System for Selecting Extracular Talents Using Simple Additive Weighting Method (SAW) At Madrasah Ibtidaiyah (MI) Ismaria Al-Qur'aniyyah Bandar Lampung

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Abstract: Madrasah Ibtidaiyah (MI) Ismaria Al-Qur'aniyyah had 10 extracurricular activities, e.g., Futsal Men, Women's Futsal, Creative Dance, Scouting, Men's Basketball, Women's Basketball, Tekwondo, Soccer, Choir, and Regional Dance. The problem statement of this research was that there was a difficulty to determine the students' interest to choose the extracurricular activity. Therefore, there was a need for a system to improve the good education quality, especially in choosing the extracurricular activity based on the 3rd grade students' interests. The method used in this study was the Method Simple Additive Weighting (SAW).

Keywords: Recommendation System, Extracurricular, SAW

1. INTRODUCTION

Information systems are very important to the competition in the world of education at this time. Moreover, we live in an era of information technology, which has characteristics that are so fast in its development. In the world of education, the world changes so rapidly that it is necessary to collect information, which is the most basic thing. Information is a result of data processing that is important for the recipient.

Schools are institutions that lay the foundation for children's development; they play an important role in developing children into responsible citizens and good human beings. The types and sizes of schools also vary depending on the objectives of education providers and their resources. Maybe a school can be very simple or a school with a very large building complex and complete facilities and infrastructure, this can certainly affect the quality and quality of teaching and learning activities. In determining the extracurricular, student's ca choose when they have ascended / sat in class III and when they move up in class IV and V students have continued their Talent / Extracurricular Interests. At Madrasah Ibtidaiyah (MI) Ismaria Al- the Qur'aniyyah has, 10 Extracurricular are Men's Futsal, Women's Futsal, Creative Dance, Scouting, Men's Basketball, Women's Basketball, Tekondo, Football, Choir, Regional Dance. However, the large number of students sometimes makes it difficult for teachers to provide directions and opinions regarding the suitability of students' talents in extracurricular activities. So that there is a need for a system to improve the quality of good education, especially in the selection of extracurricular talent interests at the time of ascending / sitting in class 3. Selection of pre-existing methods (adopting existing ones) for extracurricular election decisions at Madrasah Ibtidaiyah (MI) Ismaria Al- Qur'aniyyah using the Method Simple Additive Weighting (Saw).

Extracurricular activities are an internal part of the learning process that emphasizes meeting student needs. Extracurricular activities cannot been separated from extracurricular activities because extracurricular activities are complementary to extracurricular activities. Extracurricular activities can be a means to channel talents or encourage the development of the potential of students to reach the maximum level. Extracurricular or extracurricular activities are additional activities that carried out either outside of class hours, which carried out at school, or outside of school with the aim of gaining additional knowledge, skills and insights

and helping to shape the character of the education participants according to their respective interests and talents.

2. LITERATURE REVIEW

2.1 Previous Research

Previous research has become the basis for research in compiled journals, namely:

1. Research with the titled "Decision Support System Design for Determining Extracurricular Using the SAW Method in MTs N Sumber District Students Web Based Development" concluded that the system is very feasible to use based on system testing with ISO 9126 standards and gets a feasibility percentage of 87.75% and proven by the test results. White box shows a 100% success rate. The advantage of this system is that it is able to perform calculations automatically without change source code if there are additional criteria and weights. (Khuli Handayani, Dhidik Prastiyanto, Sugeng Purbawanto)
2. Research from the journal entitled "Decision Support System to Determine Extracurricular Activities Based on Talent and Interests Using the SAW Method" The conclusion of the journal is that the application designed is a Decision Support System to Determine Extracurricular Activities Based on Interests and Talents at SMK Taruna Satria Pekanbaru. This application can provide several advantages compared to systems that are currently running, namely efficient and effective in information processing and data management (Yuda Irawan, Herianto, Susi Oustria Simamora)
3. Research with titled "Decision Support System for Village Aid Recipients in Klungkung Sub district Using the SAW Method" the conclusion decision support system for village aid recipients in the Klungkung sub-district is useful for decision makers in determining which villages are entitled to receive assistance in the form of conditional goods from the government (Ni Kadek Sukerti).
4. Research from the journal entitled " Rewarding the Best Employees Using the Simple Additive Weighting Method (SAW) "
   The conclusion of this journal is that based on calculations using the SAW method in determining the giving of rewards to employees, it is found that there are two people who deserve the reward, namely Alternatives to A5 and A6 with a value of 85 and 72.5. In further research, it suggested to add the search for the error value so that the results obtained maximized. (Ferly, Dwi Marisa Efendi).
5. Research from the journal entitled "Comparison Analysis of the Accuracy of the Profile Matching Method and SAW"
   The conclusion of the journal is the accuracy of the method SAW (Simple Additive Weighting) Female = 88.73% From the accuracy test, it can be concluded that the method Profile Matching has a greater degree of accuracy compared to the method SAW (Fadinda Suci Rosiana, Agung Nilogiri, M.Kom, Deni Arifianto, M.Kom)

2.2 Simple Additive Weighting (SAW)

One method of solving MADM problems is by using the Simple Additive Weighting (SAW) method. The SAW method is often also known as the weighted sum method of performance ratings for each alternative of all attributes, the SAW method requires a decision matrix normalization process (X) to a scale that can been compared with all available alternative ratings.

The Simple Additive Weighting (SAW) method known as the weighted addition method. The basic concept of the SAW method is to find a weighted sum of the performance ratings for

each alternative on all attributes [8] (MacCrimmon, 1968). Method SAW requires a decision matrix normalization process (X) to a scale that can been compared with all available alternative ratings. This method is the most well-known, most widely well-known, and most widely used method in dealing with Multiple Attribute Decision Making (MADM) situations. MADM itself is a method used to find optimal alternatives from a number of alternatives with certain criteria. His method (SAW) known as the weighted addition method. The basic concept of the Simple Additive Weighting Method is to find the weighted sum of the performance ratings for each alternative on all attributes.

3. METHOD

The Simple Additive Weighting method requires a decision matrix normalization process (X) to a scale that can been compared with all available alternative ratings. This Simple Additive Weighting method requires the decision maker to determine the weight for each attribute. The total score for the alternatives obtained by adding up all the multiplication results between the rating and the weight of each attribute. The rating of each attribute must be dimension-free in the sense that it has passed the previous matrix normalization process. Step - SAW settlement steps are as follows [2]:

1. Determine the criteria that will been used as a reference in making decisions, namely Ci.
2. Determine the rating of the suitability of each alternative on each criterion.
3. Make a decision matrix based on the criteria (Ci), then normalize the matrix based on the equation adjusted for the type of attribute (profit attribute or cost attribute) in order to obtain a normalized matrix R.

The result obtained from the ranking process, namely the sum of the normalized matrix multiplication

R with the weight vector so that the largest value is chosen as the best alternative (Ai) as a solution.
The formula for carrying out the normalization is the formula for the benefit attribute:

$$r_{ij} = \begin{cases} \dfrac{x_{ij}}{\max_i x_{ij}} & \text{jika } j \text{ adalah atribut keuntungan (benefit)} \\ \dfrac{\min_i x_{ij}}{x_{ij}} & \text{jika } j \text{ adalah atribut biaya (cost)} \end{cases} \quad \text{..... (1)}$$

Where: rij = normalized performance rating Max xij = maximum value of each criterion column i Min xij =
Minimum value of each criterion column i xij = rows and columns of the decision matrix
rij is the rating rating ja is normalized from the alternative Ai at attribute Cj i = 1,2,… m and j = 1,2,…, n. The preference value for each alternative (Vi) is

$$V_i = \sum_{j=1}^{n} w_j r_{ij} \quad \text{..... (2)}$$

Where: Vi = The final value of the alternative wj = the weight that has been determined rij = Normalization of the matrix, a larger Vi value indicates that the alternativeAi is preferred (Kusumadewi, et al., 2006).

4. RESULTS AND DISCUSSION

In the selection process to get the best extracurricular activities using the SAW method, there are steps that must be taken to determine the best extracurricular activities in Madrasah Ibtidaiyah (MI) Ismaria Al- Qur'aniyyah Bandar Lampung is as follows:

1. Determining the criteria used, the criteria are as follows:

A) Criteria's:
C1: Excellent Physical Condition
C2: Height
C3: Running speed
C4: Average value of report cards
C5: Discipline
C6: Confidence
C7: Weight gain

2. Determine the Benefit criteria to been used, the criteria are as follows:

b) Benefit criteria:

C1: Excellent Physical Condition
Value: 1. Not Prima 2. Fairly Prima 3. Very Prima
C2: Height

Value: 1. 80-90kg 2. 100-110kg 3.
11 -120kg
C3: Running speed
Value: 1. ≥ 10 m / minute 2. ≥15 m / minute 3.≥20 m / minute

C4: The average score of report cards

Value: 1. ≥7 2. ≥8 3.≥9
C5: Discipline

Weight: 1. not disciplined 2. Sufficiently disciplined 3. Very disciplined C6: Self-confidence
Weight: 1. not confident 2. Self-confident 3. Very confident

3. Determine the Cost criteria used, the Cost criteria are as follows:

c) Criteria Cost:
C7: Weight
Weight: 1. 25Kg-30kg 2. 40kg-50kg 3. 50kg-60kg

4. Determine the Suitability Rating of each alternative on each criterion, assessed by 1 to 4, namely:

d) Alternative:
A1: Futsal Extracurricular
A2: Scout Extracurricular
A3: Postkibra
Extracurricular

A4: Creative Dance
Extracurricular

5. Below is a description of each criterion
   The following table 1.2 describes the stages of giving weight to the criteria with weighting details and values.

Table 1.2 Weight values for each alternative

Extracurricular (Alternative)	Criteria						
	C1	C2	C3	C4	C5	C6	C7
A1 futsal	3	3	3	2	2	2	2
A2 Scout	3	2	2	3	3	2	2
A3 Paskibra	3	3	2	2	3	3	1
A4 Dance	2	2	1	2	2	3	1

6. The following is Table 1.3 All the calculation results of the input in the normalized factor table.

Table 1.3 Normalized Factors

C1	C2	C3	C4	C5	C6	C7
1	1	1	0.66	0.66	0.66	0.5
1	0.66	0.66	1	1	0.66	0.5
1	1	0.66	0.66	1	1	1
0.66	0.66	0.33	0.66	0.66	1	1

Before multiplying, the tables must make the criteria for the taking weight

7. The following describes the stages of giving weight to the criteria with weighting and value details:

C1	C2	C3	C4	C5	C6	C7
20%	10%	10%	20%	15%	15%	10%

The preference weights for each criterion for the best extracurricular assessment are as follows: Then W = (0.20 0.10 0.10 0.20 0.15 0.15 0.10)

8. The ranking process based on the equation (Value V)

   V1 = (0.20) (1) + (0.10) (1) + (0.10) (1) + (0.20) (0.66) + (0.15) (0.66) + (0.15) (0.66) + (0.10) (0.5) = 0.780

   V2 = (0.20) (1) + (0.10) (0.66) + (0.10) (0.66) + (0.20) (1) + (0.15) (1) + (0.15) (0.66) + (0.10) (0.5) = 0.831

   V3 = (0.20) (1) + (0.10) (1) + (0.10) (0.66) + (0.20) (0.66) + (0.15) (1) + (0.15) (1) + (0.10) (1) = 0.898

   V4 = (0.20) (0.66) + (0.10) (0.66) + (0.10) (0.33) + (0.20) (0.66) + (0.15) (0.66) + (0.15) (1) + (0.10) (1) = 0.712

   From the results of the calculation above, the largest value is found in V3, namely 0.898, the second largest in V2,0.831, the third largest in V1, namely 0.780, the fourth largest in V4, namely 0.712. Then Alternative A3 is the best alternative.

5. CONCLUSIONS

Based on the discussion in the previous chapter, it can been concluded as follows:

a. That used for decision-making using Simple Method Additive Weighting (SAW) with the assessment criteria are excellent physical condition, height, running speed, average value of report cards, discipline, self-confidence and body weight.
b. Based on 4 extracurricular alternatives, namely Futsal, Scouting, Paskibra and Creative Dance, it can be recommended that the Pakibra Extracurricular with the greatest value is 0.898

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