Retraction

Retracted: Promotion Strategy of Ideological and Political Education Management in Colleges and Universities Using Clustering Techniques

Mobile Information Systems

This article has been retracted by Hindawi following an investigation undertaken by the publisher [1]. This investigation has uncovered evidence of one or more of the following indicators of systematic manipulation of the publication process:

(1) Discrepancies in scope

(2) Discrepancies in the description of the research reported

(3) Discrepancies between the availability of data and the research described

(4) Inappropriate citations

(5) Incoherent, meaningless and/or irrelevant content included in the article

(6) Peer-review manipulation

The presence of these indicators undermines our confidence in the integrity of the article's content and we cannot, therefore, vouch for its reliability. Please note that this notice is intended solely to alert readers that the content of this article is unreliable. We have not investigated whether authors were aware of or involved in the systematic manipulation of the publication process.

In addition, our investigation has also shown that one or more of the following human-subject reporting requirements has not been met in this article: ethical approval by an Institutional Review Board (IRB) committee or equivalent, patient/participant consent to participate, and/or agreement to publish patient/participant details (where relevant).

Wiley and Hindawi regrets that the usual quality checks did not identify these issues before publication and have since put additional measures in place to safeguard research integrity.

We wish to credit our own Research Integrity and Research Publishing teams and anonymous and named external researchers and research integrity experts for contributing to this investigation.

The corresponding author, as the representative of all authors, has been given the opportunity to register their agreement or disagreement to this retraction. We have kept a record of any response received.

References

[1] F. Cao, Z. Huang, and Y. Weng, "Promotion Strategy of Ideological and Political Education Management in Colleges and Universities Using Clustering Techniques," *Mobile Information Systems*, vol. 2022, Article ID 3179260, 9 pages, 2022.

Research Article

Promotion Strategy of Ideological and Political Education Management in Colleges and Universities Using Clustering Techniques

Fei Cao ,[1] **Zhigang Huang**,[2] **and Yunxuan Weng** [1]

[1]*College of Chemistry and Materials Engineering, Beijing Technology and Business University, Beijing 100048, China*
[2]*School of Artificial Intelligence, Beijing Technology and Business University, Beijing, China*

Correspondence should be addressed to Yunxuan Weng; wyxuan@th.btbu.edu.cn

Computer-based technologies have changed our daily lives, such as the way we live, interact, learn, and play. Data collected through these technologies are now being used to support the second round of revolution in all of these areas. Data mining (DM) research has progressed rapidly in recent years, and the information design of educational management systems has also progressed significantly. Using big data technologies, several educational management systems have collected a great deal of information. However, the DM implementation in educational management systems is still in its initial stages. The use of DM techniques in educational management systems is theoretically important and practically useful. With the advancement of information technology (IT) in the field of college education, the present ideological and political theory courses in colleges and universities have gradually developed into information-based teaching, which has increased teaching efficiency and quality. This paper investigates the "work assessment quantitative table" of ideological and political education (IAPE) administration in universities using data mining and clustering technology techniques. In addition, this study utilizes the k-means clustering algorithms to analyze the data from the "work assessment quantitative table" of IAPE of university administration, which successfully overcomes the limitations and inadequacies of standard analysis approaches.

1. Introduction

Data analysis, data mining (DM), and other branch technologies are successively used in the field of big data technology. Each technological branch provides a particular type of data application [1]. Recently, the big data technology has become increasingly integrated with modern education, and it has been utilized to assess student development and improve teaching techniques, with positive outcomes. DM and machine learning (ML) are used to extract useful patterns from large datasets [2]. DM research began in the 1980s and has been successfully implemented in the fields of marketing, finance, business, and education. In recent years, DM research has made significant progress in the development of an informatization management system [3].

The political and ideological theory courses of colleges and universities play an important role in education. It plays an important guiding role in the current political views of colleges and university students and also provides the ideological basis for promoting students' all-round development. Many schools and colleges analyze and implement an education management system based on a particular situation, and each institution has its own system [4]. Educational management systems perform many activities such as organizing data and information, evaluating histograms, making reports, and printing conclusions.

The continuous development of higher education increases the number of high school graduates who are enrolling in colleges and has a significant impact on college teaching and administration staff [5]. Some students do not have strong learning skills, which creates lots of new issues

for teachers in the classroom [6]. On the other hand, universities are also facing great ideological and political challenges from college students due to which it is difficult to build an excellent educational environment. Students' interest and motivation in the study can be substantially influenced by the establishment of a bad learning environment, which is typically a challenging issue for administrators of IAPE in universities [7]. Many ethnic groups at universities have various learning methods, and students' basic knowledge also varies from student to student. As a result, managing ethnic minority students from various locations is usually tough for the university education management department [8, 9].

Under normal conditions, the university's relevant departments have gathered a huge volume of data via regular education management activities. But data processing is now confined to a low level of search and simple analysis, which cannot discover important and instructional information [10]. So, utilizing the traditional techniques is unfair, and the impact of their management activities cannot be evaluated effectively and appropriately. To overcome the limitations of traditional analysis, we used clustering analysis of DM and used the k-means algorithm of DM to analyze data from the "work assessment quantitative table" of the university administration's ideological and political education. Clustering is a frequent exploratory data analysis method used to gain an understanding of the data structure [11]. K-means clustering is a data clustering technique that may be used in unsupervised ML. Unlabeled data can be sorted into a predetermined number of clusters based on their characteristics (k) [12]. The K-means clustering method calculates centroids to determine the centroid and then repeats the process to get the optimum centroids. The number of clusters produced by the algorithm from data is represented by the letter "K" in K-means. Due to its scalability, the k-means clustering technique may be used to efficiently handle large datasets [13].

The remaining paper is structured as follows. Section 2 illustrates the related work of this study; Section 3 shows the material used and the techniques followed in the accomplishment of this study; Section 4 demonstrates the experimental outcomes of this study and a detailed discussion on the attained analysis results; and Section 5 presents the overall theme of the proposed study.

2. Related Work

Data mining (DM) is a technique for extracting beneficial information from huge volumes of data that is implicit, previously unknown, and possibly helpful. Rules, constraints, concepts, visualization, patterns, and other types of extracted knowledge can be expressed [14]. DM refers to a decision-making procedure that finds patterns in a set of facts or observations. The K-means clustering technique of DM is mainly used in this research work in order to investigate the evolution of IAPE innovation paths in colleges and universities. Jodylf et al. [15] examined the applications of DM in college IAPE in their research study. They evaluated the current state of IAPE using DM techniques and

highlighted the key aspects of IAPE reforms, such as theoretical reform, practical reform, and examination reform. In the context of new media, they also examined the evolution of ideological and political education. They analyzed the data of counselors' "job evaluation scale" using cluster analysis in DM and the k-means technique. Furthermore, they used the "job evolution scale" in college IAPE management as a data source, and clustering is done on the "work check scale" of counselors [16]. Jiang [17] established a network education platform using cluster analysis to examine the ideological position of college students. The network provides a vital forum for college teachers and students to express themselves and exchange their views, providing the groundwork for the relevance and timeliness of ideological education. Hong [5] investigated the current state of IAPE in colleges and universities using a questionnaire survey and proposed a clustering model using a cloud computing platform.

2.1. Data Mining (DM).
DM is a nontrivial method for extracting significant, previously unknown, implicit, and possibly useful information or patterns from large datasets. DM research is divided into two parts: applied research and basic theoretical research. A theoretical framework should be capable of representing common DM activities such as clustering, rule discovery, and classification, as well as discussing the probabilistic nature of observed patterns and models, discussing data and inductive generalizations of data, and accepting the presence of various data types (sequences, relational data, Web data, and text) [18]. The applied DM research group (ADMRG) focuses on the creation and application of DM techniques that help people to make better decisions. ADMRG gives a special focus on developing models based on fine-grained and large-scale behavior data, such as payment, location, and website browsing [19]. Nowadays, DM is used in all aspects of life and has many applications. Figure 1 describes the areas where data mining is widely used.

2.2. University Management Strategies for Enhancing Ideological and Political Education

2.2.1. Manage Attitude Strategies.
Under the backdrop of college ideological teaching work in the new era, a teacher should fully analyze the individual ideological education idea. At the same time, work on quality education is based on college students' development demands, ideological work, and scientific guidance for students [20]. Only under the guidance of teachers' ideological and political ideas, college students can carry out various practical activities, strengthen students' ability to experience, and effectively solve the deficiencies and contradictions existing in the current stage of IAPE [21].

2.2.2. Manage Ability Improvement Strategies.
Strengthen teacher training, introduce, and train several high-quality talents with the knowledge of IT and ideological and
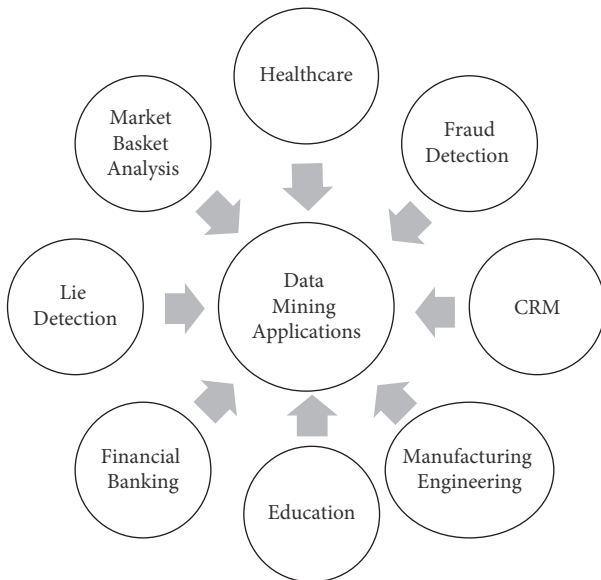
FIGURE 1: DM applications in different fields.

political education. Political and ideological work-related topics should also take the initiative to alter their views, adapt to the data mining application environment, master appropriate big data technology, and utilize quantitative analysis competently in educational practice [22]. To encourage rational and effective data exchange, a multifunctional and cross-departmental data mining platform for IAPE at universities and colleges should be established.

2.2.3. Manage Method Improvement Strategies. Administrators of college IAPE should make the student realize their role and value in social development, improve their sense of social responsibility, and stimulate their consciousness of making achievements [23].

2.2.4. Manage Effect Improvement Strategies. The objective of the whole mechanism is to use an effective evaluation method for IAPE in both universities and colleges. The evaluation of the IAPE effect after the use of DM technology is completely based on the judgment of objective data, the conclusion is more real, and the objectives provide systematic support for ensuring the overall effect of IAPE [17]. It is vital to building a long-term supervision system to assure the reasonable progress of evaluation in order to evaluate the influence of IAPE objectively and openly in universities and colleges.

3. Materials and Methods

The materials and methods of the proposed research work are briefly described in the following sections.

3.1. Analysis Process. Data mining (DM) is a method of confirming a strategy and conducting comprehensive data research and evaluation. The use of DM in the inspection

system of IAPE administrators' work evaluations at colleges and universities is particularly significant [24]. Most evidence regarding the accuracy of IAPE management at universities were previously collected by searching a huge number of data [25]. This research proposes the cluster investigation DM technique for dealing with the data and information of IAPE management at universities, which can convert a huge amount of data into cluster findings and improves the use of this kind of data. Figure 2 depicts the data mining procedure.

3.1.1. Dataset Collection. The development of a dataset that has a strong connection with the target class is one of the most significant and fundamental steps in the development of an intelligent system. Keeping the importance of the dataset into consideration in 2019, we collected and sorted the "work assessment quantitative table" of the university administration's IAPE (see appendix for sample table). We sorted 210 quantitative assessment tables related to the educational management of IAPE administrators in universities. We used the k-means clustering algorithm of DM to analyze the data from the "work assessment quantitative table" of IAPE of university administration and draw some major conclusions which provide exceptional guiding values for management and instructions.

3.1.2. Data Preprocessing Techniques. Data preprocessing is the process of preparing raw data for use in a model. It is a necessary step for cleaning and formatting data before it can be utilized in a model and is an essential step for cleaning and structuring data before using it in a model, which improves the model's accuracy and efficiency. Data cleaning and conversion are the two main aspects of data preprocessing.

(1) Data Cleaning. When the data are combined/integrated from multiple sources, there are opportunities for data mislabeled or duplication. Data cleaning is the process of removing or correcting corrupted, erroneous, duplicate, incorrectly formatted, or incomplete data from a dataset.

(2) Data Conversion. Data conversion is the process of transforming data from one form to another. While data translation may appear to be a simple concept, it is an essential stage in the data integration procedure.

3.2. Data Types in Cluster Investigation. Enable clustering complexities to the arrangement with n data items of various kinds. In most cases, the data types in cluster investigation primarily have two categories, which are listed below.

3.2.1. Matrix Data. Interval scaling is used to measure certain data types which are subsequently represented as a related table or an $n \times p$ matrix.
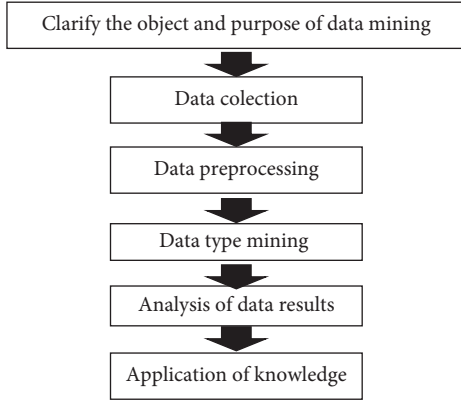
Figure 2: Overall process of DM operations.

$$\begin{bmatrix} X_{11} & X_{12} & \ldots & X_{1P} \\ X_{21} & X_{22} & \ldots & X_{2P} \\ \ldots & \ldots & \ldots & \ldots \\ X_{N1} & X_{N2} & \ldots & X_{NP} \end{bmatrix}. \tag{1}$$

3.2.2. Matrix Dissimilarity. The matrix dissimilarity is utilized to determine the degree of similarity between two pairs of n items, and its formal expression is the $m \times m$ matrix.

$$\begin{bmatrix} 0 & & & \\ S(2,1) & 0 & & \\ S(3,1) & S(3,2) & 0 & \\ & \ldots & & \\ & \ldots & & \\ & \ldots & & \\ S(m,1) & S(m,2) & .. & 0 \end{bmatrix}. \tag{2}$$

For phase difference, $S(i, j)$ is used, where $S(i, j)$ is the quantum mechanical system of the degree of dissimilarity among two items i and j, which is usually larger than or equal to zero. The measurement methods of phase difference $d(i, j)$ include the following.

(1) Interval Scaling Variables. The distance between each set of items is commonly used to quantify the difference or resemblance between objects, defined by interval scale variables, which include

$$S(i, j) = \sqrt{\left| x_{i1} - x_{j1} \right|^2 + \left| x_{i2} - x_{j2} \right|^2 + \cdots + \left| x_{in} - x_{jn} \right|^2}. \tag{3}$$

In the above equation, i and j are n-dimensional data substances. The distance metric is Manhattan, which is another standard distance metric and is described as follows:

$$S(i, j) = \sqrt{\left| x_{i1} - x_{j1} \right| + \left| x_{i2} - x_{j2} \right| + \cdots + \left| x_{in} - x_{jn} \right|}. \tag{4}$$

The Minkowski coldness is a generalization form of the two distances mentioned above. The following formula is used to describe it.

$$S(i, j) = \left\| x_i - x_j \right\| = \left(\sum_{k=1}^{n} \left| x_{ik} - x_{jk} \right|^p \right)^{1/p}. \tag{5}$$

(2) Binary Variables. Each variable can be in one of two states: 0 or 1, 0 indicating that it is empty and 1 indicating that it is present. Based on this, a conditional dependency table is obtained that assumes the weights of all binary variables are the same as shown in Table 1.

Furthermore, it describes the degree of difference between item i and object j which may be calculated using the following formula:

$$S(i, j) = \frac{x + r}{(q + x + r + y)}. \tag{6}$$

(3) Categorical Variables. Binary variables are expanded into categorical variables. The categorical variable normally has more than one state as compared to the binary variable. Type O, type A, type B, and type AB are four preferable state values for the classification variables. The phase difference between classification variables i and j is calculated using the following formula:

$$S(i, j) = \frac{T - n}{T}. \tag{7}$$

In the above formula, m refers to the number of competitions that is the amount of variable quantity in the same state when "i" and "j" are taken, and "p" refers to the number of all variables.

(4) Ordinal Variables. Discrete ordinal variables and continuous ordinal variables are the two types of ordinal variables. Classified variables are compared with discrete ordinal variables.

(5) Mixed Type Variables. If there are "p" mixed-type variables in the database, the degree of variation between objects "i" and "j" can be measured by the following formula:

$$d(i, j) = \frac{\sum_{f=1}^{p} \delta_{if}(f) d_{if}^{(f)}}{\sum_{f=1}^{p} \delta_{if}(f)}. \tag{8}$$

In (8), the variable f gives the calculation of the difference between i and j, $d_{if}^{(f)}$ is calculated according to its kind, if there is no metric value between objects. When the variable is not a symmetric binary variable, then the indicator term $\delta_{if}(f)$ is equal to 0. The variable f gives the computation of the dissimilarity between i and j, and $x_{if} = x_{jf} = 0$ is computed according to its type.

3.3. K-Means Clustering Algorithm Implementation. K-means clustering is a data clustering technique that may be used in unsupervised machine learning (ML). Unlabeled

Table 1: Conditions for binary variables.

Binary variables	1	0	Total
0	x	y	$x + y$
1	q	r	$q + r$
Total	$x + q$	$y + r$	T

data can be sorted into a predetermined number of clusters based on their characteristics (k). The selected similarity measuring method will have an impact on the k-means clustering process. To improve clustering performance, similarity measurement systems utilize the error square criterion function. Assume that X consists of K cluster subsets $x_1, x_2, x_3, \ldots, x_k$; each cluster subset has $n_1, n_2, n_3, \ldots, n_k$ samples; and each cluster subset's mean points are $m_1, m_2, m_3, \ldots, m_k$. The following formula is used to calculate the error square sum criteria function:

$$E = \sum_{i=1}^{n} \sum_{p \in X_i} \left\| p - m_i \right\|^2. \tag{9}$$

Mark each sample as the category closest to the categories center, namely,

$$\text{label}_i = \arg \min_{1 \le j \le k} \left\| X_i - m_j \right\|. \tag{10}$$

Replace the mean of all samples in each category with the center of that category:

$$m_j = \frac{1}{\left| n_j \right|} \sum_{i \in n_j} X_i. \tag{11}$$

The following steps are required to implement the K-means clustering algorithm:

(i) To calculate similarity, the average value of items in a cluster is utilized

(ii) Designate k cluster center at random

(iii) Using the rule of minimal distance, assign each sample X_i to the class with the closest neighbor

(iv) Move the cluster's sample mean to the cluster's center

(v) Keep repeating steps 2 and 3 until the cluster's center remains unchanged

In this research, we employed clustering analysis in DM and k-means algorithms to evaluate data from the "work assessment quantitative table" of university administration's ideological and political education.

4. Results and Discussion

4.1. Algorithm Path. First of all, the first three samples were selected as clustering centers, and then, the Euclidean distance was used to divide the data points into the nearest cluster. Finally, the method was separated into the mean vector of points in each cluster, which served as the new center point for the iterative process. The specific algorithm consists of a dataset $D = \{x\_1, \ldots, x\_n\}$, and its purpose is to

find k clusters $\{c\_1, \ldots, c\_k\}$. Algorithm 1 is described as follows:

4.2. Data Clustering Mining. There are 15 items of assessment grade table of work in the quantification, as well as the after-class mastering situation, comments, and suggestions. In order to synthesize these data items into a cluster analysis model, this study reorganizes and merges the data in the quantitative table of job appraisal in four qualities such as "management attitude," "management ability," "management approach," and "management effect." The five grades of the assessment rating such as "excellent, good, qualified, poor, very poor" are arranged in order with special meaning. According to the formula, the five values of assessment rating can be calculated as 1, 0.75, 0.5, 0.25, and 0. The values of the four attributes are measured by means of the arithmetic average of the items they contain and are illustrated as follows.

Management attitude = (adhere to the standard + get along well with classmates + talk properly + business objective)/4

Management ability = (identify the condition of difficult students + accurately grasp the situation of special student groups + investigate and punish students who violate rules strictly + competent + conscientiously organize students to do a good job in evaluation)/5

Management method = (go to classes and dormitories more than 3 times a week + check dormitory hygiene once a week + talk with students in preparation during the school year + actively participate in and check students' morning running + distribute student awards and grants in place)/5

Management effect = (actively participate in or host group class meetings + understand the situation after class + comments and suggestions)/3

As a consequence of the preprocessing information of data samples, the datasets used in the analytical techniques are provided in Table 2.

The reference value for the K-means algorithms is the typical value of the items in the cluster. While the K-center method uses the point object at the center of the cluster as the reference value to calculate the dissimilarity. Figure 3 illustrates the values of the four attributes.

4.3. Sample Improvement. In this process, more measures were taken to improve the K-means algorithm, and at the beginning, the samples representing the three levels were replaced with the first three defined sample data as the clustering center, so, as to reduce the skewness of the data and the times of execution as much as possible. The sample data representing the three levels are shown in Table 3 and Figure 4.

Using the Notepad editor, the km.dat form database file is used to prepare for **later** use. In this database file, set (S) is represented as a sample which is described as follows.

```
As in clustering centers, the first k samples were used.
While changes do in clustering c_k
Forming clustering;
    For k = 1,...,n do
c_k  = {x belong to DID  (R_k, x) ≤ D(R_j, x)j = 1,..., k, j ≠ k}
    End
```

ALGORITHM 1: Pseudocode of the algorithm.

FIGURE 3: Analytical procedure of data samples used in the management.

TABLE 2: Analytical procedure of data samples used in the management.

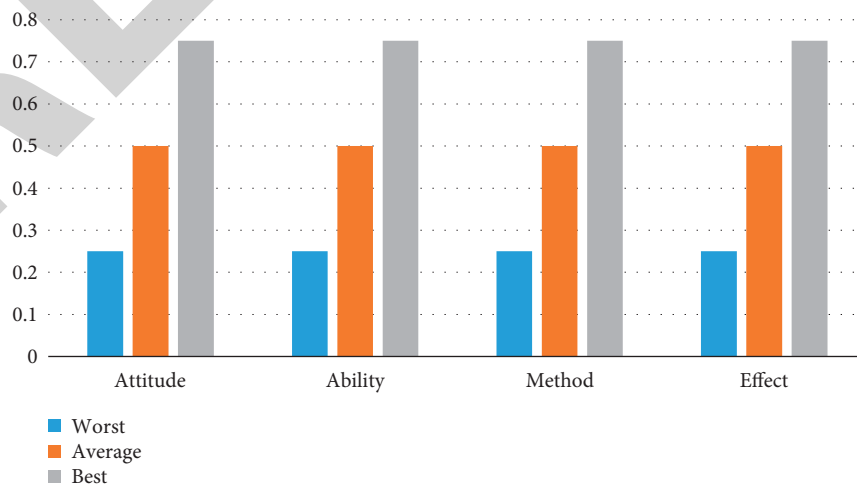| Attitude	Ability	Method	Effect
0.52	0.61	0.55	0.57
0.56	0.69	0.55	0.57
0.31	0.35	0.30	0.31
0.77	0.77	0.67	0.65
0.82	0.82	0.81	0.84

FIGURE 4: Data sample from the three levels.

TABLE 3: Sample data representing the three levels.

Levels	Attitude	Ability	Method	Effect
Worst	0.25	0.25	0.25	0.25
Average	0.50	0.50	0.50	0.50
Best	0.75	0.75	0.75	0.75

TABLE 4: Data input format.

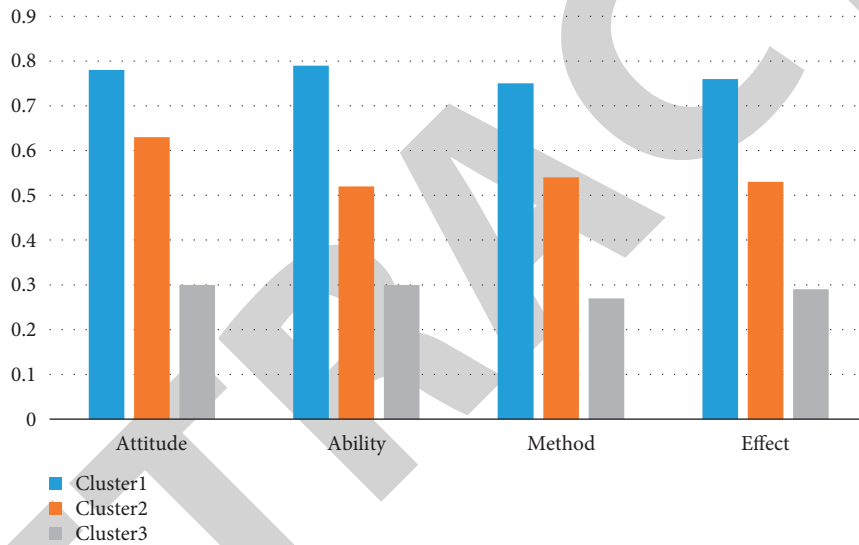| Npat	...	...	Int
Size Vect	...	...	Int
Nclust	...	...	Int
Vect[1, 1]	...	Vect[1, Size Vect]	Real
Vect[2, 1]	...	Vect[2, Size Vect]	Real
Vect[Npat, 1]	...	Vect[Nclust, Size Vect]	Real

FIGURE 5: Results of the final excavations.

TABLE 5: The completed excavation's outcome.

Cluster	Attitude	Ability	Method	Effect
C-1	0.78	0.79	0.75	0.76
C-2	0.63	0.52	0.54	0.53
C-3	0.30	0.30	0.27	0.29

TABLE 6: The final division results.

Scores	Number of samples	Percentage
>80	509	21.83
60–80	1583	67.88
<60	240	10.29

Npat = 114 + 6 = 120

Size Vect = 4

Nclust = 3

0.75, 0.75, 0.75, 0.75

0.50, 0.50, 0.50, 0.50

0.25, 0.25, 0.25, 0.25

Data input format is shown in Table 4.

4.4. Clustering Results. The results of the final excavations are shown in Table 5 and Figure 5.

We acquired the full quantitative scores of 2332 students from the School of Computer Science in 2019. To validate the ultimate findings of DM, the data were collected from 10
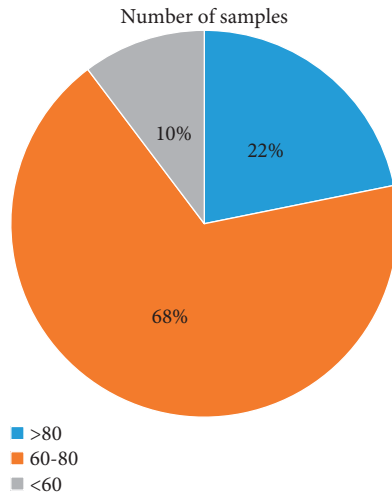
Figure 6: Results of final division.

activities conducted by the school. To rate these data samples, Table 6 and Figure 6 show the final division results after counting the overall score as 100 points and classifying it on a scale of 0 to 100.

From the obtained experimental results, it has been demonstrated that the DM model based on the quantitative table of IAPE managers' job analysis is an actual positive model. It brings positive improvements in IAPE management and educational efforts in universities and colleges.

5. Conclusion

In recent years, researchers and experts in the fields of AI and database management systems have started to take more interest in DM technologies. Clustering analysis is one of the core concepts of DM that involves the study of grouping actual or intellectual data elements into a group. In this paper, the basic concept, applications, and development prospects of DM and cluster analysis are discussed. Then, the data types, analysis process, and main clustering methods of cluster analysis are analyzed. In this article, we used the k-means clustering algorithm of DM to analyze the data from the "work assessment quantitative table" of IAPE of university administration and draw some major conclusions which provide exceptional guiding values for management and instructions. The use of cluster analysis in IAPE management in universities is investigated and implemented based on a number of parameters. There are 15 items of assessment grade table of work in the quantification, as well as the after-class mastering situation, comments, and suggestions. This study recombines data from four areas of work evaluation in a quantitative table, which include "management attitude," "management ability," "management approach," and "management effect" which calculates the arithmetic mean value of the data. From the experimental results, it is obvious that the analysis method of the proposed system is way better than the earlier approaches. Furthermore, this method will be more helpful for the college and

university administrations to implement in their corresponding institutions and will help the students in getting high grades and understanding the ideological and political education.

Data Availability

The datasets used and analyzed during the current study are available from the corresponding author upon reasonable request.

Conflicts of Interest

The authors declare that they have no conflicts of interest.

References

[1] L. Yue, "Analysis on the construction of network IAPE system in colleges and universities," *Beijing Education (Higher Education Edition)*, vol. 777, no. 3, pp. 30–33, 2017.

[2] S. Z. Zhao, H. Xu, N. Gao, and Y. R. Sun, "Dynamic authorization management model based on ASP.NET and WBS," in *Proceedings of the International Conference on Wireless Communications, Networking and Mobile Computing*, pp. 6258–6261, Shanghai, China, September 2007.

[3] Q. Liu and Y. Ding, "Xian technological university research on the management of IAPE in colleges and universities based on data mining technology," *Electronics Test*, vol. 64, no. 38, pp. 942–949, 2015.

[4] M. S. Elayidom, S. Mary Idikkula, and J. Alexander, "Design and performance analysis of data mining techniques based on decision trees and naive bayes classifier," *Journal of Convergence Information Technology*, vol. 6, no. 5, pp. 89–98, 2011.

[5] J. Hong, "Research on the development of innovation path of IAPE in colleges and universities based on cloud computing and K-means clustering algorithm model," *Scientific Programming*, vol. 2021, Article ID 4263981, 6 pages, 2021.

[6] Q. He, *Newspapers and the Journalistic Public in Republican China: 1917 as a Significant Year of Journalism*, Routledge, England, UK, 2018.

[7] Y. Yan, "Research status of big data and education informatization in China–study based on biliometric and content analysis (2010–2019)," in *Proceedings of the 2020 International Conference on Big Data and Informatization Education (ICBDIE)*, pp. 99–104, Zhangjiajie, China, April 2020.

[8] F. Lv, "Research on evaluation of teaching quality of marxist theory in massive open online course based on artificial intelligent," *Journal of Physics: Conference Series*, vol. 1915, Article ID 022050, 2021.

[9] A. Bartal and K. M. Jagodnik, "Role-aware information spread in online social networks," *Entropy*, vol. 23, no. 11, p. 1542, 2021.

[10] M. Yiben, *The Case of Jin Jing, Ts Lingue Culture Mediazioni Languages Cultures Mediation*, Lingue Culture Mediazioni, Milan, Italy.

[11] A. Bhutoria, "Personalized education and artificial intelligence in United States, China, and India: a systematic review using a human-in-the-loop model," *Computers & Education: Artificial Intelligence*, vol. 3, Article ID 100068, 2022.

[12] M.-D. Shieh and T.-H. Wang, "Chih-chieh yang, affective response dimension selection for product design: a comparison of cluster analysis and procrustes analysis," *International Journal of Digital Content Technology and its Applications*, vol. 5, no. 1, pp. 305–318, 2011.

[13] X. Xie, B. Liu, and L. Li, "Construction of an ideology information network communication system targeting college students," *China Metallurgical Education*, vol. 3, pp. 43–45, 2016.

[14] C. Romero and S. Ventura, "Data mining in education," *Wiley Interdisciplinary Reviews: Data Mining and Knowledge Discovery*, vol. 3, no. 1, pp. 12–27, 2013.

[15] S. Zhang, J. Li, and M. Jodylf, "The related factors analysis of ideological and political effectiveness in self-media based on data mining," *Journal of Intelligent and Fuzzy Systems*, vol. 37, no. 3, pp. 3247–3255, 2019.

[16] J. Long, "Effectiveness analysis of college students' iape in new media environment," in *Proceedings of the 2020 Annual Conference of Education, Teaching and Learning (ACETL 2020)*, Winnipeg, Canada, March 2020.

[17] W. Jiang, "Research on the construction and application of college ideology network system based on data mining," in *Proceedings of the 2021 4th International Conference on Information Systems and Computer Aided Education*, pp. 2430–2434, Dalian, China, September 2021.

[18] H. Mannila, "Theoretical frameworks for data mining," *ACM SIGKDD Explorations Newsletter*, vol. 1, no. 2, pp. 30–32, 2000.

[19] M. Xue and C. Zhu, "Applied research on data mining algorithm in network intrusion detection," in *Proceedings of the 2009 International Joint Conference on Artificial Intelligence*, pp. 275–277, Hainan, China, April 2009.

[20] V. Stolojan-filipesco, *7 Honouring Revolutionary Heroes, Cold War Cities: The Politics of Space in Europe and Asia during the 1950s*, Taylor and Francis, London, UK, 2021.

[21] J. Qiu, *Research on Information Teaching Mode of College Ideological and Political Theory Course in Big Data Environment*, Academic Press, Cambridge, MA, USA, 2019.

[22] M. Nesamanikandan, M. Kannan, and R. Pushpanathan, "Placement analysis using data mining," *International Journal of Advanced Engineering Research and Science*, vol. 3, Article ID 236770, 2016.

[23] R. Vogt, "Europe and China after the global financial crisis," *Europe and China Strategic Partner sor Rivals*, vol. 1, pp. 219–228, 2012.

[24] K. Dejaeger, W. Verbeke, D. Martens, and B. Baesens, "Data mining techniques for software effort estimation: a comparative study," *IEEE Transactions on Software Engineering*, vol. 38, pp. 375–397, 2011.

[25] R. S. Baker, "Educational data mining: an advance for intelligent systems in education," *IEEE Intelligent Systems*, vol. 29, no. 3, pp. 78–82, 2014.