Application Analysis of Data Mining Technology in Ideological and Political Education Management

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Abstract. With the continuous popularization and development of educational informatization, more and more educational data are stored in university databases, which poses new challenges to the educational management of universities. In the tide of big data, education data plays an important role, and college education data accounts for a large proportion of education data. Education management has gradually changed from traditional management mode to information management mode. Teaching quality is the core of higher education, which is directly related to teaching management means. The wide application of data mining technology provides technical support for the informatization of university education management. With the advancement of educational informatization, educational management means have gradually realized informatization. Compared with the traditional means of educational management, both efficiency, efficiency and effect have been significantly improved. This paper puts forward the use of modern information technology, the use of data mining to achieve the effective mining of Ideological and political education experience of counselors, so as to use Internet thinking to improve the ideological and political work in Colleges and universities.

Keywords: Educational Informationization, Data Mining, Teaching Quality

1. Introduction

With the popularity of the Internet and the rapid development of information technology, people produce a lot of information every day, and valuable information can be obtained through continuous exploration and mining. In recent years, due to the gradual increase in the number of students in university campuses, the number of teachers is also increasing, and a large amount of data has been accumulated in the education management database [1]. In the teaching process, teachers' "teaching" is influenced by many factors, including individual teachers and teaching management means. In the tide of big data, education data plays an important role, and college education data occupies a large
proportion of education data. Education management has gradually changed from traditional management mode to information management mode [2]. Scientific and reasonable teaching management means not only help to improve teachers' teaching interest, but also help to implement teaching objectives and methods scientifically and effectively, so as to improve teaching effect [3]. Through data mining technology, we can find some useful knowledge hidden behind a large amount of data, and use this knowledge to guide managers to improve management methods and strengthen management in a targeted manner [4]. In the future learning society, the high integration of education and information technology is becoming a new trend in the development of education in all countries in the world, which will give birth to a new economic growth model and education form, and continue to promote the leapfrog development of social economy and education industry. At the same time, it also challenges traditional education management methods [5].

With the advancement of the process of education informatization, educational management methods have gradually realized informatization. Compared with traditional educational management methods, both efficiency, effectiveness and effectiveness have been significantly improved [6]. The management of ideological and political education in colleges and universities is a very important part of the education management database. It is an important standard for evaluating the quality of ideological and political education management, and also an important symbol for evaluating whether the ideological and political education managers are effective in the education management of students [7]. Ideological and political education managers work evaluation quantitative table evaluation method is suitable for longitudinally measuring the degree of mastery of ideological and political education managers over the students they manage. Teaching quality is the core of higher education, and teaching quality is directly related to teaching management methods [8]. How to implement scientific and reasonable teaching management methods in the teaching process is critical to improving teaching effects. Using data mining technology to analyze the relationship between the potential value of educational information and the data will help leaders make scientific decisions, improve the efficiency of management departments, make the educational management of universities more humane, and promote the construction of university information Development and progress [9]. This paper proposes to adopt modern information technology and use data mining to realize the effective mining of instructor students' ideological and political education experience, so as to use Internet thinking to improve the ideological and political work of colleges and universities.

2. Overview of data mining technology

Data mining generally refers to the process of searching hidden information from a large amount of data through algorithms. Simply put, data mining is a process of discovering knowledge from data. Data mining involves extracting, transforming, analyzing and modeling a large amount of data in the database, extracting key data for decision-making, and deriving useful knowledge according to the characteristics of the field. A great deal of teaching information has been generated in the teaching process, including usual grades, attendance, experiment, usual homework and final exam results [10]. If we can find useful information from these large amounts of data and formulate reasonable and effective teaching management measures on this basis, it will be of great benefit to improve the teaching effect. The basic process of data mining is as follows. First, interpret the demand. Interpretation of requirements runs through the whole life cycle of the project, and the requirements at each stage will be different. It is necessary to communicate more and interpret the correct
requirements to provide effective guidance for the next step. Second, data collection. On the premise of correctly understanding the demand, enough data is the basis of effective data mining. Therefore, to correctly understand the sampling distribution, we should not take partial sampling, but collect data comprehensively to ensure the coverage of data. Third, preprocess the data. Generally, the collected data are incomplete, discrete and noisy, so these data should be sorted and denoised.

There is a big defect in the current higher education, which is the lack of humanization. Many educational methods and concepts ignore the unique personality of students and the differences between students. Good teaching effect can not be separated from good teaching atmosphere and environment, and individualized teaching in ideological and political teaching in colleges and universities can not be separated from the teaching and learning environment conducive to individualized teaching. If the ideological and political teachers in colleges and universities can personalize their own ideological and political classroom from their own specialties and students' reality and rely on their own practical teaching experience, they will certainly form their own personalized classroom teaching style that students like. Students' independence and autonomy in college are more demanding, but college students at this stage are often influenced by factors with less social experience. Their independence and autonomy are often manifested as arbitrary, sometimes contradictory, and often lead to self-loss. It can be seen that students at this stage need teachers' active and correct guidance. Ideological and political teaching in the field of health and ideological and political learning is based on the needs of students' physical and mental development. We should focus on sports technology learning, master ideological and political knowledge and skills through living teaching materials and effective teaching strategies in the learning atmosphere of enjoying sports fun. Personalized online teaching assistant system based on data mining is the assistant and extension of classroom teaching, and it is a tool to help students to review and consolidate after class and reduce teachers' workload. The interface module of data mining system mainly presents relevant content pages to users for different operations of different users. By using natural language processing, semantic query, data mining technology, etc., it provides an operation interface to realize man-machine interaction, and realizes the interaction between users and systems.

Data mining can help managers find rules, find neglected elements, predict trends and make decisions. It is a high abstraction and generalization of the inner and essence of data, a sublimation of data from rational cognition to perceptual cognition, and a high generalization of a large number of complicated data with knowledge. Data mining method can find the correlation between students' activities and academic achievements in terms of students' achievements and students' behaviors, provide reference for school administrators and teachers, and greatly improve the effectiveness of learning management decision-making, teaching quality and management efficiency. Therefore, it is necessary to mine the correlation between academic achievements and students' behaviors. According to the principle of deep learning, the analysis of association rules for ideological and political courses requires index selection, training and testing. The specific design idea is shown in Figure 1.
Data mining technology is mainly as follows. First, forecast. Grasp the development law of the analysis content, predict the development trend, and establish a model of combining some data to deduce another data. Second, cluster analysis. Divide the data into groups. The data in the same group are as similar as possible, and the differences between different groups are obvious. Cluster analysis is to divide physical data objects into data object sets, so as to realize the division of similar data. The object group of data generated by analyzing data is called cluster, and the object data in cluster has high similarity. Third, correlation analysis. Find the correlation between data, for example, compare the learning situation of different types of students, and study the correlation between students' practical courses and theoretical courses [11]. There are many methods of data mining technology, one of which is association analysis, that is, discovering the association between data. In most cases, analysts are unknown about the hidden relevance in data, and even if they realize that there may be relevance among data due to accumulated experience, it is uncertain. Therefore, mining association rules in frequent patterns is convenient to find some hidden and highly reliable association rules in data.

3. Application of data mining in university education management

3.1. Educational administration

Students' test scores occupy a large proportion in the whole teaching information database, which can reflect not only the students' learning situation, but also the test papers and teachers' teaching effect. By mining, analyzing and summarizing the test scores, we can get the assessment and evaluation of all aspects, which can make students know more clearly the aspects that need to be focused on in the next study, and make their own personalized study plans and plans. Education evaluation plays a vital role in education reform and development, education management and decision-making. However, most of the current educational evaluation indexes are formulated by referring to the relevant evaluation index systems at home and abroad, combined with practical experience and questionnaires, etc., and it is difficult to make judgments on the dependence relationship, importance degree and rationality of the existence of the indexes [12]. Teachers can discover potential teaching problems according to the data mining and analysis of students' test scores and test papers, and then change teaching methods and improve teaching activities to provide students with better and more efficient classroom teaching and improve teachers' own teaching level. Analyze students' scores in various subjects and predict students' behavior of dropping out of school. It is of great significance to explore effective methods to evaluate the quality of test questions in the actual teaching process.
At present, most schools simply draw the score distribution curve according to students' test scores. If it is normal distribution, it is considered that the difficulty and discrimination of test questions basically meet the requirements. Usually, the relevant departments of the school have collected a large amount of data through the usual education management work, but at present, the processing of these data only stays at the relatively low-level search and simple analysis stage, and no valuable and instructive information has been excavated. The association rules in data mining are applied to the test paper analysis database. According to the students' scores, the indexes such as difficulty, discrimination and relevance of each question can be analyzed. Based on this, teachers can make a more accurate evaluation of the quality of the test paper, which can be used to check their own teaching situation and students' mastery and provide guidance for future teaching.

3.2. Student management

The management of students in vocational education is particularly important, because they are younger, have poor ability to distinguish right from wrong, and have poor self-management ability, which requires us to strengthen student management. After students enter the school, they will set up student files in the database, including personal basic information, interests, family information, rewards and punishments, etc. Through clustering, statistics, forecasting and other data mining of this information, the class teacher or counselor can be more familiar with the students' situation and facilitate the student work. The school's student management database contains students' family background, academic achievements, recreational activities, rewards and punishments, interests and hobbies, etc., so that we can analyze useful data from the student management database to analyze students' behavior patterns, and use the functions of correlation analysis and deduction analysis of data mining to find the internal relations among students' various behaviors [13]. Using data mining technology, students' data can be clustered, and decision tree algorithm can be used to analyze students' academic achievements, quality development activities, vocational qualification certificates, social practice activities and internships, analyze students' job-seeking tendency and suitable employment scope, and provide targeted employment guidance for students. Many clustering algorithms are effective for small data sets with hundreds of data objects. However, with the gradual expansion of the database scale in practical application, the database has changed from the original small and medium-sized to a large database or data warehouse. There may be some deviations when these original clustering algorithms are reused in large data sets. If there is deviation, we can use deviation detection to analyze why there is such deviation, and combine the students' situation mastered by other channels to analyze the reasons and respond in time.

3.3. Curriculum

In the process of educational management in colleges and universities, if we can effectively mine the educational data, grasp the laws and foreseeable development trends, it will provide the basis for teachers' teaching reform, provide strong help for students' learning, provide more effective management suggestions for managers and promote the overall progress and development of colleges and universities. Before learning a higher-level course, you must take some advanced courses. If you don't learn the advanced courses well, it will inevitably affect the follow-up courses. For example, from the evaluation of each student's teaching method and the teaching achievements obtained by different teaching methods, the regression linear analysis and association rules are used to determine
which kind of students or courses this teaching method is suitable for, so that the hierarchical teaching can be further implemented. It is of great significance for clustering algorithm to deal with high-dimensional data objects, especially high-dimensional data may be sparse in space, and even high-dimensional tilt. Applying association rules to teachers' evaluation data can discuss the relationship between teaching effect and teachers' age and professional title, provide timely guidance for teachers' teaching and professional development, and improve teachers' post ability. The curriculum design of colleges and universities should be regular and scientific, including public basic courses, professional basic courses, professional compulsory courses, etc., and the curriculum arrangement should be reasonable.

4. Conclusion

It is very important to fully realize the significance of data mining technology in modern education management. As an auxiliary means of education management under the condition of informationization, it can help us explore and construct a new teaching mode. Data mining is an increasingly widely used discipline, and the application of data mining technology in college education management has great prospects. After students enter the school, they will set up student files in the database, including personal basic information, interests, family information, rewards and punishments, etc. Through clustering, statistics, forecasting and other data mining of this information, the class teacher or counselor can be more familiar with the students' situation and facilitate the student work. Applying association rules to teachers' evaluation data can discuss the relationship between teaching effect and teachers' age and professional title, provide timely guidance for teachers' teaching and professional development, and improve teachers' post ability. The curriculum design of colleges and universities should be regular and scientific, including public basic courses, professional basic courses, professional compulsory courses, etc., and the curriculum arrangement should be reasonable. Through data mining analysis technology, the corresponding laws are analyzed and found from a large number of objective teaching data, and the corresponding teaching management measures are formulated according to these laws, which is of great help to improve the teaching effect.

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References

[1] Liu Qiangjun, Ding Yangbin. Research on University Ideological and Political Education Management Based on Data Mining Technology[J]. Electronic Testing, 2015(1):101-103.

[2] Guan Cuiling. The application of data mining technology in ideological and political education in colleges and universities[J]. Microcomputer Applications, 2018, 034(006):50-52.

[3] Li Xi. Research on the Ideological and Political Evaluation Model of College Students Based on Data Mining[J]. Journal of Higher Education, 2020, 000(005):189-190,193.
[4] Zhou Di. The transformation and development path of ideological and political education in colleges and universities from the perspective of big data[J]. Knowledge Economy, 2017, 000(011):144-145.

[5] Zhong Xueyan. Innovative research on practical teaching of ideological and political courses in colleges and universities in the era of big data[J]. Xue Theory, 2017(6):219-222.

[6] Ren Ne. Research on the new model of ideological and political education management for college students in the new era [J]. Youth, 2019, 000(004): 83-84.

[7] Chen Yuyi. Research on the Development Path of Ideological and Political Education in Colleges and Universities from the Perspective of Big Data [J]. Brand Research, 2018, 000(003):119-120.

[8] Dong Zhuoning. Using student big data to improve the accuracy of ideological and political work in colleges and universities[J]. Ideological and Theoretical Education, 2018, 000(004): 108-111.

[9] Lin Xiao, Miao Dawang. Research on the Innovation of Ideological and Political Education Management System in Colleges and Universities [J]. Journal of Heihe University, 2018, 60(06):74-75.

[10] Huang Meiling. New exploration of college ideological and political education in educational administration [J]. Journal of Higher Education, 2018, 85(13):186-188.

[11] Jiang Siwei. The coordinated development of student management and ideological education in applied undergraduate colleges in the new era [J]. Management and Technology of Small and Medium-sized Enterprises, 2020, 000(005): 110-111.

[12] Ren Lihua. Exploring the ideological and political education mode and continuously improving the management level of students [J]. Journal of Jilin Province Education College, 2015, 031(006): 149-150.

[13] Zhang Min. Analysis of the "Internet + Ideological and Political Education" New Ideas for Graduate Management[J]. Education Teaching Forum, 2018, 363(21):222-223.