Decision Support System for Selecting Exemplary Students with Simple Additive Weighting Method

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A R T I C L E   I N F O

A B S T R A C T

The selection of exemplary students carried out by the school is expected to trigger the enthusiasm of students to be able to develop their interests, talents, and abilities in the academic and non-academic fields. However, decision-making has not been measured with data so a decision support system is needed. With the use of this method, it is hoped that it can make it easier and minimize the occurrence of errors in making decent decisions therefore this system is needed to be able to make good decisions. In this study, one of the decision support system methods that are often used was chosen, namely Simple Additive Weighting (SAW). The use of the SAW method is due to its uncomplicated calculations. Research conducted at this school in determining decisions is still done manually so it is less effective and efficient. Therefore, this decision support system must be able to calculate exemplary students to be more effective and efficient. This system displays the final results of the ranking of exemplary students using the SAW method. From the overall results of the research that has been carried out, the calculation results that got rank 1 were obtained, namely Kenzo Ecclesio Taha with a total score of 0.9025. From the results of the study, it can be concluded that the results meet the criteria, so this study can be considered in calculations to determine exemplary students in the future.

1. INTRODUCTION

Education can help a person improve the quality of life, both in terms of social and economic. In addition, education can help a person in improving his career and professionalism. Therefore, education is very important for everyone to have. But it is not always easy to pursue high-quality education. Several factors affect the learning process and the quality of education, such as the quality of teachers, curriculum, and assessment systems, as well as other external factors. One of the aims of a good education is to form exemplary students. The process to form exemplary students may use assessment criteria such as [1] report card average, attendance, and extracurricular organizational scores. The process of selecting exemplary students must be following established rules, as in research [2] The guidance of exemplary students stems from many assessments, namely organizing training in class and requiring congregational prayers. The large number of criteria and students selected makes decision-making difficult. Even if the selection of exemplary students is carried out directly by teachers, it will certainly provide loopholes for those who are not responsible. The selection can be made with there emotional closeness of the teacher. Even if the election was done directly in one's opinion, it would also be able to arouse social jealousy among the Students.

The most encouraging impact of the implementation of the selection of exemplary students is that it can increase student participation. This consistently occurs when the selection of exemplary students is applied at the preschool, elementary, junior high, and high school levels. For this reason, it is necessary to apply the selection of exemplary students. Recruitments should be done methodically and organized.

Information disclosure and assessment standards must also be understood by relevant parties to reduce social turmoil.

SMP Negeri 1 Sampit is one of the schools that has a large number of students. Based on the recapitulation of basic education data, this school has 925 students in the odd semesters of the 2022/2023 school year. SMP Negeri 1 Sampit not only has a superior number of students in the East Kotawaringin district but also has good quality. Students who take part in learning at this school experience an increase in ability. The improvement of students' abilities is quite diverse, some are significantly good and some are slow. In the psychological aspect, applied learning also has a positive impact. The methods applied in this school are proven to increase children's confidence in learning. Because of the variety of abilities and expertise possessed by students, stimulation is also needed to motivate students to continue to excel. SMP Negeri 1 Sampit implements the selection of Exemplary Students at the end of each school year as an effort to motivate students. Decision-making in this selection is not only based on academic and non-academic ability but also involves judgment from principals and teachers. However, the decisions made are sometimes not approved by parents.

The emergence of discrimination or selection based on the personal preferences of SMP Negeri 1 Sampit teachers resulting in students who deserve to be selected as exemplary students can be missed. The determination of exemplary students often occurs because teachers only focus on student achievement without considering other variables. This happens because teachers always assume that outstanding students must have good exemplary grades. Even teachers also find it difficult because they have to collect how many activities students participate in and find out how their academic performance is progressing. Therefore, with the development of science today, the selection of Exemplary Students can be assisted by the Decision Support System method.

One method of decision support system is Simple Additive Weighting or currently known as the SAW Method. The SAW method is an extension of fuzzy[3] otherwise known as the simple weighting method [4] which can be used in solving problems [5]. The SAW method can be applied in various decision support systems such as scholarship acceptance [6], selection of cloth masks [7], selection of new students[8], recruitment of BEM members [9], and several other decision supporters. The SAW method is one method of solving problems by doing calculations[9]. The SAW method has a more precise and accurate assessment ability because it determines criteria values and weights [10]. The SAW method is also able to solve educational problems such as problems in the selection of exemplary students [11]. The application of this method in the selection of exemplary students is carried out so that assessment is not carried out subjectively based on several criteria that are considered important to be applied as provisions in the selection of exemplary students. The SAW metide also applies the Likert scale to determine the importance of each criterion, which is then converted into weights. After that, the weight is applied to each alternative to determine a final score that indicates how well the alternative meets the specified criteria. The SAW method is also said to be one of the simplest of several settlement methods that use the *Multi-Attribute Decision Making* technique [12].

Other studies say the SAW method is an established Single Average Weighting method and is undoubtedly the most widely known for playing the role of metamodel[13]. The use of an appropriate system will be very helpful in solving problems by implementing a decision support system to have a positive impact [14]. Research by Putar, et al[15] suggests that there is an information system to reduce errors and fraud. To minimize errors and provide fair decisions, a system and method are needed to support decisions[16]. The research of Zainal Alamsyah and Dudih Gustian is about how to solve the problem of accepting new teachers using Weighted Products and Simple Additive Weighting [17].

In addition, the contribution of this study is significant in providing recommendations and solutions that can be used to improve school operations. In addition, the current essay can be used as a foundation for future essays. It is hoped that this study can provide a better understanding of the importance of using the Simple Additive Weighting method in the process of recruiting prepaid employees. As a result, the registration process for new school employees is predicted to be more transparent and effective. In this case, there must be cooperation from all parties, both principals, teachers, students, and students, so that learning can run successfully and give the greatest results.

In the research of Faraz Wahyudi, Moh. Ali Albar, and Royana Afwani[6] made calculations using the criteria of father's income, mother's income, number of dependents, house ownership, land area, building area, distance from the city center, toilet washing bath, water source, electricity source by applying the SAW Method. The research is the same as what we did but has different criteria in the research we did. Likewise, [7], [8], [9], [18], and [10] have conducted research by applying the SAW method but have

criteria differences in the object studied. Then some other previous studies are also presented in Table 1 below.

Table 1. of past research

Year	Researchers	Topic	Past researchers	Gap
2021	Renny Puspita Sari, Ahmad Cahyono Adi [12]	Quality Determination System of Sacrificial Animals in Indonesia with SAW Method	The study conducted calculations using criteria of age, animal weight, disability, animal color, and gender.	Our research is based on several criteria (attendance, average report card, attitude score, and academic achievement). Our research uses decision support systems to optimally determine exemplary students.
2021	Mikhael Armando Manullang, Hasanul Fahmi[19]	Decision Support System for Motorcycle Lending at PT Adira Finance Medan Using SAW Method	This study conducted calculations using the criteria of customer 1, customer 2, customer 3, customer 4, customer 5.	Our research is based on several criteria (attendance, average report card, attitude score, and academic achievement).). Our research uses decision support systems to optimally determine exemplary students.
2021	Muhammad Rizky Ramadhan, Muhammad Khairul Nizam, Mesran [20]	Application of the SAW (Simple Additive Weighting) method in the selection of outstanding students at Mustafa Private Vocational School	This study conducted calculations using attendance criteria, average report card score, academic achievement, non-academic achievement, the organization followed, and the number of dependents of parents.	Our research is based on several criteria (attendance, average report card, attitude score, and academic achievement). Our research uses decision support systems to optimally determine exemplary students.
	Falentino Sembiring, Sudin Saepudin, Dea Siti Rahima Juliansa, Elsa Yulia Rahman, Atika Fauzia Akbari, Muhamad Muslih, Anggun Fergina, dan Heliani [21]	Decision Support System For Best Catering Using Simple Additive Weighting Method In PT. YHS	Determination of the most suitable type of catering service. The results showed that 9 caterers had the highest value and 4 criteria that were suitable for use	Determination of exemplary students by using 5 criteria to determine the highest alternative
	Sadegh Niroomand, Sam Mosallaeipour, dan Ali Mahmoodirad[22]	A Hybrid Simple Additive Weighting Approach for Constrained Multicriteria Facilities Location Problem of Glass Production Industries Under Uncertainty	The novelty of formulation: 1) overcoming the value of the criterion interval; 2) Maintaining the possibility of choosing the best set of locations among all possible locations, and 3) Addressing the managerial limitations of the problem.	Determination of exemplary students applying the SAW method by using 5 criteria in decision-making.
	Wahyu Saptha Negoro, M. Irfan Aldy Nasution, Agung Ramadhanu, Fhery Agustin, Muhatri Muhatrii, dan Syahputra Amri [23]	Participants' Evaluation of Computer-Based Writing Exam Eligibility in High School Using Simple Additive Weighting Method	Perform calculations for UTBK selection for the SBMPTN pathway as an application for admission of college entrance participants. The data was used in 2 groups, namely the IPA group and the Soshum group.	Selecting exemplary students with 5 criteria with many alternatives sampled were 37 students

Over the past few decades, *decision support systems* research has grown tremendously. Some previous studies in Table 1 show a gap between the proposed research and the research referenced in this article. The gap in this research article can be noted that in almost all previous studies did not use attitudinal criteria as

a research variable. In addition, data is used in research, and steps in solving problems. Even different situations and conditions also affect the results of the decisions concluded in the study. Based on the criteria, data, problem-solving steps, situations, and research conditions, it can be seen that this article is a development of previous studies.

This study aims to assist schools in making decisions on the selection of exemplary students, as it is known that as many as 925 students in odd semesters of the 2022/2023 school year. This research can also provide benefits in improving science in the field of computers and also on the object studied. It will be easier and more effective and can even reduce social jealousy in the selection of exemplary students if the decision support system as a result of this study is utilized optimally. Some other things that can be given are by knowing exemplary students, it can make it easier to choose the best students to be included in extracurricular activities or organizations at school and even to consider scholarship recipients.

2. RESEARCH METHODS

This Research Method sub-method provides an overview of the stages of research and an overview of the mathematical model that will be applied to this research. Solving problems related to the selection of exemplary students in this study will be solved by carrying out research stages and applying mathematical models contained in the decision support system. As contained in previous research that mathematical models that can be applied in developing decision support systems in the case of selecting exemplary students, one of which is the SAW (*Simple Additive Weighting)* method.

Research methods are applied so that research can be carried out systematically. Some systematic steps carried out in this research are literature study, topic determination, problem identification, data collection, data validation, data processing, and analysis, and finally the preparation of reports. By performing each step systematically, these researchers can ensure that the research has been conducted properly and reliably. For this reason, figure 1 shows the stages of research carried out in this study.
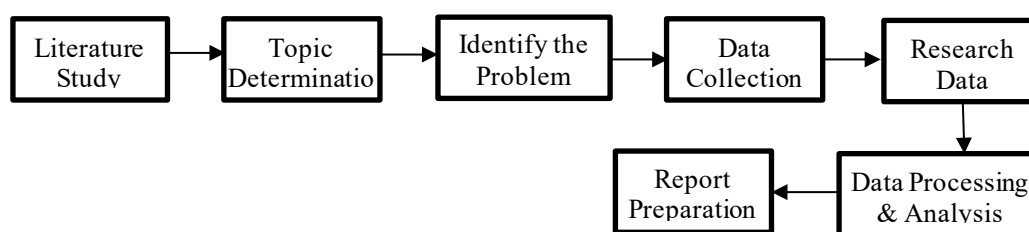
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┌──────────┐   ┌──────────────┐   ┌──────────────┐   ┌──────────────┐   ┌──────────┐
│Literature│ → │    Topic     │ → │ Identify the │ → │     Data     │ → │ Research │
│  Study   │   │ Determinatio │   │   Problem    │   │  Collection  │   │   Data   │
└──────────┘   └──────────────┘   └──────────────┘   └──────────────┘   └──────────┘
                                                                              │
                                                                              ↓
                          ┌──────────────┐   ┌──────────────────┐
                          │    Report    │ ← │ Data Processing  │
                          │ Preparation  │   │   & Analysis     │
                          └──────────────┘   └──────────────────┘
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Figure 1. Stages of Research

a. Literature Study
    Literature studies function in collecting and deepening theories related to the design and processing of decision support systems. This research was conducted by reading previous journals and articles as reference material for making journals. The journals studied are related to decision support systems, but this research is more focused on the SAW method.

b. Topic Determination
    The topic is a general and abstract subject matter. Basically, the topic discusses a foundation for researchers to convey their goals. The author determines the topic by collecting and looking for problems that occur to help in making decisions. This study takes the topic of education to be able to help in determining decisions.

c. Identify the Problem
    At this stage, it is carried out to find out a problem in determining exemplary students at SMPN 1 Sampit and then processing the student data. At this stage, understand the problem under study. The problem identification stage is carried out to be able to formulate the problem in such a way that this research can be carried out regularly.

d. Data Collection
    At this stage, researchers collect information sourced directly from the school to learn more about the problems in compiling research. The type of data used in this study is a mixture referring to numerical and descriptive data. The number of students at SMP 1 Sampit 925 has 24 classrooms. The sample data used in this study used class VIII data. Class VIII data is used as a research sample because it is considered to have criteria standards that can represent the total number of student data at SMP 1 Sampit. Data collection is carried out by observation, interviews, and review of class VIII documents owned by homeroom teachers, or called secondary data.

e. Research Data Validation

Data that has been obtained from various sources is checked for consistency of the data. Checking data to ensure there are no data input errors by reviewing documents that have been obtained from the object of research. This is done to ensure that the data used in the research is reliable and in accordance with the characteristics of the research data needed.

f. Processing and Analysis

The purpose of data processing of this study is to determine exemplary students using the decision support system of the SAW method. To be able to achieve the main goal, it is necessary to process and analyze data. Data processing is carried out by manual calculations.

g. Report Preparation

At this stage of preparing the report, the researcher compiles all processes from literature study to data creation until the results are obtained, and the results are compiled into a report. So that readers can see the overall results of the report made.

2.1 SAW Method

The *Simple Additive Weighting* method can be used to normalize data by using a reasoning model that can be compared with all other alternatives. This method performs monitoring by weighting all results using ratings (not attributes) and *individual attribute bots* for each result. The method in question requires the user to provide a reason to specify the weight of each attribute and the number of other values that can be selected from the sum mentioned above.

The SAW method is a weighting technique also called the weight addition technique. In addition, this method makes it possible to sort each alternative according to predetermined criteria to facilitate the process of comparison of alternatives. As a result, the SAW method can be used as an effective and efficient system in the recruitment process of exemplary students in accordance with predetermined criteria. In addition, this method makes it possible to sort each alternative according to predetermined criteria to facilitate the process of comparison of alternatives. Therefore, the SAW method can be used as an efficient and effective system in the recruitment of remote workers who meet predefined criteria and can provide workable solutions to any problems that arise during the hiring process.

2.2 Stages of the SAW Method

The stages carried out in solving using the SAW method are:

a. Determine the data to be carried out research first and then it will be transformed.
b. Determine the weighting of criteria that will be used as a reference in decision-making.
c. Define alternative assessments into the rating values on each criterion.
d. After determining the alternative assessment, the calculation of the performance rating value is then carried out. The following formula for calculating the performance rating value is contained in

$$\text{Equation 1:} \quad r_{ij} = \begin{cases} \dfrac{x_{ij}}{max_i(x_{ij})} & \text{If } j \text{ is profit criterion (benefit)} \\[2ex] \dfrac{min_i(x_{ij})}{x_{ij}} & \text{If } j \text{ is the cost criterion (cost)} \end{cases} \tag{1}$$

Information:

rij	= Normalized performance rating of alternatives
max xij	= The greatest value of each criterion
min xij	= The smallest value of each criterion
xij	= Existing attribute values on each criterion

Furthermore, the preference formula can be seen in the following equation 2:

$$v_i = \sum_{j=1}^{n} W_j R_{ij} \tag{2}$$

Information:

Vi	= Ranking of each alternative
Wj	= Rank weighted value
Rij	= Normalized performance rating values

A higher Vi value indicates that the alternative was selected.

e. The next step forms a normalized performance matrix.
f. The results of the study of preference values in obtained from the addition and multiplication of normalized matrices with preference weights.

2.3 *MSE*

Mean Squared Error (MSE) is one of the commonly used evaluation methods in forecasting analysis to measure how close the predictions made by forecasting models are to actual values[24], [25]. MSE calculates the average of the differences between the actual values and the predictions generated by the model, which are then squared. In calculating MSE, the greater the difference between the actual and predicted values, the greater the MSE value. The MSE formula can be seen in the following equation 3:

$$MSE = \frac{\sum_{t=1}^{n}(A_t - F_t)^2}{n} \qquad (3)$$

Information:

- A_1 = Actual Data at Time 1
- F_1 = Data Forecasting / Prediction at Time 1
- n = Amount of Data

3. RESULTS AND DISCUSSION

This research is carried out to solve the problems owned by the object of research. This research begins with conducting *a literature* study or reading scientific articles that can be used as a reference and to assist in determining the research topic. The study conducted here shows that there are research topics that can be raised so it is necessary to identify the problem. The problem that can be seen in the object of research is about determining exemplary students. The determination of exemplary students is a concern and can also cause further problems, especially the emergence of social violence if not handled properly. For this reason, it is necessary to conduct in-depth research on the object (SMP Negeri 1 Sampit). After finding the problems raised, proceed with collecting data.

3.1 Data Collection

The results of observation, interviews, and document review can collect the data shown in Table 2. This study has several variables including Attitude, Absence, Achievement, Eskul, and Grades. These variables in decision support system research are used as criteria in decision-making.

Table 2. Research data

No	Name	Attitude	Absent	Achievement	Eskul	Value
1	Abdul Khodir Al Gajali	good	2	1st Place in PORCAM in Pencak Silat 2nd Winner of KOSN at the Provincial Level (National Participants) in the field of Pencak Silat	3	89.00
2	Adi Malik Pratama	good	0	0	2	89.18
3	Ahnaf Nanda Satwika	good	0	0	3	89.82
4	Alfa Christian	good	0	0	2	90.27
5	Alfayza Putri Farania	good	3	Received IYSA Youth National Science Fair (YNSF) 2022 gold medal Received the 2022 Global Competition for Life Science (GloCoLis) bronze medal	2	91.36
6	Andika Pernando Siagian	good	0	0	3	90.18
7	Athillah Nanda Mahdia	good	2	0	1	89.00
8	Aurelia Rara Pratista	good	3	0	2	90.73
...	...	...	...	...	...	...
...	...	...	...	...	...	...
37	Zenzia Taulina Samadan	good	1	8th Place in Primagama (PMJ) Online Mathematics Olympiad 3rd Place in KSN Mathematics Junior High School at the district level	3	91.36

3.2 Research Data Validation

Table 2. Shows that each student has different criteria values, which are needed as a reference for the school in determining exemplary students. Each criterion has an important role in the final assessment in determining exemplary students. Attitude information is used to measure student attitudes towards the school environment, attendance is used to determine student attendance in class, the achievement is used to measure student activeness and performance in exams or competitions at school or outside school, extracurricular is used to measure student performance, activeness, and social spirit in extracurricular activities, and grades are used to measure student learning outcomes in each subject. This data is used by teachers, school administration, and concerned government authorities for the determination of exemplary students. Because the mathematical model used in this study is *Simple Additive Weighting* which is a method that performs weighting and calculations requiring numerical numbers. Because the data obtained in the study is still mixed (numerical and descriptive), in the validation of research data, it is necessary to

weigh and transform the data into numerical values. The results of the data transformation can be shown in Table 3.

Table 3. Data Transformation

No	Name	Attitude	Absent	Achievement	Eskul	Value
1	Abdul Khodir Al Gajali	3	2	2	3	89
2	Adi Malik Pratama	3	0	0	2	89
3	Ahnaf Nanda Satwika	3	0	0	3	89
4	Alfa Christian	3	0	0	2	90
5	Alfayza Putri Farania	3	3	3	2	91
6	Andika Pernando Siagian	3	0	0	3	90
7	Athillah Nanda Mahdia	3	2	0	1	89
8	Aurelia Rara Pratista	3	3	0	2	90
…	…	…	…	…	…	…
…	…	…	…	…	…	…
37	Zenzia Taulina Samadan	3	1	1	3	91

Table 3 shows that data transformation has been carried out which shows that the data conditions are in accordance with the characteristics of the data desired in the study. In the criteria attitude, it is said that if the behavior is better, the agreement reached by students is also better. In the absenteeism section, the more absences the student has, the smaller the reported weight. Achievement assessment is carried out based on limited categories, such as 1st, 2nd, and 3rd place, participating in the competition, and not participating in the competition. When using the Simple Additive Weighting method, achievement numbers need to be converted into numerical form to carry out the calculation process. With more extracurricular activities taking place in the area, the quality of conversion numbers will be better. The higher the average score of students in the nail field, the more favorable the weight of nails received.

3.3 Data Processing and Analysis

At the stage of data processing and analysis, they implement the procedures contained in the *Simple Additive Weighting* (SAW) mathematical model or often referred to as the SAW Method. After transforming the data to match the characteristics of the relevant data to further carry out criteria weighting. Criteria weighting is shown in Table 4.

Table 4. Criteria Weighting

No	Criteria Name	Weight Value	Criterion Weights
1	Prestasi (C1)	30%	0.3
2	Nilai rata-rata (C2)	25%	0.25
3	Absensi (C3)	20%	0.2
4	Sikap (C4)	15%	0.15
5	Eskul (C5)	10%	0.1

In Table 4, this method is used to identify each criterion used to select exemplary students who best fit the criteria under consideration during the learning process. The total criteria weighting in Table 4 is 1. After determining the weight criteria, the best alternative was sought by reviewing the weight data using the *Simple Additive Weighting (SAW) method*. Utilizing this technique makes the recruitment of new staff members more transparent and accessible to all school staff members.

Table 5. Alternative Assessments

No	Alternative	Criteria Name				
		C1	C2	C3	C4	C5
1	SW1	2	89	2	3	3
2	SW2	0	89	0	3	2
3	SW3	0	89	0	3	3
4	SW4	0	90	0	3	2
5	SW5	3	91	3	3	3
6	SW6	0	90	0	3	1
7	SW7	0	89	2	3	2
8	SW8	0	90	3	3	2

...	...	...	...	...	...	...
...	...	...	...	...	...	...
37	SW37	1	91	1	3	3

Table 5 shows that each criterion is given *the symbol* C1 to C5. Then the alternative is given the *symbol* SW1 to SW37. Table 6 is a value that provides information about the weight value contained in each criterion associated with the final result.

Table 6. Calculating Performance rating values

No	Alternative	Criteria Name				
		C1	C2	C3	C4	C5
1	SW1	2/4 = 0,5	89/91 = 0,97	2/5 = 0,4	3/3 = 1	3/4 = 0,75
2	SW2	0/4 = 0	89/91 = 0,97	0/5 = 0	3/3 = 1	2/4 = 0,5
3	SW3	0/4 = 0	89/91 = 0,97	0/5 = 0	3/3 = 1	3/4 = 0,75
4	SW4	0/4 = 0	90/91 = 0,98	0/5 = 0	3/3 = 1	2/4 = 0,5
5	SW5	3/4 = 0,75	91/91 = 1	3/5 = 0,6	3/3 = 1	3/4 = 0,75
6	SW6	0/4 = 0	90/91 = 0,98	0/5 = 0	3/3 = 1	1/4 = 0,25
7	SW7	0/4 = 0	89/91 = 0,97	2/5 = 0,4	3/3 = 1	2/4 = 0,5
8	SW8	0/4 = 0	90/91 = 0,98	3/5 = 0,6	3/3 = 1	2/4 = 0,5
...	...	...	...	...	...	...
...	...	...	...	...	...	...
37	SW37	1/4 = 0,25	91/91 = 1	1/5 = 0,2	3/3 = 1	3/4 = 0,75

Table 6 shows that alternative values already have performance rating values. In the calculation of the first performance rating, criteria or factors must be determined to be used to assess performance. Then, each of these factors is weighted according to its level of importance. Next, a performance score is assigned for each factor. This score can be obtained through calculations with the above method. After that, the performance score is multiplied by the factor weights and summed to get the total performance score. To obtain more accurate results, normalization or standardization of performance methods can also be used, which allows fair comparisons for all students. After getting the alternative value, it can be presented into the normalized performance matrix as in Table 7 below.

Table 7. Normalized performance matrix

$$\begin{pmatrix}
0,5 & 0,97 & 0,4 & 1 & 0,75 \\
0 & 0,97 & 0 & 1 & 0,5 \\
0 & 0,97 & 0 & 1 & 0,75 \\
0 & 0,98 & 0 & 1 & 0,5 \\
0,75 & 1 & 0,6 & 1 & 0,5 \\
0 & 0,98 & 0 & 1 & 0,75 \\
0 & 0,97 & 0,4 & 1 & 0,25 \\
0 & 0,98 & 0,6 & 1 & 0,5 \\
... & ... & ... & 1 & ... \\
... & ... & ... & 1 & ... \\
0 & 0,98 & 0 & 1 & 0,5 \\
0,25 & 1 & 0,2 & 1 & 0,75
\end{pmatrix}$$

Calculates the value of the preference weight for each alternative
V1 = (w1 * sw1) + (w2 * sw1) + (w3 * sw1) + (w4 * sw1) + (w5 * sw1)
   = (0,3 x 0,5) + (0,25 x 0,97) + (0,2 x 0,4) + (0,15 x 1) + (0,1 x 0,75)
   = 0,15 + 0,2425 + 0,8 + 0,15 + 0,075 = 0,6975

V2 = (0,3 x 0) + (0,25 x 0,97) + (0,2 x 0) + (0,15 x 1) + (0,1 x 0,5)

$$= 0 + 0,2425 + 0 + 0,15 + 0,5 = 0,4425$$

$$V3 = (0,3 \times 0) + (0,25 \times 0,97) + (0,2 \times 0) + (0,15 \times 1) + (0,1 \times 0,75)$$
$$= 0 + 0,2425 + 0 + 0,15 + 0,075 = 0,4575$$

$$V4 = (0,3 \times 0) + (0,25 \times 0,98) + (0,2 \times 0) + (0,15 \times 1) + (0,1 \times 0,5)$$
$$= 0 + 0,245 + 0 + 0,15 + 0,05 = 0,445$$

$$V5 = (0,3 \times 0,75) + (0,25 \times 1) + (0,2 \times 0,6) + (0,15 \times 1) + (0,1 \times 0,5)$$
$$= 0,225 + 0,25 + 0,12 + 0,15 + 0.05 + 0.05 = 0,795$$

$$V6 = (0,3 \times 0) + (0,25 \times 0,98) + (0,2 \times 0) + (0,15 \times 1) + (0,1 \times 0,75)$$
$$= 0 + 0,245 + 0 + 0,15 + 0,075 = 0,47$$

$$V7 = (0,3 \times 0) + (0,25 \times 0,97) + (0,2 \times 0,4) + (0, 0,15 \times 1) + 0,1 \times 0,25)$$
$$= 0 + 0,2425 + 0,08 + 0,15 + 0,025 = 0,4975$$

$$V8 = (0,3 \times 0) + (0,25 \times 0,98) + (0,2 \times 0,6) + (0,15 \times 1) + (0,1 \times 0,5)$$
$$= 0 + 0,245 + 0,12 + 0,15 + 0,05 = 0,565$$

$$V9 = (0,3 \times 0,25) + (0,25 \times 1) + (0,2 \times 0,8 + (0,15 \times 1) + (0,1 \times 0,5)$$
$$= 0,075 + 0,25 + 0,16 + 0,15 + 0,05 = 0,685$$

$$V10 = (0,3 \times 0) + (0,25 \times 0, 97) + (0,2 \times 0,4) + (0,15 \times 1) + (0,1 \times 0,5)$$
$$= 0 + 0,2425 + 0,8 + 0,15 + 0,5 = 0,5225$$

After calculation, the following results were obtained: 1st place was Kenzo Ecclesio Taha with a total value of 0.9025. Ranked 2nd is Syifa Dewi Aristyawati with a total value of 0.8675. The 3rd place is Dwi Agis Mutmainah with a total value of 0.8125. Followed by the next data of 37 *data records* until the last rank, namely Luna Julianti Aurelia with a total value of 0.4375. In the calculation data of *the preference* weight value in each *alternative*, the maximum value (max), minimum value (min), and range value can be found by sorting the values from smallest to largest. The maximum value is obtained from the largest value in the data set, while the minimum value is obtained from the smallest value in the data set. Meanwhile, the range value is calculated by subtracting the maximum value by the minimum value. In this study, the maximum value of the data was 0.9025 in V16, the minimum value was 0.4375 in V17, and the range value of the data was 0.465. The presentation of the predicted value and MSE value can be seen in the following table 8.

Table 8. Forecasting result value and *MSE* value

No	Actual Value	Forecast Value	SE
1	99	0,6975	9663,382
2	94	0,4425	8753,006
3	95	0,4675	8936,394
4	95	0,445	8940,648
11	101	0,8125	10037,54
16	102	0,9025	10220,7
35	102	0,8675	10227,78
36	95	0,445	8940,648
37	99	0,59	9684,528
Max Value of Forecasting			**0,9025**
Minimum Forecasting Value			**0,4375**
Forecasting Rentag Value			**0,465**
MSE value			**9289,135311**

The *MSE* method in this study is used as a standard to determine the performance value of the Simple Additive Weighting (SAW) method in predicting the selection of late students. Table 8 shows that the performance of the Simple Additive Weighting (SAW) method has a value of 9289.135311.

3.4 Penyusunan Laporan

In the research process carried out starting from the stages of literacy studies to data processing and analysis that the results of exemplary student decisions on behalf of Kenzo Ecclesio Tahan were alternatives that had the highest ranking scores and then continued with other students. Furthermore, to be used as a research report in this study, a description of each value obtained at each stage of data processing was carried out using the *Simple Additive Weighting (SAW) method.* Then the results of the research were submitted to SMP Negeri 1 sampit and also carried out the preparation of scientific articles that could be published in scientific journals.

4. CONCLUSION

The development of an exemplary student identification system using the *Simple Additive Weighting* method can help schools identify late students. This study had 37 *data sets* obtained after conducting interviews with homeroom teachers. It is known that the results of research using the *SAW* method that the results ranked 1st with a total value of 0.9025, ranked 2nd with a total value of 0.8675 and ranked 3rd with a total value of 0.8125. This system can be used as a backup media for achievement data obtained by students. Then the results of testing the performance of the SAW method in predicting exemplary students resulted in *an SME* score of 9289.135311. Based on the results of the research that has been done, the author suggests that this research can be continued with different concepts so that it can produce even better performance values. This means that if the next study uses the same data, it can look for *a Mean Squared Error (MSE)* value close to zero.

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