Artificial Intelligence-based Learning Behavior Data Mining and Network Teaching Quality Monitoring Mechanism

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Abstract. The integration of artificial intelligence technology and school education has become a future trend, which represents that students receiving education in the current society have to develop to a higher level supported by "intelligent education". The popularity of network education also means that higher education has a higher demand for "artificial intelligence education". The purpose of this paper is to verify the feasibility of these methods by data mining and evaluation of students' learning behaviors through different methods in artificial intelligence, aiming at the new situation and new problems of students' learning behaviors in modern education and teaching environment. This paper takes the students of school A as the research objects, starts from the perspective of learners and takes the online learning behavior of learners as the starting point, analyzes the effectiveness of online learning from multiple perspectives, and analyzes the quality monitoring mechanism of online teaching in this university by combining artificial intelligence technology, and puts forward targeted Suggestions.

Keywords: Artificial Intelligence, Network Education, Data Mining, Cluster Analysis

1. Introduction
As an indispensable factor in the process of educational reform, technology has a profound impact on the process of education and teaching. With the enrichment of theory and practice of education and development of education of the connotation and extension of information technology constantly changing, in digital multimedia computer and a new generation of network communication technology as the core of modern education technology and information technology in our country, comprehensive development and application in the field of higher education, the teaching contents, teaching means, teaching methods and teaching mode and so on all has brought the huge impact and change, led to the modern education thought, teaching idea, teaching theory and even the entire education system are closely corresponding great changes have taken place, Network information and
learning has also become the mainstream of modern education science and technology teaching development research direction. At present, the research on the teaching of network information and learning mainly adopts the speculative teaching method, and the research results are not objective and convincing. The application of data mining method to the study of effective learning mechanism of network is a new perspective and an embodiment of the research method of digital education.

The PBL teaching mode is a teaching method widely used in today's normal colleges. Ke Yu summarized the development of PBL, summarized the application examples of PBL teaching model in normal colleges and PBL-based online teaching platforms, and compared the advantages of PBL with traditional teaching methods and different teaching methods through GLM analysis. University as a research object. In order to promote the transformation of higher normal education concepts, the reconstruction of the curriculum system and the innovation of teaching methods provide new ideas [1]. Artificial intelligence aims to mimic human cognitive functions. The continuous improvement of the availability of teaching data and the rapid development of analytical techniques have transformed the normal teaching model. Tavares A P C introduced the current application of artificial intelligence in the field of normal education and looked forward to its development prospects. AI can be applied to all types of teaching data. Popular artificial intelligence technologies include machine learning methods for structured data, such as classic support vector machines and neural networks, as well as modern deep learning and natural language processing for unstructured data. Tavares A P C then reviewed in more detail the application of artificial intelligence in the three main areas of teaching, prediction and evaluation in normal colleges. Finally, Jiang and F discussed pioneering AI systems such as IBM Watson and obstacles to AI deployment in real life [2]. Christopher Yaw KWAAH described an artificial intelligence designed to perform secretarial tasks and is designated as an artificial intelligence design that mimics the design of secretaries. The basic implementation of SMILE is a set of computer programs that work together to "listen" to voice commands and "see" window changes caused by scanning with a sliding barcode. MILE responds to these inputs by operating on the PowerPath client window and its Microsoft Word plug-in window, which is done in a printed and finalized report. Artificial intelligence that mimics the Secretary-General also provides relevant information to pathologists through computer speakers and message boxes on the screen [3].

Based on the artificial intelligence technology, analyse the application of data mining in network learning research background and significance, as well as the content and purpose of the study, and the detailed review on the present situation of the research, defining the relevant concepts of network effective learning mechanism, this paper introduces the theoretical basis and methods, and from the concept of data mining, methods, functions, the process model of data mining and data mining software to compare the network teaching quality monitoring mechanism, and puts forward Suggestions for improvement.

2. Proposed method

2.1. Artificial intelligence

Artificial intelligence is an interdisciplinary subject. Although it sounds like a course, it is actually a comprehensive subject including psychology, philosophy, neurophysiology and computer technology. Although it contains the word intelligence, it does not flesh and blood, which is mainly through the
computer to the human intelligence such as perception, learning, reasoning, communication and other related complex series of activities to simulate artificial agents. It differs from human natural intelligence in that it produces organic activities such as metabolism and reproduction that are largely eliminated. Its creation is like the realization of human intelligence on a machine. A major goal of ai research is to enable machines to perform complex tasks that normally require human intelligence. Since the development and use of intelligent machines can imitate and extend the functions of human organs, they have replaced many simple, repetitive and even complex tasks that are difficult to be done at ordinary times, thus greatly changing the demand of the society for workers [4].

(1) Characteristics

1) Deep learning

The primary technical feature of artificial intelligence should be deep machine learning. Using the hierarchical deep learning architecture, we can calculate the semantic expression of hierarchical objects at different levels of knowledge through deep learning, so that we can effectively help further analyze and solve more complex abstract artificial intelligence problems and make their complexity more precise. At present, deep machine learning has made a series of significant advances in the application of speech, image and natural language understanding. In the field of image and natural language processing, it is widely used in speech machine translation and semantic data mining. It has also made a lot of achievements in the field of speech and image processing [5].

2) Cross-border integration

The effective fusion of artificial intelligence and various fields can achieve the effect of "1+1>2". In the field of education, artificial intelligence assistants and real-time monitoring devices can liberate teachers from a large number of repetitive labor, better carry out humanistic care for students and teach students in accordance with their aptitude, and help students develop into better themselves. These are manifestations of cross-border integration [6].

3) Man-machine collaboration

In the age of intelligence, people and intelligent machines are required to complete the work, boring, repetitive work by intelligent machines to complete the innovative work and humanistic care work is our competence. In the future, as ai advances, the ai circle at the bottom left will expand to the right. Therefore, in the era of artificial intelligence, machines are just our assistants, serving us. In our future life, we will deal with machines, which is the era of human-computer collaborative interaction.

2.2. Data mining

(1) Data mining method

1) Classification

Classification is based on the analysis of the sample data in the database, for each of a given category data make an accurate classification and description, unearth data classification rules, or to construct a classification function or classification model, the classification model usually can change the one data in a database project map directly to a database in a given category. Data classification model can be widely used to classify customer data, analyze customer data attributes and characteristics, analyze customer service satisfaction, and predict customer purchase behavior trend. The commonly used strategy classification models for data classification include decision tree, generative data analysis rules, bayes and rough set, etc. Among them, the decision tree algorithm is an
important core technology and algorithm in generative data analysis and mining technology [7].

2) Clustering

Clustering is a collection of data objects that are very similar to each other. It is the process of grouping the collection of physical or abstract objects into multiple classes or families, so that the objects in the same cluster have a high degree of similarity, while the objects in different clusters are quite different. Clustering is the inverse process of classification. Different from classification, the classes to be classified are unknown, and it does not depend on predefined classes and training instances with class labels. Through clustering, dense and sparse regions can be identified, thus global distribution patterns and interesting interrelationships between data attributes can be found [8].

3) Association rules

Correlation analysis is used to describe the management mode of strong correlation features in data. By virtue of correlation features, it reveals an internal connection between things, that is, according to the internal appearance of some items in a transaction, it can be deduced that other items also appear internally in the same transaction, that is, the association or mutual relationship hidden in the same transaction data. In enterprise customer relationship management, through to the company or enterprise customer database, a large number of mining and analyze customer data record, a record from a large number of fast find interesting association or correlation, in finding out the key factors affecting the effects of enterprise marketing, marketing for marketing the product positioning, pricing and provide customized customer base, seek, segmentation and keep customers, marketing and product sales, marketing and risk assessment and a xu cheat risk prediction and so on decision data support for the customer provides the reference and decision-making basis [9-10].

3. Experiments

3.1. Experimental background

In view of the demand for network learning quality assurance, this study will adopt data mining methods such as classification, clustering and association rules. The application of SQL Server2008 as a data mining tool, and Excel2007 and other software for visual display, data is through the execution of SQL query collection, standardization and other tasks are also through SQL statements to achieve, the output of data characteristics can be in a variety of forms, including bar chart, curve, etc. In the process of mining, the network course, the network platform and the teacher's behavior information are fixed, and the learner's behavior activities are taken as the starting point of the research.

3.2. Experimental design

This study is based on the information of 2,500 undergraduate students and more than 300 masters of education students of the class of 2016. The learning period was from march to June, and the system was logged in for over 100,000 times, with 1.5 million records of learning behaviors. First, the database of online courses has been improved for several years, and the data in 2018 is the most complete. Second, the cognitive basis and characteristics of learners in the same year are relatively close, and the mining conclusions are relatively reliable. However, the mixed data of many years is not conducive to the interpretation and evaluation of learning behaviors. Third, the data in 2018 is rich enough, if the data volume is too large, it needs to be analyzed on a higher performance server.
4. Discussion

4.1. Data analysis of school a’s learning behavior based on artificial intelligence

Learners made statistical figure, according to the scale of the grade is shown in figure 1, the learner's performance in line with normal distribution, from the point of data, the number of less than 60 accounted for 1.2% of the total, more than 90 points, the number of accounts for 1.4% of the total, the largest number of 79 points and the learner's grade point average of 75.5 points, is the overall performance is slightly on the high side, but there will be no mutation or uneven phenomenon, to show that the learners learning under the network environment with ChuanTongKe always environment is a basic visible under the network environment of learning is effective, its data investigation as shown in Table 1.

| Undergraduate achievement sample size | Undergraduate grade distribution | Sample size of postgraduate results | Graduate grades are distributed |
|---------------------------------------|----------------------------------|------------------------------------|--------------------------------|
| 114                                   | 60-70                            | 98                                 | 60-70                          |
| 122                                   | 70-80                            | 77                                 | 70-80                          |
| 68                                    | 80-90                            | 34                                 | 80-90                          |
| 32                                    | 90-100                           | 6                                  | 90-100                         |

4.2. Analysis of network teaching quality monitoring mechanism based on artificial intelligence

The network provides a powerful and integrated information medium, and the collection and acquisition of information resources is an important form of network learning activities. In the network environment, learners not only learn the content of the network course, but also learn the auxiliary resources and resources on the Internet, web page browsing and information retrieval. Information processing is the process of information understanding and absorption, including the process of perception, attention, memory, understanding, etc., with the help of information downloading, classification and saving, Blog learning notes to complete, so that learners can creatively and effectively use information. As shown in Figure 1, online education classes can meet the needs of daily teaching and provide many convenient functions and monitoring mechanisms to help students communicate and learn. The release of its information includes Posting questions on BBS discussion boards, answering questions, handing in homework, and displaying study notes. Information exchange includes the communication between learners and teachers and between learners and learners. Information is spread and Shared through BBS, Blog, learning notes, Message, telephone, email and other means. Information application is to use the acquired information to solve practical problems, such as completing the information teaching design, making multimedia courseware and so on.
5. Conclusions
In this paper, the potential of artificial intelligence in network education is explored through the investigation and statistics of students participating in network education classes in A school, the analysis of data based on artificial intelligence technology, and the introduction of data mining methods. In this paper, knowledge discovery has been clear about the data mining is the most important and most critical step, problem definition, were carried out to collect the relevant data, the data preprocessing and standardization, application of classification algorithms, clustering algorithms, and associated algorithms such as data mining application in network learning model is established, and the methods of association rule mining, clustering, classification and the establishment of model and the evaluation study, discusses the differences of network learning and the influence factors of network study effect, and the effective supervision mechanism and learning behavior under the network environment to make predictions.

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