The Evaluation Model of Curriculum in Department of Risk Management and Insurance

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ABSTRACT

This work presents a model based on the modified Delphi method and analytic hierarchy process (AHP) for selecting an appropriate curriculum provided by a university that can educate employable graduates for life insurance companies. Research results found that experts selected the most appropriate curriculum designed by universities for life insurance companies based on the following rank: Personal Insurance, Insurance Company Operation and Management, and Insurance Theory and Legal, respectively.

INTRODUCTION

In an increasingly knowledge and service based economy, the labor market have also been significantly changed over the last 10 years (Moreau and Leathwood, 2006). The requirement of flexibility, adaptability, innovation, the development of information technology, and the emergence of the networking firm collaborating to enable competitiveness have led to new education and training demands (Delanty, 2000).

In recent years, the education system is genuinely doing better year on year at improving the employability of young people, but not by enough to match ongoing shifts in the quantitative and qualitative demand for skills (MOE, 2006). These is the reason why employers in Taiwan often report that university graduates lack business awareness and are poorly prepared for work. Indeed, in a more technologically advanced complex economy the search for “talent” becomes even more important as there is no room for sinecures.

Given the trend of rapidly changing financial environment (Chiu, 2000; Kwon, 2002), life insurance companies must cope with less productivity of their employees and increasing competition in the market (Fan and Cheng, 2006). As a result, life insurance companies need increase the training budget to improve competencies of their employees in the short term. In order to decrease the training cost in the long term, insurance companies commonly intend to recruit graduates who are employable and qualified. Therefore, this work presents a model based on the modified Delphi method and analytic hierarchy process (AHP) for selecting an appropriate curriculum provided by a university that can educate employable graduates for life insurance companies.

LITERATURE REVIEW

Employability

Employability is about workforce acquiring the knowledge, skills and capability to ensure people...
get meaningful jobs (McQuaid and Lindsay, 2003; Morrison, 2007). However, in ignores the fact, that employability is primarily determined by the labor market rather than the capabilities of individual. Employability will vary according to economic conditions. Employability cannot, therefore, be defined solely in terms of individual characteristics (McQuaid and Lindsay, 2003). In other words, whether graduates find employment will depend on whether there are other more qualified or experienced people looking for the same kinds of work. Employability not only depends on fulfilling the requirements of a specific job, but also on how graduate stands relative to others within job seekers (Brown et al., 2003).

The Changing Legitimating Idea of Higher Education

Higher education is being repositioned as an industry, rather than as a social institution (Gumport, 2000). Education is being Japanised, with values and approaches to leadership coming directly from industrial processes (Morley and Rassool, 1991). Higher education in Britain increasingly is being viewed as sub-system of the economy (Morley, 2001). In concerning with graduate employability, Ministry of Education (MOE) of Taiwan set employability as a performance indicator in higher education (MOE, 2007). The implication is higher education institution under global economic changes needs to expand their existing focus to prepare graduates for new forms of employment in new economic areas. In other words, institutions should become more responsive to the needs and expectations of industry to ensure economic and social prosperity (Kruss, 2004).

Collaboration between University and Industry

Several employers express disappointment on the employability of school leavers. In addition, failure to match industry demand results in an “employability gap” that higher education institutes and employers must work together to close (Philpott, 2006). Reengineering the relationship between university and industry in the rapidly changing workplace, therefore, can help graduates meet the requirements of employment (Mcgroddy, 1995; Slotte and Tynjala, 2003). The opportunities for cooperation between university and industry sector range from education consulting to applied research to practices. According to some findings of researches, university curriculum continues to grow in response to the needs of industries is a more effective way to develop and improve the partnership between universities and industries (Lukas, 2003). Moreover, in order to enhance university teaching relative to the needs of the workplace, business should aid the university to develop curriculum to meet industry requirements (Deen, 2005). Therefore, industry has played a key role in designing the curriculum (Ronalds, 1999). Specially, the larger employers have dominated debates about employability (Hesketh, 2000). This raises the issue of how companies are redefining the skills and personal characteristics of the knowledge workers of the future (Brown et al., 2003). In other words, working with large employers to design the curriculum can effectively improve employability of graduates.

METHODOLOGY

An attempt is made to develop an evaluation model to select an appropriate curriculum which can educate qualified graduates for working in life insurance companies. In addition to adopting the modified Delphi method to accumulate expert opinions and identify a normal evaluation criterion, this study also utilizes the AHP theory to establish a model for selecting curriculums offered by universities currently. Theoretical approaches adopted herein is described as follows.
Modified Delphi Method

Appropriate curriculums must be designed effectively, systematically and objectively to facilitate universities in decision-making. Therefore, the Delphi method is adopted to enable experts in life insurance industry to reach consensus efficiently, subsequently providing educators with an objective means of selecting courses to educate students. By incorporating quantitative and qualitative considerations, the Delphi method can facilitate a discussion through writing among anonymous experts to achieve consistency in approaching a topic under debate (Hartman, 1981). The Delphi method comprises the following five steps: (1) select the experts; (2) perform a questionnaire survey in the first round; (3) perform a questionnaire survey in the second round; (4) perform a questionnaire in the third round; and (5) synthesize expert opinions to reach a consensus (Sung, 2001). For experts unable to reach a consensus, steps (3) and (4) are repeated until a uniform result is achieved. Given the unique features of the Delphi method, questionnaire results must be determined repeatedly, thus expending a considerable amount of time and reducing the recovery rate of questionnaires submitted (Murry and Hammons, 1995; Sung, 2001). The structured questionnaire was designed based on the curriculums designed by risk management and insurance departments in six universities located in Taiwan currently, and the 5-point Likert scale, from 1 (least important) to 5 (most important), were used to measure the relative importance of evaluation criteria of curriculums. Therefore, to remedy the above limitations in the Delphi method, records of expert interviews are accumulated to draw up a basic criterion instead of gathering the opinions of all experts through a questions and answer approach. A minimum of five to nine must be included in the control group (Delbecq et al., 1975). As an efficient means of gathering expert opinions on a particular topic, the modified Delphi method is used in this study to perform a questionnaire survey during the second-making group a consensus opinion is subsequently achieved in the non-interference with those results gathered. Finally, subjective factors are identified using an objective measurement method.

Analytic Hierarchy Process Methodology

As a decision-making method that decomposes a complex multicriteria decision problem into a hierarchy (Saaty, 1980), Analytic Hierarchy Process (AHP) is also a measurement theory that priorities the hierarchy and consistency of judgmental data provided by a group of decision makers. AHP incorporates the evaluations of all decision makers into a final decision, without having to elicit their utility functions on subjective and objective criteria, by pairwise comparisons of the alternatives (Saaty, 1990). AHP steps are as follows.

1. Establish a hierarchical structure

Complex issues can be addressed effectively by using a hierarchical structure given the inability of human to compare more than seven categories simultaneously. A hierarchy should not contain more than seven elements. Under this limited condition, a rational comparison can be made and consistency ensured as well (Saaty, 1980). The first hierarchy of a structure is the goal. The final hierarchy involves selecting projects or identifying alternatives, while the middle hierarchy levels appraise certain factors or conditions.

2. Compute the element weights of various hierarchies

2.1. Establishment of pairwise comparison matrix A.

Based on an element of the upper hierarchy that is an evaluation standard, a pairwise comparison is conducted for each element. While n elements are assumed, n(n-1)/2 elements of the pairwise comparison must be drive. Let \( C_1, C_2, ..., C_n \) denote the set of elements, while \( a_{ij} \) represents a quantified judgment on
A pair of elements \( C_i, C_j \). The relative importance of two elements is rated using a scale with the values 1, 3, 5, 7 and 9, where 1 refers to ‘equally important’, 3 denotes ‘slightly more important’, 5 equals ‘strongly more important’, 7 represents ‘demonstrably more important’ and 9 denotes ‘absolutely more important’. This yields an \( n \)-by-\( n \) matrix \( A \) as follows:

\[
A = \begin{bmatrix}
C_1 & C_2 & \cdots & C_n \\
C_1 & 1 & a_{12} & \cdots & a_{1n} \\
C_2 & 1/a_{12} & 1 & \cdots & a_{2n} \\
\vdots & \vdots & \vdots & \ddots & \vdots \\
C_n & 1/a_{1n} & 1/a_{2n} & \cdots & 1
\end{bmatrix}
\]  

(1)

The results of the comparison of the \( n \) elements are inserted into the upper triangle of pairwise comparison matrix \( A \). The lower triangle values are relative positions for the reciprocal values of the upper triangle. Where \( a_{ij} = 1 \) and \( a_{ji} = 1/a_{ij} \), \( i, j = 1, 2, \ldots, n \), two elements \( (C_i, C_j) \) become one quantization value for an important relative judgment. In matrix \( A \), \( a_{ij} \) can be expressed as a set of numerical weights, \( W_1, W_2, \ldots, W_n \) in which the recorded judgments must be assigned to the \( n \) elements \( C_1, C_2, \ldots, C_n \). If \( A \) is a consistency matrix, relations between weights \( W_i \) and judgments \( a_{ij} \) are simply given by \( W_i/W_j = a_{ij} \) (for \( i, j = 1, 2, \ldots, n \)) and matrix \( A \) as follows:

\[
A = \begin{bmatrix}
\begin{array}{cccc}
W_1/W_i & W_1/W_2 & \cdots & W_1/W_n \\
W_2/W_i & 1 & \cdots & W_2/W_n \\
\vdots & \vdots & \ddots & \vdots \\
W_n/W_i & W_n/W_2 & \cdots & 1
\end{array}
\end{bmatrix}
\]  

(2)

2.2. Compute the eigenvalue and eigenvector

Matrix \( A \) multiplies the elements weight vector \( (x) \) equal to \( nx \) i.e., \((A - nI)x = 0\), where \( x \) is the eigenvalue \( (n) \) of eigenvector. Given that \( a_{ij} \) denotes the subjective judgment of decision makers, the actual value \( (W_i/W_j) \) has a certain degree of difference. Therefore, \( Ax = n.x \) cannot be set up. Saaty (1990) suggested that the largest eigenvalue \( \lambda_{\text{max}} \) would be

\[
\lambda_{\text{max}} = \sum_{j=1}^{n} a_{ij} \frac{W_j}{W_i}
\]  

(3)

If \( A \) is a consistency matrix, eigenvector \( X \) can be calculated by

\[
(A - \lambda_{\text{max}}I)X = 0
\]  

(4)
2.3. Perform the consistency test
Saaty (1990) proposed utilizing consistency Index (CI) and consistency Ratio (CR) to verify the consistency of the comparison matrix. CI and RI are defined as follows:

\[
CI = (\lambda_{\text{max}} - n) / (n - 1) = 0
\]

\[
CR = CI / RI
\]

where RI represents the average CI over numerous random entries of same order reciprocal matrices. If \( CR \leq 0.1 \), the estimate is accepted; otherwise, a comparison matrix is solicited until \( CR \leq 0.1 \).

2.4. Compute the entire hierarchical weight
After various hierarchies and element weights are estimated, the entire hierarchy weight is computed, ultimately enabling decision makers to select the most appropriate strategy.

**DECISION MODEL APPLICATION AND RESULTS**

The estimation model in this study consists of two phrases. In the first phrase, appropriate courses for university students are identified using the modified Delphi method. In the second phrase, the weights of the courses also used as the decision evaluation criterion are calculated and effectiveness of the curriculum, which is designed to educate university students to be employable life insurance employees, model is evaluated—both by employing the AHP theory.

**The Result in The First Phrase**

The satisfactory courses which are used to establish an estimate model for curriculum designed in the department of risk management and insurance was formed by experts after three rounds of questionnaire surveys (see Table 1).

<table>
<thead>
<tr>
<th>Categories</th>
<th>Courses</th>
<th>References</th>
</tr>
</thead>
<tbody>
<tr>
<td>Insurance Theory and Legal</td>
<td>Principle of Insurance</td>
<td>Opinions from the group of experts</td>
</tr>
<tr>
<td></td>
<td>Insurance Law</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Regulation of Insurance</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Contract</td>
<td></td>
</tr>
<tr>
<td>Personal Insurance</td>
<td>Life Insurance</td>
<td>Opinions from the group of experts</td>
</tr>
<tr>
<td></td>
<td>Health and Accident Insurance</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Annuity Insurance</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Unit-Linked life Insurance</td>
<td></td>
</tr>
<tr>
<td>Insurance Company Operation and</td>
<td>Derivates</td>
<td>Opinions from the group of experts</td>
</tr>
<tr>
<td>Management</td>
<td>Insurance Marketing</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Product Design for Life Insurance</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Personal financial Planning and Insurance</td>
<td></td>
</tr>
</tbody>
</table>

The Results in The Second Phrase

1. The criteria weights for evaluation criteria of curriculum designed by risk management and insurance department in universities.

   After applying AHP, the criteria weights for evaluation criteria of curriculum designed are obtained (see Figure 1).

2. Life insurance company application of the AHP model to select an appropriate curriculum designed by universities.

   In alternative hierarchy level, there are six universities in Taiwan have department of risk management and insurance which provide curriculums to educate their students to become an employable employees working in insurance institutions, including National Chengchi University (NCCU), Tamkang University (TKU), Shih Chen (SCU), Ming Chuan University (MCU), Feng Chia University (FCU), and Kainan University (KNU). The most appropriate curriculum is selected based on the highest score, in the following order: TKU (0.218), SCU (0.215), FCU (0.197), NCCU (0.176), MCU (0.109), and KNU (0.085), Confirming that TKU designs the most appropriate curriculum based on the opinion of the experts from the viewpoint of employability, as shown in Table 2.

   Table 2: Life Insurance Company Application of the AHP Model to Select an Appropriate Curriculum Designed by Universities

<table>
<thead>
<tr>
<th>Criteria</th>
<th>TKU</th>
<th>SCU</th>
<th>FCU</th>
<th>NCCU</th>
<th>MCU</th>
<th>KNU</th>
</tr>
</thead>
<tbody>
<tr>
<td>Insurance Theory and Legal</td>
<td>0.206</td>
<td>0.191</td>
<td>0.184</td>
<td>0.218</td>
<td>0.118</td>
<td>0.083</td>
</tr>
<tr>
<td>Personal Insurance</td>
<td>0.262</td>
<td>0.221</td>
<td>0.223</td>
<td>0.128</td>
<td>0.097</td>
<td>0.070</td>
</tr>
<tr>
<td>Insurance Company</td>
<td>0.181</td>
<td>0.229</td>
<td>0.180</td>
<td>0.191</td>
<td>0.116</td>
<td>0.103</td>
</tr>
<tr>
<td>Operation and Management</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rank</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
</tbody>
</table>

   Research results find that experts select the most appropriate curriculum designed by universities for life insurance companies based on the following rank: Personal Insurance (0.359), Insurance Company Operation and Management (0.333), and Insurance Theory and Legal (0.308), respectively.

   Finally, the findings in this study demonstrate the effectiveness of the proposed method in selecting an appropriate curriculum which can educate the most qualified students base on point of employability. In other words, the proposed method to evaluate the curriculums in universities can be an objective way to help a human resources manager in a life insurance company to judge the employability of the university graduates.
REFERENCES


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