Decision support system for the selection of exemplary teachers using profile matching method

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Abstract. According to Law No. 14 of 2005 in Indonesia regarding teachers and lecturers, Article 36 paragraph (1) mandates that teachers who have achievements, are extraordinarily dedicated, and / or work in a special area are entitled to receive awards. However, in determining or choosing an exemplary teacher is not as easy as imagined, this is because there are many teachers who can be used as candidate for exemplary teachers, this is certainly a difficulty for decision makers, in this case, namely the principal to determine exemplary teachers, it cannot be denied that too selection is often done not objectively due to unclear judgments. This study aims to design a decision support system using the Profile Matching method. This method was chosen because the assessment through a decision support system with profile matching has a better level of objectivity, this is done by measuring the value of each indicator of the assessment variable which is then derived again using sub-indicators and weighted using the assessment parameters then calculated using the decision-making mechanism assuming that there is an ideal predictor variable level that must be met by the subject. The output of this study is in the form of recommendations for exemplary teachers who have criteria in accordance with the criteria set by the relevant parties.

1. Introduction
The rapid development of information technology has helped humans in many ways. Especially in processing information that can be created and processed in a relatively short time so that it becomes more effective and efficient. Because, basically information technology is built to make it easier for humans to complete their tasks which can be streamlined and streamlined by the help of machines. Selection of exemplary teachers who are supported by a decision support system is one of the implementations of information technology developments.

Selection of exemplary teachers at the unit level of primary school education is generally not based on subjective assessments, sometimes it is done by pointing directly to a particular teacher who looks the most active or based on emotional closeness. However, the most difficult thing in determining a model teacher is the effort to eliminate the subjectivity factor [1], so that every choice made is objective based on predetermined criteria. So that the evaluation process of teachers is very necessary in order to improve the quality of human resources at the level of the education unit. [2] argues that teacher evaluation is one of the mechanisms that must be passed to provide opportunities for teachers to improve their performance. [3] There is a reform towards the evaluation system for teachers that must be carried out properly so that it has the potential to trigger more underperforming teachers,
especially in increasing their skills. So that [4] the results of the evaluation of teachers in the education process may be able to encourage the release of teachers who get less evaluation results through an independent selection process.

Based on the things above, it is necessary to make a decision support system as a recommendation in determining the achieving teachers objectively. In this study using the Profile Matching method as a problem solving model to provide decisions in determining model teachers at the primary school education unit level. this is based because this method is the right method, because it can rank the best candidates based on predetermined criteria. In addition, this method was chosen because the assessment using the profile matching decision support system has a better level of objectivity, this is done by measuring the value of each indicator of the assessment variable which is then derived again with sub-indicators and weighted using the assessment parameters then calculated using the decision making mechanism. assuming that there is an ideal predictor variable level that must be met by the subjects. [5] The profile matching method is one of the simplest methods in a decision support system by comparing the GAP between the value and alternative criteria. The purpose of this research is to build an exemplary teacher selection system so that it can make it easier for school principals to objectively determine exemplary teachers.

2. Methodology
In completing this research, the authors used several research methods including:

2.1 Method of collecting data
a. Observation Method. The author made observations by coming directly to the location of the primary school level of education in Kuningan West Java Indonesia. Arrival to that location to observe the current situation and conditions. This is done to obtain data directly on the object under study as research material.

b. Interview Method. After the writer carried out the observation method to the location, then the writer spoke and gave several questions directly to find out the existing conditions and to know the needs as research material.

c. Literature Study Method. Literature study was carried out after the authors carried out the two methods above. The author compiles a research report by collecting data and in the form of collecting relevant information and obtained from several sources such as books, journals and the internet related to research needs with the aim of completing the data and information needed in the research.

2.2 Problem Solving Methodology
In the research that will be conducted, the writer uses problem solving methods to solve existing problems. The problem solving method used is Profile Matching. Profile Matching is a decision-making mechanism by assuming that there is an ideal level of predictor variables that must be met by the subject under study, not a minimum level that must be met or passed [6]

The steps for the Profile Matching Method are as follows:

a. Determination of the aspects of the assessment aspects. In this stage the researcher determines several aspects that will be used as assessment materials.

b. Calculating the Gap. After the aspects and ideal values are determined, then the next step is to calculate the gap (difference) using the formula Gap = Value Attribute – Value Target

c. Weighting. After obtaining a gap in each alternative (teacher), each teacher is given a weighted value based on the difference, the smaller the difference, the greater the weight.

d. Calculation and grouping of Core Factors and Secondary Factors. After determining the weight of the gap value, calculations will be carried out based on the grouping of Core Factors and Secondary Factors in each aspect.

e. Total value calculation. Based on the calculation of each aspect, then the total value is calculated based on the percentage of the Core Factor and Secondary Factor which are estimated to affect each profile.
f. Ranking. Of the candidates proposed to be exemplary teachers, ranking is done by adding up the total value of each profile.

3. Result and Discussion

3.1 Assessment Aspects

The aspects used in this study consisted of work attitude aspects with a percentage of 60% and skills aspects with a percentage of 40%. The following are details of the aspects of the assessment:

| Table 1. Assessment Aspects |
|----------------------------|
| **aspects of the** | **criteria** | **Sub criteria** | **type** |
| Work attitude | Attendance | Attendance of teachers at school. | Core Factor |
| Discipline | Discipline related to the implementation of their duties as educators. | Core Factor |
| Skills | Achieves | Compliance with teacher discipline in schools. | Secondary Factor |
| Productivity | Productivity | Able to make scientific papers. | Core Factor |
| Creative and innovative | Creative and innovative. | Able to create teaching and learning activities that are not monotonous. | Core Factor |

3.2 Profile Matching process

Following are the steps for the completion process using the profile matching method:

a. Gap calculation

| Table 2. Gap in Work Attitude Aspects | Table 3. Skills Aspect Gap |
|--------------------------------------|---------------------------|
| **Number** | **Name** | **SK1** | **SK2** | **SK3** | **SK4** | **Number** | **Name** | **SK5** | **SK6** | **SK7** | **SK8** | **SK9** | **SK10** |
| 1 Teacher 1 | 5 | 4 | 4 | 4 | | 1 Teacher 1 | 1 | 4 | 3 | 3 | 3 | 3 |
| 2 Teacher 2 | 5 | 4 | 4 | 4 | | 2 Teacher 2 | 1 | 1 | 3 | 2 | 2 | 1 |
| 3 Teacher 3 | 5 | 4 | 4 | 4 | | 3 Teacher 3 | 2 | 2 | 3 | 3 | 3 | 3 |
| **Ideal Weight** | | 5 | 4 | 4 | 4 | | **Ideal Weight** | | 3 | 3 | 4 | 4 | 4 |
| 1 Teacher 1 | 0 | 0 | 0 | 0 | | 1 Teacher 1 | -2 | -1 | 0 | -1 | -1 | 0 |
| 2 Teacher 2 | 0 | 0 | 0 | 0 | | 2 Teacher 2 | -2 | -2 | 0 | -2 | -2 | -3 |
| 3 Teacher 3 | 0 | 0 | 0 | 0 | | 3 Teacher 3 | -1 | -1 | 0 | -1 | -2 | -1 |

b. Weighting

| Table 4. Weight of Work Attitude Aspects | Table 5. Skill Aspect Weights |
|-----------------------------------------|-----------------------------|
| **Number** | **Name** | **SK1** | **SK2** | **SK3** | **SK4** | **Number** | **Name** | **SK5** | **SK6** | **SK7** | **SK8** | **SK9** | **SK10** |
| 1 Teacher 1 | 0 | 0 | 0 | 0 | | 1 Teacher 1 | 3 | 4 | 5 | 4 | 4 | 4 |
| 2 Teacher 2 | 0 | 0 | 0 | 0 | | 2 Teacher 2 | 3 | 3 | 5 | 3 | 3 | 2 |
| 3 Teacher 3 | 0 | 0 | 0 | 0 | | 3 Teacher 3 | 4 | 4 | 5 | 4 | 3 | 4 |
c. Classification of Core Factor and Secondary Factor

**Table 6. Classification of Work Attitude Aspects**

| Number | Name   | SK1 | SK2 | SK3 | SK4 | NCF | NSF |
|--------|--------|-----|-----|-----|-----|-----|-----|
| 1      | Teacher 1 | 5   | 5   | 5   | 5   | 5   | 5   |
| 2      | Teacher 2 | 5   | 5   | 5   | 5   | 5   | 5   |
| 3      | Teacher 3 | 5   | 5   | 5   | 5   | 5   | 5   |

**Table 7. Classification of Skill Aspect Factors**

| Number | Name   | SK5 | SK6 | SK7 | SK8 | SK9 | SK10 | NCF     | NSF     |
|--------|--------|-----|-----|-----|-----|-----|-------|---------|---------|
| 1      | Teacher 1 | 3   | 4.5 | 4   | 4   | 4   | 5     | 3.66666667 | 4.83333333 |
| 2      | Teacher 2 | 3   | 3   | 5   | 3   | 3   | 3     | 3.33333333 | 3.33333333 |
| 3      | Teacher 3 | 4   | 4   | 5   | 4   | 4   | 4     | 3.66666667 | 4.83333333 |

d. Total Value Calculation

**Table 8. Total Value of Work Attitude Aspects**

| Number | Name      | NCF | NSF | Total |
|--------|-----------|-----|-----|-------|
| 1      | Teacher 1 | 5   | 5   | 5     |
| 2      | Teacher 2 | 5   | 5   | 5     |
| 3      | Teacher 3 | 5   | 5   | 5     |

**Table 9. Total Value of Skill Aspects**

| Number | Name      | NCF     | NSF     | Total             |
|--------|-----------|---------|---------|-------------------|
| 1      | Teacher 1 | 3.66666667 | 4.83333333 | 4.13333333 |
| 2      | Teacher 2 | 3       | 3.33333333 | 3.13333333 |
| 3      | Teacher 3 | 3.66666667 | 4.33333333 | 3.93333333 |

e. Ranking

Of the candidates submitted to become exemplary teachers, ranking refers to the results of certain calculations. This calculation can be shown with a formula:

\[
\text{Ranking} = (x) \% \cdot Ns + (x) \% \cdot Np
\]

Based on this formula, from the two aspects, namely work attitude and skills, then determine the most needed aspects, in this case the work attitude aspects are 60% work attitude and 40% behavior. The following is an example of the calculation of Teacher's profile 1.

Ranking \(= (60\% \times 5) + (40\% \times 4.13333333)\)
\(= 3 + 1.65333333\)
\(= 4.65333333\)

After each candidate gets the final result, the ranking or ranking of the candidate can be determined based on the value of the final result as in Table 10. The greater the final result score, the greater the opportunity to become an exemplary teacher.

**Table 10. Ranking**

| Number | Name      | Work Attitude | Skill | Result | Rank |
|--------|-----------|---------------|-------|--------|------|
| 1      | Teacher 1 | 5             | 4.13333333 | 4.65333333 | 1    |
| 2      | Teacher 3 | 5             | 3.93333333 | 4.57333333 | 2    |
| 3      | Teacher 2 | 5             | 3.13333333 | 4.25333333 | 3    |

4. Conclusion

The decision support system for selecting exemplary teachers uses the profile matching method in this study using several aspects of assessment by comparing the competencies possessed by individuals with performance competencies so that it can be seen the differences in competencies, where the smaller the gap, the greater the chance for the teacher to get the value of his performance. So that the
system will produce output in the form of exemplary teacher recommendations based on criteria that match the criteria set by the education unit where the teacher works.

References

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