The Design of Learning Management Mode of Higher Vocational Students Based on Internet Information Fusion

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Abstract. The purpose of this paper is to study the design of management mode of students' learning situation based on Internet information fusion. First of all, the concept of multi-source information fusion and the processing flow of multi-source information are described. Combined with the algorithm of support vector machine, the data platform architecture of learning situation of higher vocational students is designed, and the quality design of learning situation is analyzed. The experimental results show that the average score coefficient of each class in the grade forms a change linear graph, and the horizontal axis is the time, For example: 15–16 at the end of the next period, 16–17 at the middle of the last period, 16–17 at the end of the last period, 16–17 at the middle of the next period, 16–17 at the end of the next period, 17–18 at the middle of the last period, 17–18 at the end of the last period, etc., the vertical axis is the average score coefficient value of each class. Different classes use different colors for linear discrimination. The basic score of the second class is 1.2148, which is higher than the average score coefficient of the first class, 0.9220.

Keywords: Information fusion · Higher vocational students · Learning management · Information technology

1 Introduction

In the modern education environment, correct analysis and management of students' learning is the key to realize "student-centered" education and concept. Combined with the characteristics of the learning situation of the students in Colleges and universities, this paper studies the structure of the student learning situation management system based on multi-source information fusion technology, and provides a more effective way of thinking for the management of learning situation in Colleges and universities. By using multi-source information fusion technology, all kinds of learning data of school students can be deepened.

Through factor analysis of questionnaire data, Prasertsak Herntheisong concluded four factors that affect the learning status of Arts Postgraduates: experimental conditions, autonomous learning conditions, team learning and teachers' practical ability. Through multiple regression analysis and empirical analysis of the tourism experimental teaching center of Jinan University, the research results on the one hand confirm

that the tourism experimental teaching center of Jinan University has established a suitable learning environment for graduate students majoring in tourism management, which has certain guiding significance for the study of graduate students majoring in tourism management, on the other hand, it is the construction of learning situation for graduate students majoring in arts It provides ideas and strategies [1]. Daoprakai Raso discussed virtual learning and the future development of traditional universities. Specifically, it considers these issues by thinking about the following issues: first, it focuses on the impact of information technology on "cross-cultural" curriculum teaching. It critically evaluates how these approaches affect teaching in the context of the international management curriculum through three recent examples. Second, from the above examples, the paper reflects the meaning of these technologies more broadly: for new forms of knowledge and knowledge production; for the future of university system conditions [2].

In the multi-source information fusion technology of Higher Vocational Students' learning information management system, the main goal of this paper is to solve a large number of information collection, saving, analysis, mining and other problems, and provide technical support for modern information education. According to the analysis results of university data platform, we can adjust majors, teachers' teaching methods and students' learning methods more reasonably. From the perspective of education as a whole, the data collection of education is still in the primary stage of configuration and construction. Data mining and analysis technology in the decision-making of education policy, the use of the process of education in the exploration and improvement. At present, many educational applications tend to "the maturity of industrial application is greater than that of school education", but the academic information management system proposed in this study meets this gap. With the rapid development of information technology, these problems are being solved.

2   Proposed Method

2.1   Multi Source Information Fusion

The key problem of information fusion research is to use relevant theoretical methods to process the multi-source data from the monitoring system, so as to obtain the fusion information with the hidden information of the monitored object.

Multi-source information fusion contains three levels of meaning, which are a) the full space of information data. That is to say, this information should have the dynamic characteristics of continuous change [3]. b) The integration of information and data. That is to say, this information should be collected from many angles and aspects. c) Complementarity of information and data. In a word, the first layer is about fusion space; the second layer is about the dynamic information flow of fusion; the third layer is about the algorithm properties of fusion.

2.2   Processing Flow of Multi-source Information

The multi-source information here can also be called data [4]. The data analysis of single module is processed by Excel software, such as score ranking. Support vector machine method is used to realize the implicit relationship between the data of multiple modules through the existing program of MATLAB. Due to the lack of real data, the calculation results are not introduced here. The data processing process is as follows:

Step 1. Collect relevant information of the school;

Step 2. Select the collected data according to different objectives;

Step 3. Preprocess the selected data;

Step 4. Feature extraction of data;

Step 5. Analyze the extracted features and select the features that are more related to the target;

Step 6. Determine the input samples based on the selected features;

Step 7. Use SVM to train the samples;

Step 8. Use the training model to carry out the data fusion calculation;

Step 9. The final conclusion is to evaluate students' learning situation from different departments (Perspectives) and analyze the reasons.

2.3   Support Vector Machine

At present, the theory of support vector machine is seldom used in education management, and the references are very limited. Since this study only involves linear classification, this paper only introduces linear support vector machine [5, 6]. The definition is: the separation hyperplane obtained from the known linear separation training data set, interval maximization or equivalent solution learning corresponding to the convex quadratic programming problem is as follows:

$$w^* \cdot x + b^* = 0 \tag{1}$$

Classification decision function:

$$F(x) = \text{sign}(w^* \cdot x + b^*) \tag{2}$$

It is called linear separable support vector machine.

3   Experiments

3.1   System Operation Environment

(1) System deployment hardware environment

According to the actual situation of the platform, according to the data amount of the learning situation data collection platform in higher vocational colleges, in order to ensure the stability of the system operation, the basic system hardware configuration required for the inspection system is determined as follows:

1) Server: special server, dual CPU, main frequency more than 2G, 8g memory, 100 M/1g network card, with raid card, more than 5 36g hard disks (2 for RAID1, install the operating system; 3 for RAID5, install the database).

2) Network: 100M backbone network, 10m to workstation.

3) Workstation: the CPU configuration is more than 2.0g dual core, and the memory is more than 1G.

(2) System deployment software environment

According to the requirements of software operation, the software environment configuration of the system deployment is as follows:

1) Server software: Windows system, and install the software required for system operation, including Tomcat server and JDK.

2) Database software: SQL Server 2005 Chinese version.

3) Client software: the client can choose windows operating system and support various browsers, such as Firefox, etc.

3.2   Import and Export

The function of import and export is needed in the evaluation information import and export module in the data collection platform of talent training in higher vocational colleges. In order to improve the reusability of the code, the system extracts the import and export functions into common classes, so that all the functions in the system can be used. The information saving file used in this paper is excel, and the technology used is jxl, which provides the corresponding interface to operate the excel file.

4   Discussion

4.1   Analysis and Design of Learning Quality

(1) Evaluation on the development trend of personal learning quality

In order to reflect the progress of students' learning quality, we can analyze the rank, standard score, grade, ratio coefficient and cognitive level of each test.
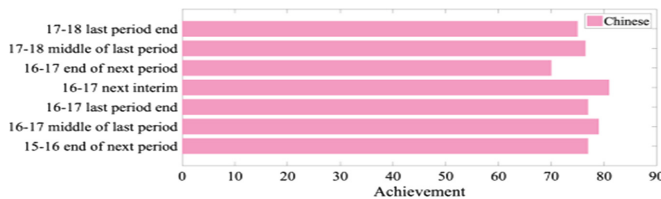

Fig. 1. Score table analysis

The score curves and grades of one or more subjects can be tracked according to the grades in the class or grade, or according to the scores or total scores of each subject. As shown in Fig. 1, the data in the table is not true. The data shows the linear chart of

personal performance changes. The horizontal axis is the time and the vertical axis is the rank. It can be divided into two broken lines, one shows the class rank and the other shows the grade rank.

(2) Evaluation of the development trend of the quality of the whole learning situation

In order to track the overall comprehensive learning quality progress, it can be obtained by analyzing the average score coefficient, excellent rate coefficient, qualified rate coefficient, M 'value, standard score, number and other indicators. Take the average coefficient tracking as an example. Average score coefficient = overall average score/grade average score. The arrow ↑ indicates the lifting rate, and the arrow ↓ indicates the lowering rate. The value after the arrow indicates the difference between the current coefficient value and the last coefficient value. As shown in Table 1, the data in the table is not true. Form a linear chart of the change of the average score coefficient of each class in the grade. The horizontal axis is the time, such as: 15–16 at the end of next period, 16–17 at the middle of last period, 16–17 at the end of last period, 16–17 at the middle of next period, 16–17 at the end of last period, 17–18 at the middle of last period, 17–18 at the end of last period, etc. the vertical axis is the value of the average score coefficient of each class. Different classes use different colors for linear discrimination. For example, class 2 is higher than Class 1 in enrollment, but it is still due to other classes in its previous examinations, but it is in a downward trend. Although the three classes are still backward, they are on the rise, that is to say, they are making continuous progress.

Table 1. Tracking table of average coefficient

Type /class	Class 1	Class 2	......	......
16–17 middle of last period	0.9220	1.2148	......	......
16–17 last period end	0.9854 ↑0.0634	1.0997 ↓0.1151	......	......
......	......	......	......	......

The above shows the change of the average score coefficient, so the inference can track the excellent rate coefficient, qualified rate coefficient, standard score and personal rank.

The overall evaluation and percentage can be used to analyze the comprehensive discussion of the whole class. Then the radar data map can be obtained for partial inspection. We can also compare the average scores of each class and each subject to analyze the development and change of each class and track the development of the overall average score.

5   Conclusions

As for the management of students' learning situation, it is necessary to study the method based on multi-source information fusion technology, correctly realize the analysis and management of learning situation, improve the management quality of college students, and achieve the guiding goal of "students in the center". In order to solve these problems, it is necessary to collect and analyze the data of students' study, life, character, psychology and habits. From the daily life and living conditions of vocational college students, extract, analyze and explore the key data information related to links, realize the integrated management of data from different information sources, and provide three-dimensional and comprehensive correct analysis and management methods of learning situation by using subtle data.

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