The Implementation of the MFEP (Multi Factor Evaluation Process) Method In Determining the Learning Model

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Abstract. The success of every generation of children is the hope of the success of the education world. The role of educators especially teachers has an important role in achieving the success of their students then a teacher must have a strategy in developing the learning system. A system approach is needed by using specific learning models , in order to help the teacher design the learning system. With the selection of the right learning model is one of the factors that support the success of the learning system. One factor of student achievement is less than the maximum is the application of learning models that are not appropriate, the selection of learning models still using manual systems makes the learning models applied less precise and appropriate. The purpose of this study is to determine the decision support system in determining learning models including cooperative learning models, problem based learning models, contextual learning models, Direct learning models, with the aim to assist teachers in determining the appropriate learning model to be applied in teaching and learning activities. The method applied is using the MFEP (Multi Factor Evaluation Process) method.,by determining and giving subjective / intuitive assessments on factors / criteria that are very influential on indicators / alternatives and ranking systems to find out the alternative with the highest value. The results of this study cooperative learning models are highly recommended in the learning process in determining the level of success of students with a value of 6.18

1. Introduction

The teacher is someone who has the authority and duties in the world of education and teaches in formal education institutions [1][2][3] . Teacher profession is an educator who has an important role for students in developing a science. To achieve success in educating, therefore it would be better for a teacher to have a strategy in the learning development system that will be delivered to students. With the right learning model will result in the success of students in mastering what has been learned. The learning system model itself is basically ways to achieve learning objectives, namely the achievement of maximum learning outcomes by students in learning activities. Through learning outcomes obtained by students, it can be seen that the ability of students to understand the learning material delivered by the teacher can also determine a student's success or achievement in the learning process. While for teachers, the results of a

learning achieved by students can provide a picture of the success and quality of teachers in the teaching process. The system approach to the problem of learning is where the system approach uses specific methods to design the learning system.

The method consists of systematically structured procedures for planning, designing, completing and evaluating the teaching and learning process as a whole. One of the things that can provide success in the learning system is the teacher chooses the appropriate learning model or method. Learning model is a plan or pattern that can be used to form a curriculum (long-term learning plan), design learning materials, and guide learning in other classes [4] The learning model itself is referring to the learning system approach that will be applied, including to the objectives of teaching, and procedures in teaching activities and the environment, as well as management of the classroom. Many types or types of learning models make it difficult for teachers to determine which learning model is appropriate and appropriate. These difficulties are also caused by the characteristics of students and learning materials that have different difficulties. The learning model will usually be determined by a teacher when compiling the education administration of an Implementation and Learning Plan (RPP). How to choose the learning model teachers usually use and study handbooks about learning models. Inappropriate selection methods often convey learning not in accordance with several factors in the field. Therefore, it is very necessary for a decision support system to be used by teachers in determining appropriate and appropriate learning models.

According to [5][6][7] Decision Support System (SPK) is a computer technology solution that can be used to support decision making that is complex in solving problems in an organization. One method of the Decision Support System (SPK) is the MFEP (Multi Factor Evaluation Process) method. The MFEP (Multi Factor Evaluation Process) method is a decision making model that uses a collective approach to the decision making process [8]. Multifactor Evaluation Process (MFEP) is a decision making method that uses a collective approach or in other words, together or a combination of decision making processes [9][10].

In previous studies [9] The decision-making system that exists for the route planning process that results in the resulting process route often needs to be modified. To promote the effectiveness of the resulting process route, the multifactorial decision making method for the route planning process proposed a multifactorial decision model based on pair analysis of pairs discussed to select the final process route from the potential process route. Finally, two cases about the route planning process are presented to validate the proposed method. It is expected that the proposed method can provide support for the route planning process in manufacturing. Research [11] Decision Support System (SPK) Skills Competency Selection for prospective vocational students to facilitate the selection of expertise competencies according to the interests or preferences of prospective students using the method Multi Factor Evaluation Process (MFEP) from the results of the study concluded that prospective students chose skills competencies with a percentage of 54.4%.

2. Method

At this stage, in the software development process the approach based on the process model used is the waterfall. According to [12] the waterfall method is a simple classic model with a linear system flow, the output from the previous stage is input for the next stage.

(i) Data Collection Techniques
Conducting observations, interviews and library research to gather some documents needed in research

(ii) Determine the Title
At the stage of determining the title based on the results of data collection techniques in determining the learning model that must be applied at schoolooperative.

(iii) Method Selection
At the selection stage of the decision support system method with MFEP (Multi Factor Evaluation Process)

(iv) Calculation of Decision Support Systems
In the Calculation of Decision Support Systems, the authors analyze the data using method with MFEP (Multi Factor Evaluation Process)

(v) Conclustion
At this stage the authors hope to find out which method is more effective in determining the best learning model to be applied in schools

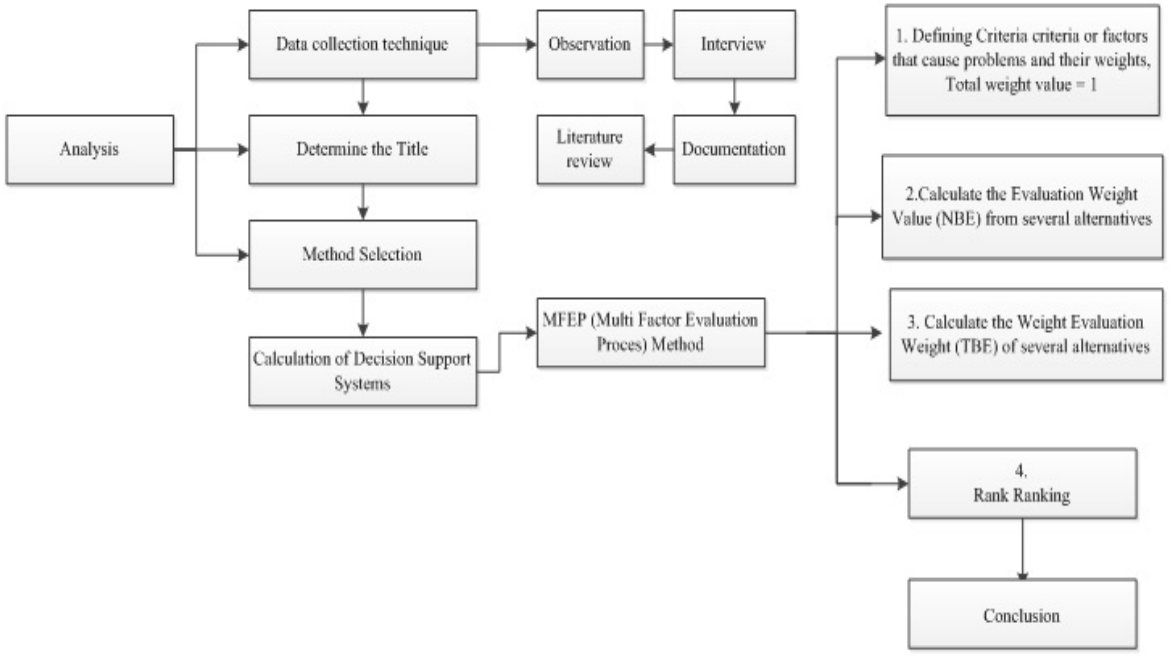

Figure 1. Research Method

3. Result and Discussion

According to [8] is a decision making model that uses a collective approach to the decision making process. The technique of solving this method is by subjective and intuitive assessment of the indicators, criteria or causal factors of a problem that is considered important. These considerations are carried out by giving a weighting system based on priority scale based on the level of importance. The algorithm for solving this method are:

(i) Step 1: first define the criteria or factors that cause problems and their weights.
(ii) Step 2: calculate the Evaluation Weight Value (NBE)
(iii) Step 3: calculate the Total Evaluation Weight (TBE)
(iv) Step 4: rank to get a decision

The formulas used to calculate NBE values in the MFEP (Multi Factor Evaluation Process) method are:

$$NBE = NBF * NEF$$

Information
NBE = Evaluation Weight Weight
NBF = Weight Factor Value
NEF = Factor Evaluation Value

The formula used to calculate the TBE value in the MFEP (Multi Factor Evaluation Process) method, namely:

$TBE = NBE_1 + NBE_2 + NBE_3 + ...NBE_n$

Information:
TBE = Total Evaluation Weight
NBE = Evaluation Weight Weight

The technique in providing weighting must be based on priority scale or level of importance, one of the rules used in weighting criteria in a decision support system is the approach to using a percentage where the calculation has a value of 0 to 100% with a note value $\sum Wj = 100\%$.

3.1. Calculation of the MFEP Manual

The completion steps in the process of determining the learning model for teachers:

(i) Defining Factors related to or related to the Learning Model and its weight value. TBF must be = 1.

Table 1. Defining factors and total factor weights

No	Factor Name/Criteria	Weight
1	Learning objectives	0.15
2	Learning materials	0.18
3	Students	0.20
4	Situation / Condition	0.25
5	Infrastructure	0.22
Total Factor Weight		1

(ii) Calculating the Value of Evaluation Weight
From the results of analysis and sample data obtained by the author, From the results of analysis and sample data oThe following is the teacher's assessment of the direct learning model, the cooperative learning model, the problem based learning model, and the contextual learning model with an assessment range the author 1-10 on factors that have been determined:

Table 2. Calculating Value of Evaluation Weight

Model Name	Value Evaluation Factors				
Cooperative Learning Model	8	10	9	2	1
Problem Based Learning Model	2	8	10	8	2
Contextual Learning Model	6	6	10	6	2
Direct Learning Model	6	10	6	4	4

(iii) Calculate the Total Evaluation Weight
Calculating the Value of Evaluation Weight and Total Evaluation Weight of Alternative Learning Models Directly.

Table 3. Calculate the Total Weight of Alternative Evaluation of Direct Learning Models

Factor Name / Criteria	NBF	NEF	NBE
Learning objectives	0.15	8	1.2
Learning materials	0.18	10	1.8
Students	0.20	9	1.8
Situation / Condition	0.25	2	0.5
Infrastructure	0.22	1	0.22
TBE from the Direct Learning Model			5.52

Table 4. Calculate the Total Weight of Alternative Evaluation of Cooperative Learning Models

Factor Name / Criteria	NBF	NEF	NBE
Learning objectives	0.15	2	0.3
Learning materials	0.18	8	1.44
Students	0.20	10	2
Situation / Condition	0.25	8	2
Infrastructure	0.22	2	0.44
TBE from the Cooperative Learning Model			6.18

Table 5. Calculating the Total Weight of Alternative Evaluation of Problem Based Learning Models

Factor Name / Criteria	NBF	NEF	NBE
Learning objectives	0.15	6	0.9
Learning materials	0.18	6	1.08
Students	0.20	10	2
Situation / Condition	0.25	6	1.5
Infrastructure	0.22	2	0.44
TBE from the Problem Based Learning Model			5.92

Table 6. Calculate the Total Weight of Alternative Evaluation of Cooperative Learning Models

Factor Name / Criteria	NBF	NEF	NBE
Learning objectives	0.15	6	0.9
Learning materials	0.18	10	1.8
Students	0.20	6	1.2
Situation / Condition	0.25	4	1
Infrastructure	0.22	4	0.88
TBE from the Contextual Learning Model			5.78

(iv) Ranking based on Total Evaluation Weight

Table 7. Range Ranking

Alternative	Total Evaluation Weight	Information
Cooperative Learning Model	6.18	Strongly recommended
Problem Based Learning Model	5.92	recommended
Contextual Learning Model	5.78	Not Recommended
Direct Learning Model	5.52	Not Recommended

4. Conclusion

Based on the results of data processing and analysis that has been done, it can be concluded that the Analysis of Learning Model Determination System has been designed using the MFEP (Multi Factor Evaluation Process) method, the cooperative learning model recommended in determining the level of success of students with a value of 6.18, in the presence of analysis of this learning model determination system, can streamline the teacher's time in the process of determining the learning model to be precise and appropriate, and the management of the data contained in this Learning Model Determination System Analysis can be used as material or an accurate result in making decisions for teachers choosing the right learning model .

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