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Integration of AHP and TOPSIS Methods in Decision Making Models to Identify High Achieving Students

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ABSTRACT

Selection of outstanding students is an essential process in education to ensure that students with high achievements receive appropriate recognition and guidance. However, this process often suffers from subjectivity and the absence of a structured decision-making system. This study aims to develop an objective and accountable decision support model by integrating the Analytic Hierarchy Process (AHP) and Technique for Order Preference by Similarity to Ideal Solution (TOPSIS) methods. The AHP method is used to determine the weight of each selection criterion, while the TOPSIS method is used to rank students based on their proximity to the ideal solution. The study involved 10 student candidates and assessed them based on 6 criteria, including academic performance, discipline, extracurricular activities, and religious values. The results show that the integrated AHP-TOPSIS model successfully identifies students with the highest preference values as the most outstanding, while those with lower values are recommended for further coaching. The model demonstrates its effectiveness in supporting accurate, data-driven student selection at MIMA 37 Sunan Kalijogo Ambulu.

Keywords: Student Achievement, Criteria, AHP, TOPSIS

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INTRODUCTION

Education plays a very important role in the progress and sustainability of a nation. The world of education functions to produce the next generation who have adequate quality to continue the leadership and development of the nation (Rahardiansyah et al., 2022). Education has a very important role in preparing the next generation of the nation to be qualified. At the elementary school level, the selection of outstanding students is one way to recognize and develop the potential of students (Ajiansya & Sari, 2022). Therefore, it is expected that the implementation of good and proper education can produce competent graduates who are ready to face future challenges. Student achievement is an important indicator in measuring the success of the education process in a school institution. This achievement can be in the form of academic achievements such as exam scores, or non-academic achievements such as activeness in extracurricular activities, attitude, and leadership. Therefore, the selection of outstanding students is a routine agenda that not only functions as a form

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of appreciation, but also as motivation for other students to continue to improve their quality. However, the selection process requires a systematic and objective mechanism so that the results can be accepted by all parties fairly and transparently. At MIMA 37 Sunan Kalijogo Ambulu, Jember Regency, the selection of outstanding students has so far been carried out using a conventional approach, which is often subjective. Assessments often only consider aspects of academic value, while other aspects such as attitude, leadership, or activeness in school activities have not received a balanced portion of assessment. This can cause dissatisfaction among students and parents, as well as reduce the level of trust in the selection mechanism implemented by the school (Defa et al., 2022).

One of the main criteria for selecting outstanding students at MIMA 37 Sunan Kalijogo Ambulu is Academic Value, which reflects the level of understanding and ability of students in the subjects studied during a certain period (Muhaimin et al., 2024). In addition, extracurricular values are also an important assessment because they show the extent to which students actively participate in activities outside formal class hours, such as sports, arts, and various interest clubs at school (Nofianti, 2019). Students' attitudes and personalities are also taken into account in the assessment, because good character will support students' success in various fields, both in the school environment and in society. This aspect includes students' discipline, responsibility, cooperation, and personal integrity in living their daily lives (Pohan & Syaimi, 2023). In addition, Attendance and Discipline are important criteria in assessing student achievement, because they show how consistent students are in carrying out their obligations as students, both in terms of attendance in class and punctuality in completing assignments (Susanti & Atmini, 2022). Participation in competitions is also an important indicator in assessing achievement, because it shows that students are able to compete and achieve outside the school environment through various relevant competition events, both at the local, regional and national levels (Saputri et al., 2024). Finally, Religious Activities are one of the assessment criteria that are no less important, because it is expected that students will not only excel in academic and non-academic aspects, but also have a strong spiritual foundation. Religious activities, such as involvement in religious studies, congregational prayers, and reading the Qur'an, are indicators for assessing students' religious character and their contribution to social life at school (Panji, 2023).

To overcome these problems, a decision assistance system is needed that can help schools determine students' achievements objectively and measurably. This system must be able to accommodate various criteria that are relevant to student achievement, and provide ranking results that can be scientifically accounted for. In this context, a multi-criteria approach is very important, considering the many aspects that need to be considered in assessing a student's achievement (Rusito & Widiyanto, 2024). The Analytic Hierarchy Process (AHP) method is an effective decision-making involving multiple criteria method for determining the weight of each criterion based on its level of importance (Rahardiansyah et al., 2022). Meanwhile, the Technique for Order Preference by Similarity to Ideal Solution (TOPSIS) method is able to rank alternatives by measuring their closeness to the ideal solution and the worst solution (Hizham & Nurdiansyah, 2023). The combination of these two methods is believed to produce a more comprehensive, rational, and reliable decision-making model in the process of selecting outstanding students. Thus, this study aims to integrate the AHP and TOPSIS approaches in creating a decision support system for selecting high-achieving students at MIMA 37 Sunan Kalijogo Ambulu. It is hoped that the results of this study can provide a real contribution in supporting a more objective, fair, and transparent selection process, and can be used as a model for other schools in managing a reward system for outstanding students.

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METHOD

This study uses a quantitative research method with a descriptive-analytical research design. This design aims to identify, measure, and analyze the criteria used in the selection of outstanding students. This study was conducted by collecting data objectively and analyzing it using multicriteria analysis techniques. The population in this study were all students at MIMA 37 Sunan Kalijogo Ambulu, who were registered in the 2024/2025 academic year, including students from grades 1 to 6, with a population of around 106 students. The research sample was taken from students who met the inclusion criteria, namely students who actively participated in learning and were involved in extracurricular activities, especially in grades 4 to 6. Based on these criteria, 51 students were selected for further analysis in this study.

This research utilizes two primary methods: AHP and TOPSIS. AHP serves as a decision-making approach designed to address complex problems that involve numerous interconnected criteria. This method was first introduced by Thomas L. Saaty in the 1970s (Siregar et al., 2022). AHP is very useful in decision-making involving multiple factors that need to be considered objectively and rationally (Rahardiansyah et al., 2022). In the AHP method, the levels of importance between criteria are expressed in the form of a numerical scale known as the Saaty Fundamental Scale. This scale is used to compare pairs of criteria in pairs and give their relative weights. The following is the scale:

Table 1. Importance Level Weight

Score	Level of Interest
1	Of equal significance
3	Rather important
5	Greater significance
7	Highly significant
9	Extreme factors are crucial
2, 4, 6, 8	The value lies between two primary levels of significance
1/3	Somewhat insignificant
1/5	Fairly insignificant
1/7	Considerably insignificant
1/9	Extremely insignificant
1/2, 1/4, 1/6, 1/8	An intermediate value between the two

Source: (Nurhayati, 2021)

The following are the calculation steps for the AHP method:

1. Compile a comparison matrix between elements in pairs.
2. Add up the values in each column in the matrix.
   $\sum_{j=1}^{n} a_{ij} = 1$ (1)
   Explanation:
   a: Matrix containing pairwise comparisons
   i: Indicates the i-th row in the matrix
   j: Indicates the j-th column in the matrix
3. Sum all the values across each row in the matrix, then divide each by the total sum of the corresponding column in the pairwise comparison matrix to calculate the average value.
   $w_i = \frac{1}{2}\sum_{j=1}^{n} a_{ij}$ (2)
   Explanation:
   n : Total number of criteria used
   wi : Average value of the i-th row in the matrix

The next stage of weighting with AHP is to calculate consistency metrics, namely the Consistency Index and Consistency Ratio. This stage aims to test whether the respondent's preferences used in

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the pairwise comparison are consistent or not. Consistency is very important so that the assessment results can be considered valid and can be used in the decision-making process. If the CR value <0.1, then the respondent's preferences are considered consistent, and the results of the criteria weight calculation can be declared valid and acceptable. Conversely, if the CR value exceeds this limit, then the assessment needs to be reviewed because it indicates inconsistency (Masnuryatie & Triyono, 2022).

The calculation of CI and CR values is carried out using the following formula:

$$CI = \frac{(\lambda\, max - m)}{n-1} \quad (3)$$

$$CR = \frac{CI}{CR} \quad (4)$$

Explanation
CI : Consistency Index
λ max : Maximum eigenvalue
N : Number of data
CR : Consistency Ratio
RI : Random Index

Table 2 contains a list of consistent random indices used in the AHP method.

Table 2. Consistency in Random Index List

n	Value RI
1	0.00
2	0.00
3	0.58
4	0.90
5	1.12
6	1.24
7	1.32
8	1.41
9	1.45

Source: (Putri & Okitasari, 2024)

TOPSIS is a multicriteria decision-making method used to evaluate various alternatives based on their proximity to the most desirable outcome (ideal maximum) and the least desirable outcome (ideal minimum). This approach was created by Hwang & Yoon in 1981 and is often used in situations where there are several alternatives that need to be selected based on a number of predetermined criteria (Raharjo et al., 2021). The following are the steps in the TOPSIS method:

1. Normalize the decision matrix.
   $$R_{ij} = \frac{x_{ij}}{\sqrt{\sum_{i=1}^{m} x_{ij}^2}} \quad (5)$$
   with i = 1, 2, 3, …, m; and j = 1, 2, 3, …, n
   Explanation:
   Rij denotes the i-th and j-th elements of the normalized matrix
   xij denotes the i-th and j-th elements of the decision matrix x
2. Calculate the normalized and weighted decision matrix.
   $$y_{ij} = w_i r_{ij} \quad (6)$$
   with i = 1, 2, 3, ... m and j = 1, 2, 3, ... n.
   Explanation:
   Yij is the element in the i-th row and j-th column of the normalized matrix.
   Wij is the weight of the i-th criterion obtained from the calculation results of the AHP method.
3. Determine the best (positive ideal) and worst (negative ideal) solution matrices.

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Formula for positive ideal solution (A+):

$A^+ = (y1^+, y2^+, y3^+, \dots, yn^+)$ (7)

Formula for negative ideal solution (A-):

$A^- = (y1^-, y2^-, y3^-, \dots, yn^-)$ (8)

4. Measure the closeness of every option in relation to the ideal positive and negative outcomes solutions.
   Formula to calculate distance to A+:

   $D_i^+ = \sqrt{\sum_{i=1}^{n}(y_{ij} - y_i^+)^2}, i = 1, 2, 3, \dots m$ (9)

   Formula to calculate the distance to A-:

   $D_i^- = \sqrt{\sum_{i=1}^{n}(y_{ij} - y_i^-)^2}, i = 1, 2, 3, \dots m$ (10)

   Explanation:
   D_i^+ = The first alternative distance to the positive ideal solution
   y_i^+ = Positive ideal solution components on [i]
   y_{ij} = Components of the normalized matrix
   D_i^- = The first alternative distance to the negative ideal solution
   y_i^+ = Worst possible solution components on [i]
5. Calculate the preference score of each alternative using the formula in the previous step.
   Formula for calculating preferences:

   $V_i = \frac{Di^-}{Di^- + Di^+} = 1,2,3, \dots, m$ (11)

   Explanation:
   Vi = Distance for each alternative
   $Di-$ = Alternative proximity to ideal social solutions
   $Di+$ = The closeness of the i-th alternative to the ideal negative solution.

In this research, the AHP and TOPSIS methods are combined to offer more objective and thorough decisions for selecting exceptional students. AHP is applied to assign the relative importance of each criterion through pairwise comparisons, while TOPSIS is used to rank the students based on how closely they match the ideal solution. By using this approach, this study aims to optimize the selection process for outstanding students at MIMA 37 Sunan Kalijogo Ambulu, Jember Regency, by ensuring that each relevant assessment criterion is taken into account objectively and proportionally.

The following are the steps in conducting data analysis using both methods, as seen in Figure 1. Figure 1 shows the stages of using the combination method of AHP and TOPSIS in the decision-making process. The process begins by creating a pairwise comparison matrix to determine the weight of the criteria. Next, the decision matrix is normalized against the criteria, followed by calculating the weight of each criterion. After that, the consistency value is calculated to ensure the validity of the matrix. If the consistency ratio (CR) value is less than 0.1, then the criteria weight is considered consistent and can be used in the next stage.

The following step involves the TOPSIS method, starting with the normalization of the decision matrix in relation to the alternatives. Once normalized, the positive and negative ideal solutions are identified. Subsequently, the preference score for each alternative is determined based on how close it is to the ideal solution. The final phase ranks the alternatives according to their preference scores, completing the decision-making process. By integrating the AHP and TOPSIS methods, the decision-making process becomes more objective and structured.

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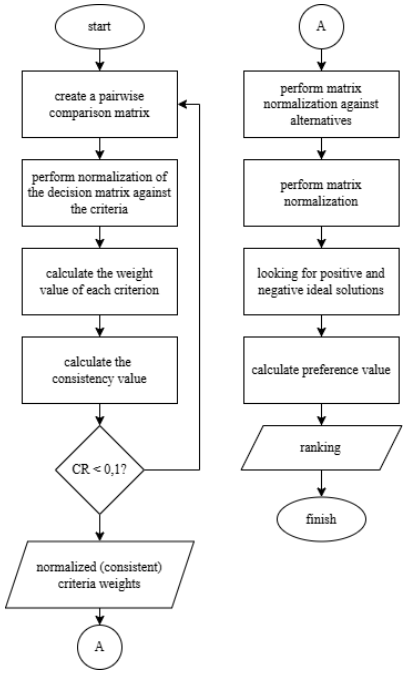

Figure 1. Flowchart Combination of AHP and TOPSIS Methods
Source: Reseacher, 2025

RESULTS AND DISCUSSION

This section showcases the outcomes of applying the integration of AHP and TOPSIS methods within a decision-making model for selecting outstanding students at MIMA 37 Sunan Kalijogo, located in Ambulu District. The analysis was carried out based on data that had been collected and processed according to the stages of each method, starting from determining the weight of the criteria using AHP to ranking alternatives using TOPSIS. The results obtained were then discussed to determine the effectiveness of the model in supporting objective decision making.

A. Criteria Weighting with the AHP Method

The initial step in the AHP method calculation process is to determine the priority level between the criteria that will be used to compile the pairwise comparison matrix. Details of the criteria used in the selection of outstanding students along with their criteria codes are shown in Table 3.

Table 3. Criteria and Criteria Codes

Code	Criteria
C-1	Academic Values
C-2	Extracurricular Values
C-3	Attitude and Personality
C-4	Attendance and Discipline
C-5	Participation in Competitions
C-6	Religious Activities

Source: Reseacher, 2025

The priority of each criterion in this study is presented in Table 4 in the form of a pairwise comparison matrix. The preparation of the pairwise comparison matrix between criteria is carried out based on the level of importance values determined by the school.

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Table 4. Determining the Pairwise Comparison Matrix

	C-1	C-2	C-3	C-4	C-5	C-6
C-1	1.00	3.00	5.00	4.00	7.00	6.00
C-2	0.33	1.00	2.00	3.00	5.00	4.00
C-3	0.20	0.50	1.00	2.00	3.00	3.00
C-4	0.25	0.33	0.50	1.00	3.00	2.00
C-5	0.14	0.20	0.33	0.33	1.00	2.00
C-6	0.17	0.25	0.33	0.50	0.50	1.00
Amount	2.09	5.28	9.17	10.83	19.50	18.00

Source: Reseacher, 2025

Each value in the pairwise comparison matrix the normalization is done by dividing each element in the column by the sum of the values in that column. The normalization process in Table 4 aims to change the range of values to between 0 and 1. The results of the normalization process can be seen in Table 5. The values in the priority column will be used as the criteria weights in the alternative calculation stage using the TOPSIS method. The priority value is obtained by splitting the overall quantity of values in the row by the number of criteria, which in this study is six.

Table 5. Normalization of Pairwise Comparison of Criteria

	C-1	C-2	C-3	C-4	C-5	C-6	Amount	Priority
C-1	0.478	0.568	0.545	0.369	0.359	0.333	2.653	0.442
C-2	0.159	0.189	0.218	0.277	0.256	0.222	1.322	0.220
C-3	0.096	0.095	0.109	0.185	0.154	0.167	0.804	0.134
C-4	0.119	0.063	0.055	0.092	0.154	0.111	0.594	0.099
C-5	0.068	0.038	0.036	0.031	0.051	0.111	0.336	0.056
C-6	0.080	0.047	0.036	0.046	0.026	0.056	0.291	0.048
Amount	1.000	1.000	1.000	1.000	1.000	1.000	6.000	1.000

Source: Reseacher, 2025

The following step is to determine the maximum Lambda value (λmax), which will be used as a basis for measuring the level of consistency. The λmax value is obtained from the matrix calculation process, namely by adding up each row of the multiplication results between the values in the priority column in Table 5 and the values in each criteria column in Table 4. The outcomes of this calculation are shown in Table 6.

Table 6. Matrix Sum of Each Row

	C-1	C-2	C-3	C-4	C-5	C-6	Amount
C-1	0.442	0.661	0.670	0.396	0.392	0.291	2.852
C-2	0.147	0.220	0.268	0.297	0.280	0.194	1.407
C-3	0.088	0.110	0.134	0.198	0.168	0.145	0.844
C-4	0.111	0.073	0.067	0.099	0.168	0.097	0.615
C-5	0.063	0.044	0.045	0.033	0.056	0.097	0.338
C-6	0.074	0.055	0.045	0.050	0.028	0.048	0.299

Source: Reseacher, 2025

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The final step in this weighting process involves computing the Consistency Ratio to verify that the priority values (criteria weights) can be used in the next stage, namely the calculation of alternative rankings using the TOPSIS method. Table 7 presents the results of the summation of each row of the matrix and the priority values obtained from the normalization process of pairwise comparisons between criteria.

Table 7. Calculating Consistency Ratio

Criteria	Number Per-line	Priority	Amount
C-1	2.852	0.442	3.294
C-2	1.407	0.220	1.627
C-3	0.844	0.134	0.978
C-4	0.615	0.099	0.714
C-5	0.338	0.056	0.394
C-6	0.299	0.048	0.348
	Amount		**7.355**
	n (many criteria)		**6**
	lamda max		**= 7.355/6 = 1.226**
	CI		**= (1.226-6)/(6-1) = -0.955**
	CR		**=-0.955/1.24 = -0.770**

Source: Reseacher, 2025

Since the Consistency Ratio (CR) value obtained is in the range of 0 to 0.770 and less than 0.1, it can be concluded that the weight of each criterion is consistent. Therefore, the weights generated through the AHP method are suitable for use.

B. Alternative Ranking with TOPSIS Method

The initial step in implementing the TOPSIS method for the process of ranking outstanding students is to compile a decision matrix founded on alternative data and criteria from prospective outstanding students at MIMA 37 Sunan Kalijogo Ambulu. The decision matrix can be seen in Table 8.

Table 8. Decision Matrix Based on Alternative Values

Alternative	Criteria					
	C-1	**C-2**	**C-3**	**C-4**	**C-5**	**C-6**
Siswa_1	76	89	84	80	77	90
Siswa_2	76	95	88	92	80	80
Siswa_3	93	90	73	77	93	72
Siswa_4	91	90	71	93	81	75
Siswa_5	71	90	70	81	95	91
…	…	…	…	…	…	…
Siswa_51	72	88	85	85	72	89

Source: Reseacher, 2025

The next step is the preparation of the normalized decision matrix. The normalization process begins by squaring each value in the xij matrix, which can be seen in Table 9.

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Table 9. Square of Each Matrix Value

Alternative	Criteria					
	C-1	C-2	C-3	C-4	C-5	C-6
Siswa_1	5776	7921	7056	6400	5929	8100
Siswa_2	5776	9025	7744	8464	6400	6400
Siswa_3	8649	8100	5329	5929	8649	5184
Siswa_4	8281	8100	5041	8649	6561	5625
Siswa_5	5041	8100	4900	6561	9025	8281
…	…	…	…	…	…	…
Siswa_51	5184	7744	7225	7225	5184	7921
Amount	**352050**	**361802**	**350835**	**344288**	**339139**	**336863**

Source: Reseacher, 2025

The next step in the normalization process is to calculate the square root of the total of the squared values for each criterion. The results can be seen in Table 10.

Table 10. Root Of The Total Square Value Of Each Criteria

Criteria	Calculation	Results
C-1	$\sqrt{5776 + 5776 + 8649 + 8281 + 5041 + \cdots + 5184}$	593.338
C-2	$\sqrt{7921 + 9025 + 8100 + 8100 + 8100 + \cdots + 7744}$	601.500
C-3	$\sqrt{7056 + 7744 + 5329 + 5041 + 4900 + \cdots + 7225}$	592.313
C-4	$\sqrt{6400 + 8464 + 5929 + 8649 + 6561 + \cdots + 7225}$	586.761
C-5	$\sqrt{5929 + 6400 + 8649 + 6561 + 9025 + \cdots + 5184}$	582.356
C-6	$\sqrt{8100 + 6400 + 5184 + 5625 + 8281 + \cdots + 7921}$	580.399

Source: Reseacher, 2025

The final step in the normalization process is to divide each element of the xij matrix, using the results in Table 9. The final results of the decision matrix normalization can be seen in Table 11.

Table 11. Decision Matrix Normalization Results

Alternative	Criteria					
	C-1	C-2	C-3	C-4	C-5	C-6
Siswa_1	0.128	0.148	0.142	0.136	0.132	0.155
Siswa_2	0.128	0.158	0.149	0.157	0.137	0.138
Siswa_3	0.157	0.150	0.123	0.131	0.160	0.124
Siswa_4	0.153	0.150	0.120	0.158	0.139	0.129
Siswa_5	0.120	0.150	0.118	0.138	0.163	0.157
…	…	…	…	…	…	…
Siswa_51	0.121	0.146	0.144	0.145	0.124	0.153

Source: Reseacher, 2025

At this stage, the AHP and TOPSIS methods are combined by compiling a weighted normalization matrix using the priority weights generated from the AHP method. The calculation is done by multiplying each alternative value in the normalized decision matrix by the AHP weight. The results of the weighted normalization matrix are presented in Table 12.

JOURNAL OF INFORMATICS DEVELOPMENT
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Table 12. Normalized and Criteria-weighted Decision Matrix Output

Alternative	Criteria					
	C-1	C-2	C-3	C-4	C-5	C-6
Siswa_1	0.019	0.018	0.017	0.018	0.020	0.020
Siswa_2	0.019	0.019	0.018	0.020	0.020	0.018
Siswa_3	0.023	0.018	0.015	0.017	0.024	0.016
Siswa_4	0.023	0.018	0.014	0.020	0.021	0.017
Siswa_5	0.018	0.018	0.014	0.018	0.024	0.020
…	…	…	…	…	…	…
Siswa_51	0.018	0.018	0.017	0.019	0.018	0.020

Source: Reseacher, 2025

The following step in applying the TOPSIS method is to establish the matrix for the positive and negative ideal solutions. The values for both the positive and negative ideal solutions for each criterion are presented in Table 13.

Table 13. Positive Ideal Solution and Negative Ideal Solution Matrix

	C-1	C-2	C-3	C-4	C-5	C-6
A+	0.024	0.019	0.019	0.021	0.024	0.021
A-	0.017	0.014	0.014	0.015	0.018	0.016

Source: Reseacher, 2025

Next, determine the distance relative to both the positive and negative ideal solutions. The Ideal Solution Distance (D) was computed using the Euclidean distance method to measure the difference between the values of each alternative and the ideal solution for each criterion. The results of these calculations are shown in Table 14.

Table 14. Distance Calculation Results against Positive and Negative Standards Solutions

Alternative	Ideal Solution Distance	
	D+	D-
Siswa_1	0.0075	0.0076
Siswa_2	0.0072	0.0088
Siswa_3	0.0077	0.0096
Siswa_4	0.0073	0.0093
Siswa_5	0.0085	0.0088
…	…	…
Siswa_51	0.0091	0.0076

Source: Reseacher, 2025

The following step involves assigning a preference value to each alternative. The calculated preference scores are shown in Table 15. The results of these preference calculations are displayed in Table 15.

JOURNAL OF INFORMATICS DEVELOPMENT
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Table 15. Preferred Value

Alternative	Preferences
Siswa_1	0.5044
Siswa_2	0.5505
Siswa_3	0.5566
Siswa_4	0.5616
Siswa_5	0.5100
…	…
Siswa_17	**0.7257**
…	…
Siswa_31	0.5434
Siswa_32	0.5363
Siswa_33	0.5681
Siswa_34	**0.2578**
…	…
Siswa_48	0.5314
Siswa_51	0.4568

Source: Reseacher, 2025

The final results obtained through the Topsis method show that the ranking is determined based on the highest value of each prospective outstanding or alternative student. From the calculation results, Siswa_17 has the highest preference value, so it can be stated as an outstanding student. Meanwhile, Siswa_34 obtained the lowest preference value, so the student can be directed to follow the coaching program.

Based on the criteria weight and individual scores, it was found that academic performance and discipline significantly influenced the final rankings. Student A consistently scored highest in these two criteria, which contributed to their top position. On the other hand, students ranked lower generally showed weaker performance in extracurricular and religious activity components.

CONCLUSION

This study aims to build a decision support model in the selection process of outstanding students at MIMA 37 Sunan Kalijogo Ambulu by integrating the Analytical Hierarchy Process (AHP) and Technique for Order Preference by Similarity to Ideal Solution (TOPSIS) methods. Based on the results obtained, the AHP method is used to determine the weight of each selection criterion objectively and consistently, while the TOPSIS method is applied to rank alternatives (students) based on their proximity to the ideal solution. The final results show that this integrative approach is able to produce precise and accurate decisions in identifying outstanding students. Students with the highest preference scores (Siswa_17) are determined as the most outstanding students, while students with the lowest preference scores (Siswa_34) are identified as students who need further coaching. This model has proven effective in helping schools conduct selection in a more systematic, transparent, and data-based manner.

However, this study has several limitations. The implementation is still conducted manually using spreadsheet-based calculations, which may not be efficient for large-scale applications. In addition, the study is limited to one institution and a relatively small number of student alternatives, which may affect the generalizability of the results. For future development, it is recommended to design a digital system or application that integrates AHP and TOPSIS to facilitate automated decision-

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making. Such a system could be equipped with user-friendly interfaces for data input, real-time ranking outputs, and reporting features, making it more accessible for educational institutions to adopt. Further research can also involve testing the model in different schools or educational levels to validate and enhance its effectiveness in diverse educational settings.

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