Journal of Information System Research (JOSH)
Volume 3, No. 4, Juli 2022, pp 499−506
ISSN 2686-228X (media online)
https://ejurnal.seminar-id.com/index.php/josh/
DOI 10.47065/josh.v3i4.1860

Comparative Analysis of MOORA and MOOSRA Methods in Determining Prospective Students Recipient of the Indonesian Smart Card (KIP)

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Submitted: **13/07/2022**; Accepted: **23/07/2022**; Published: **31/07/2022**

Abstract-The Smart Indonesia Card (KIP) is a government program breakthrough in equitable distribution of education development throughout the country. The Smart Indonesia Card is here for those who cannot afford to continue their education to a higher level. It is hoped that the existence of the Smart Indonesia Card can create human resources who can compete and innovate in national and international development. In the process of giving the Smart Indonesia Card So far, there are still many problems. To be right on target for Indonesia Smart Card recipients, it is necessary to first consider using a Decision Support System. Comparison of the MOORA and MOOSRA methods in determining prospective students who receive the Smart Indonesia Card with 5 alternatives and 5 criteria. Then the calculation using the MOORA method produces an optimization value of 0.12205 on alternative A2 while sample calculation data using the MOOSRA method produces an optimization value of 1.78948 on alternative A4 as the first rank.

Keywords: Smart Indonesia Card (KIP); MOORA Method; MOOSRA Method

1. INTRODUCTION

The availability of human resources at this time in various developing countries is no exception, Indonesia is still lacking. Seeing these conditions, the Indonesian government at this time has taken various actions and decisions in catching up with the world of education to create human resources who are capable and able to innovate[1]. One of the decisions of the Indonesian government to catch up is by issuing the Smart Indonesia Card (KIP). Based on Law No.12/2012 concerning Higher Education, the Government of Indonesia is obliged to increase access and learning opportunities in Higher Education and prepare Indonesian people who are smart and competitive. Basically, the Smart Indonesia Card is prioritized for poor families. With the Smart Indonesia Card, it is hoped that it will be able to help prospective students to continue their chosen higher education according to their desired majors. Smart Indonesia Cards have been implemented in recent years with various selection methods, both from the central government and from universities appointed by prospective students who receive the Smart Indonesia Card.

In the selection process that has been going on so far, there are still many obstacles that need to be addressed so that the Smart Indonesia Card is right on target for those who need it. For the determination of prospective students who receive the Smart Indonesia Card, a decision support system is needed that aims to be right on target. The decision support system itself has various methods in the settlement process. In the decision-making process for determining prospective students who receive the Smart Indonesia Card, two methods are used, namely the Moora and Moosra methods where the two methods are compared in order to get the right decision.[2]. Using the Moora method for giving Smart Indonesia Cards can be used in making decisions[3]. Applying the Moosra method, you can determine the criteria by applying the provisions with the Fuzzy Multiple Attribute Decision Making model formula from each alternative[4]. The application of the MOORA method can assist in the selection of recipients of student assistance for poor students and the results provided are quite effective[5].

Some of the studies that are used as references in this research, such as the research conducted in 2021 bySultan Chaeruddin, et al who discussed aboutthe use of the MOORA method in selecting the Marketplace produces an optimization value of 0.417 on A1[6][7]. Research conducted byAldi Surya Pranata, et al in 2021 who discussed the MOORA method used in selecting tourist location recommendations resulted in an optimization value of0.2685 on A3[8][9].Research conducted in 2021 byAhmad Safitra, et alwhich discusses aboutthe use of the MOOSRA method in selecting mechanics to become Service Advisors resulted in an optimization value of6.6823 on alternative A10[10].Research conducted byDivya Febrina, et al in 2021in determining the best local content using the MOOSRA method produces an optimization value of 4.5815 on alternative A3[4]. Research conducted in 2022 byAbdul Karim, et al regarding the use of the MOOSRA method in determining the best graduates resulted in an optimization value of0.418397 on alternative A7[11].

In this study the authors are interested in comparing the method*Multi-Objective Optimization on the basis of Ratio Analysis* (MOORA) with the Multi-Objective Optimization Method on the Basis of Simple Ratio Analysis (MOOSRA)to obtain the best alternative value and the weighting value is obtained from the use of the Rank Order Centroid (ROC) method.

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2. RESEARCH METHODOLOGY

2.1 Smart Indonesia Card (KIP)

Smart Indonesia Card (KIP) is a cash assistance provided by the government for underprivileged students in their education. The purpose of KIP is for students to obtain educational services until they graduate from high school, to prevent students from dropping out of school or not being able to continue their education due to economic difficulties.[12].

2.2 Multi-Objective Optimization Method on The Basic of Ratio Analysis (MOORA)

The MOORA method uses multiplication to relate the ratings of several attributes, where the attribute rating must first be raised to the power of the corresponding weight. The following are the steps for the MOORA method[13]–[18].

1. Creating a Decision Matrix
   Represents all available data and information for each attribute in the form of a decision matrix. Raw data is the basic form of a matrix of responses with rows containing alternatives and columns containing objectives (objectives), attributes/criteria, or indicators.

$$x_{ij} = \begin{bmatrix} x_{11} & x_{12} & \dots x_{1n} \\ x_{21} & x_{22} & \dots x_{2n} \\ \dots & \dots & \dots \dots \\ x_{nm} & x_{nm} & \dots x_{nm} \end{bmatrix} \quad (1)$$

2. Calculating the Normalization Matrix
   Normalization aims to unite each element of the matrix so that the elements in the matrix have uniform values. The equation for calculating the normalization matrix is as follows:

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

Calculating Optimization Value
The normalized value is added to the maximized status attribute (benefit type attribute) and reduced by minimized status attribute (cost type attribute). Here is the equation for calculating the optimization value:

$$y_i^{*} = \sum_{j=1}^{g} X_{ij} - \sum_{j=g+1}^{n} X_{ij} \quad (3)$$

The following is the equation for calculating the weighted optimization value:

$$y_i^{*} = \sum_{j=1}^{g} W_j X_{ij} - \sum_{j=g+1}^{n} W_j X_{ij} \quad (4)$$

2.3 Multi-Objective Optimization on the Basis of Simple Ratio Analysis (MOOSRA) Method

The MOOSRA method is a multi-purpose optimization method. When the MOOSRA method is compared with the MOORA method, negative performance scores in the MOORA method do not appear and the MOOSRA method is less sensitive to large variations in criterion scores. The first MOOSRA method has been developed by Das et al. In general, the MOOSRA methodology begins with the formulation of a decision matrix that generally has four parameters, namely: alternatives, criteria or attributes, individual weights or coefficients of significance for each criterion and measures the performance of alternatives with respect to the criteria[4], [11], [19]. The method for completing the Decision Support System (DSS) using the MOOSRA method is as follows:

1. Decision Matrix Formation
   This method starts with the definition of a decision matrix in which a number of criteria and alternatives are listed. The performance of each alternative with respect to each of its criteria is carried out using the following equation:

$$x_{ij} = \begin{bmatrix} x_{11} & x_{12} & \dots x_{1n} \\ x_{21} & x_{22} & \dots x_{2n} \\ \dots & \dots & \dots \dots \\ x_{nm} & x_{nm} & \dots x_{nm} \end{bmatrix} \quad (5)$$

2. Calculating the Normalization Matrix
   X ratio indicates the ith size of the alternative on the jth criterion, m indicates the number of criteria. In the MOOSRA method the elements are normalized from the decision matrix using the following equation:

$$x_{ij}^{*} = \frac{x_{ij}}{\sqrt{\sum_{i=1}^{m} x^{2}ij}} \quad (6)$$

   Where is the valuerepresents the normalized performance of i^{th} alternative to j^{th} objective at i= 1,2,3…..n and j= 1,2,3….m
3. Determining Optimization Value

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Yi performance scores of all alternatives are calculated as a simple ratio of the favorable number on the beneficial criteria to the favorable number on the unfavorable criteria using the following equation:

$$y_i^* = \frac{\sum_{j=1}^{g} w_j x^* ij}{\sum_{n=g+1}^{n} w_{jw_j} x^* ij} \quad (7)$$

Where g is the number of attributes to be maximized, (ng) is the number of attributes that must be minimized.is the weight associated with the jth attribute.
In some cases, if you consider that the attributes are equally important then the optimization formula becomes as follows:

$$y_i^* = \frac{\sum_{j=1}^{g} w_j x^* ij}{\sum_{n=g+1}^{n} w_{jw_j} x^* ij} \quad (8)$$

2.4 Research Stages

The following are the stages of the research that the author didin making this research:

1. Identification of problems
   This stage aims to identify the problems discussed in this study.
2. Data collection
   In this stage, data collection is carried out by means of a Literature Study to find material from several related sources from the internet, books and e-journals.
3. ROC Weighting Method
   In this stage, the ROC method is used to obtain the weight values that will be used in testing the sample data.
4. Application of the MOORA Method and the MOOSRA Method
   In this stage the data sample testing is completed through the application of the MOORA Method and the MOOSRA Method.
5. Comparison of the MOORA Method and the MOOSRA Method
   In this stage, a comparison of the MOORA method and the MOOSRA method is carried out to obtain the best results in solving the problems in this study.
6. Research Report Making
   In this stage a research report is made with the aim of clearly showing the final results of the problems that have been obtained.

The stages of the research above can be described clearly as shown in image 1 below:

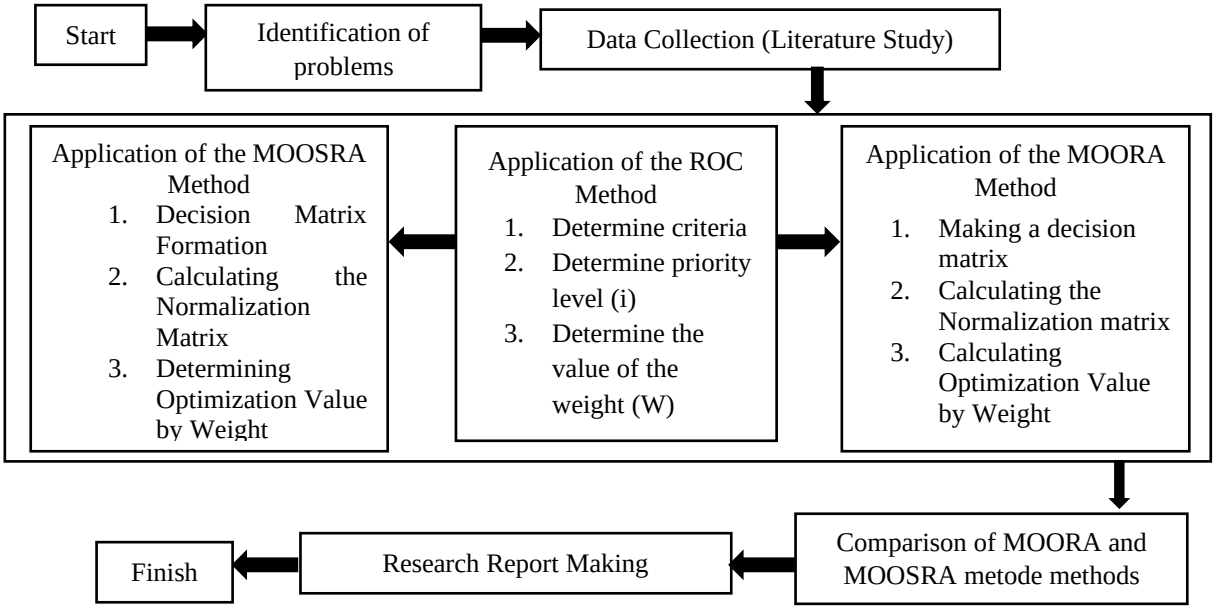

Figure 1. Research Stages

3. RESULTS AND DISCUSSION

In giving the Smart Indonesia Card (KIP) to prospective students, it is necessary to pay attention to various criteria that become the assessment process. To be more accurate and on target in the process of assessing prospective students receiving KIP, it is necessary to consider a decision method that is worthy of consideration. There are two methods used, namely the MOORA method and the MOOSRA method, both methods are carried out comparative

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analysis in the calculation process to find out which method is more relevant in determining the awarding of Smart Indonesia Cards to prospective students.

3.1 Determination of Criteria

In determining the prospective KIP recipients there are criteria that must be met and the weighting in this study using the Rank Order Centroid (ROC) method. Rank Order Centroid is a method of getting the ranking weight values needed in making a decision support system[20]. The criteria used in the selection of prospective students for receiving the Smart Indonesia Card are as shown in table 1.

Table 1. Criteria Data

Criteria	Information	Weight	Type
C1	Parents' Income	0.46	*Cost*
C2	Performance	0.26	*Benefits*
C3	Parents' job	0.16	*Benefits*
C4	The number of dependents	0.09	*Benefits*
C5	Home Status	0.04	*Benefits*

3.2 Determination of Alternatives and Criteria Data

Next, determine some alternative data samples as prospective students who receive the Indonesia Pi Cardlater can be seen in table 2.

Table 2. Alternative KIP Recipient Students

Alternative	Name	C1	C2	C3	C4	C5
A1	Afri Nirmala Sari	2,000,000	Provincial Level	Farmer	5	One's own
A2	Monika Stefani	750,000	National level	Farmer	2	cost
A3	Robiah Al Adawisyah	2,000,000	National level	Self-employed	3	Rent
A4	Eka Fitriani	4,000,000	International Level	Employee	4	Rent
A5	Yogie Arifansyah	1,500,000	Provincial Level	Farmer	1	cost

In table 2 above, data of the linguistic type is still found, therefore it requires weighting as follows:

Table 3. Weighted of Achievement Criteria (C2)

Information	Score
International Level	3
National level	2
Provincial Level	1

Table 4. Weighted of Parent's Occupational Criteria(C3)

Information	Score
Self-employed	3
Employee	2
Farmer	1

Table 5. House Status Criteria Weight(C5)

Information	Score
One's own	3
Rent	2
cost	1

Table 6. Alternative Conversion Results and Criteria After Weighting

Alternative	Name	C1	C2	C3	C4	C5
A1	Afri Nirmala Sari	2000000	1	1	5	3
A2	Monika Stefani	750000	2	1	2	1
A3	Robiah Al Adawisyah	2000000	2	3	3	2
A4	Eka Fitriani	4000000	3	2	4	2
A5	Yogie Arifansyah	1500000	1	1	5	1

3.3 Implementation of the MOORA Method

In the MOORA method there are several process steps that must be carried out as follows:

1. Creating a Decision Matrix

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$$x_{ij}^{*}=\begin{bmatrix}2000000 & 1 & 1 & 5 & 3\\ 750000 & 2 & 1 & 2 & 1\\ 2000000 & 2 & 3 & 3 & 2\\ 4000000 & 3 & 2 & 4 & 2\\ 1500000 & 1 & 1 & 5 & 1\end{bmatrix}$$

2. Calculating the Normalization Matrix

C1

$$x_{1,1}^{*}=\frac{2000000}{\sqrt{[2000000^2+750000^2+2000000^2+4000000^2+1500000^2]}}=0.386$$
$$x_{2,1}^{*}=\frac{750000}{\sqrt{[2000000^2+750000^2+2000000^2+4000000^2+1500000^2]}}=0.145$$
$$x_{3,1}^{*}=\frac{2000000}{\sqrt{[2000000^2+750000^2+2000000^2+4000000^2+1500000^2]}}=0.386$$
$$x_{4,1}^{*}=\frac{4000000}{\sqrt{[2000000^2+750000^2+2000000^2+4000000^2+1500000^2]}}=0.772$$
$$x_{5,1}^{*}=\frac{1500000}{\sqrt{[2000000^2+750000^2+2000000^2+4000000^2+1500000^2]}}=0.290$$

C2

$$x_{1,2}^{*}=\frac{1}{\sqrt{[1^2+2^2+2^2+3^2+1^2]}}=0.229$$
$$x_{2,2}^{*}=\frac{2}{\sqrt{[1^2+2^2+2^2+3^2+1^2]}}=0.459$$
$$x_{3,2}^{*}=\frac{2}{\sqrt{[1^2+2^2+2^2+3^2+1^2]}}=0.459$$
$$x_{4,2}^{*}=\frac{3}{\sqrt{[1^2+2^2+2^2+3^2+1^2]}}=0.688$$
$$x_{5,2}^{*}=\frac{1}{\sqrt{[1^2+2^2+2^2+3^2+1^2]}}=0.229$$

C3

$$x_{1,3}^{*}=\frac{1}{\sqrt{[1^2+1^2+3^2+2^2+1^2]}}=0.250$$
$$x_{2,3}^{*}=\frac{1}{\sqrt{[1^2+1^2+3^2+2^2+1^2]}}=0.250$$
$$x_{3,3}^{*}=\frac{3}{\sqrt{[1^2+1^2+3^2+2^2+1^2]}}=0.750$$
$$x_{4,3}^{*}=\frac{2}{\sqrt{[1^2+1^2+3^2+2^2+1^2]}}=0.500$$
$$x_{5,3}^{*}=\frac{1}{\sqrt{[1^2+1^2+3^2+2^2+1^2]}}=0.250$$

C4

$$x_{1,4}^{*}=\frac{5}{\sqrt{[5^2+2^2+3^2+4^2+5^2]}}=0.563$$
$$x_{2,4}^{*}=\frac{2}{\sqrt{[5^2+2^2+3^2+4^2+5^2]}}=0.225$$
$$x_{3,4}^{*}=\frac{3}{\sqrt{[5^2+2^2+3^2+4^2+5^2]}}=0.338$$
$$x_{4,4}^{*}=\frac{4}{\sqrt{[5^2+2^2+3^2+4^2+5^2]}}=0.450$$
$$x_{5,4}^{*}=\frac{5}{\sqrt{[5^2+2^2+3^2+4^2+5^2]}}=0.563$$

C5

$$x_{1,5}^{*}=\frac{3}{\sqrt{[3^2+1^2+2^2+2^2+1^2]}}=0.688$$
$$x_{2,5}^{*}=\frac{1}{\sqrt{[3^2+1^2+2^2+2^2+1^2]}}=0.229$$
$$x_{3,5}^{*}=\frac{2}{\sqrt{[3^2+1^2+2^2+2^2+1^2]}}=0.459$$
$$x_{4,5}^{*}=\frac{2}{\sqrt{[3^2+1^2+2^2+2^2+1^2]}}=0.459$$
$$x_{5,5}^{*}=\frac{1}{\sqrt{[3^2+1^2+2^2+2^2+1^2]}}=0.229$$

So from the above calculation, it produces a normalized matrix as follows:

$$x_{ij}^{*}=\begin{bmatrix}0.386 & 0.229 & 0.250 & 0.563 & 0.688\\ 0.145 & 0.459 & 0.250 & 0.225 & 0.229\\ 0.386 & 0.459 & 0.750 & 0.338 & 0.459\\ 0.772 & 0.688 & 0.500 & 0.450 & 0.459\\ 0.290 & 0.229 & 0.250 & 0.563 & 0.229\end{bmatrix}$$

3. Calculating Optimization Value by Weight

$$y_1^{*}=(0.26*0.229)+(0.16*0.250)+(0.09*0.563)+(0.04*0.688)-(0.46*0.386)=0.00017$$

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$y_2^*=(0.26*0.459)+(0.16*0.250)+(0.09*0.225)+(0.04*0.229)-(0.46*0.145)=0.12205$
$y_3^*=(0.26*0.459)+(0.16*0.750)+(0.09*0.338)+(0.04*0.459)-(0.46*0.386)=0.11056$
$y_4^*=(0.26*0.688)+(0.16*0.500)+(0.09*0.450)+(0.04*0.459)-(0.46*0.772)=0.03738$
$y_5^*=(0.26*0.229)+(0.16*0.250)+(0.09*0.563)+(0.04*0.229)-(0.46*0.290)=0.02597$

So after performing calculations in determining the optimization value by including weights, the results are obtained as shown in table 7 below:

Table 7. Optimization Value

Alternative	Student name	Optimization Value	Ranking
A2	Monika Stefani	0.12205	1
A3	Robiah Al Adawisyah	0.11056	2
A4	Eka Fitriani	0.03738	3
A5	Yogie Arifansyah	0.02597	4
A1	Afri Nirmala Sari	0.00017	5

Based on the ranking results in the table above in the application of the MOORA Method, the best alternative produced is A2 on behalf of Monika Stefani with an optimization value of 0.12205.

3.4 Implementation of the MOOSRA Method

In the MOOSRA method there are also steps that must be carried out as follows:

1. Decision Matrix Formation

$$x_{ij}^*=\begin{bmatrix}2000000 & 1 & 1 & 5 & 3\\ 750000 & 2 & 1 & 2 & 1\\ 2000000 & 2 & 3 & 3 & 2\\ 4000000 & 3 & 2 & 4 & 2\\ 1500000 & 1 & 1 & 5 & 1\end{bmatrix}$$

2. Calculating the Normalization Matrix

C1

$x_{1,1}^*=\frac{2000000}{\sqrt{[2000000^2+750000^2+2000000^2+4000000^2+1500000^2]}}=0.386$
$x_{2,1}^*=\frac{750000}{\sqrt{[2000000^2+750000^2+2000000^2+4000000^2+1500000^2]}}=0.145$
$x_{3,1}^*=\frac{2000000}{\sqrt{[2000000^2+750000^2+2000000^2+4000000^2+1500000^2]}}=0.386$
$x_{4,1}^*=\frac{4000000}{\sqrt{[2000000^2+750000^2+2000000^2+4000000^2+1500000^2]}}=0.772$
$x_{5,1}^*=\frac{1500000}{\sqrt{[2000000^2+750000^2+2000000^2+4000000^2+1500000^2]}}=0.290$

C2

$x_{1,2}^*=\frac{1}{\sqrt{[1^2+2^2+2^2+3^2+1^2]}}=0.229$
$x_{2,2}^*=\frac{2}{\sqrt{[1^2+2^2+2^2+3^2+1^2]}}=0.459$
$x_{3,2}^*=\frac{2}{\sqrt{[1^2+2^2+2^2+3^2+1^2]}}=0.459$
$x_{4,2}^*=\frac{3}{\sqrt{[1^2+2^2+2^2+3^2+1^2]}}=0.688$
$x_{5,2}^*=\frac{1}{\sqrt{[1^2+2^2+2^2+3^2+1^2]}}=0.229$

C3

$x_{1,3}^*=\frac{1}{\sqrt{[1^2+1^2+3^2+2^2+1^2]}}=0.250$
$x_{2,3}^*=\frac{1}{\sqrt{[1^2+1^2+3^2+2^2+1^2]}}=0.250$
$x_{3,3}^*=\frac{3}{\sqrt{[1^2+1^2+3^2+2^2+1^2]}}=0.750$
$x_{4,3}^*=\frac{2}{\sqrt{[1^2+1^2+3^2+2^2+1^2]}}=0.500$
$x_{5,3}^*=\frac{1}{\sqrt{[1^2+1^2+3^2+2^2+1^2]}}=0.250$

C4

$x_{1,4}^*=\frac{5}{\sqrt{[5^2+2^2+3^2+4^2+5^2]}}=0.563$
$x_{2,4}^*=\frac{2}{\sqrt{[5^2+2^2+3^2+4^2+5^2]}}=0.225$
$x_{3,4}^*=\frac{3}{\sqrt{[5^2+2^2+3^2+4^2+5^2]}}=0.338$

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$$x^*_{4,4}=\frac{4}{\sqrt{[5^2+2^2+3^2+4^2+5^2]}}=0.450$$
$$x^*_{5,4}=\frac{5}{\sqrt{[5^2+2^2+3^2+4^2+5^2]}}=0.563$$

C5

$$x^*_{1,5}=\frac{3}{\sqrt{[3^2+1^2+2^2+2^2+1^2]}}=0.688$$
$$x^*_{2,5}=\frac{1}{\sqrt{[3^2+1^2+2^2+2^2+1^2]}}=0.229$$
$$x^*_{3,5}=\frac{2}{\sqrt{[3^2+1^2+2^2+2^2+1^2]}}=0.459$$
$$x^*_{4,5}=\frac{2}{\sqrt{[3^2+1^2+2^2+2^2+1^2]}}=0.459$$
$$x^*_{5,5}=\frac{1}{\sqrt{[3^2+1^2+2^2+2^2+1^2]}}=0.229$$

So from the above calculation, it produces a normalized matrix as follows:

$$x^*_{ij}=\begin{bmatrix}0.386 & 0.229 & 0.250 & 0.563 & 0.688\\ 0.145 & 0.459 & 0.250 & 0.225 & 0.229\\ 0.386 & 0.459 & 0.750 & 0.338 & 0.459\\ 0.772 & 0.688 & 0.500 & 0.450 & 0.459\\ 0.290 & 0.229 & 0.250 & 0.563 & 0.229\end{bmatrix}$$

3. Determining Optimization Value by Weight

$$y^*_1=\frac{(0.26*0.229)+(0.16*0.250)+(0.09*0.563)+(0.04*0.688)}{(0.46*0.386)}=1.00095$$
$$y^*_2=\frac{(0.26*0.459)+(0.16*0.250)+(0.09*0.225)+(0.04*0.229)}{(0.46*0.386)}=1.06302$$
$$y^*_3=\frac{(0.26*0.459)+(0.16*0.750)+(0.09*0.338)+(0.04*0.459)}{(0.46*0.386)}=1.62266$$
$$y^*_4=\frac{(0.26*0.688)+(0.16*0.500)+(0.09*0.450)+(0.04*0.459)}{(0.46*0.386)}=1.78948$$
$$y^*_5=\frac{(0.26*0.229)+(0.16*0.250)+(0.09*0.563)+(0.04*0.229)}{(0.46*0.386)}=0.89756$$

So after doing the calculations in determining the optimization value by including the weights, the results are shown in table 8 below:

Table 8. Optimization Value

Alternative	Student name	Optimization Value	Ranking
A4	Eka Fitriani	1.78948	1
A3	Robiah Al Adawisyah	1.62266	2
A2	Monika Stefani	1.06302	3
A1	Afri Nirmala Sari	1,00095	4
A5	Yogie Arifansyah	0.89756	5

Based on the ranking results in the table above in the application of the MOOSRA Method, the best alternative produced is A4 on behalf of Eka Fitriani with an optimization value of 1.78948.

3.5 Comparison Results

The results of the comparison of the application of the MOORA method and the MOOSRA method that produce optimization values can be seen in table 9 below:

Table 9. Method Comparison

Alternative	MOORA method		Alternative	MOOSRA method	
	Optimization Value	Rating		Optimization Value	Rating
A2	0.12205	1	A4	1.78948	1
A3	0.11056	2	A3	1.62266	2
A4	0.03738	3	A2	1.06302	3
A5	0.02597	4	A1	1,00095	4
A1	0.00017	5	A5	0.89756	5

From the method comparison table above, it can be concluded that the use of a decision support system in determining prospective students who receive the Smart Indonesia Card (KIP) uses the MOORA method and the MOOSRA method obtains the best alternative that meets the criteria that have been previously set, there are different alternatives. Using the MOORA method produces an optimization value of 0.12205 while using the MOOSRA method produces an optimization value of 1.78948.

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DOI 10.47065/josh.v3i4.1860

4. CONCLUSION

Based on the results of the calculation process of comparative analysis of the MOORA method and the MOOSRA method on prospective students receiving the Smart Indonesia Card (KIP), it can be concluded thatthe calculation process between the MOORA method and the MOOSRA method using the same criteria and alternatives cannot provide a ranking value in the same alternative. Sample calculationdata using the MOORA method produces an optimization value of 0.12205 on alternative A2 while Sample calculation data using the MOOSRA method produces an optimization value of 1.78948 on alternative A4 as the first rank.

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