The Research on Performance Evaluation Indicator System of Entrepreneurship Education in Higher Vocational Colleges

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Keywords: Component, Entrepreneurship education, Evaluation, AHP, Judgment matrix

Introduction

In China, about 4000 startup are born every day, in new UHY International research found. The government has instituted the relevant policies to support entrepreneurship, and the government hopes that universities should pay attention to the training of students’ entrepreneurship, to match talents demand of the development society. Although the higher vocational colleges take some useful exploration for entrepreneurship education, there are some problems, for example, the prevalence rate is not high, lack of continuity and systematization in teaching practice, cultural atmosphere of innovation and entrepreneurship is not strong [1]. Entrepreneurship education is very important in higher vocational colleges, but it is not incorporated into formal professional sequences, and curriculum system is yet to be standardized, the quality and quantity of teachers is not proportional to the number of students, success rate of entrepreneurship of students is low. [2] The entrepreneurship education really fall in the higher vocational colleges, the idea and supporting courses should be pay attention to, the other more important thing is found a set of reasonable evaluation system. If we do not evaluate the final results of the entrepreneurship education in higher vocational colleges, the entrepreneurship education in many colleges will be in the slogan. So it is a practical significant to design and research the performance evaluation indicator of entrepreneurship education.

The Construction of Hierarchical Structure Model

According to the "total quality management theory", this article evaluates and designs Performance Evaluation Indicator System of Entrepreneurship Education from three respects which are the school investment, the construction of teachers’ curriculum and the output of talents. Scientific performance evaluation system of entrepreneurship education is the basis of performance evaluation, and the establishment of evaluation indicator system is the core of the evaluation. According to the target of entrepreneurship education performance evaluation in higher vocational colleges, on the basis of reviewing relevant literatures, this paper sets up a total index, five first grade indexes, 13 second grade indexes and 41 third grade indicators, and establishes the hierarchy model of the performance evaluation index system (Figure 1)[5-8].
Figure 1. The hierarchy model of performance evaluation of entrepreneurship education.

**Generation and Verification of Judgment Matrix**

According to the experience of expert evaluation, taking upper level element as the criterion, comparing the lower level of the elements one to one, rating on a scale of one to nine[3], we get a series of verification of judgment matrix as the following[4].
The Judgment Matrix of the First-Grade Index to the Total Index

\[
A = \begin{pmatrix}
1 & 1 & 1 & 3 \\
2 & 1 & 1 & 7 \\
2 & 1 & 2 & 1 \\
4 & 1 & 3 & 3 \\
4 & 5 & 5 & 2 \\
7 & 4 & 5 & 1 \\
2 & 1 & 1 & 1 \\
3 & 2 & 9 & 1
\end{pmatrix}
\]

Eigenvector is \(w^{(1)}=(0.0706 \ 0.1330 \ 0.2479 \ 0.4841 \ 0.0654)^T\), \(\lambda_{\text{max}}=5.1719\), \(CR^1=0.0384<0.1\), the judgment matrix tested for consistency.

The Judgment Matrix of the Second-Grade Index to the First-Grade Index

\[
B_1 = \begin{pmatrix} 1 & 2 \\ 1 & 1 \end{pmatrix}
\]

\[
B_2 = \begin{pmatrix} 1 & 1/2 \\ 4 & 1 \\ 2 & 3/7 \end{pmatrix}
\]

\[
B_3 = \begin{pmatrix} 1 & 1/2 \\ 2/5 \\ 3 \end{pmatrix}
\]

\[
B_4 = \begin{pmatrix} 1 & 1/2 \\ 2/3 \\ 3/2 \end{pmatrix}
\]

\[
B_5 = \begin{pmatrix} 1 & 2/5 \\ 5/2 \\ 1 \end{pmatrix}
\]

Table 1. The judgment matrix analysis table of second grade index.

<table>
<thead>
<tr>
<th>k</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>(w_k^{(2)})</td>
<td>0.6667</td>
<td>0.1406</td>
<td>0.4702</td>
<td>0.3071</td>
<td>0.2857</td>
</tr>
<tr>
<td>(\lambda_{\text{max}})</td>
<td>3.0026</td>
<td>3.0014</td>
<td>3.0092</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>(CR_k^2)</td>
<td>0.0022</td>
<td>0.0012</td>
<td>0.0079</td>
<td>0</td>
<td></td>
</tr>
</tbody>
</table>

The above is tested for consistency.

The Judgment Matrix of the Third-Grade Index to the Second-Grade Index

\[
C_1 = \begin{pmatrix}
1/2 & 3 \\
3/2 & 1 \\
4/3 & 4 \\
3/5 & 1 \\
2 & 5/6
\end{pmatrix}
\]

\[
C_2 = \begin{pmatrix} 3/7 \\ 1/3 \\ 1 \\ 1/8 \end{pmatrix}
\]

\[
C_3 = \begin{pmatrix} 1/2 \\ 1/5 \\ 3 \\ 2/8 \end{pmatrix}
\]

\[
C_4 = \begin{pmatrix} 1/3 \\ 1/2 \\ 1/5 \\ 1/3 \end{pmatrix}
\]

\[
C_5 = \begin{pmatrix} 1/4 \\ 1/2 \\ 1/3 \\ 2/3 \end{pmatrix}
\]

\[
C_6 = \begin{pmatrix} 1/2 \\ 1/3 \\ 1/4 \\ 5/6 \\ 1 \\ 5/3 \\ 1 \\ 4/3 \\ 1 \\ 2 \\ 1/3 \\ 3 \\ 3 \\ 1 \end{pmatrix}
\]

\[
C_7 = \begin{pmatrix} 1/3 \\ 1/2 \\ 1/3 \\ 1/5 \\ 1/4 \\ 3 \\ 1/5 \\ 2 \\ 1 \\ 3/1 \\ 4 \\ 1 \\ 2 \\ 1/3 \\ 5 \\ 3 \\ 1 \\ 2 \\ 1/3 \\ 3 \\ 1 \end{pmatrix}
\]
The judgment matrix analysis data of third grade index is as Table 2, and these data are all tested for consistency.

**Calculation and Test of Combined Weight Vector**

**Calculation of Combined Weight Vector.** According to the method of literature [9], the weight vector of the third grade index for the total index is calculated, and the corresponding weight from D1 to D4 is as follows: (0.0081 0.0127 0.0112 0.0150 0.0052 0.0019 0.0165 0.0040 0.0023 0.0111 0.0013 0.0511 0.0096 0.0184 0.0044 0.0127 0.1043 0.0521 0.0112 0.0337 0.0498 0.0234 0.0132 0.0664 0.0222 0.0457 0.0144 0.0459 0.0111 0.0239 0.0092 0.0758 0.1427 0.0269 0.0102 0.0053 0.0033 0.0205 0.0188 0.0074).

**Combinatorial consistency test.** According to the following combination of consistency test formula:

\[
R^{(k)} = \left( R_1^{(K)}, R_2^{(K)}, \ldots, R_n^{(K)} \right) * W^{(k-1)}
\]

(2)

\[
\frac{C}{R}^{(K)} = \frac{A^{(K)}}{R^{(K)}}
\]

(3)

From top to bottom layer by layer to carry out the consistency check, we get \(\frac{C}{R}^{(2)}=0.0088<0.1\), \(\frac{C}{R}^{(2)}=0.062<0.1\), the results are tested for consistency.

**Conclusion**

Entrepreneurship education is essential part in promotion innovation and improvement the quality of education, due to the implementation of innovation and entrepreneurship education is not easy to operation and difficult to quantify, most of the higher vocational colleges of entrepreneurship education stay in the relatively shallow stage. In order to better promote entrepreneurship education, the entrepreneurship education should be incorporated into the examination of colleges. This paper focus on analysis and research performance evaluation of entrepreneurship education of higher vocational colleges, found the hierarchical structure model of performance evaluation indicator of entrepreneurship education, analyzes and calculates the weight of each index with AHP.
References


