Application of Data Mining Algorithms in Data Analysis of Information Education Evaluation

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Abstract. In the new century, China has attached great importance to informatization work. Based on the development of education and teaching, the necessary infrastructure for informatization must be gradually improved. At the same time, we should make reasonable and effective use of information technology in the analysis of educational evaluation data, so that informatization teaching becomes an indispensable part of education. The purpose of this article is to study the application of data mining algorithms in data analysis of information education evaluation. This article will give full play to the interactive, dynamic and open advantages of the teaching resources of the network platform, combined with the ability of teachers to use information technology, rationally optimize the education evaluation data analysis system, use existing information technology to build an evaluation system, and evaluate the participating teachers. Ensure that the evaluation results are objective and effective. According to the overall framework and demand analysis of the system, the teacher information technology application ability assessment system is divided into different functional modules, each module is analyzed in detail according to user needs, and the corresponding database is designed. The evaluation system has an intuitive user interface, easy operation, and stable operation. It is suitable for first-line teachers and school administrators in primary and secondary schools to make a fair assessment of the teaching of teachers. Through the evaluation and analysis report, teachers can optimize and comprehensively understand their own teaching situation, see the problems in their teaching, and change the teaching method in time; appropriately summarize and analyze to improve the teaching level. Understand the teaching work of teachers, and realize the in-depth integration of informatization and teaching. Experimental investigations have shown that students have a great lack of experimental ability. The other four abilities are not far apart, all of which are above 70%. They are in the upper middle and upper reaches. Among them, the analysis and application tools are about 5% higher than the grade level. In general, the experimental ability must be strengthened to enhance. Let students achieve all-round development. Through the evaluation and analysis report, teachers can find their own shortcomings in teaching more clearly based on their optimization, and change the teaching methods in time; appropriately summarize and analyze to improve the teaching level.

Key words: Big Data, Information Education, Evaluation Data, Design Optimization
1. Introduction
The rapid development of big data has brought the era of our lives from the "information age" to the "data age" [1-2]. All walks of life are using big data to change production and life, and this change inevitably also affects the education field [3]. In the new century, China has attached great importance to informatization work [4]. Based on the development of education and teaching, the necessary infrastructure for informatization needs to be gradually improved [5]. At the same time, we should also make reasonable and effective use of information technology in the analysis of educational evaluation data, so that informatization teaching becomes an indispensable part of education [6].

In the research on the application of data mining algorithms in the data analysis of informatization education evaluation, many scholars at home and abroad have studied them and achieved good results. For example, the Dick-Kerry model proposed by Lu in 1978, the biggest feature is the closest to the actual teaching of teachers is to study how to transmit teaching information under the conditions of the teaching content and teaching objectives stipulated in the curriculum. [7] Because most teachers cannot change the existing courses and their prescribed teaching content and teaching goals, they can only study the question of "how to teach" at the micro level. That is, how to organize teaching information faster and better and deliver it to learners in an effective way[8-9]. Roberts pointed out that teaching design must consider students' own conditions and external conditions. Even unplanned teaching may enable students to obtain individual development, but system design can affect individual development as much as possible. Continuously optimizing teaching design will have a positive effect on teaching [10].

This article mainly uses data mining algorithms to study educational evaluation data analysis, how to apply them, discover the problem to solve the problem, and make practical applications to improve teaching efficiency and students' learning effects. Through the evaluation and analysis report, teachers can optimize and comprehensively understand their own teaching situation, see the problems in their teaching, and change the teaching method in time; appropriately summarize and analyze to improve the teaching level. Understand the teaching work of teachers, and realize the in-depth integration of informatization and teaching.

2. Research on the Application of Data Mining Algorithms in Data Analysis of Information Education Evaluation

2.1. Insufficiency in Data Analysis of Information Education Evaluation

1) Insufficient awareness and ability of its application
The analysis and application of educational evaluation data can essentially not only enable teachers to correctly define the scope of students' understanding in teaching, and establish a logical relationship between new and old knowledge points, but also allow teachers to allocate teaching resources reasonably according to the specific learning situation of students. Dynamically adjust the teaching progress and provide personalized guidance for individual differences among students, etc. The obvious effect of the analysis and application of educational evaluation data is to save a lot of statistical time for teachers in teaching. Other functions are not obvious enough (such as defining the scope of understanding, adjusting the teaching progress, etc.). The reason may be that teachers are The use of data is still in the exploratory stage, and I have not fully grasped how to use educational evaluation data to guide teaching, which leads to a phenomenon that is only unusable, so that the educational evaluation data hardly plays its real role in actual teaching. Analysis and application, in essence, not only enable teachers to correctly define the scope of students' understanding in teaching, and establish a logical relationship between new and old knowledge points, but also enable teachers to reasonably allocate teaching resources according to the specific learning situation of students, and dynamically adjust teaching Progress and individualized counseling for individual differences among students, etc.
(2) Cannot fully use educational evaluation data analysis
In actual applications, some older teachers may not be able to keep up with the times for a while, and need time to understand, learn and use, in order to analyze the results better and effectively and apply them in practice. The information concerned is still limited to the information available in traditional teaching (such as grades, rankings, etc.). Teachers who use better can pay attention to the dynamics of individual students and the selection of high-frequency wrong questions, but these do not give full play to the educational evaluation. The actual value of the data.

(3) Outdated methods of using educational evaluation data analysis
The analysis and application of educational evaluation data can essentially not only enable teachers to correctly define the scope of students’ understanding in teaching, and establish a logical relationship between new and old knowledge points, but also allow teachers to allocate teaching resources reasonably according to the specific learning situation of students. Dynamically adjust the teaching progress and provide personalized guidance for individual differences among students, etc. However, it is found in practical applications that the more obvious effect of the analysis and application of educational evaluation data is to save teachers a lot of statistical time in teaching, and other functions are not obvious enough (such as defining the scope of understanding, adjusting the teaching progress, etc.) The reason may be that the use of data by teachers is still in the exploratory stage, and they have not fully grasped how to use the educational evaluation data to guide teaching, which leads to the fact that the educational evaluation data hardly play its real role in actual teaching. It may be that the use of data by teachers is still in the exploratory stage, and they have not fully grasped how to use educational evaluation data to guide teaching. As a result, educational evaluation data has hardly played its true role in actual teaching. Teachers still use their previous teaching. Methods, and lack of systematic combing of knowledge, and inability to scientifically grasp and evaluate learning content and learning objectives.

2.2. The Application Advantages of Data Mining Algorithms in Data Analysis of Information Education Evaluation

(1) Precision teaching
Analyze based on educational evaluation data to achieve precise teaching. Draw up the average standard, and formulate personalized learning goals based on the actual situation and the actual ability of the students. Let teachers re-understand the level of students, treat students' achievements objectively, and give students an opportunity to show themselves and achieve all-round development.

(2) Select learning focus
Analyze based on the educational evaluation data and select the learning focus. Perform data analysis on the actual situation of the usual questions, and give students the most suitable answers and analysis. Extract the wrong question options and the wrong question personnel data from the educational evaluation data, so that teachers can explain in a targeted manner, and students can more clearly know their own shortcomings, and improve themselves according to their own shortcomings, double pertinence Solve problems, let students know themselves better, and improve their academic performance.

(3) Master the evaluation of students' learning
According to the analysis of educational evaluation data, master student learning evaluation. From the educational evaluation data, we pay attention to the students' exam situation, the completion of normal homework and the correct rate of homework, extract from the key data, and analyze, find out the students' problems, and solve the problems. Fully realize the use value of the educational evaluation data analysis system, understand students from it, and improve yourself.
(4) Strengthen learning feedback
Enhance learning feedback based on the analysis of educational evaluation data. Learning feedback is the most important part of the learning process, and it has an irreplaceable position. According to various information in the educational evaluation data, targeted learning feedback is carried out. According to the anti-adjustment of teaching speed and teaching mode, it can be optimized and designed. Better application to the education industry to realize its maximum value.

2.3. Data Mining Algorithm Evaluation Scale Quantitative Statistics
The scores of each student's violation items are quantified according to the evaluation scale. According to the data of the violation record table, the total number of violations of a certain indicator of the student is counted, and then the evaluation scale can be consulted to obtain the score value. Calculated as follows:

\[ V_i = \sum_{j=1}^{n} V_{ij} \times W_j \]  \hspace{1cm} (1)

Among them, \( A_i \) (i=1,⋯,m) is the evaluation object; \( X_j \) (j=1,⋯,n) is the evaluation index (criteria, item);\( w_j \) is the index weight, the formula is:

\[ 0 < w_j < 1, \ \sum_{j=1}^{n} w_j = 1 \]  \hspace{1cm} (2)

3. Experimental Research on the Application of Data Mining Algorithms in Data Analysis of Information Education Evaluation

3.1. Subjects
The main application group of the educational evaluation data analysis system is all teachers and students. Its fundamental purpose is to help middle school teachers better improve the teaching level of various subjects and help students learn more easily and vividly.

3.2. Experimental Method
Use the questionnaire survey method to consult with the vast number of university teachers and students to understand the application optimization countermeasures of data mining algorithms in education evaluation and analysis in today's era of big data information, so as to achieve better applications in practice. At the same time, the teachers and students are consulted to analyze the current situation of using the educational evaluation data system, and to design and improve their suggestions and needs.

3.3. Data Collection
Investigation task decomposition makes a detailed breakdown of the total amount of investigation activities, assigns investigation tasks to investigators or investigation teams, and assigns tasks equally by default. The survey task is divided into specific task assignments, such as how many answers each investigator or survey team needs to collect, the time range for collecting the answer sheets, and the location of the survey. The survey tasks can also be manually assigned. If the system automatically divides them into an inappropriate way, you can modify the assigned tasks.

4. Experimental Research and Analysis of Data Mining Algorithms in Data Analysis of Information Education Evaluation

4.1. Analyze the Mastery of Student Learning
This experiment takes a certain subject as an example. From the five aspects of students’ understanding ability, imagination and reasoning ability, comprehensive analysis ability, ability to use tools, and ability to experiment, data mining algorithms are used to analyze the educational evaluation data. The experimental results are as follows Table 1 shows:
Table 1. Mastering ability of students in a certain subject

| Ability                              | Class  | Grade  |
|--------------------------------------|--------|--------|
| Comprehension ability                | 76%    | 76.6%  |
| Imagination and reasoning ability    | 75.85% | 76.38% |
| Comprehensive analysis ability       | 75.65% | 69.9%  |
| Ability to use tools                 | 86.6%  | 81.15% |
| Ability to experiment                | 0      | 0      |

Figure 1. Mastering ability of student in a certain subject

As shown in Figure 1, students have a great lack of experimental ability, and the other four abilities are not big, all of which are more than 70%. They are in the upper middle and upper reaches. Among them, the analysis and use of tools are 5% higher than the grade level. In general, the experimental ability must be strengthened. Let students achieve all-round development.

4.2. Analyze the Learning Feedback of Teachers

This experiment takes an assignment as an example. The average scoring rate of this assignment class is 79.42%. The scores of five students in different classes are used as experimental data for comparison, and data mining algorithms are used to analyze the learning feedback education evaluation data. The experimental results are shown in Table 2:

Table 2. Data analysis of learning feedback education evaluation

|                  | Student A | Student B | Student C | Student D | Student E |
|------------------|-----------|-----------|-----------|-----------|-----------|
| Individual rate  | 80.4%     | 79%       | 69.78%    | 88.27%    | 75.69%    |
| Class rate       | 75.89%    | 81.23%    | 77.94%    | 85.49%    | 70.98%    |
As shown in Figure 2, the individual score rates of student B and student C are 79% and 69.78%. These two students failed to reach the standard of the average score rate of the class. The teacher will ask the students to give written or oral feedback according to the actual situation. Improve students' correct rate of questions and increase the overall scoring rate of the class.

5. Conclusions
In the era of fast-changing big data, education is also advancing with the times. This article mainly studies the application of data mining algorithms in education evaluation and analysis. Analyzing the advantages of educational evaluation data analysis and application, and proposing countermeasures in practical application, using educational evaluation data for analysis and design is conducive to reducing the teaching burden of teachers, improving students' learning status, and enhancing teaching effects. From the perspective of the implementation effect of the teaching optimization plan, students’ learning attitudes have been improved; teachers’ working hours have been rationally arranged, and there is no need to be busy anymore with minimal results; teachers’ evaluation of students can be one-to-one, and there are Pertinence: Teachers give more feedback to students than usual teaching, and give reasonable feedback based on the specific situation of the students and within the acceptable range of the students. Make it more effective in practical education and reflect its due value.

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