Application of Data Mining Technology in Teaching Quality Monitoring and Evaluation of Higher Vocational Colleges

Zhen Li

Jiangsu Maritime Institute, Nanjing 211112, China.

Abstract: Strengthening the monitoring and evaluation of teaching quality in higher vocational colleges can effectively improve the teaching quality of higher education. With the development of Internet and information technology, campus management is becoming more and more information-based. In the educational administration system of higher vocational colleges, a large amount of data information has not been effectively developed. In order to improve the teaching quality of higher education, it is essential to study and monitor the relevant data. Based on the current situation of the development of higher vocational education in China, this paper analyzes the application of data mining technology in the monitoring and evaluation of teaching quality in higher vocational colleges, and expounds its function, application strategy and related refinement steps and methods, so as to provide a theoretical basis for the application of data mining technology in the teaching of higher education.

Keywords: Data Mining Technology; Higher Vocational Education; Teaching Quality Monitoring and Evaluation

1. Introduction

In order to adapt to the development of the new era, improving the education and teaching quality of higher vocational colleges has become an urgent problem to be solved in the stage of higher education. Teaching quality is very important for the development of colleges and universities. With the advancement of daily teaching work in colleges and universities, the scope of teaching management in colleges and universities continues to expand. The information is stored in the background system in the form of digitization, and the data information is complex. Data mining can strengthen the monitoring and adjustment of teaching quality in higher vocational colleges. Using data mining technology, we can find new methods to manage the teaching work in higher vocational colleges and innovate the monitoring and evaluation system of teaching quality.

2. Development status of higher vocational education in China

In modern society, the social division of labor is constantly refined, and the demand for talents in social economy is also gradually increasing. Higher education can be roughly divided into two types: colleges and universities and higher vocational schools. Colleges and universities mainly cultivate research talents, while higher vocational colleges mainly cultivate professional application-oriented technical talents. The purpose of higher vocational colleges is to cultivate high-quality professional and skilled talents required by the society, so they should focus on the changes of social talent market demand, constantly adjust the school's education mode, and cultivate skilled talents with strong adaptability, excellent technology, innovative thinking and development consciousness for the society, to set professional skill training meeting the post and social requirements. Based on the educational nature of higher vocational colleges, we should first recognize that higher vocational colleges need to strengthen the management of education and teaching, establish and improve the school management and operation mechanism, scientifically and reasonably monitor and evaluate the teaching quality, in order to shoulder the mission entrusted by the times, ensure the educational quality of higher vocational schools and improve the quality of talents.

The survey shows that most higher vocational colleges still use the method of "weighted summation" in the monitoring and evaluation of teaching quality. First of all, this method is simple to operate and the results are obvious, but its accuracy is

not enough. There is no way to comprehensively compare the teaching results and quality of grades, majors and colleges. In the statistics of the use of the new methods, it can be found that some higher vocational colleges insist on using information technology to carry out teachers' self-evaluation, teachers' mutual evaluation and students' teaching evaluation on the social platform or school system through the network, which has innovated the ways and methods of school teaching evaluation. In this way, the information collected by the school is diversified and the analysis results are more accurate, but the evaluation channels are increased, the workload of school data processing is increased, the school's database information increases exponentially, and some data information has not been effectively explored and utilized.

3. The role of data mining technology in the monitoring and evaluation of teaching quality in higher vocational colleges

Data mining technology refers to confirming the corresponding accurate data information from the massive data resource information base according to the provided screening conditions, and can carry out data processing operations such as cleaning, selection and replacement, form an integration effect, and conduct relevant evaluation according to the data performance. Through data mining technology, locating relevant information from the complex university database can greatly improve the work efficiency of the school affairs management system and reduce the waste of management resources.

The teaching quality monitoring and evaluation system of higher vocational colleges is a complex system with multi-level and wide audience. We should apply data mining technology to the teaching quality management of higher vocational schools, classify the information of the academic affairs office, and establish corresponding information database and official website, in order to timely analyze and process the generated data and feedback relevant problems, and more accurately predict the possible problems in the education management of higher vocational schools and provide solutions. It is conducive to the improvement of teaching quality of higher education. It is mainly reflected in the following points:

3.1 Reflecting educational problems and helping the school's educational work

In the process of quality education, the continuous application of data mining technology can continuously innovate ways and methods from the educational work and promote the development of the new curriculum reform. In the specific application process, data mining technology can also more clearly reflect the educational problems, affect the relevant policies of teaching management in colleges and universities, and help the educational work of higher vocational schools in all aspects.

3.2 It is conducive to improving teachers' teaching quality and promoting educational equity

When data mining technology is applied in education system, it can promote educational equity. The data processing system can enable teachers and students to evaluate teaching effectiveness fairly and fairly, weaken the influencing factors of evaluation, and increase the objectivity of evaluation, which is not only reduce the amount of teachers' tasks, but also promote teachers' educational work and improve teachers' teaching quality.

3.3 Improving the assessment quality and clarifying the key information affecting teaching

In the process of dealing with the educational administration examination, the data processing system can determine the impact of various factors on the achievement, clarify the key information affecting the teaching effect, and develop a more scientific and reasonable teaching mode, so as to reform and monitor the examination methods of students.

4. Application analysis of data mining technology in teaching quality monitoring and evaluation of higher vocational colleges

Due to the continuous development of higher education, quality standards are also changing. The teaching effect is finally reflected in the performance of talents in the assessment process. Monitoring and evaluating the teaching quality of higher vocational colleges through data mining technology can start from improving its teaching quality. For example, you can start from the following aspects:

4.1 Analyzing the specific situation of students and customizing the learning environment

When data mining technology is applied to analyze students, it is necessary to mine the relationship between students' ability and their teaching environment, and customize the learning environment for students. Through decision tree induction, educators can analyze students' different personality characteristics and study the relationship between students' ability, achievement and learning environment through students' performance in different aspects. For example, we should analyze the distribution of test scores to see whether students' scores are related to seats. When evaluating students' learning habits and moral quality, teachers can also formulate class management methods, study specific teaching strategies, select relevant teaching equipment, etc., in combination with the class situation, so as to optimize students' learning environment.

4.2 Reasonably setting up courses according to time series model and association rules

Teachers make full use of the time series model and association rules to conduct association analysis on students' test data, screen out effective information from the database of all higher vocational students, and analyze the association between students' test scores and other factors, so as to discharge the order of influencing proportion. Finally, they can find the key factors affecting students' test scores and abilities, and according to the analysis results, put forward relevant measures of curriculum reform.

4.3 Evaluating teaching quality and effect

Through information mining technology, relevant teaching management and evaluation models are established according to the specific situation of colleges and universities, which can reverse promote the improvement of teaching situation and improve teaching quality and effect. By analyzing the relevance of the score resource database, the school can refine the students' knowledge mastery. According to the students' scores, the school can count the data of the difficulty, relevant test sites, investigation depth and discrimination of the test paper, accurately analyze the teachers' teaching work, and be able to analyze the teachers' teaching content, teaching design rational analysis of teaching scope and timely feedback of teaching and research data, so that teachers can improve teaching quality and teaching effect.

4.4 Modeling and analyzing teachers and cultivating excellent teachers' team

By analyzing the basic teaching situation, teaching results and evaluation results of teachers, establish a teacher growth model and formulate the standards of excellent teachers. Through teachers' own efforts and school policy support, cultivating more excellent teachers to improve teachers' professional quality, establish excellent teachers' team, and provide reference basis for the follow-up talent introduction of the school.

5. Methods and steps of monitoring and evaluating teaching quality by data mining technology

In order to improve the scientificity of monitoring and evaluating teaching quality, a variety of data processing technologies can be used, such as decision tree, proximity search method, rule reasoning, model exploration and so on. The research on monitoring and evaluating the teaching quality of higher vocational schools by data mining technology can be divided into the following steps:

5.1 Data preparation

According to the teaching quality monitoring and evaluation system of higher vocational colleges, we can collect the relevant data of the research object in many aspects, establish the data model, and make the preliminary preparations for data mining.

5.2 Establishing the relevant system model of data mining

Firstly, sort out the data, change the complex and various data into a unified form, and establish the relevant system model of data mining.

5.3 Evaluating the results

In order to improve the scientificity of data mining results, it is necessary to evaluate the screening criteria such as rules and trends used in the model.

5.4 Analyzing decision information

Because data mining technology is only a tool to assist school decision-making, its main function is to analyze and sort out the complicated information and feed it back to teaching managers in an intuitive form. Teachers can adjust the school's teaching quality monitoring and evaluation system in combination with the specific situation of feedback.

6. Conclusion

In the era of big data, the practical application of data mining technology needs people to deeply explore and explore. Using data mining technology in the teaching management of higher vocational colleges can predict the future development direction of the school, improve the scientificity of teaching decision-making, and promote the development of higher vocational colleges.

References

[1] Ma J. Research on the application of data mining technology in teaching quality monitoring and evaluation in higher vocational colleges. Intelligence 2020; (4): 122.

[2] Liu H. Application of data mining technology in teaching quality monitoring and evaluation in higher vocational colleges. Gansu Science and Technology 2019; 35(8): 80-81.