



## Improving the Guidance Learning (LBB) Consumer Satisfaction in Malang using DANP - TOPSIS Method

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### ABSTRACT

Decision analysis of Multiple Attribute Decision Making (MADM) model is used to assess the performance, not only in a rank but also in a plan of marketing strategy as an effort to increase consumers' satisfaction by combining DEMATEL-based Analytical Network Process (DANP) method and the Technique for Order of Preference by Similarity to Ideal Solution (TOPSIS) method. One of the industrial services in the education nowadays is the services of the Guidance Learning (LBB). This article has 3 alternatives to 6 criteria. The questionnaire was distributed to 80 LBB' students and 55 LBB' mentors. The result of the dominant criteria affecting customer satisfaction of LBB in Malang by DANP method is the mentor quality. Meanwhile, the TOPSIS result showed that the LBB of Avicenna Education Malang is the best alternative to the marketing strategy.

**Keywords:** Dominant Criteria, Alternative, LBB, DANP, TOPSIS

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### INTRODUCTION

The system of education in Indonesia is growing rapidly that affecting the students' learning patterns. In order to improve the learning ability of students outside school hours, one of the solutions is to engage students at the Guidance Learning (LBB). LBB services are considered helping parents who have difficulties in teaching and guiding their children's assignments from the school. However, we found some LBB in Malang so that it was difficult for parents to select the best LBB for their children [1]. Such conditions can increase the competition among the similar educational institutions in terms of offering the best products to meet the consumer needs [1]. The guidance business can be said to be successful if it has many satisfied consumers and has new customers who come in this LBB. The right marketing strategy is the success key and the target of success in running a business in education is the fulfillment of consumers' satisfaction.

Some research on the LBB decision-making system was established such as the election decision support system of a private tutor for LBB' students by AHP method [2], the election decision support system of tutoring institution [3], and the implementation of TOPSIS method for the LBB selection decision support system [4]. In addition, the research on the high school students' motivation in taking part in LBB also has been done by [5]. In early 2013's, [6] combines DEMATEL and ANP to evaluate the implementation of viable information systems. Infact, the research undertaken by [7] combines the decision-making method of DEMATEL-based Analytical Network Process (DANP) and Visekriterijumsko Kompromisno Rangiranje (VIKOR) to improve e-store business services. In this paper, we will be combining the DANP and TOPSIS methods to assess the LBB's marketing strategy not only in a rank but also to improve and create marketing strategies to enhance the LBB's customer satisfaction. The criteria which we will use here

is according to [8] without wi-fi criteria.

## METHODS

Determine the value of dominant criteria by DEMATEL-based ANP (DANP) method. The Analytical Network Process (ANP) method was published in [9]. The first step of ANP procedure is comparing the criteria through the systems to form the unweighted super matrix by pairwise comparisons. Then the weighted super matrix is obtained by summing up each column to obtain a value of one. Each element in the column is divided by the number of clusters, such that the elements in the column are one. On the basic concept of ANP, each cluster is assumed to have the same value, this assumption will obtain the weighted super matrix become irrational as there are different degrees [10]. The weakness of the basic concept of ANP is improved by adopting the DEMATEL method to determine the degree of the affecting criteria and applying this method to normalize unweighted super matrix in the ANP method. The refinement of the ANP basic concepts is called DEMATEL-based ANP (DANP). The input of the DANP method is  $T_c$  matrix in DEMATEL method, that is, 80 LBB students by grouping criteria on several clusters, namely cluster 1 (D1) for the cost criteria (A), cluster 2 (D2) for mentor quality criteria (B), cluster 3 (D3) for location criteria (C) and cluster 4 Facility (D4) for classroom (D) criteria, additional consultation (E) and activities outside KBM (F) (see in [11]).

Determine the analysis of marketing strategy ranking in order to increase the consumer's satisfaction of each alternative by TOPSIS method. TOPSIS is one of the methods to find the optimal decision-making. According to [12], TOPSIS is one of the multi-criteria decision-making methods that first introduced by Yoon and Hwang in 1981. TOPSIS considers the distance to the positive ideal solution and the distance to the negative ideal solution simultaneously. According to [13], TOPSIS is the method used to deal with the problem of alternative rank from the best to the worst. The input of this method is questionnaire of 55 LBB mentors. This method obtained the highest index value ( $C_j^+$ ) as the best alternative. The alternative ranking in the TOPSIS method depends on the selection of the profitable criteria or cost criteria. The cost criteria are obtained from affecting criteria and profitable criteria are obtained from the criteria influenced by the map digraph impact result by DEMATEL method [11].

Step of data analysis above can be described as below:

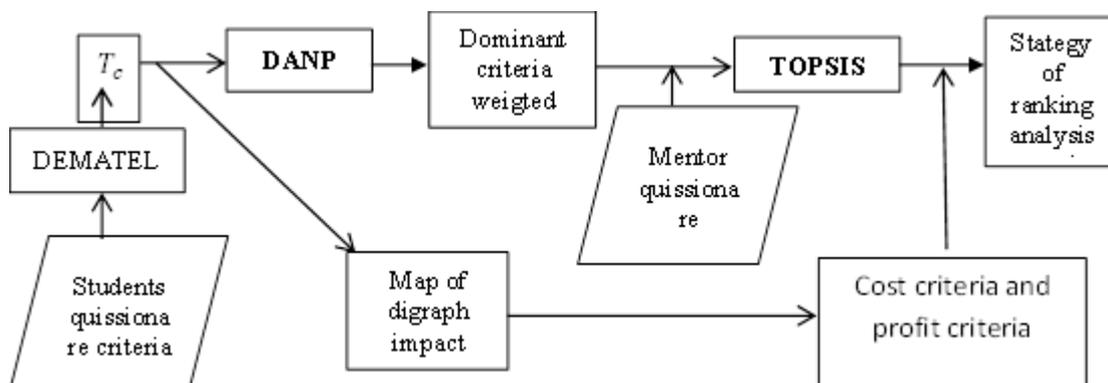


Figure 1. Step of data analysis

**RESULT AND DISCUSSION**

1. Use Tc in [11] to determine the Value of Dominant Criteria using DANP Method by calculating the Limiting super matrix which presented in Table 1.

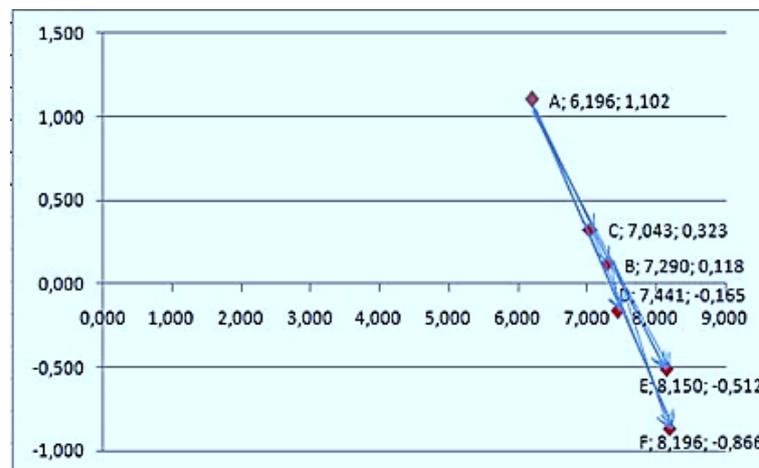
**Table 1.** Value Criteria.

Criteria	A	B	C	D	E	F
Value	0,243	0,249	0,247	0,085	0,089	0,087

The table 1 showed that the highest criteria are the criteria B (mentor quality) of 24.9%. Meanwhile, the lowest criteria are the criterion D (classroom) of 8.5%. The calculation of the value criteria is obtained based on the error value of questionnaire data that is 2.022%, so the result of the questionnaire test is valid because the error value is <5%, with the validity value is 97,978%.

2. Determine the analysis of LBB marketing strategy ranking of each alternative by TOPSIS method

2.1. From [11] the selection of cost criteria or profitable criteria is obtained based on the map digraph impact of DEMATEL method. The cost criteria are the price criteria (A), mentor quality (B) and the location (C). Meanwhile, the profitable criteria are the classroom (D) criteria, additional consultation (E) and activities outside Teaching and Learning Activities (KBM) (F) [12]. The map digraph impact can be seen in Figure 2.



**Figure 2.** The map of digraph impact

The cost criteria is a criterion affecting the LBB selection, which the consumers expect the price, mentor quality, and the location commensurate with paid cost. Otherwise, the profitable criteria is the criteria affected by LBB selection, which is the consumers will obtain the profit with the paid cost by obtaining the classroom criteria, additional consultation, and activities outside the KBM. Generally, in this case, the profitable criteria is the facilities cluster (D4) of the DANP method.

2.2. Calculate the value of proximity relative to the positive ideal solution (Cj+). The alternatives are sorted from the largest Cj+ value to the smallest value. The first alternative rank with the largest Cj+ value is the Avicenna Education (AII) with a value of 0.543. The second alternative rank is Bu Lastri’s tutoring (AIII) with a value of 0,509. Meanwhile, the

LBB Progressive Private Center (P2C) (A1) as the third alternative rank with a value of 0,457. The criteria of marketing strategy that must be upgraded to fulfill LBB's consumer satisfaction at Avicenna Education is the criteria of the activity outside KBM (F), at the LBB Progressive Private Center (P2C) is additional consultation criteria (E), and at the Bu Lastri's guidance is the classroom criteria (D). Generally, to improve the LBB marketing strategy in Malang, all the alternative LBBs have to improve the Cluster Facility (D4).

## **CONCLUSION**

The best alternative for this case is obtained from the highest  $C_j+$  value in the LBB Avicenna Education Malang. The marketing strategy that needs to be improved on LBB Avicenna Education Malang is cluster D4, which is classroom criteria, additional consultation, and activities outside KBM. By understanding the marketing strategy to be improved, it is expected to improve the quality of LBB customer satisfaction.

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