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Construction of Information Security Platform for University Teaching Staff Combined with Data Collection

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Abstract:

The teaching staff management information system is an important guarantee to realize the scientific and standardized management of teacher staffs in colleges and universities, and it plays a very important role in the process of school information construction. In order to improve the data processing effect of the construction of teaching staff in colleges and universities and improve the rational configuration of teaching staff, this paper combines intelligent data clustering method to process the data of teaching staffs in colleges and universities, and proposes a teacher evaluation method based on fuzzy C-means clustering algorithm. The purpose is to dig out all aspects of factors that affect teachers' teaching ability, so as to evaluate teachers in many aspects and objectively. Secondly, this paper proposes a teaching staff allocation model, and uses the discrete binary particle swarm optimization algorithm to optimize the solution. Finally, this paper validates the effectiveness of the proposed method through experimental research, so we can use this model for auxiliary data processing in the follow-up construction of teaching staff in colleges and universities.

Keywords: Information Security; colleges and universities; information system

1 INTRODUCTION

In today's information age, information management technology has been widely used. Information management has penetrated into all walks of life, and it has penetrated into many management tasks such as education and teaching, assets and funds, and performance appraisal in colleges and universities. In the past, the management of teachers' archives information has some shortcomings such as low efficiency and easy to make mistakes and omissions in the management process. Therefore, this management model has not been able to meet the actual development needs of colleges and universities [1]. With the continuous improvement of educational reform in colleges and universities, the process of informatization construction in colleges and universities is also accelerating. Under the circumstances that the scale of running a school and the number of teachers in colleges and universities are getting bigger and bigger, how to better manage the work of teachers and the number of teachers and realize standardized, scientific and reasonable management has become an important problem that needs to be solved urgently [2].

In this paper, an innovative teacher evaluation method based on fuzzy C-means clustering algorithm is proposed. The purpose of this paper is to find out the factors that affect teachers' teaching ability, and find a model of teachers' allocation, and use discrete binary particle swarm optimization algorithm to optimize it. The main object of this topic is the university teaching staff management information system. With the help of this system to manage, count and edit the relevant information of in-service teachers will help teachers and administrators of the teaching staff of the school to improve their work efficiency, and can effectively protect the safety of all kinds of teachers' information. At the same time, with the continuous acceleration of the development of Internet technology, various intelligent electronic devices have also been widely used, and people's study and life are closely related to the network. The information management system can be closely integrated with the changes of teaching staff information to ensure the convenience and accuracy of the work of administrators of the teaching staff in colleges and universities. The system is mainly used for in-service teachers, teachers to be recruited and administrators of the teaching staff. Finally, the teaching staff management information system developed requires that various teaching staff management data can be easily imported, queried and stored. The research significance of this system is to improve the efficiency of teaching staff management in the application unit, protect the safety of teaching staff information, adapt to the requirements of deepening education and teaching reform, match the gradually expanding school scale of the application unit, and at the same time use the data resources of relevant departments reasonably with the help of database management, and complete resource sharing.

2 RELATED WORKS

There has been no specialized research on the performance evaluation of university faculty construction. In relevant literature, there are mainly two research directions that are closer to the content of this study, one is the construction of university faculty.

Reference [3] defines teacher allocation balance, which refers to the high-quality allocation of teacher resources by the government and education departments based on relevant laws, policies, fair and equal educational concepts, and combined with actual situations, fully considering the differences in the quantity, quality, structure, and other aspects of teacher resources in different regions and schools. Reference [4] suggests that balanced allocation of teaching staff is an effective allocation of teacher resources based on the actual development needs of schools in different regions. Some scholars also believe that teacher allocation is the rational allocation of teacher resources within the education sector or between different departments. Based on the above definition of "balanced allocation of teaching staff", it can be concluded that balanced allocation of teaching staff is the rational allocation of teacher resources within a certain regional scope according to the needs of balanced development of education and the concept of fairness and equality in education. Teacher allocation is not about evenly distributing teacher resources, but about achieving a balance between the supply and demand of teacher resources to a certain extent[5].

Reference [6] pointed out that the evaluation mechanism in teacher recruitment is not perfect enough, and the preparation work before recruitment has not carried out sufficient analysis of the relevant current situation and expectations, ignoring the analysis of the teacher structure and the evaluation of the effectiveness of the entire recruitment process. Therefore, recruitment needs should be analyzed first, and then the selection of teacher qualifications and feedback on teacher abilities should be carried out according to positions to determine candidates. Therefore, the performance management of teachers should be considered from the recruitment process, and in the current stage of teacher recruitment, there are few scientific and reasonable tests that truly affect the long-term development of the school's talent layout. Therefore, the performance evaluation of recruitment should be more reasonable and effective. From the perspective of the entire recruitment process, it is necessary to establish scientific and reasonable evaluation standards. Reference [7] analyzed the current situation of teacher recruitment, and in general university teacher recruitment, written tests are mainly used to assess theoretical knowledge, interview tests to assess teaching ability, and professional skills tests to test the skill level of teachers. Therefore, the focus of written tests affects the assessment space for teacher skills, making it difficult for teacher recruitment to select talents based on actual operational and teaching abilities, resulting in difficulties in talent mobility. From the perspective of the recruitment process, teachers should be treated separately from ordinary teachers in terms of recruitment, and scientific and reasonable assessment methods should be incorporated into the performance evaluation of the recruitment process in order to make the performance evaluation of the recruitment process in teacher construction more effective.

From the basic theory of teacher recruitment, more scientific evaluation methods have already been used to select and hire teachers. Reference [8] summarized the selection and employment of teachers, mainly using the method of competency evaluation to ensure that vocational colleges can choose suitable teachers to engage in vocational education. In the process of selecting teachers, scientific and reasonable evaluation indicators should be constructed to ensure the effectiveness of selection. Reference [9] analyzed the recruitment process of different types of vocational colleges, and overall, the recruitment process is relatively simple. Schools independently determine the recruitment standards and required number of people, first conduct data review, and then directly adopt the form of interviews to evaluate the professional skills of the applied teachers. It is not only about education, but also about the professional ability and comprehensive quality of the teachers. From this perspective, it is necessary for teachers to simplify the process, increase the autonomy of vocational colleges in personnel selection, and scientifically determine the number of teachers needed. This requires the development of more scientific assessment methods, such as defense and interview, professional practice operations, work performance display, and other evaluation methods.

In teacher training, in addition to school support for teacher enterprise practice, collaborating with enterprises to build on campus and off campus practice workstations is also a way to strengthen the practical skills of teachers and students. The method described in reference [10] is to establish a workstation by selecting suitable enterprises and universities for cooperation, dispatching suitable teachers and enterprise professionals to jointly build the

profession, and collaborating on professional training. This approach introduces enterprises into campuses, while cultivating students, teachers can also receive relevant training, improve professional skills, and cultivate qualified teachers. However, this approach requires detailed and scientific management of the implementation methods of external enterprise cooperation. Reference [11] summarized and analyzed the effectiveness of setting up practical workstations on campus. Although this method of cultivating teachers has achieved certain results, it still needs to strengthen the assessment mechanism and process management to ensure continuous operation. From the research, it can be seen that this method can also improve the quality of the teaching staff. However, considering the actual operation situation, adopting this method requires a good operating mechanism for schools and enterprises, as well as the establishment of relevant management systems and quality evaluation systems in order to operate well in the long term. Based on the purpose of cultivating qualified teachers in teacher training and development, literature [12] proposes corresponding strategies for teacher development from the perspective of teacher training mechanisms, and provides suggestions and reflections on teacher team construction in terms of teacher training and human resource development. An analysis was conducted from the perspective of human resources on the factors that need to be considered in the recruitment, assessment, and evaluation of teacher training mechanisms. Reference [13] points out the improvement of the teacher admission system and the innovation of relevant admission conditions. The assessment of teachers is comprehensively evaluated by multiple subjective factors, and the idea of data is adopted in the evaluation process. The evaluation method is oriented towards teacher training and teacher recruitment, and there is no corresponding evaluation of the effectiveness of teacher training in teaching.

Reference [14] argues that information-based personnel management plays an important role in the current management of faculty in universities. High quality human resource management in universities is an important aspect of promoting the rapid development of schools. Good human resource management will lead to a better operation of the administrative system. In the development of personnel management information systems, digitizing the application process can not only improve work efficiency but also provide convenience for the maintenance of teaching staff. Reference [15] believes that the informatization of education is a key focus of our current education reform, and in the informatization of education, the informatization management of human resources is a key improvement. Reference [16] applied the idea and method of modeling to the development process of university teacher management software, believing that modeling methods can help with software development. The advantage of modeling is to provide a general description of the developed system; Visualized processing and data flow; Explain the expected impacts during system development, including the impact on equipment, software, user organization, and system operation. Therefore, the expected results and potential issues can be demonstrated in advance to improve the efficiency of information system development.

Through the above research, we can see that there are still some problems in the construction of teacher staff team in colleges and universities at present. Through the combination of intelligent data collection platform and intelligent data processing method, the construction effect of teacher staff team in colleges and universities can be effectively improved.

3 TEACHER STAFF CONFIGURATION MODEL

3.1 Data preprocessing

Due to the diversity of data sources, such as the education statistics database of a certain city and the academic management systems of various schools, as well as actual survey statistics from different stages, our teacher data has resulted in data duplication and structural confusion. Therefore, preprocess these data.

(1) Data cleaning: For educational statistical databases, as they contain various similar data from various schools over the years, the data mining analysis in this article mainly focuses on teachers, so the data is cleaned according to certain rules. Therefore, the data needs to be cleaned according to certain rules.

(2) Data conversion: One important reason for the large amount of data in the original education statistics database and educational management system, but the complex data analysis process, is that a large amount of data is user historical record data, which has not been properly converted. On this basis, this article transformed the data according to the research objectives, using statistical methods and even some simple clustering and classification methods to compress, generalize, and standardize the data. For example, regarding the teaching investment data of

teachers, this article uses statistical methods to convert the original data into data forms that reflect the teacher's weekly lesson preparation time, extracurricular tutoring investment time, and other factors that can reflect the teacher's investment in the teaching process and the focus of work; For the evaluation indicators of teachers, a unified percentage system is adopted, such as converting the teaching scores of some subjects into a percentage system proportionally.

(3) Data reduction: The original data comes from a wide range of sources, each from different systems, resulting in duplicate data attributes, many of which have no reference significance in this study. Therefore, data reduction and elimination are carried out in the preprocessing stage to reduce data redundancy. The basic salary of teachers is determined by the teacher's professional title, so only the teacher's professional title is retained in both

For the teacher tables in multiple databases, after data preprocessing, the attributes in the teacher tables are divided into two categories as research indicators. One is the basic indicators used to reflect the basic characteristics and work conditions of teachers in many aspects, including age, gender, professional title, education background, homework volume, lesson preparation time (weeks), number of classes (weeks), Counseling duration after work (weeks), drag situation, number of absences, teaching management positions, learning investment, bonuses, etc. The basic indicator information of teachers obtained after data preprocessing is shown in Table 1:

Table 1 Basic indicators of teachers

Indicator symbol	Attribute description	Data type
	Teacher number	Character type
B1	Teacher gender	Character type
B2	Teacher age	Numerical type
B3	Professional title of teachers	Enumerated type
B4	Education background of teachers	Enumerated type
B5	Homework volume	Enumerated type
B6	Lesson preparation time (weeks)	Numerical type
B7	Number of classes (weeks)	Numerical type
B8	Counseling duration after work (weeks)	Numerical type
B9	Drag situation	Enumerated type
B10	Number of absences	Numerical type
B11	Teaching management positions	Enumerated type
B12	Learning investment time (weeks)	Numerical type
B13	Teaching-related bonus (yuan)	Numerical type

The other is the evaluation indicator reflecting the teaching ability of teachers, which mainly comes from the teacher evaluation system in the education system, including five indicators (all on a 100-point system), as shown in Table 2. Figure 1 shows the teacher indicator system diagram.

Table 2 Evaluation indicators

Evaluation indicator	Indicator description
T1	Teacher performance
T2	Discipline of students when teachers teach
T3	Study guidance to students in teaching process
T4	Innovation of teaching methods and teaching strategies
T5	Teacher's popularity with students

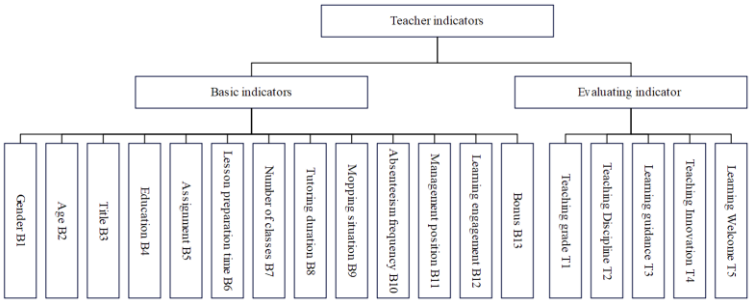


Figure 1 Indicator system diagram

The outline design of the teacher staff shared service platform is to convert the requirements analysis content obtained in the requirements analysis stage into software structure and data structure.

The platform uses 5 servers as the main servers of the system, of which 3 servers are used to send and receive requests for load balancing configuration, and the remaining two are used as hot standby servers to prevent server downtime. The complete architecture configuration of the platform is shown in Figure 2.

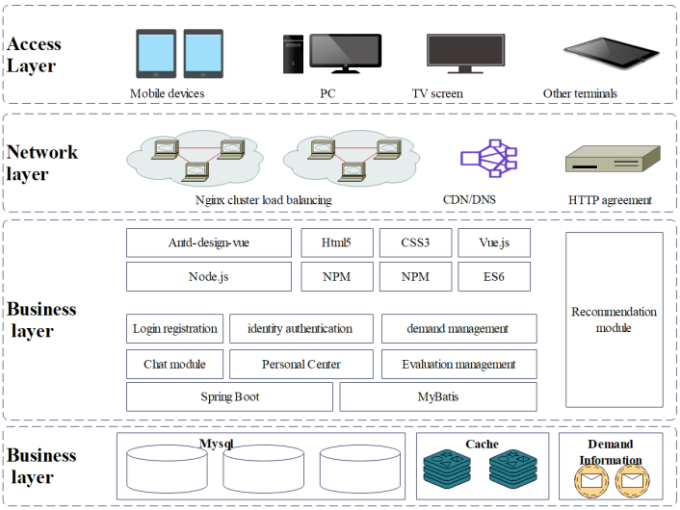


Figure 2 The architecture diagram of the platform

For the network architecture of the system, first of all, the data can be roughly divided into two types in terms of technical architecture: decentralized data and centralized data. By comparing and analyzing the two models, we can see that the decentralized information management system was often used in the past, but now it can't meet the current needs. How to concentrate information and realize unified management has become a top priority. Network database is to store user data on the server side for centralized management, so as to achieve effective control of data in different links. Figure 3 shows the network architecture diagram of the system.

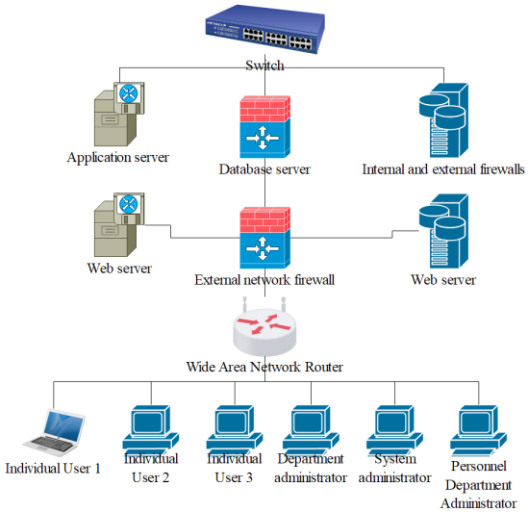


Figure 3 The network architecture diagram of the system

3.2 Teacher staff data clustering

Fuzzy C-means algorithm is generalized from hard clustering algorithm, abbreviated as FCM. The C value of fuzzy C-means clustering algorithm and K-means clustering algorithm have the same meaning, both refer to the number to be clustered in advance, both do not need human intervention, and the basic idea is the same.

FCM algorithm divides n data into c clusters, each data object is represented as $x_j\left(j=1,2,...,n\right)$, the cluster center of each cluster is $v_j\left(i=1,2,...,c\right)$, and the clustering results are represented by the membership matrix U of $c\times n$. The row i and column j of the matrix represent the membership degree $u_{ij}, u_{ij}\in\left[0,1\right]$ of the j-th data point in the i-th cluster. After that, U is normalized, so that the total membership degree of each data point belonging to all clusters in the clustering result is 1:

$$\sum_{i=1}^{c}u_{ij}=1,\forall j=1,...,n \tag{1}$$

The FCM algorithm calculates the value function during the iteration process to determine the clustering result. The calculation formula of the value function J is as follows:

$$J\left(U,v_1,...,v_i\right)=\sum_{i=1}^{c}\sum_{j}^{N}u_{ij}^{m}d_{ij}^{2} \tag{2}$$

The necessary conditions for minimizing formula (2) are as follows:

$$\overline{J}\left(U,v_1,...,v_2,\lambda\right)=\sum_{i=1}^{c}\sum_{j}^{n}u_{ij}^{m}d_{ij}^{2}+\sum_{j=1}^{n}\lambda_j\left(\sum_{i=1}^{c}u_{ij}-1\right) \tag{3}$$

Among them, $\lambda_j, j=1,2,...,n$ represents the Lagrangian multiplier of the j-th constraint of formula (1). If all input parameters are derived, the necessary condition for the minimum value of formula (2) is:

$$v_i=\frac{\sum_{j=1}^{n}u_{ij}^{m}x_j}{\sum_{j}^{n}u_{ij}^{m}} \tag{4}$$

$$u_{ij}=\frac{1}{\sum_{j=1}^{n}\left(\frac{d_{ij}}{d_{ki}}\right)^{2/(m-1)}} \tag{5}$$

To sum up, the steps of FCM algorithm are as follows: (1) The algorithm randomly initializes the membership matrix U, and each element of the matrix is a random number in interval $[0,1]$ and satisfies formula (1); (2) The algorithm uses formula (4) to calculate the cluster center $v_1, v_2, ..., v_3$.(3) According to formula (2), the algorithm calculates the value function J, and if J satisfies the iteration termination condition, the algorithm ends. (4) According to Formula (3), the algorithm updates the membership matrix U and returns to Step (2). Due to the fuzziness of the clustering results of the FCM algorithm, it can more objectively reflect the real world than hard partitioning. It has important research significance and application value in image processing, data mining, pattern recognition, big data analysis and other fields.

The Euclidean distance formula in fuzzy C-means algorithm is as follows, and z means that each data point has z attributes:

$$d_{ij} = \sqrt{\sum_{k=1}^{z} \left(x_{ik} - x_{jk} \right)^2} \tag{6}$$

However, in practical applications, due to the characteristics of the data itself, different attributes play different roles in the process of clustering analysis, some are important, and some are secondary. The purpose of teacher classification is to evaluate the teaching ability of teachers and find out what kind of basic indicator distribution teachers will have in the clustering results. Among the five indicators of teachers, teaching performance *T1* is objective data, while the four indicators of *T2, T*3, *T4* and *T5* mainly come from subjective evaluation and research. Analyzing the evaluation indicators in teacher data, it can be found that *T1* is more discrete than other indicators, that is, T1 plays a greater role in the clustering process. The table shows the dispersion degree of each indicator in the sample data of mathematics teachers (the standard deviation of the indicator is used to measure the dispersion degree).

Table 3 Dispersion degree of each evaluation indicator of teachers

Evaluation indicator	T1	T2	T3	T4	T5
Degree of dispersion	14.79	7.07	5.24	5.78	7.86

In order to measure the different importance of each indicator in the clustering process, this paper determines the weight of the five indicators through the standard deviation of each indicator, and the calculation formula is formula (7). Then, combined with the traditional Euclidean distance, the Euclidean distance based on the indicator weight is obtained, as follows:

$$w_k = \frac{\sigma_k}{\sum_{i=1}^{z} \sigma_i} \tag{7}$$

$$d_{ij}^{w} = \sqrt{\sum_{k=1}^{z} w_k^2 \left(x_{ik} - x_{jk} \right)^2} \tag{8}$$

When $W = (1,1,1,1,1)$, the distance between data i and data j is the ordinary Euclidean distance. Each index is given different importance, that is, the weight of each index is not equal to 1, and the distance between data i and data j is d_{ij}^{w}. When $w_k = 1$ is specified, the k-th dimensional coordinate axis remains unchanged and plays its full role in clustering. The smaller w_k is, the greater the compression degree of k-th dimensional coordinates is, and the smaller the role it plays in clustering. When $w_k = 0$, the k-th dimension index has no effect in the clustering process. To sum up, the value function of fuzzy C-means based on index weight is as follows:

$$J(U, c_1, ..., c_2) = \sum_{i=1}^{c} \sum_{j}^{N} u_{ij}^{m} \left(d_{ij}^{(w)} \right)^2 \tag{9}$$

The optimized formula (5) is as follows:

$$u_{ij} = \frac{1}{\sum_{j=1}^{n}\left(\frac{d_{ij}^{(w)}}{d_{kj}^{(w)}}\right)^{2/(m-1)}} \tag{10}$$

In addition, the implementation steps of the fuzzy C-means algorithm based on indicator weight are the same as those of the ordinary fuzzy C-means algorithm.

4 EXPERIMENTAL STUDY

4.1 Data processing

In this paper, the data of several teachers are randomly selected from the network database. After data preprocessing, MATLAB simulation experiments are carried out.

In this paper, 100 input samples are selected, and the index data of the samples are shown in Table 4. Each column in Table 4 is the score of a teacher's indicator in the teacher evaluation system, corresponding to *T1, T2, T3, T4* and *T5* from left to right, and each row represents all the evaluation indicators of a teacher object.

Table 4 Teacher evaluation indicator data (partial)

BH	T1	T2	T3	T4	T5	BH	T1	T2	T3	T4	T5
1	57.21	69.93	80.06	79.32	61.95	11	69.12	56.49	59.25	59.50	60.98
2	52.49	57.95	66.93	83.15	76.96	12	69.79	67.72	84.88	62.55	75.03
3	53.99	62.02	78.20	50.03	91.31	13	48.28	56.88	67.90	81.54	52.84
4	65.95	68.84	59.92	90.79	92.79	14	61.63	86.50	90.34	72.33	83.37
5	55.39	53.18	68.79	79.20	67.29	15	48.56	91.83	84.81	79.71	88.20
6	61.85	82.68	79.00	86.42	88.97	16	74.45	79.82	81.26	74.59	85.90
7	51.90	69.29	67.55	51.89	62.46	17	59.91	82.93	58.04	57.60	70.50
8	49.60	76.45	55.94	67.78	93.43	18	67.49	64.28	87.77	89.31	82.56
9	54.86	68.42	51.38	83.91	94.42	19	62.37	76.20	63.09	87.03	48.06
10	53.00	79.31	69.86	84.96	87.80	20	73.38	83.35	88.99	88.78	84.38

The fuzzy c-means clustering algorithm needs to determine the number of clusters c in advance. Because many practical applications cannot determine the size of c in advance, just like the teacher's division in this paper, we use different c values for clustering to determine the best number of clusters, and use *L (c)* to determine the clustering effect when choosing the number of clusters c. The calculation formula of *L (c)* function is shown in formula (11):

$$L(C) = \frac{\sum_{i=1}^{c}\sum_{j=1}^{n} u_{ij}^{m}\left\|v_i - \bar{x}\right\|^2 \Big/ (c-1)}{\sum_{i=1}^{c}\sum_{j=1}^{n} u_{ij}^{m}\left\|x_j - v_i\right\|^2 \Big/ (n-c)} \tag{11}$$

Among them, $\bar{x}$ represents the center of the entire sample data is represented, and the calculation formula is as follows:

$$\bar{x} = \frac{1}{n}\sum_{i=1}^{c}\sum_{j=1}^{n} u_{ij} x_j \tag{12}$$

$\left\|x_i - x_j\right\|$ represents the distance between data point x_i and data point x_j, which can be obtained by formula (8). u_{ij} represents the membership value of the j-th data point in the i-th cluster, and m represents the fuzzy coefficient. By observing formula (11), it can be found that the numerator is the sum of the distances from different classifications to the overall data center, the denominator is the sum of the distances from data points in various clusters to their cluster centers, and the $L(C)$ function reflects the separation degree between various

clusters and the tightness within clusters in the clustering results as a whole.

4.2 Results and discussion

The sample data is used as the input of the algorithm, and the value of c is taken [2, 15]. In MATLAB, the algorithm is run many times to calculate the average value of *L (c)* corresponding to different classification numbers, and the result shown in Figure 4 is obtained, and the best classification number c=4 is selected.

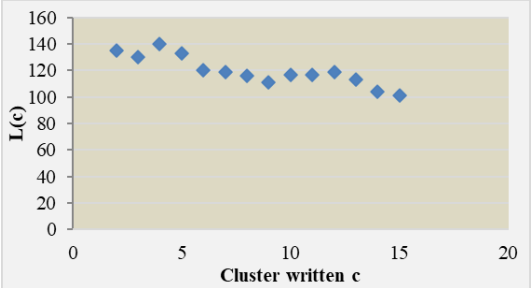
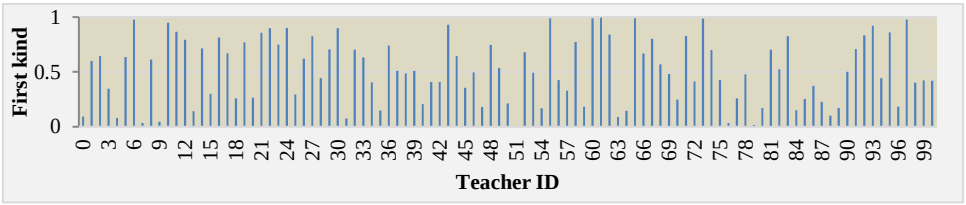


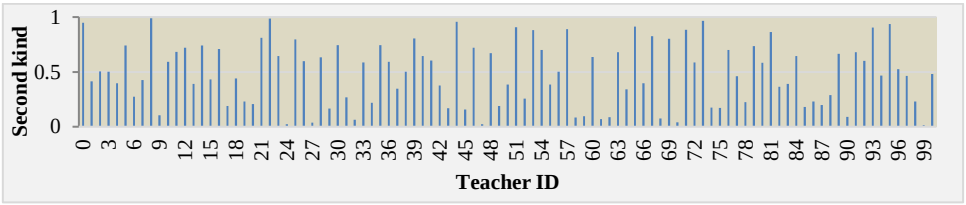
Figure 4 $L(C)$ corresponding to different cluster numbers

At the same time, because the membership matrix in the algorithm is randomly initialized, the clustering results are not unique when the value of c is determined. Therefore, *L (c)* is also used as a standard to verify the effect of the algorithm. The larger the value, the better the effect. The fuzzy coefficient m is set as an important parameter in FCM algorithm. On the one hand, it determines the fuzziness of clustering results. On the other hand, it also affects the objective function of the algorithm. The best value range of m is [1.5, *2.5*], and this paper chooses m = 2.

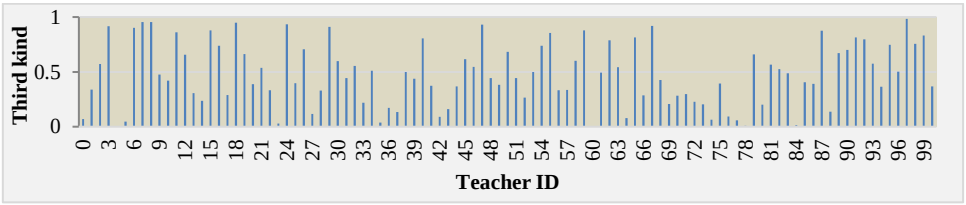
In MATLAB, the optimized fuzzy C-means algorithm is used to cluster the teacher data in the table. The changes of membership degree and objective function after clustering with iteration times are shown in Figure 5 and Figure 6:



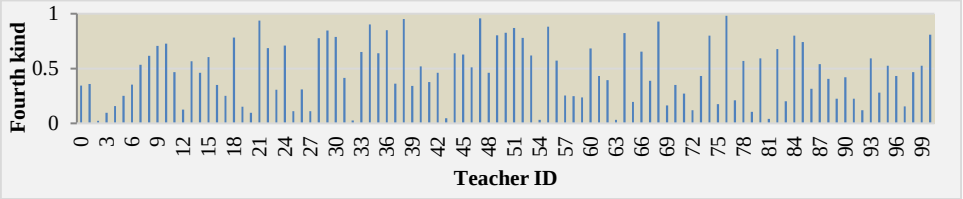
(a) First kind



(b) Second kind



(c) Third kind



(d) Fourth kind

Figure 5 Schematic diagram of membership matrix

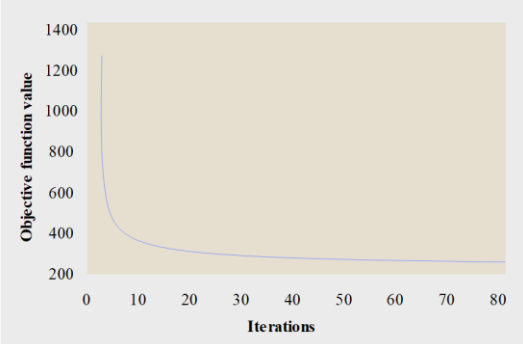


Figure 6 Schematic diagram of membership matrix

As can be seen from the figure, the objective function converges after 12 iterations, and the clustering centers are shown in Table 5.

Table 5 Clustering results

Category	Clustering center
Category 1	(79.94,86.70,80.17,81.91,79.95)
Category 2	(70.10,80.98,85.05,84.61,85.28)
Category 3	(61.52,82.56,78.77,77.05,69.89)
Category 4	(53.99,66.71,68.09,71.88,72.84)

According to the clustering results, teachers are divided into four grades: excellent, good, medium, and poor, and teachers of each grade are evaluated based on the evaluation indicators. The results are as follows: Table 6:

Table 6 Evaluation of clustering results

Category	**Feature interpretation**	**Teacher Rank**
Category 1	The teaching ability of such teachers is outstanding. The 5 evaluation indicators are more prominent among all teachers, and teachers have excellent substitutes, pay attention to teaching discipline, and are better than most teachers in learning guidance and teaching innovation, and are generally welcomed by students.	Excellent
Category 2	This kind of teacher has strong teaching ability. The overall evaluation indicators are higher, among which T3 and T4 are slightly higher than excellent teachers as a whole, that is, such teachers have outstanding teaching guidance ability and diverse teaching strategies in the teaching process, and the overall popularity is the highest.	Good
Category 3	The teaching ability of such teachers is medium. The T2 indicator of this kind of teachers is second only to the excellent teachers, and the overall maintenance of teaching discipline is better. The T3 and T4 indicators are in the middle level, but the popularity of students is the lowest.	Medium
Category 4	The overall teaching ability of such teachers is weak. Except for T5, all the	Difference

	indicators are the lowest, that is, the teaching performance of this type of teachers is not outstanding, and the maintenance of classroom discipline, learning guidance, teaching strategies are weaker than the above three types of teachers as a whole.	

As an important resource in the field of education, teachers' reasonable and fair distribution and high-quality training are not only related to the development of individual teachers, but also related to the right of tens of millions of educated students to receive fair and high-quality education. In the period of educational reform and development, it is necessary to make further research on the problem of teacher staff configuration. Combined with the requirements of education reality and education reform, and weighing various factors in the teacher staff configuration, the ultimate goal of teacher staff configuration must follow the following two basic goals:

(1) The fairness of teacher staff configuration: Within the scope of schools, the fairness of teacher staff allocation is mainly reflected between "key classes" and "non-key classes". Due to the concentration of high-quality teacher staff sources and students, there are two classes in the educational environment: key classes and non-key classes. On the one hand, the learning atmosphere of non-key classes is relatively weak, which is not conducive to teachers' organization of education, nor to the formation of students' healthy learning psychology, which strengthens the inferiority complex of students in non-key classes. On the other hand, as far as the teachers of non-key classes are concerned, due to the difficulty of producing teaching results, the chances of selecting excellent teachers and rating teachers' professional titles are relatively small. Teachers in non-key classes lack a sense of accomplishment, which is not conducive to teachers' personal development. Therefore, solving the fairness problem of teacher staff configuration can benefit both students and teachers, and is beneficial to the development of education and teaching. However, absolute fairness does not exist, and average fairness is not realistic. In the allocation of teacher staff, it is imperative to eliminate polarization and realize overall fairness according to the situation of teachers and students.

(2) The rationality of teacher staff configuration: Another purpose of teacher staff configuration is rationality, that is, to find the most suitable match between teachers and classes. In the actual teaching management, the main consideration to decide whether a teacher is assigned to a certain class is whether the teacher's history teaching performance and the class's past performance are at the same level. This approach is too one-sided. Whether a teacher is suitable for teaching in a certain class or whether a certain class of students is suitable for a certain teacher's teaching characteristics is determined by many factors. While realizing educational fairness, reasonable teacher staff allocation can effectively improve the overall teaching quality and students' grades, and promote the high-quality development of teaching teacher staff sources. It is a problem that needs to be paid attention to and studied in the period of educational reform. To sum up, this topic aims at realizing the fairness of teacher staff configuration and improving the rationality of teacher staff configuration to build a teacher staff configuration model. The teacher staff configuration in this paper mainly refers to how to reasonably arrange existing teachers to teach in different classes within the scope of specific school grades. This model is also called teacher configuration model.

5 CONCLUSION

This paper summarizes the current situation of teacher staff configuration problem at home and abroad, and focuses on the configuration of teacher staff sources within the school scope of teacher staff configuration problem. Firstly, a teacher evaluation method based on fuzzy C-means clustering algorithm is put forward according to the actual situation of domestic education and considering the basic indicators and evaluation indicators of teachers, so as to mine all aspects of factors that affect teachers' teaching ability and evaluate teachers in many ways and objectively. Secondly, this paper proposes a teacher staff configuration model and optimizes it using discrete binary particle swarm optimization algorithm. Finally, the validity and rationality of the teacher staff configuration model are verified by the simulation results. The main contents and work of this paper are as follows: (1) This paper analyzes teachers' historical data by using fuzzy C-means clustering algorithm, and analyzes teachers' own situation and teaching habits in the clustering results of teachers' groups, so as to evaluate teachers objectively in many aspects. As teachers play an important role in teacher staff allocation model, accurate teacher evaluation makes the construction, optimization and perfection of the model have evidence to follow, which is more reasonable and necessary. (2) This paper analyzes the data of teachers and classes, and determines

the weight of each evaluation index of teachers (classes) in decision-making. (3) Under ideal assumptions, this paper designs a multi-objective optimization model of teacher staff configuration, and determines the model objectives and related constraints according to the problems to be solved by teacher staff configuration. (4) This paper designs a discrete binary particle swarm optimization algorithm to solve the teacher staff configuration model, and gives the particle position correction strategy based on constraints, and uses mutation operation and local search strategy to improve the population diversity and search accuracy of the algorithm. The new teacher staff configuration scheme is obtained by solving the algorithm, and the feasibility of the model is evaluated by comparing the current situation of teacher configuration.

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