Jurnal TAM *(Technology Acceptance Model)*
Jurnal TAM, Volume 14, Number 2, December 2023
E ISSN: 2579-4221; P ISSN: 2339-1103, pp. 201-205
Accredited SINTA 4 Number 225/E/KPT/2022
https://jurnal.ftikomibn.ac.id/index.php/JurnalTam/index

ELECTION OF NEW INSTRUCTORS FOR COMPUTER COURSES AT LKP BINA TUNAS EDUCATION USING THE MULTI ATTRIBUTE UTILITY THEORY (MAUT) METHOD

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Article history:
Received: October 29, 2023
Revised: November 13, 2023
Accepted: December 09, 2023

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Keywords:
Instructor;
LKP;
Bina Tunas Education;
MAUT Method.

Abstract
An instructor is a person whose job is to teach something and at the same time provide training and guidance, teacher, trainer, and caregiver. Among other assets such as capital, buildings, office equipment, and others, only instructors can breathe, think and behave. This uniqueness, if it has good quality and is involved in business activities, will make a big contribution to the progress of the company or institution. To obtain quality trainers who meet the expected qualifications, the company carries out a selection process in recruiting new instructors. The selection process for instructor acceptance at LKP Bina Tunas Education is carried out to determine which instructor candidates will be accepted. This research aims to select new instructor candidates more objectively because weighting can be carried out against predetermined criteria using the Multi-Attribute Utility Theory (MAUT) method. Using predetermined selection criteria, namely minimum criteria for high school graduates, experience, age, status, competence, liking challenges, and orientation. Selection of the best approach (other methods) in an effort to realize the Selection of Acceptance of Candidates for LKP Instructur Bina Tunas Education.

I. INTRODUCTION

LKP Bina Tunas Education is a company that operates in the field of education as well as a course center. By expanding on the reputation, experience and commitment of the founder of LKP Bina Tunas Education, who has studied the world of education and the course business, followed by knowledge of the professionalism of teaching each of its human resources, the company will act as one of the main actors in following the development of students, especially good outlook on work life. Finally, the existence and business activities of LKP Bina Tunas Education can "Serve More Good".

Instructors, for example, are people whose job is to teach something and at the same time provide training and guidance, teachers, trainers, caregivers. In realizing the vision and mission of LKP Bina Tunas Education, it always strives to continuously improve internal quality as a strategy for companies or agencies to be able to compete with other companies or agencies providing courses. One way to improve the quality of an agency is to select supervisors or instructors. The company stipulates the criteria to be achieved by prospective instructors, namely the minimum criteria of a high school graduate or above, experience, age, status, competence, likes challenges, orientation.

The Multi Attribute Utility Theory (MAUT) method was first researched or coined by Keeney and Raiffa (1976). The Multi Attribute Utility Theory method is a quantitative comparison method that generally combines measurements of various risks and different profit margins[1], [2]. Each of the criteria contained has several other ways that can deliver a solution. To achieve another way that approaches using the dreams of agency leaders, it is to identify multiplication of the priority scale that has been influenced. As a result, what will happen is the

best and closest to the criteria required by the agency that will be taken as a solution[3]–[5].

Implementation of the Multi Attribute Utility Theory (MAUT) Method in Determining New Instructor Recipients written by, explains in determining instructor recipients at LKP Bina Tunas Education uses the Multi Attribute Utility Theory (MAUT) method, so the Bina Tunas Education LKP Leaders can be more objective in selecting instructors[6]–[9]. The MAUT method uses a scale between 0 to 1, as a result it makes it easier to assess the selection of instructors at LKP Bina Tunas Education and compare the scores for each alternative. This research aims to help LKP Bina Tunas Education in selecting the best instructors based on a more objective and neutral side.

II. RESEARCH METHODS

The research method is a design derived from research activities carried out in searching, formulating and analyzing until one can compile something using the steps that will be used and when that can be used as a reference for obtaining data analysis. It is hoped that the research method will help the writing to be directed in sync with the problem being studied. The selection of online English courses involves several criteria and alternatives, so this problem can be solved by using Multi-Criteria Decision Making (MCDM)[3], [6]. The MCDM approach is a decision-making solution that aims to get the best alternative froma number of criteria[10]–[12]. The Multi-Attribute Utility Theory (MAUT) method is a quantitative comparison method that generally combines measurements of different risks and profits. Each existing criterion must have several other ways that can convey the solution. The MAUT method is used to change the origin of several interests in a numerical value on a scale of 0-1 with 0 representing the worst choice and 1 the best. This allows exclusive comparisons of multiple sizes. Regarding data collection methods This research uses several research frameworks which are presented in Figure 1.

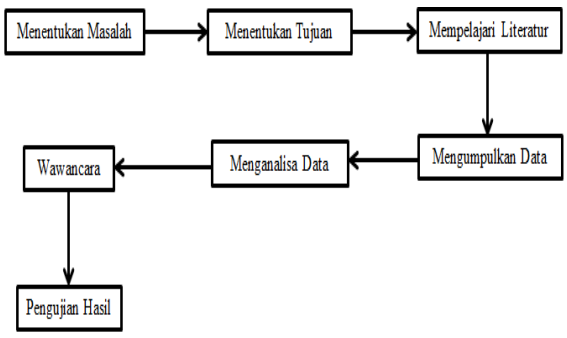

Figure 1. Research Framework

1. Determining the Problem
   On term In this case, the researcher formulates dilemmas based on the dilemmas found in the research object and provides original boundaries for each problem being studied so that it is more focused.
   - Limitations of potential candidates
   - Expectations are too high for applicants
   - Haste in making job offers
   - Evaluation of skills, abilities and knowledge
2. Studying literature
   By investigating the literature, the research carried out is not fabricated, so that the research will be well received in the world of work in the future. Learn about several stages in instructor selection at LKP Bina Tunas Education. For example, regarding interviews, knowledge ability tests and so on.
3. Determining Goals
   Choosing research objectives is necessary so that researchers do not misdirect the goals they wish to achieve in order to receive optimal results. This term explains the problem boundaries, objectives and benefits of the selection activities carried out by researchers at LKP Bina Tunas Education.
4. Collecting data
   Collecting data is done in order get the expected data news in research in order to achieve research objectives. Data collection was carried out in this research, meaning conducting observations, interviews and literature studies. Direct interview between the head of LKP Bina Tunas Education and the prospective new instructor.
5. Analyzing Data
   Using the Multi Attribute Utility Theory method, in order to analyze this research, the MAUT method was used. Things that will be analyzed are level of education, experience, competence, orientation towards challenges, age and status.
6. Interview
   This method is carried out directly by the leadership to the prospective instructor. Many of the questions asked, however, focus more on competency or skills, experience, and level of education.
7. Results Testing
   stage of the research is testing to compare the results of one instructor candidate with other instructor candidates.

III. DISCUSSION

Selection carried out by LKP Bina Tunas Education means the activity of selecting and determining whether applicants are accepted or rejected to occupy positions in accordance with the criteria required by the company. The purpose of selection in theory is to receive trustworthy instructors and can carry out tasks assigned by the company.

What will eventually happen is that the research is carried out, meaning that it will be an original order of assessment rankings that can describe the original choices for decision makers . The first steps to be taken in the calculation are as follows:

1. This research data uses data collected by the prospective instructor from the agency. In collecting this data and interviews with LKP agency leaders. Bina Tunas Education. This data is in the form of prospective instructor data with criteria that are safe to use later when selecting using the MAUT method.
2. Employee data in this study used a sample of employee data that came from prospective instructors who nominated themselves to become new instructors at LKP Binas Tunas Education.
3. Determining alternative assessments, there are several candidates New Instructors as a sample to determine Eligibility for Selection, for example in the table below.

Table 1. Alternatives

No	Alternative	Initials
1	Algebra	D 1
2	Fery	D 2
3	Lilis	D 3
4	Sayyida	D 4

4. Select criteria and weight preferences
   Selecting weight preference criteria that will be used as a reference for decision making, namely the criteria used in Determining eligibility for the selection of new instructor candidates is similar to the table below.

Table 2. Criteria and Preference Weights

No	Code	Criterion Name	Preference Weights
1	K1	Level of education	0.10
2	K2	Experience	0.15
3	K3	Competence	0.15
4	K4	Oriented	0.15
5	K5	Likes Challenges	0.15
6	K6	Age	0.15
7	K7	Status	0.15

5. Determine evaluation indicators
   Next, we will use values according to the evaluation indicators, for example in the table below This.

Table 3. Evaluation Indicators

Indicator	Indigo
Very Good (SB)	5
Good (B)	4
Enough (C)	3
Bad (K)	2
Very Bad (SK)	1

Once the indicator value is known, the next step will be to use the evaluation data generated from each other method. The initial consequences of the calculation of the MAUT Method are seen similar to the table below.

Table 4. Criteria Values for Each Other Method

No	Alternative	K1	K2	K3	K4	K5	K6	K7
1	Algebra (D 1)	4	2	2	2	4	5	4
2	Ferry (D 2)	4	4	4	4	4	4	4
3	Lilis (D 3)	5	3	2	2	4	5	4
4	Sayyida (D 4)	4	4	4	4	4	4	4
Preference Weights		0.10	0.15	0.15	0.15	0.15	0.15	0.15

6. The next step is to normalize the matrix for each criterion from each other method using equations. Here's the systematics in another way using the description of the previous tables:

a. Instructor Candidate = Algebra = (D 1)

$D1_1 = \frac{4-3}{4-4} = \frac{1}{1} = 1$

$D1_2 = \frac{2-4}{5-4} = \frac{-2}{1} = -2$

$D1_3 = \frac{2-3}{5-3} = \frac{-1}{2} = -0.5$

$D1_4 = \frac{2-4}{5-4} = \frac{-2}{1} = -2$

$D1_5 = \frac{4-4}{5-4} = \frac{0}{1} = 0$

$D1_6 = \frac{5-3}{5-5} = \frac{2}{0} = 0$

$D1_7 = \frac{4-3}{5-3} = \frac{1}{2} = 0.5$

b. Prospective Instructor = Fery = (D2)

$D2_1 = \frac{4-3}{4-4} = \frac{1}{1} = 1$

$D2_2 = \frac{4-4}{5-4} = \frac{0}{1} = 0$

$D2_3 = \frac{4-3}{5-3} = \frac{1}{2} = 0.5$

$D2_4 = \frac{4-4}{5-4} = \frac{0}{1} = 0$

$D2_5 = \frac{4-4}{5-4} = \frac{0}{1} = 0$

$D2_6 = \frac{4-3}{5-5} = \frac{1}{0} = 0$

$D2_7 = \frac{4-3}{5-3} = \frac{1}{2} = 0.5$

c. Prospective Instructor = Lilis = (D3)

$D3_1 = \frac{5-3}{4-4} = \frac{2}{1} = 1$

$D3_2 = \frac{3-4}{5-4} = \frac{-2}{1} = -2$

$D3_3 = \frac{2-3}{5-3} = \frac{-1}{2} = -0.5$

$D3_4 = \frac{2-4}{5-4} = \frac{-2}{1} = -2$

$D3_5 = \frac{4-4}{5-4} = \frac{0}{1} = 0$

$D3_6 = \frac{5-3}{5-5} = \frac{2}{0} = 0$

$D3_7 = \frac{4-3}{5-3} = \frac{1}{2} = 0.5$

d. Prospective Instructor = Sayyida = (D4)

$D4_1 = \frac{4-3}{4-4} = \frac{1}{1} = 1$

$D4_2 = \frac{4-4}{5-4} = \frac{0}{1} = 0$

$D4_3 = \frac{4-3}{5-3} = \frac{1}{2} = 0.5$

$D4_4 = \frac{4-4}{5-4} = \frac{0}{1} = 0$

$D4_5 = \frac{4-4}{5-4} = \frac{0}{1} = 0$

$$D4_6 = \frac{4-3}{5-5} = \frac{1}{0} = 0$$

$$D4_7 = \frac{4-3}{5-3} = \frac{1}{2} = 0.5$$

As long as the normalization occurs, it will be displayed in the form of a similar tab in the table below :

Table 5. Normalization of MAUT Matrix

No	Alternative	K1	K2	K3	K4	K5	K6	K7
1	Algebra (D 1)	1	-2	-0.5	-2	0	0	0.5
2	Ferry (D 2)	1	0	0.5	0	0	0	0.5
3	Lilis (D 3)	1	-2	-0.5	-2	0	0	0.5
4	Sayyida (D 4)	1	0	0.5	0	0	0	0.5
Preference Weights		0.10	0.15	0.15	0.15	0.15	0.15	0.15

The next term will be to multiply the normalized matrix with weight preferences using the formula in the equation. Next, calculate the normalized multiplication matrix s using the equation:

D 1
=(0.10*1)+(0.15*(2))+(0.15*(0.5))+(0.15*(2))+(0.15*0) +(0.15*0)+(0.15*0.5) = -0.5

D 2 =(0.10 * 1)+(0.15* 0)+(0.15 * 0.5)+(0.15 * 0)+(0.15*0)+(0.15* 0)+(0.15*0.5) = 0.25

D 3
=(0.10*1)+(0.15*(2))+(0.15*(0.5))+(0.15*(2))+(0.15*0) +(0.15*0)+(0.15*0.5) = -0.5

D 4 = (0.10 * 1)+(0.15* 0)+(0.15 * 0.5)+(0.15 * 0)+(0.15 * 0)+(0.15 * 0)+(0.15 * 0.5) = 0.25

As long as the results of the calculations above are obtained, a normalized multiplication matrix will be obtained which appears in the table below.

Table 6. What will happen to Matrix Normalization

No	Code	Alternative	Final score	Rank
1	D 1	Algebra	-0.5	2
2	D 2	Fery	0.25	1
3	D 3	Lilis	-0.5	2
4	D 4	Sayyida	0.25	1

Derived from the calculation of the MAUT method based on the selection of new instructors received from four existing candidates with the best ones meaning Fery and Sayyida. As a result of the scores obtained from the process of selecting new instructors, Fery and Sayyida are the two people with the highest scores from the four prospective new instructors.

IV. CONCLUSION

From the description or analysis above, it can be concluded that using the MAUT method can be used to select prospective instructors according to the specified criteria. Some of the criteria used mean at least a high school graduate or above, experience, age, status, competence, liking challenges, orientation. The results of this research were four prospective instructors and only two new instructor candidates were accepted. This research can help the LKP Bina Tunas Education Agency in selecting new instructor candidates.

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