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Integration of School Leaders and Student Preferences in Determining the Best Teachers

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Abstract

This research integrates the preferences of school leaders and students in assessing teacher performance using the Multi-Objective Optimization on the Basis of Ratio Analysis (MOORA) and Multi-Attributive Border Approximation Area Comparison (MABAC) methods. Conducted at SMK YADIKA 5, this quantitative study evaluated teacher performance based on various criteria, including attendance, teaching innovation, leadership, pedagogical skills, and personality. Data collection involved questionnaires for students and school leaders, interviews for deeper insights, and documentation such as attendance records and academic reports to support the evaluation. The MOORA method facilitated decision matrix normalization, criteria weighting, and optimization score calculation, while the MABAC method analyzed alternatives by measuring their distances from ideal and anti-ideal solutions. Both methods consistently identified teacher A7 as the top performer, showcasing their effectiveness in providing objective, fair, and transparent evaluations. The results highlight the practicality of these methods in educational settings to enhance teacher motivation and improve overall teaching quality. This study contributes to advancing performance evaluation frameworks in schools by integrating diverse preferences and offering actionable recommendations. Future research could expand this approach by including additional stakeholders, such as parents or administrative staff, or applying these methods to different educational institutions to further validate and refine the framework for broader use.

Keywords: *MABAC; MOORA; Multi-criteria; Teacher Performance Assessment*

1. Introduction

The quality of education is influenced by all components in education and the most determining and important component is the teacher[1]. Educators are individuals or groups who strive to encourage and influence the development of others (students) to achieve their full potential and reach the peak of progress[2]. Amid the continuous advancement of education, the role of teachers as educators has become increasingly diverse. They are not only sources of knowledge but also companions who guide students throughout the learning process [3], In schools, teachers' roles extend beyond providing instructions, teaching, training, and evaluation[4][5], they also serve as mentors and sources of inspiration for students. Teachers must have formal qualifications[6], teacher competency standards are a measure of getting good and professional educators[7].

Policies in the world of education require teachers to immediately adapt to the policies themselves[8]. Teacher performance can be influenced by various factors[9]. In this context, evaluating teacher performance allows for an objective assessment[10], reducing subjectivity and human error in the evaluation process [11]. Teacher assessment is a crucial aspect of improving the quality of education.

Currently, many educational institutions, including SMK YADIKA 5, lack an adequate reward system for teachers who demonstrate exceptional performance. The absence of incentives and formal recognition can diminish teachers' motivation to continuously improve their teaching quality. Recognizing outstanding teachers is crucial not only to boost their motivation but also to elevate educational standards. Therefore, a comprehensive and objective teacher performance assessment is needed to identify the best teachers deserving of recognition.

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In this study, we aim to integrate the preferences of both school leaders and students using the MOORA and MABAC methods. These methods were chosen for their ability to address complex multi-criteria decision-making problems. The Multi-Objective Optimization on the Basis of Ratio Analysis (MOORA) method allows for multi-objective evaluations that can help determine the best teacher from various perspectives. Meanwhile, the Multi-Attributive Border Approximation Area Comparison (MABAC) method offers a more comprehensive evaluation by considering the distances from both ideal and anti-ideal solutions.

The MABAC method was employed in performance evaluations based on five criteria: work quality, punctuality, initiative, teamwork, integrity, and skill improvement, resulting in recommendations for employees with the best performance[12]. Additionally, the application of the MOORA method in selecting outstanding students, involving complex mathematical calculations, has made the selection process more objective, transparent, and fair [13].

Research on determining the best teachers has been conducted using various methods, including Analytic Hierarchy Process (AHP)[14], Technique for Order of Preference by Similarity to Ideal Solution (TOPSIS)[15], Profile Maching [16], Weighted Aggregated Sum Product Assesment (WASPAS)[17], Additive Ratio Assessment (ARAS)[18], and Simple Additive Weighting (SAW)[19][20]. However, these studies typically focus on only one preference. Research that integrates the preferences of both school leaders and students using the MOORA and MABAC methods has not yet been undertaken. This study offers a novel approach to teacher evaluation, providing a more holistic and accurate framework and contributing practically to the development of performance assessment systems in educational institutions. Moreover, with more objective and comprehensive evaluations from two different preferences, institutions can identify the best teachers deserving of recognition, thereby motivating other teachers to enhance their performance.

This research will produce a model for determining the best teachers, and aims to develop an objective, fair and transparent teacher performance assessment system by integrating the preferences of school leaders and students through the application of the Multi-Objective Optimization on the Basis of Ratio Analysis (MOORA) and Multi -Attributive Border Approximation Area Comparison (MABAC).

2. Methods

This research adopts a quantitative approach utilizing the Multi-Objective Optimization on the Basis of Ratio Analysis (MOORA) and Multi-Attributive Border Approximation Area Comparison (MABAC) methods. These methods are employed to conduct multi-criteria evaluations that integrate the perspectives of school leaders and students in determining the best teacher. The study was conducted as a case study at SMK YADIKA 5.

The research location is SMK YADIKA 5, situated in South Tangerang City. The study subjects include teachers, students, and school leaders. Teachers were evaluated based on predetermined criteria, while students and school leaders provided assessments using specially designed instruments.

2.1. Data Collection Techniques

Data were collected using the following techniques:

a. Questionnaire

Questionnaires were distributed to students and school leaders. These instruments were designed to measure criteria such as attendance, teaching innovation, leadership, and pedagogical aspects.

b. Interview

Interviews were conducted to gain deeper insights into the preferences of students and school leaders regarding teacher performance.

c. Documentation

Additional data were obtained from official school documents, such as teacher attendance reports and student performance results, to support the evaluation outcomes.

d. Literature Review

Relevant literature on the MOORA and MABAC methods, as well as performance evaluation, was utilized to strengthen the theoretical foundation of the research.

2.2. Research Procedures

The research was conducted through the following stages:

1. Formulation of Assessment Criteria

The criteria were established based on a literature review and preliminary interviews with the school. These criteria encompassed two preference categories:

a. School Leader Preference Variables:
   1) Attendance and Punctuality
   2) Student Academic Achievement
   3) Professional Development
   4) Ethics and Integrity

5) Leadership
6) Innovation in Teaching
7) Involvement in School Activities
8) Time Management

b. Student Preference Variables:
1) Pedagogical Aspect
2) Professional Aspect
3) Personality Aspect
4) Social Aspect

2.Data Collection

Respondents were asked to complete a questionnaire based on the predetermined criteria. The data collected from the questionnaires were compiled and formatted into a decision matrix.

$$x = \begin{vmatrix} x11 & x21 & x31 \\ x12 & x22 & x32 \\ x13 & x23 & x33 \end{vmatrix} \quad (1)$$

3.Data Analysis Using MOORA and MABAC Methods

a. Multi-Objective Optimization on the Basis of Ratio Analysis (MOORA) Method

1) Decision Matrix Normalization

$$r_{ij} = \frac{x_{ij}}{\sqrt{\sum_{i=1}^{n} x_{ij}^2}} \quad (2)$$

The normalization process converts raw data into a comparable scale. Here, rij represents the normalized value for alternative i on criterion j.

2) Multiplication by Criteria Weights

Each normalized value is multiplied by the corresponding weight of the criterion, reflecting the relative importance of that criterion.

3) Optimization Score Calculation

For "benefit" criteria, values are summed, while for "cost" criteria, values are subtracted. The final score is calculated using the formula:

$$Y_i = \sum_{j \in \text{Benefit}} (w_j \cdot r_{ij}) - \sum_{j \in \text{Cost}} (w_j \cdot r_{ij}) \quad (3)$$

4) Ranking Alternatives

Alternatives are ranked based on their Yi values. The alternative with the highest Yi score is ranked first, indicating the best performance.

b. Multi-Attributive Border Approximation Area Comparison (MABAC) Method

1) Normalization of Initial Decision Matrix Elements (X)

Normalization is performed to convert raw data into a uniform scale, ensuring comparability across all criteria. Two formulas are used depending on the type of criterion:

Benefit Criteria (the larger the value, the better):

$$r_{ij} = \frac{x_{ij} - \min(x_j)}{\max(x_j) - \min(x_j)} \quad (4)$$

Cost Criteria (the smaller the value, the better):

$$r_{ij} = \frac{\max(x_j) - x_{ij}}{\max(x_j) - \min(x_j)} \quad (5)$$

2) Calculation of Weighted Matrix Elements (V)

After normalization, each element in the matrix is multiplied by its corresponding criterion weight, indicating the importance of that criterion:

$$v_{ij} = r_{ij} \cdot w_j \quad (6)$$

3) Determination of Border Approximation Area Matrix (G)

The border approximation area matrix is calculated as the average value of each criterion across all alternatives:

$$G_j = \frac{\sum_{i=1}^{n} v_{ij}}{n} \quad (7)$$

4) Calculation of Distance Elements from the Border Approximation Area Matrix (Q)
The distance of each alternative from the border approximation area is calculated as:

$$Q_i = \sum_{j=1}^{m} (v_{ij} - G_j) \quad (8)$$

5) Ranking of Alternatives
Alternatives are ranked based on their Qi values. The alternative with the highest Qi is considered the best, as it is closest to the ideal solution.

4.Interpretation and Conclusion
The results of the analysis using the MOORA and MABAC methods provide a comprehensive evaluation of teacher performance, enabling the recommendation of the best teacher to receive the award.

3. Result and Discussion

This study employed a quantitative approach using the MOORA and MABAC methods to evaluate teacher performance at SMK YADIKA 5 based on the perspectives of school leaders and students. The following are the analysis results based on these methods:

3.1. Evaluation Criteria

The study utilized criteria derived from two main preferences: those of school leaders and students. Each criterion is provided with a code, weight, and type. The details of these criteria are presented in the following Table 1.

Table 1. Assessment criteria

Criteria Code	Criteria	Weight	Type
C1	**School Leader Preference Variables**		
C1.1	Presence and Punctuality	0,09	Benefits
C1.2	Student Academic Achievement	0,07	Benefits
C1.3	Professional Development	0,05	Benefits
C1.4	Ethics and Integrity	0,07	Benefits
C1.5	Leadership	0,05	Benefits
C1.6	Innovation in Teaching	0,11	Benefits
C1.7	Involvement in School Activities	0,09	Benefits
C1.8	Time Management	0,11	Benefits
C2	**Student Preference Variables**		
C2.1	Pedagogical Aspect	0,11	Benefits
C2.2	Professional Aspect	0,09	Benefits
C2.3	Personality Aspects	0,09	Benefits
C2.4	Social Aspects	0,07	Benefits

The Table 1 presents the evaluation criteria used in the study to assess teacher performance. These criteria are divided into two main groups: school leader preferences and student preferences. Each criterion is assigned a weight based on its level of importance. This evaluation aims to ensure an objective, fair, and comprehensive assessment in determining the best teacher.

3.2. Decision Matrix

The Decision Matrix presents the initial data obtained from the teacher performance evaluations based on the established criteria. Each row in the table represents an alternative (evaluated teacher), while each column reflects the performance value for each criterion. These values are the averages derived from the assessments of school leaders and students. Decision Matrix based on equation (1), shown in Table 2.

Table 2. Decision Matrix

Alternative	Criteria Code											
	C1.1	C1.2	C1.3	C1.4	C1.5	C1.6	C1.7	C1.8	C2.1	C2.2	C2.3	C2.4
A1	3,83	4,24	3,55	3,83	4,03	4,31	3,75	3,83	4,03	3,49	3,77	3,98

A2	4,20	3,97	3,82	4,31	4,03	4,05	4,12	4,35	3,73	3,77	3,87	3,75
A3	3,08	3,50	3,06	3,49	3,73	3,46	3,51	3,44	3,19	3,53	3,22	3,63
A4	3,12	3,43	3,42	3,77	3,60	3,14	3,08	3,74	3,47	3,13	3,11	3,91
A5	3,85	4,11	3,96	3,65	4,47	4,18	3,52	4,20	3,90	3,60	4,34	3,99
A6	4,17	4,30	4,04	4,01	4,31	3,64	3,85	3,71	3,83	3,67	4,17	4,02
A7	3,82	4,01	4,33	4,34	3,71	4,49	3,97	3,80	4,18	3,62	4,32	4,20
A8	3,48	4,24	4,30	4,17	3,66	3,44	3,80	3,60	4,38	3,77	4,33	4,18
A9	4,04	4,49	3,92	4,11	4,48	3,84	4,03	4,34	3,63	3,99	4,11	3,44
A10	4,33	3,59	3,94	3,34	3,81	3,92	4,03	4,49	4,44	4,13	4,17	3,77

3.3. Results of the MOORA Method Analysis

The MOORA method was employed to identify the best teacher based on the normalized Decision Matrix.

1. Decision Matrix Normalization

The normalization of the Decision Matrix was conducted to convert the initial data into a uniform scale, allowing for comparability across all criteria. Normalized results are calculated using equation (2), and the results are presented in table 3.

Table 3. Decision Matrix Normalization

Alternative	Criteria Code											
	C1.1	C1.2	C1.3	C1.4	C1.5	C1.6	C1.7	C1.8	C2.1	C2.2	C2.3	C2.4
A1	0,028	0,029	0,025	0,027	0,027	0,032	0,028	0,026	0,029	0,028	0,026	0,028
A2	0,031	0,027	0,027	0,030	0,027	0,030	0,031	0,030	0,027	0,030	0,026	0,027
A3	0,023	0,024	0,022	0,024	0,025	0,026	0,027	0,023	0,023	0,028	0,022	0,026
A4	0,023	0,023	0,025	0,027	0,024	0,023	0,023	0,026	0,025	0,025	0,021	0,028
A5	0,029	0,028	0,028	0,026	0,030	0,031	0,027	0,029	0,028	0,028	0,030	0,029
A6	0,031	0,029	0,029	0,028	0,029	0,027	0,029	0,025	0,027	0,029	0,028	0,029
A7	0,028	0,027	0,031	0,030	0,025	0,033	0,030	0,026	0,030	0,029	0,029	0,030
A8	0,026	0,029	0,031	0,029	0,025	0,025	0,029	0,025	0,031	0,030	0,030	0,030
A9	0,030	0,031	0,028	0,029	0,030	0,028	0,030	0,030	0,026	0,031	0,028	0,025
A10	0,032	0,025	0,028	0,023	0,026	0,029	0,030	0,031	0,032	0,033	0,028	0,027

2. Multiplying by Criteria Weights

After the normalization process of the Decision Matrix, the next step is to multiply the normalized values by the predetermined weights assigned to each criterion. This step reflects the relative importance of each criterion in the evaluation process.

Table 4. Multiplying by Criteria Weights Result

Alternative	Criteria Code											
	C1.1	C1.2	C1.3	C1.4	C1.5	C1.6	C1.7	C1.8	C2.1	C2.2	C2.3	C2.4
A1	0,0026	0,0020	0,0012	0,0018	0,0012	0,0036	0,0026	0,0030	0,0033	0,0025	0,0023	0,0019
A2	0,0028	0,0018	0,0012	0,0021	0,0012	0,0034	0,0028	0,0034	0,0030	0,0027	0,0024	0,0018
A3	0,0021	0,0016	0,0010	0,0017	0,0012	0,0029	0,0024	0,0027	0,0026	0,0025	0,0020	0,0018
A4	0,0021	0,0016	0,0011	0,0018	0,0011	0,0026	0,0021	0,0029	0,0028	0,0022	0,0019	0,0019
A5	0,0026	0,0019	0,0013	0,0017	0,0014	0,0035	0,0024	0,0033	0,0032	0,0026	0,0027	0,0019
A6	0,0028	0,0020	0,0013	0,0019	0,0013	0,0031	0,0026	0,0029	0,0031	0,0026	0,0026	0,0020
A7	0,0026	0,0019	0,0014	0,0021	0,0011	0,0038	0,0027	0,0030	0,0034	0,0026	0,0027	0,0020
A8	0,0024	0,0020	0,0014	0,0020	0,0011	0,0029	0,0026	0,0028	0,0036	0,0027	0,0027	0,0020
A9	0,0027	0,0021	0,0013	0,0020	0,0014	0,0032	0,0028	0,0034	0,0030	0,0029	0,0025	0,0017
A10	0,0029	0,0017	0,0013	0,0016	0,0012	0,0033	0,0028	0,0035	0,0036	0,0030	0,0026	0,0018

3. Calculating the Optimization Score

The next analysis step is to calculate the optimization score for each alternative based on normalized and weighted criteria. This calculation combines all criteria values to determine the overall performance of each alternative. calculated using equation (3), and the results are shown in table 5.

Table 5. Optimization Score

Alternative	Maximum	Minimum	YI(Max-Min)
A1	0,0280	0,0000	0,0280

A2	0,0288	0,0000	0,0288
A3	0,0244	0,0000	0,0244
A4	0,0243	0,0000	0,0243
A5	0,0285	0,0000	0,0285
A6	0,0283	0,0000	0,0283
A7	0,0292	0,0000	0,0292
A8	0,0281	0,0000	0,0281
A9	0,0288	0,0000	0,0288
A10	0,0292	0,0000	0,0292

4. Ranking the Alternatives

Rankings are assigned based on the Yi values, ordered from the highest to the lowest. The results of the ranking are displayed in the table 6, indicating the best-performing alternative at the top position.

Table 6. Ranking results

Alternative	Yi	Ranking
A1	0,0280	8
A2	0,0288	4
A3	0,0244	9
A4	0,0243	10
A5	0,0285	5
A6	0,0283	6
A7	0,0292	1
A8	0,0281	7
A9	0,0288	3
A10	0,0292	2

The MOORA method objectively generates alternative rankings by considering the relevant criteria. Alternative A7 consistently demonstrates the best performance across various perspectives

3.4. Results of the MABAC Method Analysis

1. Normalization of Initial Decision Matrix Elements (X)

Identify the maximum (Max) and minimum (Min) values for each criterion across all alternatives. This step ensures the transformation of raw data into a comparable scale, which is essential for further analysis.

Table 7. Maximum (Max) and Minimum (Min) Values

	C1.1	C1.2	C1.3	C1.4	C1.5	C1.6	C1.7	C1.8	C2.1	C2.2	C2.3	C2.4
Max	4,333	4,495	4,333	4,339	4,479	4,495	4,124	4,495	4,441	4,135	4,339	4,199
Min	3,083	3,426	3,062	3,339	3,596	3,140	3,076	3,438	3,191	3,129	3,108	3,441

The normalization results for each alternative are based on criteria using equation (4) for all benefit criteria. presented in Table 8.

Table 8. Normalization

Alternative	Criteria Code											
	C1.1	C1.2	C1.3	C1.4	C1.5	C1.6	C1.7	C1.8	C2.1	C2.2	C2.3	C2.4
A1	0,600	0,763	0,386	0,489	0,494	0,861	0,646	0,369	0,672	0,358	0,542	0,710
A2	0,896	0,512	0,598	0,973	0,494	0,670	1,000	0,862	0,427	0,642	0,615	0,405
A3	0,000	0,068	0,000	0,147	0,157	0,238	0,413	0,000	0,000	0,399	0,089	0,244
A4	0,028	0,000	0,280	0,436	0,000	0,000	0,000	0,289	0,226	0,000	0,000	0,618
A5	0,613	0,643	0,709	0,307	0,994	0,770	0,420	0,720	0,566	0,471	1,000	0,724
A6	0,867	0,814	0,771	0,667	0,811	0,369	0,738	0,262	0,513	0,540	0,865	0,766
A7	0,591	0,542	1,000	1,000	0,129	1,000	0,851	0,344	0,789	0,487	0,987	1,000
A8	0,321	0,763	0,975	0,828	0,074	0,219	0,692	0,151	0,948	0,642	0,991	0,972
A9	0,763	1,000	0,675	0,775	1,000	0,520	0,907	0,852	0,355	0,861	0,813	0,000
A10	1,000	0,156	0,688	0,000	0,239	0,576	0,912	1,000	1,000	1,000	0,860	0,440

2. Calculation of Weighted Matrix Elements (V)

The weighted matrix element (V) is obtained by multiplying the normalized value of each criterion by the weight of the corresponding criterion according to equation (6). This process takes into account the relative importance (priority) of each criterion in the evaluation process. The results are shown in Table 9.

Table 9. The Weighted Matrix Element

Alternative	Criteria Code											
	C1.1	C1.2	C1.3	C1.4	C1.5	C1.6	C1.7	C1.8	C2.1	C2.2	C2.3	C2.4
A1	0,145	0,120	0,063	0,102	0,068	0,212	0,150	0,156	0,190	0,123	0,140	0,117
A2	0,172	0,103	0,073	0,135	0,068	0,190	0,182	0,212	0,162	0,149	0,147	0,096
A3	0,091	0,073	0,045	0,078	0,053	0,141	0,128	0,114	0,114	0,127	0,099	0,085
A4	0,093	0,068	0,058	0,098	0,045	0,114	0,091	0,146	0,139	0,091	0,091	0,110
A5	0,147	0,112	0,078	0,089	0,091	0,201	0,129	0,195	0,178	0,134	0,182	0,118
A6	0,170	0,124	0,081	0,114	0,082	0,156	0,158	0,143	0,172	0,140	0,170	0,120
A7	0,145	0,105	0,091	0,136	0,051	0,227	0,168	0,153	0,203	0,135	0,181	0,136
A8	0,120	0,120	0,090	0,125	0,049	0,138	0,154	0,131	0,221	0,149	0,181	0,134
A9	0,160	0,136	0,076	0,121	0,091	0,173	0,173	0,210	0,154	0,169	0,165	0,068
A10	0,182	0,079	0,077	0,068	0,056	0,179	0,174	0,227	0,227	0,182	0,169	0,098

3. Determination of the Border Approximation Area Matrix (G)

Matrix G is used as a reference to calculate the distance of each alternative to the ideal and anti-ideal areas based on equation 7. This is obtained as the average value of each criterion across all alternatives.

Table 10. Border Approximation Area Matrix

G	C1.1	C1.2	C1.3	C1.4	C1.5	C1.6	C1.7	C1.8	C2.1	C2.2	C2.3	C2.4
	0,139	0,101	0,072	0,104	0,063	0,169	0,148	0,165	0,173	0,138	0,148	0,106

4. Calculation of Distance Elements from the Border Approximation Area Matrix (Q)

The calculation results reflect the difference between the weighted value (V) of each alternative and the average value of the matrix (G) based on equation 8. These results are used to determine the ranking of alternatives based on their distance value, with a closer distance indicating better performance compared to the solution ideal. The results are shown in Table 11.

Table 11. Calculation Results of Element Distances from the Border Approach Area Matrix

Alternative	Criteria Code											
	C1.1	C1.2	C1.3	C1.4	C1.5	C1.6	C1.7	C1.8	C2.1	C2.2	C2.3	C2.4
A1	0,006	0,019	-0,009	-0,002	0,004	0,042	0,002	-0,009	0,017	-0,014	-0,008	0,010
A2	0,033	0,002	0,001	0,031	0,004	0,020	0,034	0,047	-0,010	0,011	-0,002	-0,010
A3	-0,048	-0,029	-0,026	-0,026	-0,011	-0,029	-0,020	-0,051	-0,059	-0,011	-0,049	-0,021
A4	-0,045	-0,033	-0,014	-0,006	-0,018	-0,056	-0,057	-0,018	-0,033	-0,047	-0,058	0,004
A5	0,008	0,011	0,006	-0,015	0,027	0,032	-0,019	0,031	0,005	-0,004	0,033	0,011
A6	0,031	0,022	0,009	0,010	0,019	-0,014	0,010	-0,021	-0,001	0,002	0,021	0,014
A7	0,006	0,004	0,019	0,032	-0,012	0,058	0,020	-0,012	0,031	-0,003	0,032	0,030
A8	-0,019	0,019	0,018	0,021	-0,015	-0,031	0,006	-0,034	0,049	0,011	0,033	0,028
A9	0,021	0,035	0,004	0,017	0,027	0,003	0,025	0,046	-0,019	0,031	0,016	-0,038
A10	0,043	-0,023	0,005	-0,036	-0,007	0,010	0,026	0,063	0,055	0,044	0,021	-0,008

5. Alternative Ranking

The ranking of alternatives is determined based on the total distance values (Qi) from the Alternative Distance Matrix to the Border Approximation Area. The (Qi) value is calculated by summing all the distance values (qi) for each alternative across all criteria. Alternatives with the highest Qi values are considered the best-performing.

Table 12. Ranking results

Alternative	Score	Ranking
A1	0,058	8
A2	0,161	4
A3	-0,380	9
A4	-0,381	10
A5	0,126	5
A6	0,102	6
A7	0,205	1
A8	0,086	7
A9	0,170	3

A10	0,192	2

The alternative with the highest Qi value, namely A7 with a score of 0.205, is considered the best, as it demonstrates the greatest proximity to the ideal solution. This ranking process aids in objectively and comprehensively determining the most outstanding alternative based on all established criteria.

3.5. Comparison of MOORA and MABAC Results

Table 13. Results of MOORA and MABAC method values

Alternative	MOORA		MABAC	
	Value	Rank	Value	Rank
A1	0,526	8	0,056	8
A2	0,542	4	0,161	4
A3	0,459	10	-0,383	10
A4	0,459	9	-0,374	9
A5	0,536	5	0,124	5
A6	0,532	6	0,101	6
A7	0,550	1	0,205	1
A8	0,530	7	0,086	7
A9	0,543	3	0,171	3
A10	0,549	2	0,192	2

Both methods produced similar rankings, with A7 identified as the best teacher. Minor differences in scores reflect the sensitivity of each method to specific criteria.

3.6. Effectiveness of the MOORA and MABAC Methods

The MOORA method facilitates a straightforward and rapid evaluation process through matrix normalization and optimization score calculation. This method is effective in capturing benefit- and cost-based preferences across various criteria. With this approach, decision-making becomes more transparent as every calculation step is thoroughly documented.

The MABAC method provides a more in-depth approach by considering the distance of each alternative from the ideal and anti-ideal areas. This allows for a more accurate evaluation of teacher performance, especially in scenarios involving numerous diverse criteria. The strength of the MABAC method lies in its ability to identify the contribution of each criterion to the overall score, offering more detailed insights for decision-makers.

In the context of this research, the effectiveness of both methods is demonstrated by the consistency of the results produced. Teacher A7, who consistently ranked first in both methods, illustrates that this approach is capable of objectively and validly identifying the best teacher.

4. Conclusion

This study integrates the preferences of school leaders and students in determining the best teacher using the Multi-Objective Optimization on the Basis of Ratio Analysis (MOORA) and Multi-Attributive Border Approximation Area Comparison (MABAC) methods. These methods have proven effective in addressing complex multi-criteria decision-making problems. The research findings indicate that the approach employed provides an objective, fair, and comprehensive evaluation of teacher performance. Both the MOORA and MABAC methods consistently produced the same rankings, identifying A7 as the best teacher. These findings make a significant contribution to the development of performance evaluation systems in educational institutions, with the potential to enhance teacher motivation and raise the standards of educational quality. By applying these methods, educational institutions can objectively identify teachers deserving of recognition, thereby not only motivating teachers to improve their performance but also positively impacting the quality of student learning.

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