

Research on the Data Analysis of College Classroom Teaching Behavior by Using Deep Learning

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ABSTRACT

With education stepping into the era of intelligence, intelligent classroom behavior recognition of students is becoming more and more important. However, due to the complexity and variety of students' classroom behavior, it is difficult to recognize intelligent students' classroom behavior. In order to improve the intensive reading of intelligent student behavior recognition, this paper uses a variety of data sources for cross comparison, and uses the mature random forest algorithm and correction matrix in the data analysis of classroom teaching behavior in Colleges and universities. Through the analysis, it shows that deep learning can timely and accurately feedback the classroom teaching phenomenon and the data and intelligence of teaching activities, which is conducive to the improvement of teaching methods, the optimization of classroom teaching and management, to improve the efficiency of teaching and learning and help the teaching reform.

Keywords: *classroom behavior, pattern recognition, deep learning, correction matrix*

1. INTRODUCTION

Classroom teaching as an important environment of college teaching, as the main place of teaching activities, as the basic cell of teaching activities, as the main field of teaching research, in which teaching behavior is an important cut-in point for us to understand and analyze and study the rules and essence of classroom teaching activities, as well as the main battlefield and key breakthrough for studying its behavior data[1]. In recent years, the realization of information and even intelligent upgrading of higher education has become a key development direction. In order to better serve the teaching, to serve the personalized learning of students, to promote the progress of modern teaching, focusing on the in-depth development of educational informatization, relying on information technology, data quantitative analysis and artificial intelligence technology, using computer technology to comprehensively process multi-dimensional information, from the traditional education industry to the education industry informatization, and then gradually to the education industry intelligence To realize the new breakthrough of intelligent education in Colleges and universities[2]. Actively explore and research the integration and innovative application of information technology, data analysis and quantification technology, machine learning technology and higher education. Using information technology and machine learning technology to optimize and reform the traditional higher education space and education mode is one of the effective ways to realize information and intelligent education; it is also a major strategy to serve the development of the new generation of artificial intelligence, promote the application of machine learning and human intelligence technology in the field of education, and serve and support the new economic development and the demand of education industry To promote the next generation of

higher education[3].

2. DATA ACQUISITION AND PREPROCESSING

At present, with the continuous improvement of the informatization level of colleges and universities, a sharing platform has been gradually formed for the data of campus card system, student status data, examination attendance data, library borrowing data, access control data, network access log data and other data, to analyze, process and excavate the potential data laws in the big data environment of campus, study the behavior characteristics of students, and analyze students Behavior law, improve students' learning input, improve school management decision-making ability to provide data basis[4]. However, there is no collection and analysis method for the first classroom data, and even less guidance research on the classroom teaching effect, especially the learning effect of students. Therefore, the first classroom data collection is realized by means of information technology [5]. Under the guidance of relevant advanced education theories, the first classroom data is analyzed by guidance, and other physiological and psychological data collection technologies are explored by means of video and audio pattern recognition under the guidance of relevant needs. The structured and unstructured data in the first classroom are mined to master psychological changes We should pay attention to the development of students' behavior in the classroom, establish reasonable learning strategy guidance according to data analysis, and implement the educational concept of teaching students according to their aptitude and with a targeted goal, to provide positive guidance for students' learning effect [7]. In this project, more than 1500 students from the information engineering branch of Xi'an Eurasian University are selected as the research objects, and the all-round HD video capture

cameras and pickups of the intelligent education laboratory under construction are used to capture the behavior, posture and psychological external performance of the students in the classroom, and the causality, strong correlation and weak correlation to the learning effect are extracted, and the classroom teaching is proposed in the aspect of students' learning. This paper analyzes the relationship between learning data and learning effect, establishes the theoretical model of classroom behavior and classroom attitude equal to learning effect, excavates the relationship system of classroom data and learning effect, establishes learning early warning mechanism, accurately guides students to establish learning strategies, improves learning efficiency, improves the quality cultivation mode of colleges and universities, and provides the exploration attempt of increasing students' burden reasonably [8].

3. STUDY ON LEARNING STRATEGIES AND SELF-EVALUATION MECHANISM BASED ON THE THEORY OF GOAL-DIRECTED BEHAVIORISM

At present, with the continuous improvement of the informatization level of colleges and universities, a sharing platform has been gradually formed for the data of campus card system, student status data, examination attendance data, library borrowing data, access control data, network access log data and other data, to analyze, process and excavate the potential data laws in the big data environment of campus, study the behavior characteristics of students, and analyze students' behavior law, improve students' learning input, improve school management decision-making ability to provide data basis. In the process of students' daily study in the school, a large number of structured data are generated, such as students' basic information, family situation, class situation, students' scores and consumption records in the school [9]. Meanwhile, students' network status and comments published on new media platforms such as QQ space, WeChat friend circle, microblog and university forum form a large amount of unstructured data. In addition, for students' location, image, video and other information, we can not only realize high bandwidth information channel and massive data sharing in school, but also realize real-time acquisition of location, expression, action and other information through self-built special image, communication and positioning network. All the data have the characteristics of massive, multi-source, timeliness, and many types. Through the structured and unstructured data produced by students in school, big data technology is used for regular classification to provide technical basis for further data mining [10].

In the process of building student multi-dimensional data model, the data source has typical multi-source. Among them, structured data such as all-in-one card data from campus, student enrollment data, examination attendance data, library borrowing data, access control data, network access log data, etc. have the characteristics of multi-source, massive, strong timeliness, etc., which can be standardized and classified through random forest algorithm [11]. Moreover, the social data of students has the characteristics of more powerful category changes, etc. for the traditional classification algorithm of fixed category books, it is unable

to accurately organize the data, so it is required that the data regularization algorithm not only can accurately classify the known user categories, but also can automatically detect the new categories when they appear, and carry out the data regularization classification in time, so as to build a learning effect prediction model Data base [12].

4. BUILDING LEARNING EFFECT PREDICTION MODEL BASED ON TRANSFORMATION REGRESSION MODEL AND CORRECTION MATRIX

According to the great randomness of the students' Multi-dimensional classroom data, the time series prediction model is adopted in the project selection. The autoregressive and vector autoregressive models assume that the current variables change according to the linear rule of the previous variables, and the traditional autoregressive model can only deal with the response variables rather than the input exogenous variables. In order to deal with the nonlinear dependence between input variables and other external variables, some other nonlinear models are also applied to time series prediction tasks, such as support vector machine and neural network. Especially in recent years, it has been found that the cyclic neural network has a good effect on time series prediction. However, this kind of methods are all in black box form and lack of certain explanation. It is necessary to be able to explain the process of multi-dimensional data and learning effect prediction and determine the factors that affect the prediction when designing the correlation analysis of students' learning effect. In the actual data analysis, it is found that different data sources and data sequences have very large heterogeneous types, and even for the same data source, the data dynamics in different stages are very different. So single model can't build learning effect prediction model. At the same time, many studies found that time series have clustering characteristics, and time series in the same category have similar growth patterns. Therefore, the construction of learning effect prediction model based on transformation regression model and correction matrix has become the key problem of project research. Reasonable prediction model construction can better reflect the correctness of learning effect association analysis, and can quantify the strong correlation, weak correlation or causality between classroom multi-dimensional data and learning effect, which is the best configuration to test the theory of association analysis [13].

5. CONCLUSION

This research is a comprehensive interdisciplinary research, and the research framework is structured and hierarchical [14] [15]. The methods used are mechanism design, algorithm design, statistical analysis and method deduction. The algorithm verification uses computer algorithm design and realizes the combination with practice and guess effect verification. Firstly, the overall research mechanism framework is determined, which is divided into four modules: model reconstruction, algorithm design, system construction, method and evaluation system construction. Its fishbone structure is divided into three levels, the first level is model

reconstruction and algorithm design, the second level is system construction, algorithm analysis and data feeding, the third level is method and evaluation system, prediction model debugging. And use the massive data accumulated in the information construction of Xi'an Eurasian University for many years, use the algorithm to carry out regular classification, according to the relevant degree of students' learning effect, and reverse combine the research of higher education and educational psychology to carry out data analysis. Through positive feedback and negative feedback, the behavior data can guide the learning effect, and the algorithm is used to predict the learning effect [16] [17].

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