



Evaluating performance criteria of Employment Service Outreach Program personnel by DEMATEL method

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ABSTRACT

The current economic and financial crisis leads to deterioration in the unemployment rate in Taiwan. In order to resolve this tough issue, the Bureau of Employment and Vocational Training, Council of Labor Affairs of Executive Yuan has been aggressively conducting Employment Service Outreach Program to reduce the unemployment rate. Under Employment Service Outreach Program, the outreach personnel are recruited, trained, and supervised to perform the duties including identifying unemployed persons and then providing job information for them, using the social resource link to increase employment opportunities, conducting employer forum or workshops for job-seekers, and so on. This study applies decision-making trial and evaluation laboratory method to not only evaluate the importance of the criteria but also construct the causal relationships among the criteria of evaluating outreach personnel. The results show that identification of the number of unemployed people and number of follow-up visit are the two most essential causes under the category of job-seeking service when the performance of outreach personnel in Employment Service Outreach Program is evaluated.

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1. Introduction

Due to the current economic and financial crisis, the US economy is increasingly gloomy. The US government figures showed that the economy contracted by a 3.8% in the final quarter of 2008, which is the worst performance since 1982. Moreover, the chief executives of leading US companies are increasingly pessimistic over the chances that the recession will subside in the near future. They expect a significant global economic slowdown, and the US recession will continue into 2010. In contrast to the US, European countries have been impacted almost immediately after the US subprime mortgage mess severely. In East Asia, the major countries have been hit hard by this contemporaneous economic downturns including Taiwan.

Taiwan, an export-oriented country, suffered the negative economic growth of 8.36% in the fourth quarter of 2008, which is the worse figure for any quarter in the history. The predicted economic growth of 2009 is -2.97% by Directorate-General Budget, Accounting and Statistics of Executive Yuan, Taiwan, compared to the economic growth ranging from 4.2% to 6.7% between 2004 and 2007. The unemployment rate has been dramatically increasing from 3.80% in January 2008 to 5.31% in January 2009, which is a

tough issue to be resolved by the government. Therefore, the Bureau of Employment and Vocational Training, Council of Labor Affairs of Executive Yuan has been aggressively conducting Employment Service Outreach Program to reduce the unemployment rate.

This program performed by outreach personnel includes identifying unemployed persons and then providing job information for them, using the social resource link to increase employment opportunities, conducting employer forum or workshops for job-seekers, and the like. These outreach personnel are recruited, trained, and supervised to perform the above duties. If their performance has not been achieved, new recruiters will replace those poor performers. To properly evaluate the performance of outreach personnel, major criteria should be identified. Moreover, the weighting for each criterion should be determined fairly such that the overall evaluation can be more objective. Furthermore, establishing the causal relationships among the criteria would be helpful for outreach personnel to improve performance.

This study intends to summarize the criteria used for performance evaluation of outreach personnel. Later, decision-making trial and evaluation laboratory (DEMATEL) method is applied to not only decide the weights of criteria but also describe the contextual relationships among those criteria. This paper is organized as follows: Section 2 briefly reviews DEMATEL method. A case study of applying DEMATEL method to evaluate the criteria used for outreach personnel of Employment Service Outreach Program in

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Taiwan is conducted and described in Section 3. Finally, conclusions are drawn in Section 4.

2. Literature review of DEMATEL

Decision-making trial and evaluation laboratory method was originally developed by the Science and Human Affairs Program of the Battelle Memorial Institute of Geneva between 1972 and 1976 to study and resolve the complicated and intertwined problem group (Tzeng, Chiang, & Li, 2007; Wu, 2008). It is believed that DEMATEL method could improve understanding of the specific problematique, the cluster of intertwined problems, and contribute to identification of workable solutions by a hierarchical structure (Hsu, Chen, & Tzeng, 2007; Tsai & Chou, 2009; Tzeng et al., 2007). Unlike the traditional techniques such as analytic hierarchy process with the assumption that elements are independent, this method, one of the structural modeling techniques, can identify the interdependence among the elements of a system through a causal diagram (Kim, 2006; Tzeng et al., 2007; Wu & Lee, 2007). The causal diagram uses digraphs rather than directionless graphs to portray the basic concept of contextual relationships and the strengths of influence among the elements (Wu, 2008).

The procedure of DEMATEL method is summarized as follows based on Tzeng et al. (2007) and Wu (2008):

Step 1: Compute the average matrix. Each respondent was asked to evaluate the direct influence between any two factors by an integer score ranging from 0, 1, 2, and 3, representing “no influence”, “low influence”, “medium influence”, and “high influence”, respectively. The notation of x_{ij} indicates the degree to which the respondent believes factor i affects factor j . For $i = j$, the diagonal elements are set to zero. For

each respondent, an $n \times n$ non-negative matrix can be established as $X^k = [x_{ij}^k]$, where k is the number of respondents with $1 \leq k \leq H$, and n is the number of factors. Thus, $X^1, X^2, X^3, \dots, X^H$ are the matrices from H respondents. To incorporate all opinions from H respondents, the average matrix $A = [a_{ij}]$ can be constructed as follows:

$$a_{ij} = \frac{1}{H} \sum_{k=1}^H x_{ij}^k. \tag{1}$$

Step 2: Calculate the normalized initial direct-relation matrix. Normalize initial direct-relation matrix D by $D = A \times S$, where $S = \frac{1}{\max_{1 \leq i \leq n} \sum_{j=1}^n a_{ij}}$. Each element in matrix D falls between zero and one.

Step 3: Calculate the total relation matrix. The total relation matrix T is defined as $T = D(I - D)^{-1}$, where I is the identity matrix. Define r and c be $n \times 1$ and $1 \times n$ vectors representing the sum of rows and sum of columns of the total relation matrix T , respectively. Suppose r_i be the sum of i th row in matrix T , then r_i summarizes both direct and indirect effects given by factor i to the other factors. If c_j denotes the sum of j th column in matrix T , then c_j shows both direct and indirect effects by factor j from the other factors. When $j = i$, the sum $(r_i + c_j)$ shows the total effects given and received by factor i . That is, $(r_i + c_j)$ indicates the degree of importance that factor i plays in the entire system. On the contrary, the difference $(r_i - c_j)$ depicts the net effect that factor i contributes to the system. Specifically, if $(r_i - c_j)$ is positive, factor i is a net cause, while factor i is a net receiver or result if $(r_i - c_j)$ is negative (Lee, Yen, & Tsai, 2008; Liou, Tzeng, & Chang, 2007).

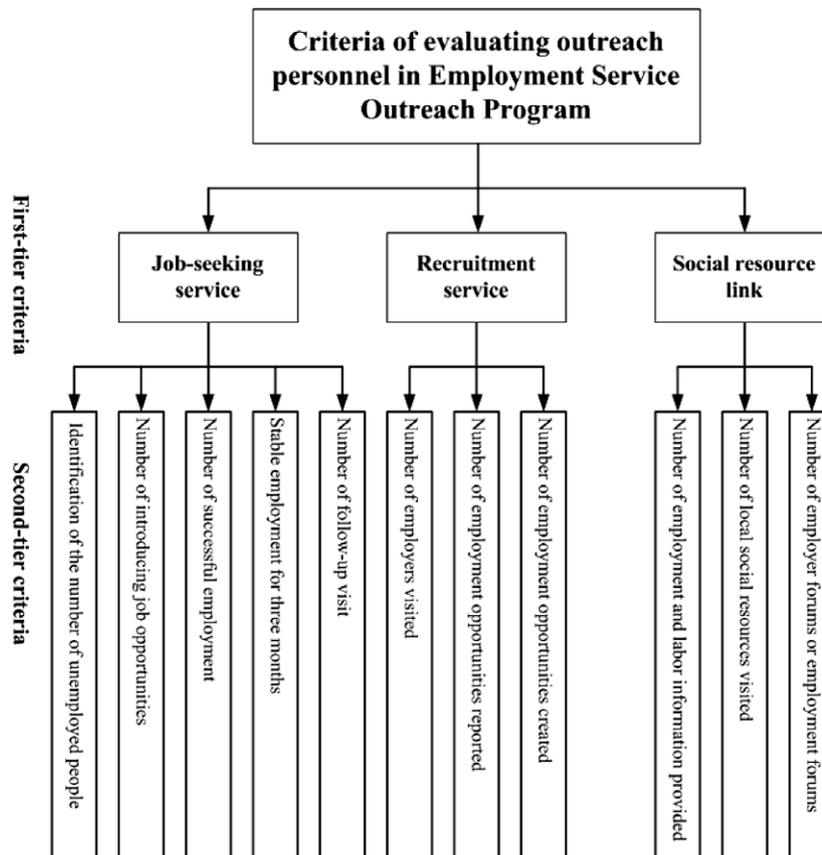


Fig. 1. The criteria used in performance evaluation for outreach personnel.

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