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Selecting the Best Students Using the Simple Additive Weighting Method Decision Support System

Meri Mayang Sari[1*], Mohamad Ifran Sanni[2], Sugeng Widada[3], Nurbaini Yusuf[4], Evi Nurkhotimah[5]
[1,2,3,4,5]University of Raharja, Tangerang, Indonesia
*Corresponding author: meri.mayang@raharja.info

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ABSTRACT

Selecting the best student is one form of appreciation implemented by An-Nawa Islamic Boarding School in Serang Regency to encourage students' motivation, achievement, and discipline. The current selection process is conducted manually, which may lead to subjectivity and inconsistencies in decision-making. This study aims to design and implement a Decision Support System (DSS) using the Simple Additive Weighting (SAW) method to assist in determining the best student objectively, transparently, and systematically. The research employed a quantitative approach using five evaluation criteria: moral character, participation in learning activities, academic performance, attendance, and responsibility. The data consisted of 30 students evaluated based on these criteria. The SAW method was applied through the stages of decision matrix construction, normalization, weighting, and preference value calculation to generate a ranking of alternatives. The results indicate that the SAW method can provide an objective and effective selection process. Alternative A28 (Mashadi) achieved the highest preference value of 1.00 and ranked first, followed by A6 (Retno Safitri) with a score of 0.97 and A19 (Hoirun Saban) with a score of 0.91. The implemented system assists school administrators in accelerating the selection process, reducing assessment subjectivity, and producing more accurate and accountable decisions. Therefore, the SAW method is proven to be effective for application in a decision support system for selecting the best student.

Keywords—Decision Support System, Simple Additive Weighting, Best Student Selection, Ranking System, Islamic Boarding School.

1. INTRODUCTION

An-Nawa Islamic Boarding School, located in Serang Regency, is an Islamic educational institution committed to developing students with noble character (akhlaqul karimah), outstanding achievements, and strong academic and religious competencies. In addition to instilling Islamic values, the boarding school continuously strives to improve educational quality through various student development programs. One form of appreciation for students' achievements is the periodic selection of the best student. This selection is important because it motivates students to improve their academic performance, discipline, responsibility, and moral character in their daily lives. However, the process of selecting the best student at An-Nawa Islamic Boarding School is still conducted manually based on assessments from multiple aspects, which may lead to subjectivity and inconsistency in decision-making.

To address this issue, a Decision Support System (DSS) is required to facilitate a more objective, transparent, and measurable evaluation process. A Decision Support System is a

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computer-based system designed to assist decision-makers in solving semi-structured and unstructured problems. One of the most widely used methods in DSS is the Simple Additive Weighting (SAW) method. SAW performs weighted summation calculations by evaluating each alternative against all predefined criteria, enabling the system to effectively recommend the best alternative[1]. Previous studies have also demonstrated that the implementation of the SAW method improves the objectivity of the selection process because each alternative is evaluated according to predetermined criterion weights, resulting in a more transparent and consistent ranking process[2][3].

The SAW method offers several advantages, including a simple computational process, ease of implementation, and the ability to generate objective results based on the assigned weights and scores of each criterion. Furthermore, this method does not require specific assumptions regarding data distribution and can be applied to various multi-criteria decision-making problems, particularly in the educational sector [4]. The fundamental principle of SAW is to calculate the preference value of each alternative by aggregating all weighted criteria, thereby producing a ranking from the highest to the lowest preference score [5][1]. The SAW method has been successfully applied to various selection problems, such as selecting outstanding teachers, scholarship recipients, and academic majors, because it provides accurate recommendations, is easy to interpret, and supports efficient decision-making processes[6][7].

Numerous previous studies have demonstrated the effectiveness of the SAW method in selection and ranking processes. Witanto and Santoso (2020) applied the SAW method to identify outstanding Islamic boarding school students based on report card scores, school examination results, attendance, and extracurricular activities[8]. Cahyati et al. (2021) compared the SAW and Weighted Product (WP) methods for extracurricular activity selection and reported effective decision-making performance[9]. Melati and Triyono (2020) found that the SAW method effectively accommodates both academic and non-academic criteria in selecting the best participants[10]. Similarly, Sholihat and Gustian (2021) demonstrated that the SAW method produces consistent and accurate rankings for determining outstanding students in Islamic boarding schools[11]. Moreover, Dwi Riyono et al. (2024) reported that implementing the SAW method enhances objectivity and transparency in student selection processes [12] [13]

Although numerous studies have implemented the SAW method in school environments, research focusing on its application for selecting the best students in Islamic boarding schools remains relatively limited. Unlike conventional schools, student assessment in Islamic boarding schools considers not only academic performance but also moral character, discipline, participation in boarding school activities, attendance, and responsibility. Therefore, a decision support system capable of integrating these diverse criteria in a structured manner is required to produce more objective, reliable, and accountable decisions [14].

Based on these considerations, this study aims to design and implement a Decision Support System for selecting the best students at An-Nawa Islamic Boarding School, Serang Regency, using the Simple Additive Weighting (SAW) method. The proposed system is expected to assist the boarding school management in determining the best students more quickly, objectively, transparently, and accurately based on the established evaluation criteria.

2. LITERATURE REVIEW

2.1 Decision Support System in Educational Decision-Making

Decision Support Systems (DSS) have been increasingly applied to support decision-making processes in educational institutions, particularly when decision-makers need to evaluate multiple alternatives based on several criteria. In educational environments, decisions such as student selection, scholarship allocation, student admission, and academic profiling often involve different assessment dimensions that must be considered simultaneously. A DSS can facilitate this process by structuring assessment data and transforming it into recommendations that support decision-makers.

In educational selection problems, the use of a DSS is particularly beneficial when conventional manual assessment processes are considered time-consuming and potentially inconsistent. Afrizal et al. (2022), for example, implemented a DSS using the Simple Additive Weighting (SAW) method for new student admission[15]. The study evaluated applicants using multiple criteria, including report card scores, tahfidz test scores, tahsin test scores, and academic scores, demonstrating how a multi-criteria approach can be used to rank prospective students systematically. This indicates that DSS implementation can provide a structured mechanism for educational institutions to process multiple assessment dimensions in a single decision framework.

The application of DSS can also be extended to student-related problems beyond admission. Yunus and Karim (2022) applied SAW within a DSS to identify problematic students and reported that the resulting system supported a more effective and efficient process than conventional record-based management[16]. Similarly, Niska et al. (2022) developed a DSS for determining student graduate profiles using SAW and demonstrated that the method could support the matching of student characteristics with predefined graduate profiles[17]. These studies indicate that DSS can be adapted to different educational decision contexts depending on the alternatives and criteria involved.

2.2 Simple Additive Weighting as a Multi-Criteria Decision-Making Method

Simple Additive Weighting (SAW) is a multi-criteria decision-making approach that determines the relative preference of alternatives by considering their performance across several criteria. The method involves assigning weights to criteria, normalizing alternative values, and aggregating the weighted normalized scores to obtain a final preference value. Alternatives can subsequently be ranked according to their preference values.

The strength of SAW lies in its ability to combine multiple evaluation dimensions into a single preference score. This characteristic is useful when a decision cannot be determined by relying on only one indicator. In educational decision-making, for instance, a student's eligibility may depend simultaneously on academic performance, attendance, participation, achievement, or other institutional requirements. By assigning different weights to these criteria, SAW allows the decision model to reflect the relative importance of each assessment dimension.

The application of SAW in educational decision-making has been demonstrated in several contexts. Afrizal et al. (2022) used SAW to support new student admission by combining several academic and religious assessment criteria[15]. In another context, Septiana et al. (2022) applied SAW to a DSS for selecting recipients of the Program Indonesia Pintar scholarship[18]. The study emphasized the need for computerized decision support because manual selection processes can require substantial time and make the analysis and reporting process less efficient. These applications demonstrate that SAW is sufficiently flexible to accommodate different educational criteria and decision objectives.

The method has also been applied to financial assistance decisions for students. Pangemanan and Seniwati (2023) developed a SAW-based DSS for determining students eligible for financial assistance[19]. The resulting system generated rankings that could be used by educational institutions as a consideration in determining beneficiaries. This finding illustrates the usefulness of SAW when the decision-making process involves multiple candidates who must be prioritized according to predetermined criteria.

2.3 Multi-Criteria Student Assessment

The evaluation of student performance is inherently multidimensional. Academic achievement may provide important information about a student's learning outcomes, but it does not necessarily represent other aspects of student development. Consequently, a comprehensive student assessment may require additional indicators, such as attendance, extracurricular involvement, achievement, discipline, or other behavioral and institutional criteria.

Ismayadi et al. (2022) demonstrated the use of multiple criteria in selecting outstanding students through a SAW-based DSS. Their model incorporated average grades, achievements, extracurricular activities, and parental income, illustrating that student selection can involve both academic and non-academic dimensions[20]. This approach is relevant to institutions that seek to identify students based on broader performance indicators rather than academic scores alone.

A similar issue can be observed in the selection of outstanding students at the secondary education level. Kamilah et al. (2024) reported that relying solely on report card scores may not adequately represent the overall qualifications of outstanding students. Their study applied SAW to incorporate additional assessment dimensions into the decision process[21]. This finding strengthens the argument that student selection models should integrate multiple indicators to obtain a more comprehensive evaluation.

The use of multiple criteria is also relevant to educational assistance programs. Mardhiah et al. (2024) applied SAW to scholarship recipient selection and highlighted the challenges associated with manual student data processing and classification[22]. The implementation of a DSS provides a mechanism for processing several criteria and generating recommendations based on calculated preference values. Therefore, multi-criteria assessment can improve the structure and consistency of student-related decision-making.

2.4 SAW-Based Ranking for Student Selection

Ranking is an important component of student selection because decision-makers often need to identify the most qualified candidate from a group of alternatives. In a multi-criteria environment, ranking based on a single criterion may result in incomplete evaluations. SAW addresses this issue by aggregating the performance of each alternative across all relevant criteria.

Ismayadi et al. (2022) showed that SAW can be used to rank students based on several academic and non-academic criteria[20]. The method provides a systematic calculation process that enables alternatives to be compared using a common preference score. This characteristic makes SAW appropriate for selection problems in which several students have different strengths across different evaluation dimensions.

The approach has also been demonstrated in student scholarship selection. Andani and Sumarlin (2023) developed a decision support system for foundation scholarship selection using SAW. The study emphasized that DSS-based selection can support more objective, accurate, effective, and efficient decision-making based on predefined criteria[23]. Similarly, Mardhiah et al. (2024) applied SAW to scholarship recipient selection and demonstrated its applicability in situations where educational institutions need to classify and prioritize students based on multiple requirements[22].

The findings from these studies suggest that SAW can provide a practical mechanism for producing rankings from heterogeneous assessment data. However, the effectiveness of the resulting ranking remains dependent on the appropriateness of the selected criteria and the weights assigned to each criterion. Therefore, the design of the decision model should be aligned with the educational objectives and characteristics of the institution.

2.5 Research Gap

Previous studies have demonstrated the application of SAW in various educational decision-making problems, including new student admission[15], student achievement selection[20], student financial assistance selection[19], scholarship selection[22][23], and outstanding student selection[21]. These studies indicate that SAW can support ranking and selection processes by integrating multiple criteria into a structured decision model.

Nevertheless, the assessment context of Islamic boarding schools presents a distinctive challenge because student quality may be evaluated through a combination of academic and character-oriented dimensions. In addition to academic achievement, students may be assessed according to moral character, participation in learning activities, attendance, and responsibility.

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These dimensions reflect the broader educational objectives of Islamic boarding schools, where student development encompasses academic and behavioral aspects.

The research gap addressed in this study is therefore the application of a SAW-based Decision Support System specifically for selecting the best student in an Islamic boarding school by integrating moral character, learning participation, academic performance, attendance, and responsibility as evaluation criteria. Unlike approaches that primarily emphasize academic grades or financial eligibility, the proposed model incorporates academic and behavioral dimensions into a unified ranking mechanism. The study consequently aims to provide a structured and transparent decision-making approach that can assist An-Nawa Islamic Boarding School in selecting the best student based on comprehensive and institutionally relevant criteria.

3. METHODOLOGY

This study employed a quantitative research approach using a Decision Support System (DSS) to determine the best student at An-Nawa Islamic Boarding School, Serang Regency. The decision-making method applied was the Simple Additive Weighting (SAW) method, which is one of the most widely used Multi-Criteria Decision-Making (MCDM) techniques for identifying the best alternative based on the highest preference value calculated from a set of predefined evaluation criteria.

The research data were collected through direct observation and interviews with the management of An-Nawa Islamic Boarding School, Serang Regency. The dataset consisted of student evaluation records based on five primary criteria: moral character (C1), participation in learning activities (C2), academic performance (C3), attendance (C4), and responsibility (C5). All of these criteria were classified as benefit attributes, meaning that higher scores indicate a greater level of eligibility for being selected as the best student.

The research procedure began with collecting student data, followed by determining the evaluation criteria and their corresponding weights, constructing the decision matrix, performing matrix normalization, calculating preference values, and finally ranking the students. These stages were implemented using the SAW method to ensure that the decision-making process was objective, systematic, and measurable.

The SAW method starts with the normalization of the decision matrix to transform the values of each criterion into a comparable scale. The normalization process is performed using Equation (1)[24]

$$rij = \begin{cases} \dfrac{Xij}{Max\ Xij} \\ \dfrac{Min\ Xij}{Xij} \end{cases}$$

where:
rij = normalized performance rating of alternative i for criterion j
Xij = value of alternative i on criterion j
Max Xij = maximum value of criterion j
Min Xij = minimum value of criterion j

After the normalization process is completed, the next step is to calculate the preference value of each alternative using Equation (2).

$$Vi = \sum_{j=1}^{n} wj\ rij$$

where:
Vi = preference value of alternative i
wj = weight of criterion j
rij = normalized performance rating of alternative i for criterion j
n = total number of evaluation criteria.

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The alternative with the highest preference value is considered the best recommendation generated by the system[25]. Therefore, the student who obtains the highest V_i value is selected as the best student at An-Nawa Islamic Boarding School, Serang Regency. The overall stages of the research methodology are illustrated in Figure 1.

Figure 1. Research Methodology

4. RESULTS AND DISCUSSION

4.1 Criteria Determination

The initial stage in implementing the Simple Additive Weighting (SAW) method is to determine the evaluation criteria used in the selection of the best student. These criteria were established based on observations and discussions with the management of An-Nawa Islamic Boarding School, Serang Regency. The criteria were designed to ensure that the evaluation process considers not only academic achievement but also students' character and discipline.

Table 1 presents the evaluation criteria used in this study, namely moral character (C1), participation in learning activities (C2), academic performance (C3), attendance (C4), and responsibility (C5). All five criteria are classified as benefit attributes, meaning that higher scores indicate greater eligibility for being selected as the best student.

Table 1. Evaluation Criteria

No	Kode Kriteria	Ketentuan Kriteria
1	C_1	Berakhlak baik
2	C_2	Aktif di kelas
3	C_3	Nilai raport tertinggi
4	C_4	Absensi kehadiran
5	C_5	Bertanggung jawab

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Based on Table 1, each alternative was evaluated using the five predetermined criteria. The alternatives were represented by crisp values, where i=1, 2,....., m, denotes the number of alternatives and j=1, 2,....., n denotes the number of evaluation criteria.

The importance level of each criterion was subsequently determined and used as the weighting factor in the SAW calculation.

Table 2. Criteria Weights

Kriteria	Nilai
Sangan Rendah (SR)	1
Rendah (R)	2
Sedang (S)	3
Tinggi (T)	4
Sangat Tinggi (ST)	5

The assigned weights represent the relative importance of each criterion in the best student selection process. A higher weight indicates a greater influence of the corresponding criterion on the final ranking results.

4.2 Determination of Criteria Weights

After defining the evaluation criteria, the next step was to assign weight values to each assessment level. This weighting process converts qualitative assessments into numerical values, allowing them to be processed using the SAW method.

In this study, the preference weights (w) represent the relative importance of each evaluation criterion. The weight values were determined through consultations with the management of An-Nawa Islamic Boarding School, Serang Regency.

Table 3. Weight Values for Each Criterion

Kode	Ketentuan Kriteria	Nilai
C_1	Berakhlak baik	0,30
C_2	Aktif di dalam kelas	0,15
C_3	Nilai raport tertinggi	0,15
C_4	Absensi kehadiran	0,20
C_5	Bertanggug jawab	0,20

Table 3 illustrates the conversion of qualitative assessments into numerical values used in the SAW calculation process. These values form the basis for constructing the decision matrix.

4.3 Suitability Rating Values

The next stage involves assigning suitability ratings for each alternative with respect to every evaluation criterion. These ratings were obtained from student assessments based on the five predetermined criteria.

A total of 30 student alternatives, labeled A1 to A30, were evaluated in this study. Each alternative received a score for every criterion, which was subsequently converted into crisp values to facilitate processing using the SAW method.

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Table 4. Suitability Ratings of Each Alternative for Each Criterion

Alternatif	Kriteria				
	C_1	C_2	C_3	C_4	C_5
A1	3	3	3	5	4
A2	3	3	3	4	3
A3	3	4	4	3	4
A4	4	4	4	4	3
A5	2	3	3	4	4
A6	5	4	5	5	5
A7	3	4	4	4	4
A8	3	4	4	5	4
A9	3	4	4	4	4
A10	4	2	3	4	3
A11	3	2	3	4	4
A12	3	3	3	4	5
A13	4	4	3	3	4
A14	3	4	5	4	5
A15	3	4	3	4	4
A16	3	2	3	4	4
A17	3	2	3	4	4
A18	2	3	4	5	5
A19	4	4	5	5	5
A20	2	3	3	3	3
A21	4	3	3	4	4
A22	4	3	3	4	4
A23	3	3	4	5	5
A24	3	2	3	4	3
A25	2	3	3	3	4
A26	3	3	3	4	4
A27	4	4	3	2	3
A28	5	5	5	5	5
A29	4	4	4	3	4
A30	2	3	3	4	4

Based on Table 4, each alternative exhibits different scores across the evaluation criteria. These differences serve as the basis for the normalization process and the calculation of preference values.

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4.4 Decision Matrix and Normalization

The next stage involved constructing the decision matrix (X) based on the suitability ratings of each alternative across all evaluation criteria. The decision matrix consisted of 30 alternatives (A1–A30) and five evaluation criteria (C1–C5).

The resulting decision matrix is presented as follows:

$$\begin{bmatrix}
3 & 3 & 3 & 5 & 4 \\
3 & 3 & 3 & 4 & 3 \\
3 & 4 & 4 & 3 & 4 \\
4 & 4 & 4 & 4 & 3 \\
2 & 3 & 3 & 4 & 4 \\
5 & 4 & 5 & 5 & 5 \\
3 & 4 & 4 & 4 & 4 \\
3 & 4 & 4 & 5 & 4 \\
3 & 4 & 4 & 4 & 4 \\
4 & 2 & 3 & 4 & 3 \\
3 & 2 & 3 & 4 & 4 \\
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4 & 3 & 3 & 4 & 4 \\
3 & 3 & 4 & 5 & 5 \\
3 & 2 & 3 & 4 & 3 \\
2 & 3 & 3 & 3 & 4 \\
3 & 3 & 3 & 4 & 4 \\
4 & 4 & 3 & 2 & 3 \\
5 & 5 & 5 & 5 & 5 \\
4 & 4 & 4 & 3 & 4 \\
2 & 3 & 3 & 4 & 4
\end{bmatrix}$$

The student data used in this study were obtained from An-Nawa Islamic Boarding School, Serang Regency. The dataset included assessments of moral character, participation in learning activities, academic performance, attendance, and responsibility, which were subsequently processed using the SAW method.

After constructing the decision matrix, normalization was performed using Equation (1) to transform the values into a comparable scale. The normalization process eliminates differences in the value ranges among criteria, ensuring that all criteria can be evaluated fairly.

The normalization results indicate that alternatives with values closer to 1 demonstrate better performance for a particular criterion. These normalized values were then used to calculate the preference values using the SAW method.

Following normalization, each normalized value was multiplied by its corresponding criterion weight, and the weighted values were summed to obtain the preference value (Vi). The highest preference value represents the best alternative recommended by the system. The preference calculation and ranking results are discussed in the following section.

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4.5 Method Evaluation Results

The Simple Additive Weighting (SAW) method was applied to determine the best student based on five evaluation criteria: moral character (C1), classroom participation (C2), academic achievement (C3), attendance (C4), and responsibility (C5). The corresponding criterion weights were assigned as 30%, 15%, 15%, 20%, and 20%, respectively.

The first step involved constructing the decision matrix containing the scores of each alternative for every criterion. The alternative scores were then normalized using the SAW normalization formula to transform all values into a range between 0 and 1. The normalization results are presented in Table 5.

Table 5. Normalized Decision Matrix

Alternatif	Kriteria				
	C_1	C_2	C_3	C_4	C_5
A1	0,6	0,6	0,6	1	0,8
A2	0,6	0,6	0,6	0,8	0,6
A3	0,6	0,8	0,8	0,6	0,8
A4	0,8	0,8	0,8	0,8	0,6
A5	0,4	0,6	0,6	0,8	0,8
A6	1	0,8	1	1	1
A7	0,6	0,8	0,8	0,8	0,8
A8	0,6	0,8	0,8	1	0,8
A9	0,6	0,8	0,8	0,8	0,8
A10	0,8	0,4	0,6	0,8	0,6
A11	0,6	0,4	0,6	0,8	0,8
A12	0,6	0,6	0,6	0,8	1
A13	0,8	0,8	0,6	0,6	0,8
A14	0,6	0,8	1	0,8	1
A15	0,6	0,8	0,6	0,8	0,8
A16	0,6	0,4	0,6	0,8	0,8
A17	0,6	0,4	0,6	0,8	0,8
A18	0,4	0,6	0,8	1	1
A19	0,8	0,8	1	1	1
A20	0,4	0,6	0,6	0,6	0,6
A21	0,8	0,6	0,6	0,8	0,8
A22	0,8	0,6	0,6	0,8	0,8
A23	0,6	0,6	0,8	1	1
A24	0,6	0,4	0,6	0,8	0,6
A25	0,4	0,6	0,6	0,6	0,8
A26	0,6	0,6	0,6	0,8	0,8
A27	0,8	0,8	0,6	0,4	0,6
A28	1	1	1	1	1
A29	0,8	0,8	0,8	0,6	0,8
A30	0,4	0,6	0,6	0,8	0,8

Based on the normalization results shown in Table 5, alternative A28 (Mashadi) achieved the maximum normalized value of 1.00 for all evaluation criteria. This indicates that the alternative demonstrated the best overall performance among all candidates across every assessment aspect considered in this study.

The next stage involved calculating the weighted preference values by multiplying each normalized value by its corresponding criterion weight and summing the results to obtain the preference value (Vi). The preference value was calculated using the following equation:

$$Vi = \sum_{j=1}^{n} wjrij$$

where:
Vi = preference value of alternative i
wj = weight of criterion j
rij = normalized value of alternative i for criterion j

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The preference values for all alternatives are presented in Table 6.

Table 6. Preference Value Calculation Results

No	Nama Siswa	Kriteria					Hasil
		Berakhlak Baik	Aktif di Dalam Kelas	Nilai Raport Tertinggi	Absensi Kehadiran	Berta nggung jawab	
1	Yulia Hartati	0,18	0,09	0,09	0,20	0,16	0,72
2	Diah Ayu Angraeni	0,18	0,09	0,09	0,16	0,12	0,64
3	Ika Anggraeny	0,18	0,12	0,12	0,12	0,16	0,70
4	Jaka Mahmud	0,24	0,12	0,12	0,16	0,12	0,76
5	Dewi Indah Ayu	0,12	0,09	0,09	0,16	0,16	0,62
6	Retno Safitri	0,30	0,12	0,15	0,20	0,20	0,97
7	Agus Santoso	0,18	0,12	0,12	0,16	0,16	0,74
8	Erma Wanti	0,18	0,12	0,12	0,20	0,16	0,78
9	Sugeng Wibowo	0,18	0,12	0,12	0,16	0,16	0,74
10	Asep Kurniadi	0,24	0,06	0,09	0,16	0,12	0,67
11	Indah Oktafitasari	0,18	0,06	0,09	0,16	0,16	0,65
12	Evi Nur Insani	0,18	0,09	0,09	0,16	0,20	0,72
13	Widianingsih	0,24	0,12	0,09	0,12	0,16	0,73
14	Mulyani	0,18	0,12	0,15	0,16	0,20	0,81
15	Denny Maulana	0,18	0,12	0,09	0,16	0,16	0,71
16	Heru Hendratno	0,18	0,06	0,09	0,16	0,16	0,65
17	Siti Maemunah	0,18	0,06	0,09	0,16	0,16	0,65
18	Roulina Lingga	0,12	0,09	0,12	0,20	0,20	0,73
19	Hoirun Saban	0,24	0,12	0,15	0,20	0,20	0,91
20	Mulyawati	0,12	0,09	0,09	0,12	0,12	0,54
21	Heny Nuraeni	0,24	0,09	0,09	0,16	0,16	0,74
22	Resti Suwardiyani	0,24	0,09	0,09	0,16	0,16	0,74
23	M. Dedi Agusriawan	0,18	0,09	0,12	0,20	0,20	0,79
24	Kurniawan	0,18	0,06	0,09	0,16	0,12	0,61
25	Eri Anshori	0,12	0,09	0,09	0,12	0,16	0,58
26	Heru Purnomo	0,18	0,09	0,09	0,16	0,16	0,68
27	Rahman Apriyanto	0,24	0,12	0,09	0,08	0,12	0,65
28	Mashadi	0,30	0,15	0,15	0,20	0,20	1,00
29	Indarti	0,24	0,12	0,12	0,12	0,16	0,76
30	Ardani	0,12	0,09	0,09	0,16	0,16	0,62

The calculated preference values ranged from 0.54 to 1.00. The highest preference value was obtained by A28 (Mashadi) with a score of 1.00, while the lowest preference value was obtained by A20 (Mulyawati) with a score of 0.54.

A higher preference value indicates a greater level of eligibility to be selected as the best student. Consequently, the alternative with the highest preference value occupies the top rank in the decision-making process.

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Table 7. Alternative Ranking Results

No	Nama Siswa	Hasil Akhir	Ranking
1	Mashadi	1.00	1
2	Retno Safitri	0.97	2
3	Hoirun Saban	0.91	3
4	Mulyani	0.81	4
5	M. Dedi Agusriawan	0.79	5
6	Ernawanti	0.78	6
7	Jaka Mahmud	0.76	7
8	Indarti	0.76	7
9	Agus Santoso	0.74	8
10	Sugeng Wibowo	0.74	8
11	Heny Nuraeni	0.74	8
12	Resti Suwardiyani	0.74	8
13	Widianingsih	0.73	9
14	Roulina Lingga	0.73	9
15	Yulia Hartati	0.72	10
16	Evi Nur Insani	0.72	10
17	Denny Maulana	0.71	11
18	Ika Anggraeny	0.70	12
19	Heru Purnomo	0.68	13
20	Asep Kurniadi	0.67	14
21	Indah Oktafitasari	0.65	15
22	Heru Hendratno	0.65	15
23	Siti Maemunah	0.65	15
24	Rahman Apriyanto	0.65	15
25	Diah Ayu Angraeni	0.64	16
26	Dewi Indah Ayu	0.62	17
27	Ardani	0.62	17
28	Kurniawan	0.61	18
29	Eri Anshori	0.58	19
30	Mulyawati	0.54	20

The ranking results indicate that A28 (Mashadi) achieved the first rank with a preference value of 1.00, followed by A6 (Retno Safitri) with 0.97, and A19 (Hoirun Saban) with 0.91. These three alternatives demonstrated outstanding performance across all evaluation criteria, resulting in the highest overall scores.

In contrast, A20 (Mulyawati) obtained the lowest preference value of 0.54, indicating relatively lower performance in several evaluation criteria compared with the other alternatives.

Overall, the findings demonstrate that the SAW method provides an objective and systematic approach for selecting the best student through weighted evaluation and multi-criteria ranking. The method effectively reduces subjectivity in the assessment process while producing transparent, reliable, and accountable recommendations for decision-makers.

Table 8. Top Three Ranked Students

Rank	Alternative	Student Name	Preference Value
1	A28	Mashadi	1,00
2	A6	Retno Safitri	0,97
3	A19	Hoirun Saban	0,91

Based on these results, Mashadi (A28) is recommended as the best student because he achieved the highest preference value among all evaluated alternatives.

5. CONCLUSION

Based on the findings of this study, it can be concluded that the Simple Additive Weighting (SAW) method was successfully implemented in a Decision Support System (DSS) for selecting the best student at An-Nawa Islamic Boarding School, Serang Regency. The SAW method effectively accommodated multiple evaluation criteria, including moral character, classroom participation, academic performance, attendance, and responsibility. Through a systematic normalization and weighting process, the method produced a more objective, consistent, and transparent evaluation.

The evaluation results showed that A28 (Mashadi) achieved the highest preference value of 1.00, followed by A6 (Retno Safitri) with a preference value of 0.97, and A19 (Hoirun Saban) with a preference value of 0.91. Based on these results, A28 (Mashadi) was recommended as the best student because this alternative demonstrated the highest overall performance across all evaluation criteria.

The implemented Decision Support System was able to assist the boarding school management in accelerating the student selection process, reducing subjectivity in decision-making, and improving the accuracy and effectiveness of the evaluation process. Furthermore, the system generated ranking results that were easy to interpret and could serve as a reliable basis for selecting the best student in each evaluation period.

Overall, this study demonstrates that the Simple Additive Weighting (SAW) method is an effective approach for selecting the best student because it integrates multiple evaluation criteria into a single preference value that supports objective, transparent, and accountable decision-making.

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CONFLICTS OF INTEREST

The authors declare that there are no conflicts of interest related to the publication of this article. The research was conducted objectively and independently, and no financial, personal, or institutional interests influenced the research design, data analysis, interpretation of results, or conclusions presented in this study.

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