Bulletin of Informatics and Data Science
Vol. 3 No. 2, November 2024, Page 70−78
ISSN 2580-8389 (Media Online)
DOI 10.61944/bids.v3i2.103
https://ejurnal.pdsi.or.id/index.php/bids/index

Implementation of WP and MOOSRA Methods in Decision Support Systems for Selecting Students Receiving Single Tuition Fee Assistance

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Abstrak

A decision support system is a decision-making process from an interactive information system that provides data to assist in decision-making by using certain information and models to solve numerous unstructured problems. One example of the implementation of a decision support system is the selection of students to receive Single Tuition Fee (UKT) assistance at Budi Darma University. The selection of students to receive assistance at Budi Darma University has been adjusted to the predetermined criteria. Due to the large number of students with the same criteria, a decision support system is needed as a solution to this research problem. In this study, the decision support system applies the Weighted Product (WP) and Multi-objective Optimization on the Basis of Simple Ratio Analysis (MOOSRA) methods to obtain accurate results in selecting students who are eligible to receive Single Tuition Fee assistance. This study has seven alternative data and five predetermined criteria along with weight values obtained from Rank Order Centroid (ROC). The WP and MOOSRA method calculations from the decision support system obtained the same alternative ranking calculation results.

Keywords: Decision Support System; DSS; WP Method; MOOSRA Method; Single Tuition Fee

1. INTRODUCTION

Single Tuition Fee Assistance (UKT) is a tuition fee paid by each student per semester that is covered by the government for study programs in higher education institutions. In implementing UKT assistance, the government conducts selection rounds for each year [1][2]. At Budi Darma University in Medan, the university selects students who are eligible for Single Tuition Fee (UKT) assistance, which is beneficial in alleviating the tuition costs for students who are economically disadvantaged.

Students who are economically disadvantaged are entitled to receive Single Tuition Fee assistance, but there is more than one requirement to receive this assistance. Of course, Budi Darma University has determined other criteria, namely parental income, parental dependents, semester presentation index (IPS), number of achievements, and semester. Due to the large number of students who meet the same criteria, Budi Darma University faces problems in selecting students to receive assistance. Therefore, a system is needed to facilitate the selection of students to receive assistance. One of the systems used in this study is a decision support system (DSS).

Decision Support Systems (DSS) are universally defined as systems that can share expertise, case-solving skills, and communication skills in semi-structured cases [3][4]. In this study, the decision support system applies the WP (Weighted Product) and MOOSRA (Multi-objective Optimization on the Basis of Simple Ratio Analysis) methods to select students who are eligible to receive UKT assistance. The Weighted Product (WP) method can be interpreted as part of the Multi Criteria Decision Making (MCDM) concept, which is a decision-making method from many alternative preferences that can evaluate many alternatives against a set of attributes or criteria, where each attribute is independent of one another. Meanwhile, the definition of the Multiobjective Optimization on the Basis of Simple Ratio Analysis (MOOSRA) method is a multi-optimization procedure using a simple ratio of the sum of normalized performance values for unfavorable standards to avoid negative values and produce positive standard values [5]. Therefore, with the methods applied in the decision support system (DSS) above, the author is interested in comparing the alternative values that have been determined as the basis for this study. In decision support systems, the commonly used methods are MOORA, MOOSRA, SAW, WP, and WASPAS [6].

The above issues require research related to the similarity of this research method in decision support systems (DSS) so that Budi Darma University can be more selective in selecting students who are entitled to receive Single Tuition Fee assistance. Some of the research conducted by previous researchers related to the application of the Decision Support System method includes that conducted by Fitri Meilida in 2021, which applied the Multi-objective Optimization on the Basis of Simple Ratio Analysis (MOOSRA) method to determine the selection of athletes with predetermined criteria, resulting in the selected alternative being Siti Sanaya (A1) with a score of 3.0617 as the best alternative [7]. In 2021, Muslimah Katoningati et al. also conducted research applying the Weighted Product (WP) method to determine the best mobile phone selection, which produced the highest alternative ranking based on predetermined criteria, namely alternative B with a score of 0.253265 for the Asus Rog Phone brand [8]. In the same year, Dedek Cahyati et al. conducted a study discussing the selection of extracurricular activities by applying a comparison of the WP and SAW methods. This resulted in the highest alternative value based on predetermined criteria, namely alternative A3 with a value of 0.308, which is volleyball [9]. The research conducted by Mohammad Aldinugroho Abdullah, et al. (2023) discussed the application of the MOOSRA method in the selection of online cake delivery applications with the support of the ROC

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Vol. 3 No. 2, November 2024, Page 70−78
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https://ejurnal.pdsi.or.id/index.php/bids/index

weighting method. In this study, the ROC method was used to determine the weight of importance of five assessment criteria, namely application usability, rating reviews, promotions (discounts), cake menus, and handling costs. Furthermore, the Multiobjective Optimization on the Basis of Simple Ratio Analysis (MOOSRA) method was used to rank eight alternative applications based on these criteria. The final results showed that the Akul Cake Delivery application obtained the highest preference score of 38.012 and was declared the best application for online cake delivery [10].

From the explanation above, with this research, the author aims to assist in selecting students who are eligible to receive single tuition assistance (UKT) at Budi Darma University Medan by using a decision support system applying the Weighted Product (WP) method and the Multi-objective Optimization on the Basis of Simple Ratio Analysis (MOOSRA) method. In this study, the author hopes to provide accurate data in selecting students who are eligible to receive Single Tuition Fee assistance.

2. RESEARCH METHODOLOGY

2.1 Research Stages

In the research methodology, data collection steps or stages are carried out, which are used to obtain data by the author in this study, namely:

1. Problem Analysis
   In this stage, an analysis is conducted on the criteria values, weights, alternatives, and rankings that influence the alternatives. This problem is formulated in terms of how to apply a decision support system using the Weighted Product (WP) and Multiobjective Optimization on the Basis of Simple Ratio Analysis (MOOSRA) methods for selecting students to receive UKT assistance. The criteria applied in the decision-making system are semester presentation index, number of presentations, semester, parental income, and parental dependents, using the Rank Order Centroid (ROC) weighting method.
2. Literature Study
   At this stage, data related to the research case was collected from various sources, such as the internet, books, journals, and other articles.
3. Method Analysis and Application
   At this stage, the case problem was applied and the research case was solved using the WP and MOOSRA methods from the data obtained to provide assistance to students who were eligible to receive UKT assistance.
4. Comparison of Method Results
   In this stage, the results of the WP and MOOSRA methods are compared with the criteria, alternatives, weights, and ranking results.
5. Research Report Writing
   In this stage, the results of the research conducted are applied in the writing of the report.

These research stages are illustrated in Figure 1:

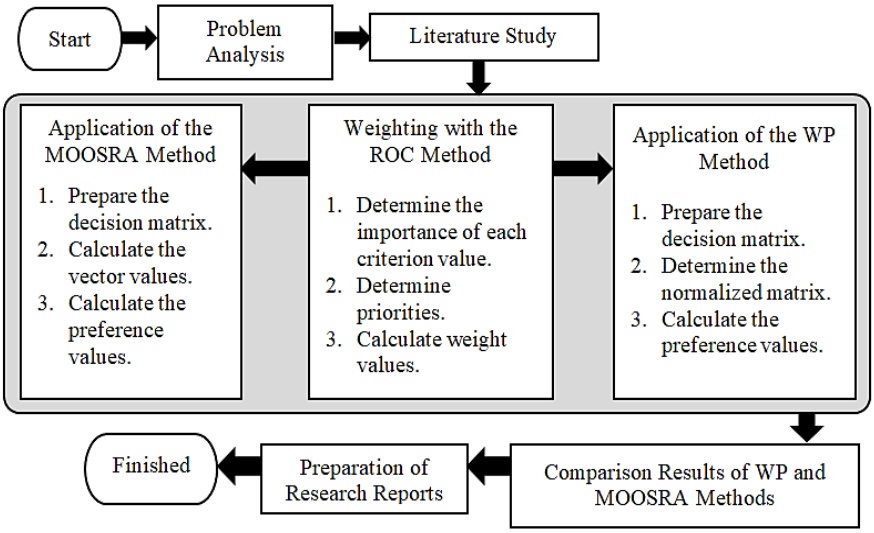

Figure 1. Research Stages

2.2 Decision Support System

A decision support system is a decision-making process from an interactive information system that provides data to aid decision-making by using certain information and models to solve a number of unstructured problems. With unstructured situations, no one knows the exact way in which decisions should be made [11][12][13][14].

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2.3 Single Tuition Fee (UKT)

The Single Tuition Fee (UKT) is a tuition fee paid by each student that is covered by the government based on their economic capacity. The total cost is covered per semester for study programs at universities, and each university will have a different UKT amount [15].

2.4 Weighted Product (WP) Method

The WP method is a decision-making method using multiplication to connect attribute ratings, where each attribute rating must first be raised to the power of the relevant attribute weight. The Weighted Product (WP) method is a multi-criteria decision-making method and a well-known multi-criteria analysis decision [16][17]. The steps for solving this are as follows [18]:

1. Prepare the decision matrix
   In forming the decision matrix obtained from the alternative values and criterion values, the following matrix equation is used:

$$Xij = \begin{bmatrix} X_{11} & X_{12} & \cdot & X_{1n} \\ X_{21} & X_{22} & \cdot & X_{2n} \\ \cdot & \cdot & \cdot & \cdot \\ X_{m1} & X_{m2} & \cdot & X_{mn} \end{bmatrix} \quad (1)$$

2. Calculating the Vector (Si)
   Each criterion value is multiplied by the other criterion values that have been raised to the power of their respective weights. The calculation results are formulated as follows:

$$Si = \prod_{j=1}^{n} Xij^{Wj} \quad (2)$$

3. Calculating Preferences (Vi)
   After finding the value of vector Si, the next step is to find the value of vector V, which is calculated using the following formula:

$$Vi = \frac{\prod_{j=1}^{n} Xij^{wj}}{\prod_{j=1}^{n} (Xij^{*})^{Wj}} \quad (3)$$

2.5 Multiobjective Optimization Method on the Basis of Simple Ratio Analysis (MOOSRA)

Multiobjective Optimization on the Basis of Simple Ratio Analysis (MOOSRA) is a multi-optimization procedure that uses a simple ratio of normalized performance values for unfavorable standards to avoid negative values and produce positive standard values. To date, MOOSRA has been associated with alternative values, weights, criteria, and decision matrices [19][20][21]. The algorithm for solving decision support systems using the MOOSRA method is as follows [22]:

1. Forming the Decision Matrix
   In forming the Decision Matrix obtained from the criteria and alternative data, where the alternative values are connected to each criterion value, the following matrix equation is applied:

$$Xij = \begin{bmatrix} X_{11} & X_{12} & \cdot & X_{1n} \\ X_{21} & X_{22} & \cdot & X_{2n} \\ \cdot & \cdot & \cdot & \cdot \\ X_{m1} & X_{m2} & \cdot & X_{mn} \end{bmatrix} \quad (4)$$

2. Determining the Normalization Matrix
   In the MOOSRA method, the following equation is used to normalize the elements of the decision matrix:

$$X_{ij}^{*} = \frac{x_{ij}}{\sqrt{\left[\sum_{i=1}^{m} xij^{2}\right]}} \quad (5)$$

3. Determining Preference Values
   All alternative values are calculated as simple comparisons of useful calculations on criterion values using the following formula:

$$y_{i}^{*} = \frac{\sum_{j=1}^{g} x_{ij}^{*}}{\sum_{j=g+1}^{n} x_{ij}^{*}} \quad (6)$$

   If each criterion has a different weighting, the optimization formula becomes as follows:

$$y_{ij}^{*} = \frac{\sum_{j=1}^{g} wj\, x_{ij}^{*}}{\sum_{j=g+1}^{n} wj\, x_{ij}^{*}} \quad (7)$$

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ISSN 2580-8389 (Media Online)
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3. RESULTS AND DISCUSSION

In the results and discussion, a decision support system was applied using the WP (Weighted Product) method and the MOOSRA (Multi-objective Optimization on the Basis of Simple Ratio Analysis) method to determine which students would receive assistance. To produce effective information in the DSS, data in the form of alternative data, criteria data, and the weight value of each criterion is required, as can be seen from the following explanation process:

3.1 Determination of Alternatives

At this stage, the author analyzed seven alternative data sets of students eligible to receive assistance at Budi Darma University, as shown in Table 1:

Table 1. Student Alternative Data

Alternative	Student Name
A_1	Miya Putri Daulay
A_2	Ridho Andrian
A_3	Dameria Marlina Lumban Gaol
A_4	Nurhafni ritonga
A_5	Wahyu Harry Bai Lumbanbatu
A_6	Andika pratama
A_7	Jhois magdalena halawa

Table 1 shows a list of students who are alternatives in the decision-making process. Each student is given a code from A1 to A7 to facilitate identification and analysis in the next evaluation stage.

3.2 Determination of Criteria

From the student alternative data above, the criteria data can be determined as the requirements for recipients of single tuition assistance. In the case of student selection, there are five criteria that have been determined by the author in the form of benefits and costs, as shown in Table 2 below:

Table 2. Student Criteria Data

Criteria	Description	Type
C_1	Semester Achievement Index (IPS)	*Benefit*
C_2	Number of Achievements	*Benefit*
C_3	Semester	*Benefit*
C_4	Parental Responsibility	*Benefit*
C_5	Parental Income	*Cost*

The description of Table 2 is as follows:
Semester Achievement Index (IPS) : This is the semester grade of students taken from the University of Budi Darma student record.
Number of Achievements : Students who have received the most awards have the greatest opportunity.
Semester : The minimum academic period for students is from semester 1 to semester 7.
Parental Responsibility : Students with many parental responsibilities are given priority.
Parental Income : Students with low parental income are given priority.

Based on the determined criteria, the weight values were calculated using the Rank Order Centroid (ROC) weighting method, which is the weight value derived from the criteria required in the decision support system weighting. The weights of the student criteria can be seen in Table 3.

Table 3. Weights of Student Criteria

Criteria	Description	Weight	Type
C1	Semester Achievement Index (IPS)	0.46	*Benefit*
C2	Number of Achievements	0.26	*Benefit*
C3	Semester	0.16	*Benefit*
C4	Parental Responsibility	0.09	*Benefit*
C5	Parental Income	0.04	*Cost*

Table 3 shows each criterion used in student assessment along with its weight and type. The weight reflects the level of importance of each criterion in decision making, while the type of criterion is divided into benefit and cost, depending on whether the expected value is higher the better (benefit) or lower the better (cost). After obtaining the student alternative data and criterion data, the author matched each student's alternative data with the predetermined criterion data, as shown in Table 4.

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ISSN 2580-8389 (Media Online)
DOI 10.61944/bids.v3i2.103
https://ejurnal.pdsi.or.id/index.php/bids/index

Table 4. Rating of Alternative Data Matching with Criteria

Alternative	C_1	C_2	C_3	C_4	C_5
A_1	3,36	1	4	4	3.000.000
A_2	3,92	3	6	4	1.000.000
A_3	3,85	1	2	2	1.500.000
A_4	3,45	2	4	2	2.700.000
A_5	3,76	3	3	2	2.000.000
A_6	3,78	1	2	2	2.500.000
A_7	3,26	1	4	3	1.500.000

Table 4 presents the values of each alternative (student) against the five predetermined criteria, namely IPS (C1), number of achievements (C2), semester (C3), parental dependents (C4), and parental income (C5). This data is used as the basis for the normalization process and final calculation to determine the best student ranking based on the decision-making method used.

3.3 Implementation of the WP (Weighted Product) Method

After the alternative data, criteria, and weight values have been formed, the WP method can be calculated as follows:

1. Prepare the decision matrix

$$X_{ij} = \begin{bmatrix} 3.36 & 1 & 4 & 4 & 3000000 \\ 3.92 & 3 & 6 & 4 & 1000000 \\ 3.85 & 1 & 2 & 2 & 1500000 \\ 3.45 & 2 & 4 & 2 & 2700000 \\ 3.76 & 3 & 3 & 2 & 2000000 \\ 3.78 & 1 & 2 & 2 & 2500000 \\ 3.26 & 1 & 4 & 3 & 1500000 \end{bmatrix}$$

2. Calculating the vector value (Si)

$$S_1 = (3.36^{0,46}) * (1^{0,26}) * (4^{0,16}) * (4^{0,09}) * (3000000^{0,04})$$
$$= 1.7463 * 1.0000 * 1.2483 * 1.1329 * 1.8159$$
$$= 4.4845$$

$$S_2 = (3.92^{0,46}) * (3^{0,26}) * (6^{0,16}) * (4^{0,09}) * (1000000^{0,04})$$
$$= 1.8746 * 1.3306 * 1.3320 * 1.1329 * 1.7378$$
$$= 6.5411$$

$$S_3 = \left(3.85^{0,46}\right) * (1^{0,26}) * (2^{0,16}) * (2^{0,09}) * \left(1500000^{0,04}\right)$$
$$= 1.8591 * 1.0000 * 1.1173 * 1.0644 * 1.7662$$
$$= 3.9049$$

$$S_4 = \left(3.45^{0,46}\right) * (2^{0,26}) * (4^{0,16}) * (2^{0,09}) * (2700000^{0,04})$$
$$= 1.7677 * 1.1975 * 1.2483 * 1.0644 * 1.8082$$
$$= 5.0856$$

$$S_5 = (3.76^{0,46}) * (3^{0,26}) * (3^{0,16}) * (2^{0,09}) * (2000000^{0,04})$$
$$= 1.8390 * 1.3306 * 1.1922 * 1.0644 * 1.7867$$
$$= 5.5477$$

$$S_6 = (3.78^{0,46}) * (1^{0,26}) * (2^{0,16}) * (2^{0,09}) * \left(2500000^{0,04}\right)$$
$$= 1.8435 * 1.0000 * 1.1173 * 1.0644 * 1.8027$$
$$= 3.9520$$

$$S_7 = (3.26^{0,46}) * (1^{0,26}) * (4^{0,16}) * (3^{0,09}) * \left(1500000^{0,04}\right)$$
$$= 1.7222 * 1.0000 * 1.2483 * 1.1039 * 1.7662$$

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ISSN 2580-8389 (Media Online)
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$= 4.1917$

3. Calculating Preferences (Vi)

$$V_1 = \frac{4.4845}{4.4845+6.5411+3.9049+5.0856+5.5477+3.9520+4.1917} = \frac{4.4845}{33.7076} = 0.1330$$

$$V_2 = \frac{6.5411}{4.4845+6.5411+3.9049+5.0856+5.5477+3.9520+4.1917} = \frac{6.5411}{33.7076} = 0.1941$$

$$V_3 = \frac{3.9049}{4.4845+6.5411+3.9049+5.0856+5.5477+3.9520+4.1917} = \frac{3.9049}{33.7076} = 0.1158$$

$$V_4 = \frac{5.0856}{4.4845+6.5411+3.9049+5.0856+5.5477+3.9520+4.1917} = \frac{5.0856}{33.7076} = 0.1509$$

$$V_5 = \frac{5.5477}{4.4845+6.5411+3.9049+5.0856+5.5477+3.9520+4.1917} = \frac{5.5477}{33.7076} = 0.1646$$

$$V_6 = \frac{3.9520}{4.4845+6.5411+3.9049+5.0856+5.5477+3.9520+4.1917} = \frac{3.9520}{33.7076} = 0.1172$$

$$V_7 = \frac{4.1917}{4.4845+6.5411+3.9049+5.0856+5.5477+3.9520+4.1917} = \frac{4.1917}{33.7076} = 0.1244$$

Based on calculations using the WP (Weighted Product) method, the ranking results from the preference calculations for all alternatives can be seen in Table 5.

Table 5. Preference Values and Alternative Rankings

Alternative	Student name	Preference score	Ranking
A_2	Ridho Andrian	0.1941	1
A_5	Wahyu Harry Bai Lumbanbatu	0.1646	2
A_4	Nurhafni ritonga	0.1509	3
A_1	Miya Putri Daulay	0.1330	4
A_7	Jhois magdalena halawa	0.1244	5
A_6	Andika pratama	0.1172	6
A_3	Dameria Marlina Lumban Gaol	0.1158	7

From the calculation of seven alternative student data using the WP method, it can be concluded that the highest score and eligible to receive a single tuition fee (UKT) is alternative A2 in the name of Ridho Andrian with a preference score of 0.1941.

3.4 Implementation of the MOOSRA (Multi-objective Optimization on the Basis of Simple Ratio Analysis) Method

Based on the suitability rating data above, MOOSRA calculations were performed as a solution for student selection. The calculation steps are as follows:

1. Forming a decision matrix

$$X_{ij} = \begin{bmatrix} 3.36 & 1 & 4 & 4 & 3000000 \\ 3.92 & 3 & 6 & 4 & 1000000 \\ 3.85 & 1 & 2 & 2 & 1500000 \\ 3.45 & 2 & 4 & 2 & 2700000 \\ 3.76 & 3 & 3 & 2 & 2000000 \\ 3.78 & 1 & 2 & 2 & 2500000 \\ 3.26 & 1 & 4 & 3 & 1500000 \end{bmatrix}$$

2. Determining the normalization matrix
   For Criterion C1 with the description Semester Achievement Index (Benefit)

$$x^*_{1.1} = \frac{3.36}{\sqrt{3.36^2+3.92^2+3.85^2+3.45^2+3.76^2+3.78^2+3.26^2}} = \frac{3.36}{9.6} = 0{,}3495$$

$$x^*_{2.1} = \frac{3.92}{\sqrt{3.36^2+3.92^2+3.85^2+3.45^2+3.76^2+3.78^2+3.26^2}} = \frac{3.92}{9.6} = 0{,}4077$$

$$x^*_{3.1} = \frac{3.85}{\sqrt{3.36^2+3.92^2+3.85^2+3.45^2+3.76^2+3.78^2+3.26^2}} = \frac{3.85}{9.6} = 0{,}4004$$

$$x^*_{4.1} = \frac{3.45}{\sqrt{3.36^2+3.92^2+3.85^2+3.45^2+3.76^2+3.78^2+3.26^2}} = \frac{3.45}{9.6} = 0{,}3588$$

$$x^*_{5.1} = \frac{3.76}{\sqrt{3.36^2+3.92^2+3.85^2+3.45^2+3.76^2+3.78^2+3.26^2}} = \frac{3.76}{9.6} = 0{,}3911$$

$$x^*_{6.1} = \frac{3.78}{\sqrt{3.36^2+3.92^2+3.85^2+3.45^2+3.76^2+3.78^2+3.26^2}} = \frac{3.78}{9.6} = 0{,}3932$$

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Bulletin of Informatics and Data Science
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https://ejurnal.pdsi.or.id/index.php/bids/index

$$x^*_{7.1} = \frac{3.26}{\sqrt{3.36^2+3.92^2+3.85^2+3.45^2+3.76^2+3.78^2+3.26^2}} = \frac{3.26}{9.6} = 0{,}3391$$

Perform the above calculations to find the normalization values of the decision criteria matrices C2 to C5. With the normalized matrix calculations, the results obtained are as follows.

$$x^*_{ij} = \begin{vmatrix} 0.3495 & 0.1961 & 0.3980 & 0.5298 & 0.5300 \\ 0.4077 & 0.5883 & 0.5970 & 0.5298 & 0.1767 \\ 0.4004 & 0.1961 & 0.1990 & 0.2649 & 0.2650 \\ 0.3588 & 0.3922 & 0.3980 & 0.2649 & 0.4770 \\ 0.3911 & 0.5883 & 0.2985 & 0.2649 & 0.3533 \\ 0.3932 & 0.1961 & 0.1990 & 0.2649 & 0.4417 \\ 0.3391 & 0.1961 & 0.3980 & 0.3974 & 0.2650 \end{vmatrix}$$

3. Determining preference values

$$y^*_1 = \frac{(0.46*0.3495)+(0.26*0.1961)+(0.16*0.3980)+(0.09*0.5298)}{(0.04*0.5300)} = \frac{0.323}{0.021} = 15.241$$

$$y^*_2 = \frac{(0.46*0.4077)+(0.26*0.5883)+(0.16*0.5970)+(0.09*0.5298)}{(0.04*0.1767)} = \frac{0.484}{0.007} = 68.453$$

$$y^*_3 = \frac{(0.46*0.4004)+(0.26*0.1961)+(0.16*0.1990)+(0.09*0.2649)}{(0.04*0.2650)} = \frac{0.291}{0.011} = 27.441$$

$$y^*_4 = \frac{(0.46*0.3588)+(0.26*0.3922)+(0.16*0.3980)+(0.09*0.2649)}{(0.04*0.4770)} = \frac{0.355}{0.019} = 18.583$$

$$y^*_5 = \frac{(0.46*0.3911)+(0.26*0.5883)+(0.16*0.2985)+(0.09*0.2649)}{(0.04*0.3533)} = \frac{0.404}{0.014} = 28.618$$

$$y^*_6 = \frac{(0.46*0.3932)+(0.26*0.1961)+(0.16*0.1990)+(0.09*0.2649)}{(0.04*0.4417)} = \frac{0.288}{0.018} = 16.275$$

$$y^*_7 = \frac{(0.46*0.3391)+(0.26*0.1961)+(0.16*0.3980)+(0.09*0.3974)}{(0.04*0.2650)} = \frac{0.306}{0.011} = 28.907$$

Based on calculations performed using the MOOSRA (Multi-objective Optimization on the Basis of Simple Ratio Analysis) method, the ranking results from the preference calculations for all alternatives can be seen in Table 6 below.

Table 6. Preference Values and Alternative Rankings

Alternative	Student name	Preference score	Ranking
A_2	Ridho Andrian	68.453	1
A_7	Jhois magdalena halawa	28.907	2
A_5	Wahyu Harry Bai Lumbanbatu	28.618	3
A_3	Dameria Marlina Lumban Gaol	27.441	4
A_4	Nurhafni ritonga	18.583	5
A_6	Andika pratama	16.275	6
A_1	Miya Putri Daulay	15.241	7

Based on the calculation results from seven alternative student data using the MOOSRA method, it can be concluded that the highest score and eligible to receive a single tuition fee (UKT) is alternative A2 in the name of Ridho Andrian with a preference score of 68.453.

3.5 Comparison of Methods

From the results of the WP and MOOSRA methods based on seven alternative student data, students who are eligible to receive a single tuition fee (UKT) have been obtained. Table 7 below shows the results of the comparison of the methods from the calculations, namely:

Table 7. Comparison of Preferences

Alternative	Student name	Metode WP		Metode MOOSRA	
		Preference score	Ranking	Preference score	Ranking
A_1	Miya Putri Daulay	0.1330	4	15.241	7
A_2	Ridho Andrian	0.1941	1	68.453	1
A_3	Dameria Marlina Lumban Gaol	0.1158	7	27.441	4
A_4	Nurhafni ritonga	0.1509	3	18.583	5
A_5	Wahyu Harry Bai Lumbanbatu	0.1646	2	28.618	3
A_6	Andika pratama	0.1172	6	16.275	6
A_7	Jhois magdalena halawa	0.1244	5	28.907	2

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Table 7 shows that the discussion of the case of selecting students to receive UKT assistance using a decision support system applying the WP method and the MOOSRA method obtained the same highest alternative, namely A2 on behalf of Ridho Andrian. The highest preference value in the WP method solution was 0.1941 and the highest preference value in the MOOSRA method was 68.453.

4. CONCLUSION

With the decision support system that applies the WP and MOOSRA methods in this study, the author obtained the best preference value from seven alternative student data and the predetermined criteria data, such as semester achievement index (IPS), number of achievements, semester, pa[]rental dependents, parental income, and the weight value of each criterion. The alternative data obtained from seven student data at Budi Darma University and five criteria data determined by the author, along with the weight values obtained from ROC weighting, formed preference values. The highest preference value indicates the student selected to receive a single tuition fee assistance. Calculations using the WP and MOOSRA methods yielded the same results. The student eligible to receive assistance is Ridho Andrian from alternative A2 with a score of 0.1941 from the WP method and a score of 68.453 from the MOOSRA method. In the discussion above, the WP and MOOSRA methods in the decision support system are accurate in determining students eligible to receive UKT assistance because, based on the results of the calculations from the two methods used by the author, the author obtained the same ranking results.

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