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The Grading Model of College Minority Students Based on Visual Information Technology

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Abstract: *At present, the most effective teaching tool is the interactive visualization platform, which directly or indirectly promotes the development of the education field. In addition, the development of this technology will affect many existing fields. The purpose of visual education is to help learners grasp relevant concepts in teaching more clearly. At the same time, visualization technology has a wide range of applications in various teaching fields of computer technology. In programming and data structure courses, the use of visualization teaching platform can deepen the understanding of learners. Based on the visualization information technology, this paper makes an in-depth study on the grading model of minority students in colleges and universities. This paper designs a scoring model by using visualization technology, and uses the model to collect teachers' scoring results of various indicators of ethnic minority students in colleges and universities, and finally analyses the data.*

Keywords: *Visualization Technology; Minority; Scoring Model; Education Field*

1. Introduction

For colleges and universities, teaching has always been the foundation of colleges and universities and the purpose of their establishment. The rapid expansion of the scale of higher education has created the need for optimized allocation of internal resources and specialization of functions, so the functional differentiation of the internal structure of higher education is bound to be carried out [1]. Doing a good job in educational administration is one of the most important tasks in the daily educational management of colleges and universities, which is related to the normal development of school teaching. In recent years, our country's colleges and universities have developed rapidly in the field of teaching, and the scale of colleges and universities is also expanding [2]. At the same time, the talent training model of colleges and universities has developed diversified, and the management of educational administration has become more and more complicated. For this reason, educational administration management should break through the original management model and add new connotations. The rapid development of informatization provides the possibility to cope with the complicated reforms of college educational administration management. In the past ten years, my country's research on education management has made great progress, and many valuable research results have been obtained. This has provided a very useful boost to the sound development of my country's education field [3]. With the application of visualization technology and visualization analysis methods in the education industry, research on visualization technology has attracted the attention of researchers in the education field, and some teaching software for the education field has been developed and produced.

Chinese scholar Li Yingzhen believes that with the continuous deepening of teaching reform, visualization technology has become a bright spot in current teaching reform research. The application of visualization technology in teaching is of great significance for improving the teaching efficiency of teachers and promoting meaningful learning of learners [4]. Jiang Yuanting and others believe that analysis and visualization technology, as a smart tool, becomes a form of auxiliary learning, which can concretize abstract knowledge, reduce complexity to simplicity, and help students quickly and accurately grasp the content of learning [5]. Wu Bei and others believe that with the continuous advancement of science and technology, data visualization technology has become more and more widely used in teaching. Starting from the process of classroom data visualization, the effective processing of classroom teaching data visualization and the difficult problems of classroom data visualization teaching, analysis of the application of data visualization technology in teaching can

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effectively improve the quality of teaching and enable students to obtain a higher level of Education [6].

The rapid development of computer technology and visual information technology can provide a certain direction and technical support for the transformation of our country's teaching management model in colleges and universities. In view of the new situations and new problems faced in the process of teaching management in colleges and universities, how to make better use of network resources to improve the overall management level of the school, especially to improve the current low-level application of large amounts of data, and to better discover the hidden behind the data connotation, to provide efficient support for the school's teaching management and decision-making, and at the same time to provide effective guarantee for the school's subject teaching, student management and grading, and the construction of the teaching team. This is the full significance of the research in this article.

2. Method of Research on Evaluation Model of Minority Students in Colleges and Universities Based on Visual Information Technology

2.1 Visualization Technology

Visualization technology is to transfer a large amount of data through computer technology into a directly visible map, so as to achieve the purpose of analyzing and researching the meaning behind the data and graphics. In the era of “big data”, the large-scale application of visualization technology can help researchers to improve the memory and analysis skills needed to deal with complex cognitive problems. It can help researchers to deal with difficult cognitive problems. When knowing the problem, improve their memory analysis ability. Use visualization methods to analyze and research problems, turn complex into simple, intuitive, and a picture is worth a thousand words! UCIT software, that is, network analysis integration software, can be used for large-scale network analysis application software programs. It can read text files, VKA and other format files [7]. This software is a strong point in matrix analysis. Compared with other software, it is the most classic and the easiest to use. In this research, UCIT software will be used to visualize high-frequency author co-occurrence and high-frequency keyword co-occurrence, and analyze and calculate related indicators such as centrality. CSPE software is a visual analysis software developed by the United States. Since the software cannot read the data format, it needs to use conversion software to convert the data first.

2.2 Components of a Decision Support System

In the education management system of colleges and universities, there are many difficult problems in decision-making, and the decision-making support system can achieve scientific and fair decision-making. The theme-oriented integration of database integration is called data warehouse, and its main function is to support decision-making functions. Generally, data in the data warehouse is extracted from internal and external data sources [8-9]. Use data warehouse technology to create four data gathering centers, basic data centers such as teaching plans and lesson plans, student performance data centers, teaching evaluation data centers, and course selection data centers. Based on the four major data information gathering centers, a set of effective analysis models are created to realize automatic analysis and provide regular analysis reports to provide school administrators with an effective basis for decision-making. Since the analysis results formulated above may be directly used as the basis for decision-making by school administrators, the analysis of data must be treated with caution. Therefore, the establishment of the data analysis model requires the common knowledge and experience of experts, teachers, and system administrators in related fields. For example, the grading information of students may contain some subjective factors of teachers. The grading of a student requires not only the current semester’s The data information is also based on a student, for several years of longitudinal comparison and comprehensive analysis [10].

2.3 Rating Information Database Establishment

Comprehensively considering the purpose of database design, based on the five principles of database establishment: reliability, ease of operation, maintainability and safety, scalability and standardization, a student rating database with multiple indicators has been established. The spatial database is established after the design of the scoring information spatial database, and its establishment generally includes three tasks. Firstly, the spatial data structure is established, then the data is loaded, and finally the debugging operation is carried out. Since this article mainly contains

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spatial data and non-spatial data, the database established in this article is the student rating database. In GIS, there are three ways to create a student grading database. The first is to design and create an empty grading database. The second is to copy and modify the existing scoring database, and then load the data set into the copied scoring database. The third way is to create a scoring database that completely replicates the existing scoring database. Considering the type of Geo and the purpose and requirements of the research in this article, the first method of student scoring database created in this article is to create an empty personal scoring database named as a student scoring database with multiple indicators.

3. The Process of Research on the Evaluation Model of Minority Students in Colleges and Universities Based on Visual Information Technology

3.1 The Grading Index System of Minority Students' Classroom Learning in Colleges and Universities

The construction of scoring indicators for student classroom learning plays a vital role in students' scoring effects. To a certain extent, the design of scoring indicators is related to the success of students' classroom scoring. After years of exploration, practice and improvement, the school puts forward a proposal. Set of indicators for undergraduate classroom learning scoring system. According to the feedback analysis of a certain student based on the grading results of minority students in the past few years, the students are positive about the teacher's grading results and are willing to use it as reference information to improve their learning level. Calculate the students' scoring options to get the actual score of each scoring index. The student's scoring system is composed of 15 indicators, and each indicator is assigned a different weight according to the actual situation. After the teacher's grading is over, the student's score is calculated according to the teacher's scoring data:

$$S = \sum_{i=1}^{15} X_i Q_i \quad (1)$$

S is the comprehensive score of the student, X is the comprehensive score of each item, and Q is the weight of the item. According to the scoring index system, each teacher must score 15 items for each course, and then N pieces of evaluation data will be formed for each student's one course.

$$N = 15 \times M \quad (2)$$

M is the number of students taking the teacher's specific course. According to the corresponding data table in the public database, the teacher grading database table is formed, and about 1.5 million grading records are generated every semester. Such a huge amount of data is a useful asset for schools and students.

3.2 Evaluation Scores for Ethnic Minority Students in Colleges and Universities

The student's personal classroom learning scoring result is an intuitive reflection of the student's learning efficiency in class. Students can understand their own learning status through the teacher's scoring, and find their own shortcomings through their own scores of various indicators, so as to make improvements. Improve the quality of classroom learning of courses. After years of practice and exploration of classroom learning scoring, the previous single scoring model has been transformed to a developmental scoring model. Teachers' classroom teaching and student evaluation should have multiple functions such as diagnosis, screening, feedback, guidance, and motivation. From the perspective of teachers, classroom teaching student evaluation is to promote the professional development of teachers, improve teachers' classroom teaching effects, and improve the quality of classroom teaching; from the perspective of students, it is to ensure the quality of teaching so that students can receive the best Higher education. Teacher development and student development are one of the fundamental issues of teaching in higher education institutions. At the same time, it provides effective information for the school's teaching management decision-making, so as to achieve the goal of sustainable development of the school's undergraduate teaching. The visual information technology algorithm formulas used are:

$$R_{y.12...K} = \sqrt{1-(1-ry1^2)(1-ry2.1^2)(1-ry3.12^2)...(1-ryk.12...k-1^2)} \quad (3)$$

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3.3 Other Grading Methods for Students' Classroom Learning

In a sense, the comparability of teachers' ratings of students' classroom learning between different courses is limited. Therefore, we are studying the implementation of classifying and scoring courses, that is, adopting different scoring index systems for different types of courses, such as experimental courses, Practical courses adopt an index system that is suitable for their course categories, and compare and study the grading results of the same type of courses, so that the results obtained are more targeted and have more practical significance. The analysis of grading data is diversified. The above are only a few simple and practical methods for teachers to analyze student grading data. The dimensions of data analysis are relatively small. It can be implemented very well by using SQL SERVER 2005 and SPSS. We can also use data analysis technology to conduct in-depth analysis of student scoring data and introduce more data analysis dimensions, such as classifying and analyzing students in different classes; analyzing scoring data for students of different ages; and students of different genders. Classification analysis; this can get more detailed and more personalized data analysis results. In actual operation, the best data analysis method should be adopted according to the specific situation.

4. Data Analysis

4.1 The Teacher's Personal Classroom Learning Scoring Results of a Certain Student are Shown in Table 1 and Figure 1

Table 1: Evaluation scores of a student

	first semester	second semester	third semester
overall ratings	4.603	4.622	4.643
teacher participation ratio	88.37%	85.00%	89.90%

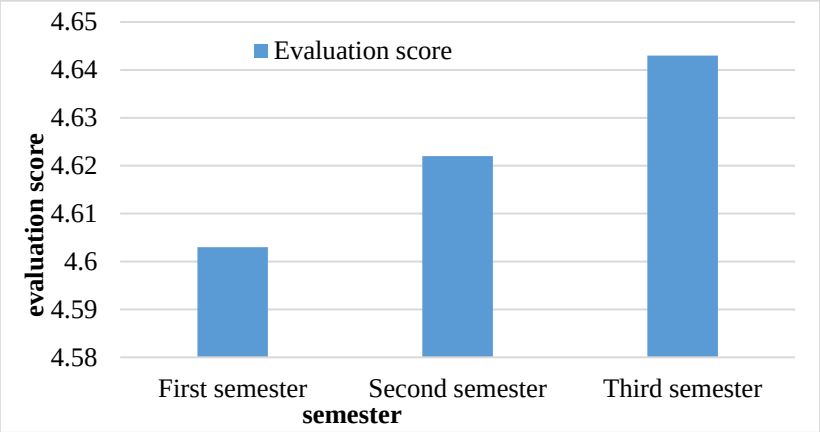

Figure 1: Evaluation score of a student

According to Table 1 and Figure 1, according to the analysis of the above two data curves, the student's teacher scoring indicators for classroom learning are generally on the rise. According to the previous analysis of the scores of a large number of students, this situation is relatively short in the length of study. How to guide the learning of similar students is also an important task to improve students' learning after grading. The comparison of student classroom learning scoring systems is of great significance for students to improve their personal learning quality, and can enable students to better understand the main deficiencies in their classroom learning efficiency. Through research, students fully affirmed this analysis.

4.2 The Scores of Some Students are shown in Table 2 and Figure 2.

Table 2: Scores of some students

index	student 1	student 2	student 3	student 4
1	4.726	4.775	4.812	4.853
2	4.815	4.458	4.622	4.756
3	4.762	4.812	4.668	4.801

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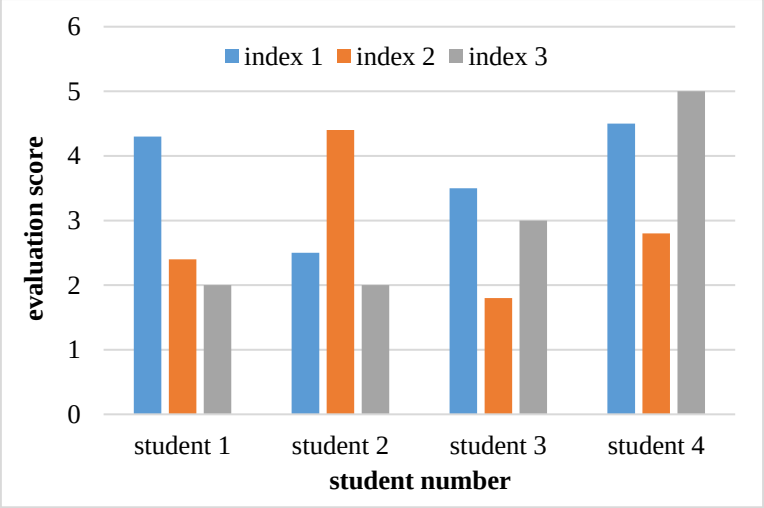

Figure 2: Scores of some students

According to Table 2 and Figure 2, we can know that through the comparative analysis of the classroom learning score data of some ethnic minority students in colleges and universities, and the intuitive diagram comparison of various scoring indicators, we can grasp and understand the learning situation of the students in the department as a whole, and the individual Information about students' classroom learning. At the same time, the overall comparison of grading of students in classroom learning of faculties and departments is helpful for teachers to improve their classroom teaching and improve the quality of classroom teaching.

5. Conclusion

This article first analyzes the current educational administration management system of colleges and universities in my country, and finds that most of the current educational administration management systems in colleges and universities provide transaction management functions, that is, realize the management and query of large amounts of data generated during the teaching operation. However, the large amount of data generated in the teaching process is not used efficiently, and it does not provide effective support for the school's teaching reform, does not provide decision support for school management, and a large amount of historical data is shelved in a dormant state. Based on this, on the basis of fully learning the theory of education informatization, this article proposes a university educational administration management system based on visual information technology, and focuses on the study of the classroom learning quality scoring model for students and the academic scoring system model for students. Build an educational administration management system based on visual information technology to provide reference.

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