

E-ISSN : 2005-4297
Vol. 13, No. 02, 2020

International Journal of Control and Automation

IJCA

SERSC

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International Journal of Control and Automation

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Implementation Multi Factor Evaluation Process (MFEP) Decision Support System for Choosing the Best Elementary School Teacher

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Abstract

Education is the main priority for the nation and state. Education is formed when someone attends elementary school. Good education requires good teachers too. Public elementary schools are one of the primary schools that must have qualified teachers. This study discusses how to measure the performance of teachers working in these schools. To improve teacher performance and quality, a decision support system is needed to measure the quality of the teacher. The MFEP method is one method that can measure teacher performance. This method works by calculating five criteria as a basis for measuring teacher quality. The results of this method are the order of teacher achievement from highest to lowest. The benefits obtained, the school can develop teacher quality based on the results of the MFEP trial method.

Keywords: MFEP, DSS, school, teacher

1. INTRODUCTION

An elementary school is a place where children first carry out education after going through kindergarten [1]. This transition requires a good teacher in guiding elementary school children, so they are not misdirected. Every teacher must be able to become a role model among the children in the school. A school is a place where children begin to have a teacher who can provide an excellent education so that children in the school can understand the lessons well. The lesson is given during the teaching and learning process.

However, not all teachers have good performance. A good teacher must be able to provide education not only in the classroom but also the teacher must provide other education such as moral education so that these children can become better people not only in terms of school education but also useful in education their moral problems. If a school can educate children to be a well-trained generation, then the quality of teachers who teach is no doubt, it also becomes one of the best achievements that can be proud of the teachers in the school. The determination of teachers has never been done in primary schools so that the schools cannot classify the abilities and performance of the teachers there. Each teacher only carries out his daily duties as a teacher of elementary school children.

Many methods can be used in providing assessments to teachers in these public elementary schools. In determining the best teacher, a decision support system is needed. The MFEP method can help schools determine the best teacher based on specified criteria [2]. Several criteria will be formed in determining the best teacher. This method works by calculating the weighting of each criterion in order to determine the ranking value of the teacher. Hopefully, using this method, teacher performance can be known.

The public elementary school needs to know the performance of teachers who educate elementary school children in order to improve the quality of education in the school [3]. Schools can use the MFEP method in determining which teachers should receive special attention to educating elementary school children.

2. THEORIES

2.1 Staff

An individual who works for an employer, based on an agreement or work agreement, both written and unwritten, to carry out a job in a certain position or activity by obtaining compensation paid based on a certain period, completion of the work, or other conditions determined by the employer, including a private person who does work in a public office.

2.2 Teacher

The teacher is someone who has the authority and duties in the world of education and teaching in formal educational institutions [4]–[6]. A teacher is a person whose job or profession teaches. The teacher is a force to educate, conduct teaching, provide guidance, add physical or non-physical training, provide assessments, and conduct periodic evaluations related to one or more sciences to all students. Besides, the teacher has several other definitions, both according to experts and legislation. Among them are: Teachers are professional educators in their fields who have the main task in educating, teaching, guiding, giving direction, giving training, assessing, and evaluating students who take their education from an early age through formal channels of government in the form of elementary schools to elementary school [7].

By the understanding or definition of the teacher above, the task of a teacher include:

1. Teaching Students
The first task of a teacher is to teach all students related knowledge that he knows in depth. In connection with the teaching assignment, a teacher is expected to be able to deliver material written in books or other media to students so that later on, the students concerned can apply the knowledge they get in their daily lives.
2. Educate Students
Each student or student has their character, which sometimes helps the learning process or vice versa. A teacher has to educate the student to walk in the proper corridor in the world of education. A teacher is obliged to set an example for students to change their behavior and character to be better. Later the positive impact that arises is the pattern of interaction from the students themselves who can distinguish between good and bad for him.
3. Give Guidance and Direction to Students
The task of another teacher is to provide guidance and direction to students. Guidance and direction are expected to develop motor skills and other abilities possessed by a student. This guidance and direction can be done in various forms, including giving assignments to students by first emphasizing what needs to be done. Provide justification or revision if students make mistakes on a given task.
4. Train Students

Providing training to students has almost the same function as when a teacher provides guidance and direction. Training in education can be done in several ways, such as: Provide homework that helps increase children's creativity, such as making art or drawing crafts. Apply group discussion in discussing a problem related to the given knowledge, practice speaking skills, and express an opinion. Provide skills training or basic training related to students' interests or talents, such as sewing training, language training, mechanical training, electrical training, and various other training that can develop their natural talents.

5. Provide Rating

A teacher has an obligation to provide an assessment to students, directly or indirectly, to help the child understand the mistakes and shortcomings that are owned, to then change it towards a more positive direction. In the world of formal education, this assessment can be done by holding written examinations or not related to specific fields of science.

6. Give Evaluation

Evaluation in education is not the same as grading. Evaluation can also be related to the teacher himself, considering this evaluation will provide a view of how successful a teacher is in providing education to their students. An evaluation has broad meaning, where evaluation can be done in writing or not.

7. Give Moral and Mental Encouragement

A teacher has a duty and obligation to provide moral and mental encouragement to his students so that the student can face all kinds of problems that occur in his life during formal and non-formal education. For example, when a child gets the lowest score among his classmates, a good teacher will encourage the child concerned to learn better in the future by giving a gift as an incentive to learn or other rewards.

3. METHODOLOGY

3.1 Multifactor Evaluation Process (MFEP)

Multifactor Evaluation Process (MFEP) is a decision-making method that uses a collective approach or in other words, together or a combination of the decision making process[8], [9]. The Multifactor Evaluation Process Method is relatively difficult to use manually if the problem to be solved is a complex problem in which many aspects or factors are taken. The Multifactor Evaluation Process method has a weight that must be given to each required criterion[10]. However, often, this is considered a personal or subjective probability where the weight is based on the level of trust, beliefs, experience, and background of decision-makers. Therefore, the value entered will become invalid when the decision-maker does not understand the problem.

The use of the MFEP model can be realized with the following example:

$$WE = FW \times E \quad \Sigma WE = \Sigma (FW \times E)$$

Information:

WE = Weighted Evaluation
FW = Factor Weight
E = Evaluation
 ΣWE = Total Weighted Evaluation

The following are the steps of the calculation process using the MFEP method, namely:

1. Determine factors and weighting factors where the total weighting must be equal to 1 ((weighting = 1), i.e., factor weight. In this study, the factors and weights are file (0.30), interviews (0.25), and practice (0.45).

2. Filling in the value for each factor that influences the decision making of the data to be processed, the value entered in the decision-making process is objective, that is undoubtedly the factor evaluation.
3. The process of calculating weight evaluation which is the process of calculating the weight between factor weight and factor evaluation with and adding up all weight evaluation results to obtain the total evaluation results.

4. RESULT AND DISCUSSION

Implementation of this decision support system interface has several menus that can run the function of the Multi-factor Evaluation Process method. Calculations must be done in full to get the results of the recommendations from the MFEP method. This chapter explains the results of implementing calculations about verifying the truth of the MFEP method. Determination of the selection of elementary school teachers is not easy to do, so it requires a decision support system in carrying out these teachers. The MFEP method can be used as a tool in determining the value of each candidate so that the reception process runs smoothly and transparently. The following will illustrate clearly the process of calculating the MFEP method in selecting the best teachers in primary schools.

Table 1 Alternative Data

No.	Code	Candidate	Discipline	Skill	Neatness	Presence	Science	Hospitality
			C1	C2	C3	C4	C5	C6
1	A1	William	EXCELLENT	BAD	ENOUGH	ENOUGH	BAD	GOOD
2	A2	Donny	FAIR	BAD	ENOUGH	EXCELLENT	BAD	FAIR
3	A3	Shindy	GOOD	EXCELLENT	GOOD	BAD	EXCELLENT	GOOD
4	A4	Derry	EXCELLENT	FAIR	ENOUGH	ENOUGH	GOOD	FAIR
5	A5	Rowan	FAIR	ENOUGH	FAIR	BAD	ENOUGH	GOOD
6	A6	Adam	ENOUGH	GOOD	ENOUGH	ENOUGH	BAD	ENOUGH
7	A7	Leo	ENOUGH	ENOUGH	ENOUGH	BAD	EXCELLENT	EXCELLENT
8	A8	Martin	BAD	EXCELLENT	BAD	ENOUGH	ENOUGH	FAIR
9	A9	Jenny	FAIR	EXCELLENT	EXCELLENT	ENOUGH	GOOD	ENOUGH
10	A10	Gwen	GOOD	ENOUGH	EXCELLENT	GOOD	BAD	FAIR

Table 1 explains the data used as the determination of the best teacher data. Six criteria are decisive in supporting the MFEP process. Each criterion has the description Bad, Fair, Moderate, Good, and Very Good. Weighting is done so that the value can be calculated using the MFEP formula. Table 2 is the result of weighting, which is done based on assessment categories.

Table 2 Weighting

No.	Code	Candidate	Discipline	Skill	Neatness	Presence	Science	Hospitality
			C1	C2	C3	C4	C5	C6
1	A1	William	5	1	2	2	1	4
2	A2	Donny	3	1	2	5	1	3
3	A3	Shindy	4	5	4	1	5	4
4	A4	Derry	5	3	2	2	4	3
5	A5	Rowan	3	2	3	1	2	4
6	A6	Adam	2	4	2	2	1	2
7	A7	Leo	2	2	2	1	5	5
8	A8	Martin	1	5	1	2	2	3
9	A9	Jenny	3	5	5	2	4	2
10	A10	Gwen	4	2	5	4	1	3

The weighting of criteria is given between 1 and 5. The function of weighting is to simplify the value to be processed in the MFEP calculation. Table 3 is the preference weights used in the MFEP process.

Table 3 Preferred weight

	C1	C2	C3	C4	C5	C6
Weight	4	5	3	4	5	3
Preferred Weight	0,1667	0,2083	0,125	0,1667	0,2083	0,125

Table 4 Normalization

No.	Code	Candidate	Discipline	Skill	Neatness	Presence	Science	Hospitality
			C1	C2	C3	C4	C5	C6
1	A1	William	0,8335	0,2083	0,25	0,3334	0,2083	0,5
2	A2	Donny	0,5001	0,2083	0,25	0,8335	0,2083	0,375
3	A3	Shindy	0,6668	1,0415	0,5	0,1667	1,0415	0,5
4	A4	Derry	0,8335	0,6249	0,25	0,3334	0,8332	0,375
5	A5	Rowan	0,5001	0,4166	0,375	0,1667	0,4166	0,5
6	A6	Adam	0,3334	0,8332	0,25	0,3334	0,2083	0,25
7	A7	Leo	0,3334	0,4166	0,25	0,1667	1,0415	0,625
8	A8	Martin	0,1667	1,0415	0,125	0,3334	0,4166	0,375
9	A9	Rizka	0,5001	1,0415	0,625	0,3334	0,8332	0,25
10	A10	Tata	0,6668	0,4166	0,625	0,6668	0,2083	0,375

Table 4 is the result of normalization criteria based on the weighted preferences that have been given. Normalization is done to get the strength of preference weights for each criterion. Users can specify preference weights with different values for each criterion so that a balance between criteria can be determined. Table 5 is the sum of the normalized values for each criterion for each alternative

Table 5 MFEP Rank

No.	Code	Alternative	MFEP
1	A1	William	2,3335
2	A2	Donny	2,3752
3	A3	Shindy	3,9165
4	A4	Derry	3,2500
5	A5	Rowan	2,3750
6	A6	Adam	2,2083
7	A7	Leo	2,8332
8	A8	Martin	2,4582
9	A9	Jenny	3,5832
10	A10	Gwen	2,9585

5. CONCLUSION

After researching getting the best teachers in primary schools, some conclusions can be drawn. The MFEP method was successful in determining the best teachers in primary schools. Several alternatives are provided as candidates in determining the best employee. There are six criteria taken, and these criteria are the right criteria in determining the best

employee. Preferential weights are balancing criteria values in determining priority criteria to be used.

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