Decision Support System For Recognizing Student Interests in School Extracurricular Fields With Topsis Method

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ABSTRACT

So far, the condition of children's development during the school period tends to choose the wrong choice or just follow along in choosing something, especially in terms of choosing an extracurricular field at school, which is basically not due to their own desire or interest in choosing an extracurricular field. So it is necessary to build a system that can help provide appropriate and appropriate decisions to help determine in recognizing the extracurricular interests of students.

One method that can be used for decision support systems is to use the TOPSIS method. In this research, a case will be raised, namely finding the best alternative based on predetermined criteria using the TOPSIS method to perform calculations on the case. This method was chosen because it is able to select the best alternative from a number of alternatives, in this case the intended alternative is the extracurricular field based on the specified criteria. The results of the implementation process can sort alternatives from the largest value to the smallest value.

Keyword : Decision Support System, TOPSIS, Extracurricular.

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1. INTRODUCTION

As is the case in the condition of children's development during the school period who tend to choose the wrong choice or just follow along in choosing something, especially in terms of choosing the extracurricular field at school, which is basically not due to their own desire or interest in choosing the extracurricular field.

Extracurricular activities are activities carried out by school students outside of standard curriculum learning hours. Extracurricular activities are intended to enable students to develop their personalities, talents and abilities in various fields outside the academic field.

TOPSIS method is one of the methods that can help the optimal decision-making process to solve decision problems practically. This is because the concept is simple and easy to understand, computationally efficient and has the ability to measure the relative performance of decision alternatives in a simple mathematical form.

Basically, this SPK (Decision Support System) is a further development of a computerized management information system, which is designed in such a way that it is interactive with the user. Broadly speaking, it can be said that SPK (Decision Support System) is designed to produce various alternatives offered to decision makers in carrying out their duties. Because, most of the decision-making process, namely problem formulation, alternative search has been done by the system, it is hoped that managers will be faster and more accurate in dealing with the problems they face [1,2,3].

DSS (Decision Support Systems) is a decision-making process carried out by elements in a management. There are four elements involved in the decision-making process, namely:

1. Data Management
   This includes databases, which support relevant for various situations and are organized by software called Database Management Systems (DBMS).

2. Model Management
   Involves financial, statistical, management science or analytical models and management software as needed.
3. Communication (Dialog Subsystem)
   Users can communicate and give commands to the DSS through this subsystem. This means providing an interface.
4. Knowledge Management. This optimized subsystem can support other subsystems or act as a stand-alone component.
   In various management processes, the decision-making process has relied heavily on DSS (Decision Support Systems) that have been developed. The process itself must go through stages before finally producing a decision [4,5,6].

2. RESEARCH METHOD/MATERIAL AND METHOD/LETERATURE REVIEW

A. Decission Support Systems

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   In various management processes, the decision-making process has relied heavily on DSS (Decision Support Systems) that have been developed. The process itself must go through stages before finally producing a decision [10,11,12].

B. Student Interest Recognition

Interest is a process that remains to pay attention and focus on something that interests him with feelings of pleasure and satisfaction [13,14].

Interest is a mental device consisting of a mixture of feelings, hopes, attitudes, prejudices, fears or other tendencies that lead individuals to a certain mind [15,16].

According to Gie (1998: 70) the importance of interest in relation to the implementation of the study are :

1. Interest generates immediate attention.
2. Interest makes it easy to create concentration.
3. Interest prevents outside interference.
4. Interest reinforces the sticking of learning materials in the memory.
5. Interest minimizes the boredom of learning in oneself.

C. Extracurricular

Extracurricular activities are activities undertaken by school or university students, outside the standard curriculum learning hours. These activities exist at every level of education from elementary school to university. Extracurricular activities are intended so that students can develop their personalities, talents and abilities in various fields outside the academic field. This

activity is held independently from the school and the students themselves to pioneer activities outside of school hours. The extracurricular activities themselves can take the form of activities in art, sports, personality development, and other activities that have a positive purpose for the progress of the students themselves.

The development of extracurricular activities is part of the development of school institutions. Extracurricular activities themselves aim to develop students' talents, personalities, achievements and creativity in order to develop students' education as a whole. Specifically, extracurricular activities aim to :

1. Provide environment that enables students to develop their potential, talents and abilities optimally, so that they are able to realize themselves and function fully in accordance with their personal needs and the needs of society.
2. Guiding (meaning identifying and fostering) and nurturing (meaning developing and improving) the potential of students as a whole.
3. Development of affective aspects (moral and social values) and psychomotor (skills) to balance the cognitive aspects of students.
4. Helping students in developing their interests, also helps students to have a new enthusiasm to study harder and instill a sense of responsibility as an independent human being (because it is done outside of class hours). Extracurricular activities are activities that are coordinated, directed and integrated with other activities at school, in order to support the achievement of curriculum goals. (http://handpage.blogspot.com/p/ekstrakurikule r.html/2013/05/11)

D. Topsis Method Steps

The steps of the TOPSIS (Technique For Others Reference by Similarity to Ideal Solution) method include [17,18,19]:

1. Build a normalized decision matrix The element rij resulting from normalizing the decision matrix R with the Euclidean length of a vector method is:

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

2. Construct weighted normalized decision matrix With weights W= (w1, w2,. ,wn), the normalized weight matrix V is :

$$V = \begin{bmatrix} W_{11}\, r_{11} & \cdots & W_{1n}\, r_{1n} \\ \vdots & \ddots & \vdots \\ W_{m1}\, r_{m1} & \cdots & W_{nm}\, r_{mn} \end{bmatrix} \quad (2)$$

3. Determine the positive ideal solution and negative ideal solution The ideal solution is denoted A*, while the negative ideal solution is denoted A-:

$$A^{+}(+) = \{(\max [V_{ij}])(\min [V_{i(j)}]) \mid j \in V_2^{+}, \cdots V_m^{+}\}$$
$$A^{+}(-) = \{(\max [V_{ij}])(\min [V_{i(j)}]) \mid j \in V_2^{-}, \cdots V_m^{-}\} \quad (3)$$

$j = \{$ j= 1,2,3,.. .....n and j is a *benefit criteria* $\}$

$j' = \{$j= 1,2,3,..... n and j is a *cost criteria* $\}$

4. Calculating separation
   Si* is the distance (in Euclidean view) of the alternative from the ideal solution defined as:

$$S_i^- = \sqrt{\sum_{j=1}^{n} (V_{ij} - V_j^-)^2}, \text{with} \quad i = 1,2,3,\ldots m$$

And the distance to the negative-ideal solution is defined as:

$$S_i^- = \sqrt[2]{\sum_{j=1}^{n} (V_{ij} - V_j^-)}, \text{with} \quad i = 1,2,3,\ldots n$$

5. Calculating the relative closeness to the ideal solution

$$C_i = \frac{S_i^-}{S_i^- + S_i^-}, \text{with} \quad 0 \ll 1 \quad \text{and} \quad j=1,2,3,..m$$

6. Ranking Alternatives
   Alternatives can be ranked in order of . Therefore, the best alternative is the one that is shortest to the ideal solution and furthest away from the solution.
   negative-ideal.

3. RESULTS AND DISCUSSION

The main menu is the form that appears first when the software is run. This form has menus that users can choose from to interact in the process of supporting the selection of extracurricular activities of interest to students with the TOPSIS method.

Figure 1. System Main Menu

In this input form is a display of a form that contains input data for prospective students who take part in extracurricular activities.

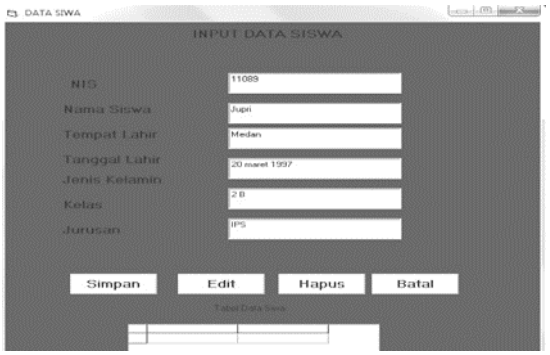


Figure 2. Prospective Student Data Display

In the following display there is a display of the scoring of the search for extracurricular categories using the TOPSIS method.

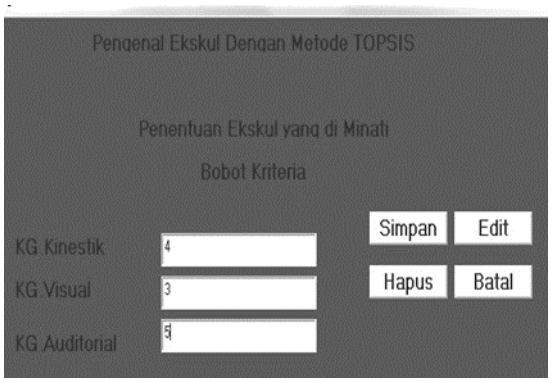
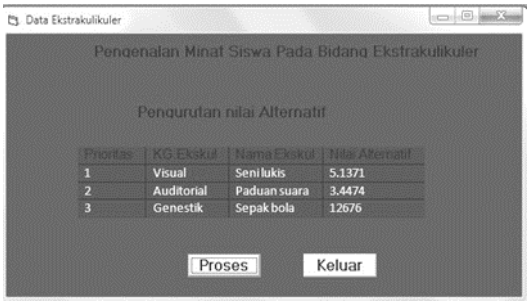


Figure 3. Criteria Weighting Data Display

In this form is a display of all extracurricular category results using the TOPSIS method as support in choosing the extracurricular activities that students want.



Prioritas	KG Ekskul	Nama Ekskul	Nilai Alternatif
1	Visual	Seni lukis	5.1371
2	Auditorial	Paduan suara	3.4474
3	Genestik	Sepak bola	12676

Figure 4. Output Display

4. CONCLUSION

1. The criteria used in recognizing students' interest in extracurricular activities is by assessing the students' hobbies, quizzes and attendance.
2. The application of the method in making decisions is by analyzing the assessment criteria so that from this analysis a decision can be good and measurable.
3. By looking at alternatives that must have the closest distance from the positive ideal solution and the farthest from the negative ideal solution, a decision will be obtained in recognizing students' extracurricular interests.

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