University Ideological and Political Education Management Based on K-means Mean Value Algorithm

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Abstract. With the continuous advancement of my country's informatization construction process, many universities have established various business-based databases for daily management. As a widely used emerging discipline, the application prospects of analyze and extract data technology in university education informatization Well, it provides a brand-new and scientific analysis method for the absurdity of the management, construction, and service process of universities. Based on this, this article mainly studies the application of clustering technology in analyze and extract data in the management of ideological and political education (PE) in universities. This paper uses analyze and extract data technology to try and propose a university ideological PE management research based on the k-means cluster analysis method, using analyze and extract data on the basic functions of the traditional system to make secondary use of ideological and PE data. Optimize the iterative process of the algorithm of k-means, preprocess various data, use the algorithm of k-means in the division method, realize the cluster analysis of the data, and extract the valuable parts of the large amount of precipitated ideological and PE data. Establishing a data model and providing decision-making guidance to managers, scientifically managing the process of ideological and PE, can effectively improve the overall efficiency of ideological and PE.

Keywords: K-means, Clustering Technology, Analyze and extract data, Ideological and PE

1. Introduction
Analyze and extract data technology [1-3] is a widely used new subject, which has a good application prospect in providing educational information for colleges, and provides a new scientific analysis method for the management, construction and service of colleges. In the new context, universities are facing great ideological and political (IP) challenges from college students. Therefore, timely adjustment of ideological methods and strengthening the exchange of experience can effectively improve the results of IP work [4-5]. In this regard, this article has a certain reference value for student work with the help of information mining technology and clustering result analysis.

The continuous growth and popularization of higher education has led to challenges in ideological and PE in colleges. Under normal circumstances, relevant school departments will collect information
about education management, but the process of this information is still at the bottom of the search, and its value cannot be determined through simple analysis. In order to further understand the work of IP educators, the school organizes students to review the work of counselors in the "work evaluation checklist" for counselors every semester. Ideological and PE in colleges is of great significance. However, even though traditional classroom teaching has many shortcomings, there are many unparalleled aspects of online learning, such as face-to-face learning, practical training, communication and interaction. Information mining technology and traditional culture education are not opposites. The two must support each other and use their advantages to unite.

This article provides the management information of university ideological and PE based on the k-means clustering [6-8] analysis method, which uses information mining technology to realize the basic functions of traditional information mining technology systems [9]. Reused and discovered an important part of PE information, and developed an information model [10] to guide managers in decision-making. Scientific management of the IP learning process can effectively improve the overall ability of ideological and PE.

2. Specific Application of Cluster Analysis in Ideological and PE Management

2.1. Data Collection

This article selects a total of 50 quantitative assessment forms for counselors' work, and the form mainly includes two attributes. It mainly includes:

1. Management attitude.
   - Disciplinary rewards and punishments at work, treat each student objectively; have a harmonious relationship with students; speak decently and be exemplary; honest and self-discipline
2. Management ability.
   - Have strong organizational and management capabilities, effectively organize students to actively participate in school activities; appropriately understand and grasp the conditions of poor students, and earnestly engage in class study and student loans; students violate fairness and selfishness at work; actively organize Students do their job well; by understanding the situation of special student groups, actively helping students to make them feel more responsible.

Therefore, it involves changing the format of the information. The above behavior value is subdivided into excellent, good, qualified, poor, and very poor. At the same time, it is estimated by the area mapping method in the time interval of [0, 1], and the average evaluation method is performed on different assessment targets.

2.2. k-means Algorithm Implementation

The k-means clustering algorithm will be affected by the selected similarity measurement method. The commonly used similarity measurement method uses the error square sum criterion function to improve the clustering performance. Assuming \( X \) contains \( k \) cluster subsets \( X_1, X_2, \ldots, X_k \); the number of samples in each cluster subset is \( n_1, n_2, \ldots, n_k \); the mean points of each cluster subset are \( m_1, m_2, \ldots, m_k \) respectively, and the error square sum criterion function formula is:

\[
E = \sum_{i=1}^{k} \sum_{p \in X_i} \| p - m_i \|^2
\]

For each sample, mark it as the category closest to the center of the category, namely:

\[
\text{label}_i = \arg \min_{1 \leq j \leq k} \| X_i - m_j \|
\]

Update the center of each category to the mean of all samples belonging to that category:
\[ m_j = \frac{1}{n_j} \sum_{i \in S_j} X_i \]  

(3)

(1) The calculation of similarity is based on the average value of objects in a cluster.

(2) Randomly designate \( k \) cluster centers.

(3) For each sample \( X_i \), assign it to the nearest neighbor class according to the principle of minimum distance.

(4) Move the sample mean in the cluster to the cluster center.

(5) Repeat the second step and the third part until the center of the cluster does not change.

When using the k-means clustering algorithm, the difference between clusters and clusters is obvious. The disadvantage of clustering is that the algorithm of k-means often leads to completely different results by setting different \( k \) values. You can use the algorithm to analyze the data distribution first, such as center, hierarchical clustering and density, etc., and then select the appropriate \( k \) value. Until the cluster center tends to be stable.

3. Experimental Thinking and Design

3.1. Experimental Ideas

This article uses information mining technology, based on the k-means cluster analysis method to study the management of ideological and PE in universities. Information mining is the reuse of ideological and PE information about the basic functions of traditional systems. Improve the intermediate algorithm of k-means, preprocess various data, and use the algorithm of k-means in the distribution method to understand the cluster analysis of the data, extract most of the information from a large amount of distorted IP data, and build the data model.

3.2. Experimental Design

The community is currently developing information rapidly. People store all kinds of information. With the passage of time, the accumulation of this information has greatly increased. How to effectively extract this information and use the recorded information to find effective solutions to meet future needs. The process of obtaining information from the potential value of large complex databases is called analyze and extract data.

Use mathematical methods to find patterns of information and clear trends. Because data processing is usually more complex and the amount of available information is relatively large, it is difficult to find patterns in data using traditional data processing methods. Therefore, we will try to use the data model to build the corresponding analyze and extract data model, analyze and predict other data, and then we will be able to identify the information contained in the batch data. In this paper, K-means algorithm is used to extract information from four perspectives of IP learning, namely, management attitude, management ability, and management method and management effect. The information is clustered and the initial K value is set to 3. The final results are shown in Table 1.

| Cluster        | Management attitude | Management ability | Management method | Management effect |
|----------------|---------------------|--------------------|-------------------|-------------------|
| Cluster 1 (good) | 0.77                | 0.77               | 0.74              | 0.79              |
| Cluster 2 (medium) | 0.61              | 0.57               | 0.54              | 0.56              |
| Cluster 3 (poor)    | 0.31                | 0.31               | 0.28              | 0.30              |

4. Discussion

4.1. Exploration and Analysis of Ideological and PE Management in colleges based on K-means Mean
K-means is an average value algorithm, which is an in-depth data analysis method that can obtain the best value of the information process through core data analysis and modification. Because data processing is usually more complex and the amount of available information is relatively large, it is difficult to find patterns in the data using traditional data processing methods. Therefore, we will try to use the data model to build the corresponding analyze and extract data model, and analyze and predict other data, and then we will be able to identify the information contained in the batch data. The application of K-means algorithm in ideological and PE in colleges facilitates the analysis of many job seekers by IP educators, and provides a new scientific analysis method for management, construction and service. In the new situation, college students are facing major IP challenges. Therefore, timely correcting the ideological line and strengthening the exchange of experience will further improve the level of IP decision-making in colleges by effectively improving IP performance. Skills training can accurately determine goals, strengthen team building and provide an effective information foundation. Under the new system, students' IP work is facing huge challenges. Therefore, continuously adjusting the ideological work methods and strengthening the exchange of advanced experience are of great significance for effectively improving the results of IP work in universities.
positioning talent training. The goal is to strengthen the education team building and provide effective data basis.

4.2. University Ideological and PE Management Plan based on K-means Mean Value Algorithm

The algorithm of k-means is a process in which a plan is affirmed. It is an in-depth data analysis and research method. It is particularly important to apply information mining technology on the general IP level of universities. Based on the above conclusions, this article further improves the management of ideological and PE in colleges. This paper proposes to use cluster analysis to analyze and extract data technology to analyze the data of ideological and PE in colleges, and transform a large amount of data into clustering results. According to the algorithm of k-means, the university’s ideological and PE management plan is as follows:

Step 1: The goal and main purpose of analyze and extract data. Although analyze and extract data cannot predict the final result, it can predict the problem. Therefore, determining the mining target is a key step in analyze and extract data.

Step 2: Data collection, the task of this process is more tedious and time-consuming. We must consciously collect information and data about ideological and PE and leadership. The information part is directly available, and the information part should be available for research.

Step 3: Data preprocessing, which transforms the collected data into an analyzable data model. The model is prepared according to the algorithm. Different algorithms have different requirements for the data model.

Step 4: K-means is an algorithmic clustering mining. Using cluster mining, the data model can be divided into several similar groups. This process is mainly used in the data model input process and clustering algorithm selection.

Step 5: Analysis of clustering results. This process mainly analyzes many groups of features obtained after analyze and extract data.

Step 6: Use knowledge, integrate the information obtained from the research into the management curriculum of teachers, as well as IP personnel, through this conclusion, promote teaching leadership and formulate good management policies.

5. Conclusions

In the research on the clustering technology of analyze and extract data in the management of ideological and PE in colleges, this paper uses analyze and extract data technology to try and propose a research on the management of ideological and PE in colleges based on the k-means cluster analysis method. Based on the basic functions of analyze and extract data, the ideological and PE data is used for the second time, through the iterative process optimization of the algorithm of k-means, various data are preprocessed, and the algorithm of k-means in the division method is used to realize the data. The clustering analysis of the ideological and PE data extracts the valuable part of a large number of precipitated ideological and PE data and establishes a data model. The research results show that the application of k-means algorithm in ideological and PE in colleges is beneficial to analyze multiple work indicators of IP educators, evaluate their comprehensive capabilities, and further improve ideological and PE management decisions for colleges. Accurately locate talent training goals and strengthen the construction of education teams to provide effective data basis.

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