacy is not inconspicuous, personal life may be affected to some extent, but overall it still benefits more than harm. From the perspective of the entire education industry, big data technology will bring new development trends for the development of education. (1) It will increase the predictability of education: one of the important functions of big data is to analyze the teaching data in the complicated daily teaching to summarize the content with predictive value: What kind of teaching method is more suitable for the actual situation of the students. At which time period the current content is more easily accepted by the students; each student is more likely to grasp what he is learning in the unique way, and in what way to consolidate and enhance the knowledge is more effective. In particular, by analyzing and generating data in the course of teaching behavior, the students' recent learning situation, state of mind and behavioral tendency can be summarized, and the occurrence of misconduct in teaching activities is effectively prevented. The prediction of the situation that will occur in teaching activities is an important teaching strategy for mastering educational autonomy, effectively improving teaching quality, and cultivating mental health students. It also reflects the forward-looking and initiative of teaching activities, and is an effective way to occupy the commanding heights of teaching activities. . (2) Teachers must not only master professional knowledge but also have the ability to analyze data: professional knowledge is one of the important contents of teachers' professional quality, and it is a necessary condition for teachers to carry out normal teaching activities and ensure basic teaching quality. [10-11] The professional knowledge of teachers is also an important basis for measuring the level of teacher education. With the rapid development of the era of big data, future teachers need not only extensive professional knowledge, but also certain data analysis capabilities in order to adapt to the progress of the times. The education data in the era of big data will become an important part of teaching activities, but the future data presentation will also be explosive. How to find the content with teaching value in the complicated data becomes an important task for teachers in teaching activities. . In particular, the deep interpretation of educational data, the analysis and correlation of student-related data, and how it can be effectively applied to teaching activities to improve student achievement and promote the healthy development of students' physical and mental health is particularly important. With the advent of the big data era, the demand for data analysis talents will be further expanded. Therefore, data analysis courses should be added in university teaching to train more data analysis talents to adjust the balance between market supply and demand. (3) The era of globalization and the rapid

development of online education. Modern education, new teaching models are emerging, such as micro-class, MOOC Mood classes, flipping classes, etc., all new teaching modes have not left the online learning. Everyone can make online videos of online learning for everyone to watch and learn. This online education method realizes the sharing of educational resources, spans geographical limitations, and promotes educational fairness.

3. Conclusion

Bill Gates once predicted: "In the 21st century, with the development of information technology and other leading technologies, the shape of the school will eventually change." [12] There are many factors affecting the development of education, although the development of education has its own rules, but As a tangible or intangible force, big data will definitely have an impact on education. We need to apply big data better, improve the quality of teaching, and make the individualization of learning and teaching possible. The intelligent learning environment constructed by learning and analysis technology in the era of big data can sense students' learning behavior, identify appropriate learning resources, change the way and content of teaching information transmission, automatically track the network learning process, and provide real-time information feedback. It is the process of educational informationization. The advanced stage is an important development direction of reform. Undoubtedly, learning and analysis technology is a field with great development potential in the era of big data. With its broad application prospects, it will certainly provide a new perspective for the advancement of education reform in the new era.

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