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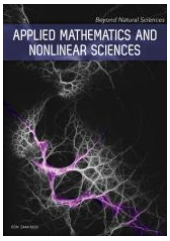

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The Integration Mechanism of Optimization Model Design of Scholarship System and Civic and Political Education under the Strategy of Financial Aid and Parenting in Colleges and Universities

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Abstract

The selection of college grants is affected by many factors, but some of the influencing factors cannot be quantitatively judged at present. In order to be more fair and reasonable to the students in need of financial assistance for the review and evaluation, this paper introduces the fuzzy comprehensive evaluation method into the process to establish a fuzzy hierarchical analysis based on the college national scholarship evaluation model, the article finally through a specific example of the application of this paper based on the fuzzy comprehensive evaluation of the optimization model of the bursary system. The affiliation degree of the fuzzy comprehensive evaluation-based scholarship system constructed in this paper is (0.536,0.323,0.130,0.014), and the article concludes that Zhang's moral education status is very good, and he is qualified to receive the scholarship.

Keywords: Bursary system optimization model; Fuzzy comprehensive evaluation method; Civic education; Assessment model.
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1 Introduction

The national scholarship system is an important part of the financial aid system for students in higher education, and its main function is to "help" and "educate" students, that is, to provide material assistance to students with financial difficulties through the implementation of the system, to help them temporarily tide over economic difficulties, and to educate students with gratitude and patriotism. Let them understand the Entu retribution, enhance their sense of gratitude, responsibility, and patriotism, and guide them to work hard, be self-reliant and inspirational, and finally get rid of poverty fundamentally [1-4]. However, in reality, the educational function of the national scholarship system has not been effectively played, and in practice, there are "two inconsistencies": one is the disharmony between helping the poor and the goal of educating people, and the other is the disharmony between solving temporary difficulties and being responsible for the long-term development of students [5-8]."

Scholarships and grants for university students have provided financial guarantees for scientific research of university students to a certain extent. However, with the comprehensive development of the scholarship policy and fee system, the problems and contradictions among the students in colleges and universities have increased significantly compared with the past period when there was no scholarship policy, and the work of civic education is facing new difficulties and challenges [9-12]. Under the new situation, the analysis of university student scholarship policy in the invisible ideological education function, the ideological education work into the scholarship policy, gives full play to the incentive and orientation of the scholarship, is conducive to improve the quality of training of students in colleges and universities, for the society to deliver top talents to lay the theoretical foundation [13-14]. Relevant department experts also pointed out that the establishment of a long-term, multi-purpose college student scholarship policy system can help to strengthen national scholarships, academic scholarships, national grants, and other incentives for college students [15-16].

Under the new situation of deepening education reform in Chinese colleges and universities, new attempts and explorations have been opened for the work of ideological education in colleges and universities. Scholarships and grants, as a powerful hand in the work of ideological and political education, are externally manifested in economic help and, at the same time, rich in implicit educational effects. Deming, D et al. examined the changes in the historical data on higher education tuition in the United States and pointed out that the changes in tuition prices had a limited impact on the achievement of higher education and that the increase in tuition was more favorable to the achievement of higher education compared to the reduction of tuition [17]. Herzog, S examined the bursary aid, noting that these student aid loans have a persistent negative impact on needy students, and concludes with a discussion of acceptable balance criteria for student loan selection [18]. Turner, L. J describes the Pell Grant Bonus Program and combines regression discontinuity (RD) and regression estimation methods for the design of the economic incidence of financial aid subsidies, and based on the results of the analysis, learns that there would be roughly 15% or so of Pell Grants are awarded directly to schools [19]. Nguyen, T. D describes the positive role played by financial aid awards in helping struggling students achieve success in higher education and conducts a systematic review and analysis of related literature studies, noting that financial aid awards help increase the probability of higher education achievement among disadvantaged students by 2-3% [20]. Lavecchia, A. M discusses the Pathways to Education, a program that provides educational support for disadvantaged students grant programs for disadvantaged students and conducted a related study using a difference-in-differences approach, finding that the Pathways to Education program contributed to some extent to the employment and income growth of sponsored students [21]. Diris, R analyzes the academic debate on tax subsidies for higher education and attempts to evaluate tax subsidies for higher education in the context of economic theory, arguing that the policy does not

address situations such as academic failure in higher education, pointing out that income-based lending and graduation tax collection are more equitable and efficient [22]. Bolton, P. talks about student loans, a form of financial assistance in which the government subsidizes interest-rate loans to students for academic purposes, which are later repaid to the government after the student graduates and works, and the significance of student loans is that they do not impede the student's regular studies [23]. Barr, N reveals the root cause of the student loan crisis in the United States - the operating mortgage, a student loan model that places a heavy burden on both borrowers and lenders and provides a comparative analysis of the shortcomings of student loans in the United States based on the better functioning income-based lending model in Africa and makes recommendations for optimization [24]. Eng, A et al. evaluated the role played by the Federal Pell Grant program in helping low-income families reduce the cost of higher education and found that the actual role played by the Federal Pell Grant program was much lower than the results of the state studies, arguing that the complex interactions between the Federal Pell Grants and the state aid programs could explain this situation [25]. Pogge, T. W et al. explored the reasons for the emergence of national poverty, which continues to worsen, especially in developed countries, and in conjunction with related arguments put forward by Kissinger, argued that the emergence of poverty is attributed to endogenous problems of domestic institutions and economic development [26]. Reardon, S. F discusses that family economic status is a strong correlate in the prediction of children's academic achievement, but there is still considerable disagreement in the academic field about the underlying logic and mechanisms for the formation of this association [27]. Zhang, H deeply analyzed that the advocate of Civic Education is the balanced development of morality, intelligence, physicality, and aesthetics, not the attention to theoretical knowledge only, and pointed out that the teaching viewpoints that focus too much on the teaching of theoretical knowledge and neglect the comprehensive development of morality, intelligence, physicality, and aesthetics are still prevalent at present [28].

The connection between the evaluation work of college grants and Civic and Political Education can better realize the function of grants to educate people and improve the quality of the work of educating people in colleges and universities. The article establishes a comprehensive evaluation model by using the fuzzy comprehensive evaluation method, calculates the comprehensive evaluation results by using examples, and concludes comprehensive evaluation through data processing. Specifically, it first gives an overview of the fuzzy comprehensive evaluation method, then proposes the optimization model of the bursary system based on fuzzy comprehensive evaluation, and further discusses the integration mechanism between the design of the optimization model of the bursary system and the Civic and Political Education. The article finally takes Zhang as an empirical study in a university and establishes the index system of college scholarship rating from five levels, namely, family factors, students' factors, college factors, financial aid policy factors, and teachers' and students' identification factors, and weights and assigns values to the indexes of college scholarship rating, so as to realize the effective evaluation of the students in need of financial aid in a comprehensive, objective and fair manner, which can be better integrated with the Civic Policy Education.

2 Method

2.1 Overview of Fuzzy Integrated Evaluation Methods

Fuzzy comprehensive evaluation is the application of the principle of fuzzy transformation and the principle of maximum degree of affiliation, taking into account the factors related to the thing being evaluated and making a comprehensive evaluation of it. It is a kind of system analysis method that uses fuzzy mathematical principles to analyze and evaluate things with "fuzziness", combining qualitative and quantitative, and unifying precise and imprecise with fuzzy reasoning [29]. The fuzzy comprehensive evaluation process is shown in Figure 1. The use of the fuzzy comprehensive

evaluation method effectively avoids the use of "yes" and "no" as a rigid scale to measure the phenomenon being evaluated and overcomes the shortcomings of the traditional comprehensive evaluation method, which may appear to varying degrees of deviation from the objective evaluation of the real situation.

According to the different ways of data representation in the evaluation process, the fuzzy comprehensive evaluation can be roughly divided into two categories: classical fuzzy comprehensive evaluation and modern fuzzy comprehensive evaluation. In the classical fuzzy comprehensive evaluation of attribute indicators and weights, the size of which is expressed by the exact number, while the modern fuzzy comprehensive evaluation of attribute indicators and the size of the weights are fully or partially expressed as a fuzzy subset or fuzzy number in the decision space. The classical fuzzy comprehensive evaluation method is the prototype of fuzzy comprehensive evaluation, and its basic idea is to apply the principle of fuzzy transformation according to multiple factors, the state of the evaluated object itself exists, or the class of the genus of the same and the same, from the number of the degree of its belonging to the portrayal and description. Due to the small number of states of the evaluated objects, this paper uses the classical fuzzy comprehensive evaluation method to comprehensively evaluate the degree of student poverty.

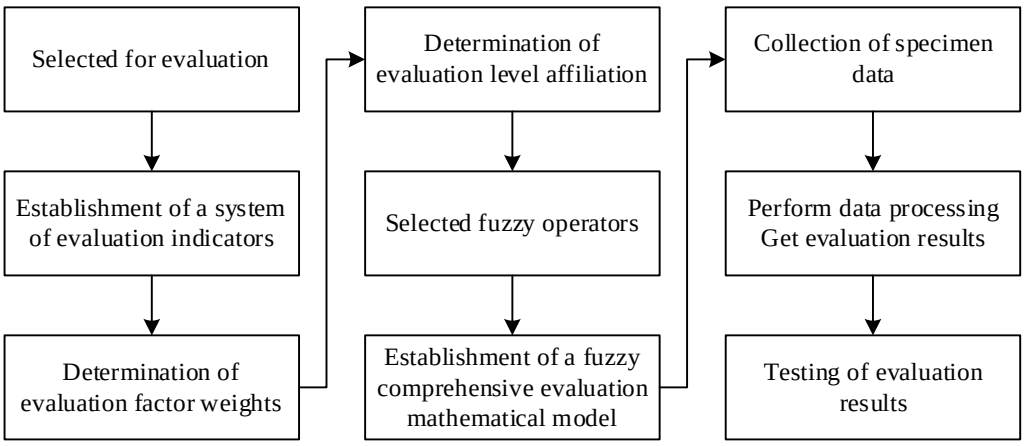

Figure 1. Fuzzy comprehensive evaluation process

The evaluation system of the comprehensive evaluation method based on fuzzy transformation is shown in Figure 2. The specific process of determining the degree of student poverty with the comprehensive evaluation method of fuzzy transformation is as follows: consider the evaluation objective as a fuzzy set of multiple factors (called factor set U), then set the judging grades that can be selected from these factors to form a fuzzy set of rubrics (called judging set V), find the degree of belonging of each single factor to each judging grade respectively (called fuzzy matrix), and then according to each The quantitative solution value of the evaluation is then calculated (called fuzzy matrix synthesis) based on the weight assignment of each factor in the evaluation objective [30].

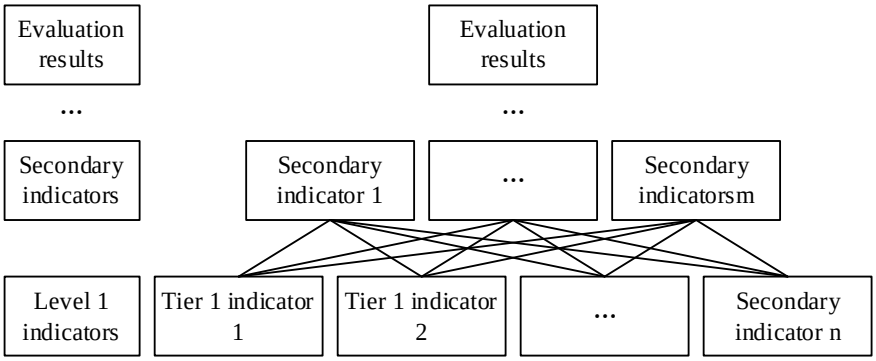

Figure 2. Evaluation system based on fuzzy transformation

2.2 Optimization model of bursary system based on fuzzy comprehensive evaluation

2.2.1 Indicator system for grading the moral status of poor students

1) Constructing the index system

In the index system for grading the moral education status of poor students, the secondary indicators include family factors, students factors, college factors, financial aid policy factors, and teacher-student identification factors. The secondary indicators include factors with lower correlation, which can reflect the degree of poverty of students, and with higher accessibility. Thus, a three-tier index system was developed to assess the level of scholarships.

2) Constructing judgment matrix

To construct the judgment matrix, this paper adopts A.L. Saaty's 1-9 scale method. The scales of the judgment matrix and their meanings are shown in Table 1.

Table 1. The scale of the judgment matrix and its meaning

Scale	meaning
1	It is equally important to represent two factors.
3	One factor is slightly more important than another factor.
5	One factor is more important than another factor.
7	One factor is more important than another factor.
9	One factor is more important than another factor.
2,4,6,8	The middle finger of the two adjacent judgments
reciprocal	In comparison with i and j, the value of the value of the value of a_{ij} is $a_{ji}=1/a_{ij}$

The members of the review committee established by the university compare the importance of the secondary indicators and the tertiary indicators under each secondary indicator separately. The judgment matrix is $\left(a_{ij}\right)_{n\times n}$, where n is the number of indicators, a_{ij} is the judgment value of the importance of the i th indicator compared to the j th indicator, and $a_{ij}=1/a_{ji}$, $a_{ii}=1$.

2.2.2 Weighting of indicators in each tier

By computing the eigenvector $W'=[W_1',W_2',\cdots,W_1']^{\mathrm{T}}$ corresponding to the largest eigenvalue $\lambda_{\max}$ of $Aa=\lambda a$ and normalizing W':

$$W_i=\frac{W_i'}{\sum_{i=1}^{n}W_i'} \tag{1}$$

Get W, which is the desired weight. Calculate the weight of each secondary indicator and the weight of each tertiary indicator under each secondary indicator several times. The weight of each tertiary indicator is multiplied by the weight of the indicator of the second level to which it belongs, that is, the final weight of all the tertiary indicators, $W=[W_1,W_2,\cdots,W_k]$ (k is the number of all the tertiary indicators. $k=14$)

2.2.3 Establishment of evaluation sets

In this paper, we categorize the moral status ratings of economically disadvantaged students in the family into four types of rubric sets $V=\{\text{very good, good, fair, bad}\}$.

2.2.4 Establishment of an evaluation matrix

From each of the indicators, the subject of the determination can be identified by obtaining the set of judgments for the factor: $R=[R_1,R_2,R_3,R_4]$, where R_i represents the degree of belonging of the subject of the determination for the factor corresponding to the i level. Regarding the determination of the degree of belonging, it is divided into the following three cases.

1) Subjective fuzzy evaluation

Subjective fuzzy evaluations include sibling's school attendance X_{13}. Family illness X_{12}. counselor's opinion X_{51}. classroom teacher's opinion X_{52}. class president's and branch secretary's opinion X_{53}. Since there are strong supervisory factors in determining the multiplicative degree of this category, a statistical method was used to determine its degree of genus. Specifically, n reviewers $\{M_1,M_2,\cdots,M_n\}$ of the panel are evaluated, where Mi is the ith reviewer. If c_1, c_2, c_3, and c_4 of the n reviewers consider that the factor should be rated as very good, good, fair, or bad, then the affiliation of the factor as very good, good, fair, or bad will be c_1/n, c_2/n, c_3/n, and c_4/n, respectively.

2) Non-evaluation

The evaluation of right and wrong includes living in remote mountainous areas X_{54}. Children of martyrs X_{16}. with disabilities X_{22}. orphans X_{15}. for the evaluation of right and wrong, the result of its determination is determined, then it is considered:

$$\begin{cases} \textit{The result is "yes", then the affiliation is } \{1,\ 0,\ 0\} \\ \textit{The result is "No", then the affiliation is } \{0,\ 0,\ 1\} \end{cases} \tag{2}$$

3) Numerical evaluation

Numerical evaluation includes: per capita annual income of family X_{11} grade X_{21} tuition fee X_{31}. accommodation fee X_{12}. textbook fee X_{33}: national student loan situation X_{11}. work-study situation X_{12}. scholarship factor X_{13}.

First, based on the data, the standard amount of numerical evaluation factors very good, good, average and bad is counted. Then, find the degree of affiliation according to the following function.

$$f_1(X_i) = \begin{cases} 1 & X_i \le S_1 \\ 1 - \dfrac{S_2 - X_i}{S_2 - S_1} & S_1 < X_i < S_2 \\ 0 & X_i \ge S_2 \end{cases} \tag{3}$$

$$f_2(X_i) = \begin{cases} 0 & X_i \le S_1, X_i \ge S_3 \\ \dfrac{X_i - S_1}{S_2 - S_1} & S_1 < X_i < S_2 \\ 1 - \dfrac{X_i - S_2}{S_3 - S_2} & S_2 < X_i < S_3 \\ 1 & X_i = S_2 \end{cases} \tag{4}$$

$$f_3(X_i) = \begin{cases} 0 & X_i \le S_2 \\ \dfrac{X_i - S_2}{S_3 - S_2} & S_2 < X_i < S_3 \\ 1 & X_i \ge S_3 \end{cases} \tag{5}$$

Where, $f_1(X_i)$, $f_2(X_i)$, $f_3(X_i)$, $f_4(x_i)$ represent the affiliation degree of the i th factor to very good, good, average, and bad respectively, S_1, S_2, S_3, S_4 are the standard values of the evaluation level of very good, good, average, and bad respectively. After the affiliation degree of all factors is determined, the evaluation matrix of the third-level indicators can be obtained:

$$R = \left[R_1, R_2, \cdots, R_k\right]^{\mathrm{T}} \tag{6}$$

2.2.5 Comprehensive evaluation

Multiplying the weight matrix U with the evaluation matrix R of the third-level indicators to form a fuzzy comprehensive evaluation matrix, i.e.

$$E = X \cdot R = \left[b_1, b_2, b_3, b_4\right] \tag{7}$$

According to the principle of maximum affiliation, the final rating of this identified object is assessed as:

If $\max\{b_1, b_2, b_3, b_4\} = b1$, it is very good.

If $\max\{b_1, b_2, b_3, b_4\} = b2$, it is good.

If $\max\{b_1, b_2, b_3, b_4\} = b3$, it is fair.

If $\max\{b_1, b_2, b_3, b_4\} = b4$, it is bad.

2.3 Integration Mechanism of Optimization Model Design of Bursary System and Civic and Political Education

Colleges and universities should construct national scholarships to realize the function of the human education mechanism, both inside and outside of joint efforts, both virtual and real. Inside, we should improve the financial aid system and focus on the financial aid work of seeking and serving the needs of the community [31]. Externally, we should cooperate with campus culture construction and other educational functions. Virtually, to ensure that the national scholarship assessment-related staff can accurately grasp the target positioning of college scholarship funding and to promote unified thinking and understanding. Real, to strengthen the evaluation and distribution of college scholarships, grants, and other financial assistance work in all aspects of the grasp. Strengthen the evaluation and issuance of college scholarships and grasp the various links in the work of financial assistance.

The construction of the mechanism for the realization of the functions of national scholarships in colleges and universities to form internal and external synergies and to grasp the real and the virtual is based on the characteristics of the development of the work of nurturing students in colleges and universities and the summary of the current situation of financial aid management in many colleges and universities and their practical experience.

To further explore the realization of scholarships in the work of student education is the requirement of the national medium- and long-term education reform and development program, and also the requirement of reflecting the principle of educating people, promoting education equity, comprehensively improving the quality of student training, and doing a good job of education to the satisfaction of the people. At the time of the national comprehensive realization of the reform of the student education investment mechanism, to further explore the evaluation of awards and grants as a grip, give full play to its function in its work of educating people, but also conducive to create a new situation of financial aid management in colleges and universities [32].

3 Results and discussion

3.1 Case Study Background

Scholarship rating is an important part of optimizing the college scholarship system. To be able to comprehensively, objectively, and fairly assess the students' scholarship level so as to better carry out the work of ideological education. In this section, based on the perspective of college financial aid and human resource development strategy, we now take Zhang as an example of a college student, using the fuzzy comprehensive evaluation-based grant system optimization model proposed in this

paper, according to the existing evaluation factors, financial aid workers to effectively assess the applicant.

3.2 Construction of the index system for grading students' moral education status

First of all, such a complex problem as the assessment of college grants is decomposed into components of multiple elements, grouped on the basis of the basic conditions of the application, with the help of which these elements are decomposed into a number of groups in accordance with certain categories, forming different hierarchical structures. The elements of the same level as a guideline, while affecting the elements of the next level, are also affected by the previous level, and this top-down influence relationship.

A preferred hierarchy is formed. We select indicators that can directly address the specific situation of individual students and families when assessing the bursary level. This section summarizes the index system for evaluating scholarships in colleges and universities, in combination with the integration mechanism for Civic and Political Education. The evaluation index system of students' moral education status is divided into the target level, the first level evaluation index level and the second level evaluation index level.X_1 is the family factor, X_2 is the student's factor, X_3 is the college factor, X_4 is the financial aid policy factor, and X_5 is the factor identified by teachers and students. The specific performance is as follows:

FAMILY FACTORS $X_1 = \{$ X_{11}: Annual per capita household income. X_{12}: Illness of family members. X_{13}: School attendance of siblings. X_{14}: Family lives in remote mountainous areas. X_{15}: Single parent\orphan. X_{16}: Martyr's children$\}$.

X_{11} Annual per capita income of the family, i.e.:

$$X_{11} = \frac{Annual\ household\ income}{Number\ of\ families} \tag{8}$$

X_{12}. Family members' illnesses: 4 categories based on the cost of the illness and the impact of the illness on the patient's ability to work: healthy, general illness, more serious illness, and serious illness.

X_{13} Siblings' schooling: 4 categories based on the cost of different education: no schooling, 9-year compulsory education, high school, junior college, vocational high school. College, university, and above.

Students' factors $X_2 = \{$ X_{21}: grade level. X_{22}: Having a disability$\}$. The higher the grade the student is in, the more independent he/she is and the more he/she is able to reduce the burden of the family. Therefore, the grade of the student is inversely proportional to the financial assistance he/she receives, i.e.:

$$X = \frac{Years\ of\ schooling\ Student's\ grade\ level}{Number\ of\ years\ of\ schooling} \tag{9}$$

Higher Education Factors $X_3 = \{$ X_{31}: Tuition. X_{32}: Accommodation fees. X_{33}: Textbook fee$\}$

Financial Aid Policy Factors $X_4 = \{$ X_{41}: National Student Loan Status. X_{42}: Work-study situation. X_{43}: Scholarship factor$\}$

Faculty and Student Determination Factor $X_5 = \{$ X_{51}: Counselor's Opinion. X_{52}: Opinion of class teacher. X_{53}: Opinion of class teacher and branch secretary$\}$ Teachers of the Youth League Committee, class teachers, class leaders, and supporters rate the student's consumption level in school by giving him/her a score. The evaluation includes the student's clothing, food, and living supplies spending. The bursary grade evaluation index system is shown in Table 2.

Table 2. Financial aid rating system

Target layer	Primary evaluation index	Secondary evaluation index
Grant rating (X)	Family factor (X_1)	Household income per capita (X_{11})
		Family illness (X_{12})
		Sisters and sisters (X_{13})
		Living in a remote mountain area (X_{14})
		orphans (X_{15})
		martyr (X_{16})
	Student factor (X_2)	grade (X_{21})
		disability (X_{22})
	College factor (X_3)	tuition (X_{31})
		Accommodation fee (X_{32})
		Cost of materials (X_{33})
	Funding policy factors (X_4)	State student loan situation (X_{41})
		Service journalism (X_{42})
		Scholarship factor (X_{43})
	Teachers and students identify factors (X_5)	Counselor opinion (X_{51})
		Teacher's opinion (X_{52})
		Monitor, group support (X_{53})

3.3 Calculation of indicator weights

Based on the existing indicators, the actual situation of the university was gathered, and the weights of the indicators were determined. The integration weights are shown in Table 3.

Table 3. Integrated weight

Target layer	Primary evaluation index	Primary index weight	Secondary evaluation index	Secondary index weight	Relative weight
X	X_1	0.3	X_{11}	0.02	0.07
			X_{12}	0.03	0.10
			X_{13}	0.03	0.10
			X_{14}	0.08	0.27
			X_{15}	0.12	0.40
			X_{16}	0.02	0.07
	X_2	0.1	X_{21}	0.08	0.8
			X_{22}	0.02	0.2
	X_3	0.15	X_{31}	0.03	0.20
			X_{32}	0.02	0.13
			X_{33}	0.1	0.67
	X_4	0.25	X_{41}	0.08	0.32
			X_{42}	0.12	0.48
			X_{43}	0.05	0.20
	X_5	0.2	X_{51}	0.04	0.20
			X_{52}	0.04	0.20
			X_{53}	0.12	0.60

In summary, the weight vector corresponding to the level 1 indicator is:

X= (0.3,0.1,0.15,0.25,0.2)

The vector of relative weights corresponding to the secondary indicators is:

X_1= (0.07,0.10,0.10,0.27,0.40,0.07)

X_2= (0.8,0.2)

X_3= (0.20,0.13,0.67)

X_4= (0.32,0.48,0.20)

X_5= (0.20,0.20,0.60)

3.4 Determination of the rubric set

Considering the objectivity and fairness of the index evaluation level, we define the evaluation factor set as X={family factor, student's factor, university factor, funding policy factor, teacher-student identification factor}. Define the evaluation set as V={Good, Good, Fair, Bad}. The results of all the evaluation indicators of the bursary rating are shown in Table 4. The moral education status of the participating students was evaluated by teachers, student leaders, and student representatives. Through the evaluation data statistics, the evaluation membership degree of the student's moral education status can be obtained.

Table 4. Evaluation grade

Index Set	Evaluation Grade			
	very well	preferably	general	bad
X_{11}	0.48	0.29	0.18	0.05
X_{12}	0.46	0.35	0.16	0.03
X_{13}	0.56	0.27	0.17	0
X_{14}	0.64	0.25	0.11	0
X_{15}	0.47	0.38	0.15	0
X_{16}	0.57	0.36	0.05	0.02
X_{21}	0.53	0.28	0.15	0.04
X_{22}	0.61	0.29	0.1	0
X_{31}	0.59	0.38	0.03	0
X_{32}	0.46	0.25	0.28	0.01
X_{33}	0.50	0.39	0.11	0
X_{41}	0.62	0.35	0.03	0
X_{42}	0.55	0.32	0.1	0.03
X_{43}	0.48	0.25	0.25	0.02
X_{51}	0.55	0.39	0.06	0
X_{52}	0.48	0.34	0.15	0.03
X_{53}	0.52	0.28	0.18	0.02

The fuzzy matrix is obtained from above:

$$E_1=X_1\cdot R_1=(0.07,0.10,0.10,0.27,0.40,0.07)\cdot\begin{bmatrix}0.48 & 0.29 & 0.18 & 0.05\\ 0.46 & 0.35 & 0.16 & 0.03\\ 0.56 & 0.27 & 0.17 & 0\\ 0.64 & 0.25 & 0.11 & 0\\ 0.47 & 0.38 & 0.15 & 0\\ 0.57 & 0.36 & 0.05 & 0.02\end{bmatrix}=(0.536,0.327,0.139,0.008)$$

$$E_2=X_2\cdot R_2=(0.8,0.2)\cdot\begin{bmatrix}0.53 & 0.28 & 0.15 & 0.04\\ 0.61 & 0.29 & 0.10 & 0\end{bmatrix}=(0.55,0.28.0.14,0.03)$$

$$E_3=X_3\cdot R_3=(0.20,0.13,0.67)\cdot\begin{bmatrix}0.59 & 0.38 & 0.03 & 0\\ 0.46 & 0.25 & 0.28 & 0.01\\ 0.50 & 0.39 & 0.11 & 0\end{bmatrix}=(0.513,0.370,0.116,0.001)$$

$$E_4=X_4\cdot R_4=(0.32,0.48,0.20)\cdot\begin{bmatrix}0.62 & 0.35 & 0.03 & 0\\ 0.55 & 0.32 & 0.1 & 0.03\\ 0.48 & 0.25 & 0.25 & 0.02\end{bmatrix}=(0.558,0.316,0.108,0.018)$$

$$E_5=X_5\cdot R_5=(0.20,0.20,0.60)\cdot\begin{bmatrix}0.55 & 0.39 & 0.06 & 0\\ 0.48 & 0.34 & 0.15 & 0.03\\ 0.52 & 0.28 & 0.18 & 0.02\end{bmatrix}=(0.518,0.314,0.150,0.018)$$

Composite value calculation:

$$E_{total}=X_{total}\cdot R_{total}=(0.3,0.1,0.15,0.25,0.2)\cdot\begin{bmatrix}0.536 & 0.327 & 0.139 & 0.008\\ 0.55 & 0.28 & 0.14 & 0.03\\ 0.513 & 0.370 & 0.116 & 0.001\\ 0.558 & 0.316 & 0.108 & 0.018\\ 0.518 & 0.314 & 0.150 & 0.018\end{bmatrix}=(0.536,0.323,0.130,0.014)$$

From the calculation results, the four values of (0.536,0.323,0.130,0.014) correspond to Zhang's comprehensive evaluation affiliation. Further analysis of the data leads to the conclusion that Zhang's moral status is very good, which qualifies him to receive financial aid. This example demonstrates the model's strong operability and guiding significance in financial aid practice.

4 Conclusion

The evaluation of college grants is rich in content, integrating student management, ideological education and school spirit construction, so the evaluation of college grants is a multi-level and multi-factor comprehensive evaluation problem combining quantitative and qualitative. In this paper, according to the basic steps of the fuzzy comprehensive evaluation method, the evaluation model of college grants based on the fuzzy comprehensive evaluation method is established so as to further optimize the college grant system. Through the optimization model of the scholarship system constructed in this paper, it can be obtained that the affiliation function matrix is E1= (0.536,0.327,0.139,0.008), E2= (0.55,0.28.0.14,0.03), E3= (0.513,0.370,0.116,0.001), E_4= (0.558,0.316, 0.108,0.018), E_5= (0.518,0.314,0.150,0.018). The total affiliation was determined to be (0.536,0.323,0.130,0.014).

In summary, the application of the fuzzy comprehensive evaluation method in the evaluation of scholarship level can largely overcome the subjective bias of the selectors, and the final result is more objective and fair, which is a better selection method.

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