Regression-Analysis-Based Vocational Colleges’ Innovative Entrepreneurship Education Transformation against the Background of the Supply-Side Reform

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Abstract

Against the background of the supply-side reform, vocational colleges’ innovative education has become one of the major drivers behind the shift of focus from resource-dependent economic development to innovation-driven development. Its transformation and upgrading can help to develop students’ innovative entrepreneurship, including good psychological qualities for entrepreneurship, entrepreneurship mindset, entrepreneurship capabilities and the entrepreneurship knowledge structure, and to further enhance the level of vocational college students’ entrepreneurship and employment. Besides, it can facilitate technological innovation in China and drive industrial upgrading. However, due to lack of theoretical research and successful cases of innovative entrepreneurship education, it’s difficult for talents produced from innovative entrepreneurship education at vocational colleges to meet the demands of the age of knowledge economy for talents. In view of that, the paper analyzes and evaluates the transformation of vocational colleges’ innovative entrepreneurship education against the background of the supply-side reform.

Keywords: Vocational College Education, Innovative Entrepreneurship, Talent Development, Education Transformation.

1. RESEARCH BACKGROUND

1.1 Literature review

In 2015, President Xi Jinping proposed the concept of “the supply-side reform” at the 11th meeting of the CPC Central Leading Group for Financial and Economic Affairs. He emphasized the importance of focusing on the supply-side structural reform to enhance the quality and efficiency of the supply system while properly increasing the overall demand (Kan et al., 2016). Against the background of the supply-side reform, all industries have carried out reforms of different levels. The supply-side reform has directly influenced vocational colleges’ talent development plans and objectives, and vocational colleges have made research into vocational colleges’ transformation of innovative entrepreneurship education based on social demands arising from the supply-side reform (Zhang Di, 2017). In the meanwhile, researchers arrive at the conclusion that innovative entrepreneurship education against the background of the supply-side reform is necessary for social and economic development and for vocational colleges to reform the education system (Miao et al., 2017). In addition, in the era of mass entrepreneurship and innovation, vocational colleges’ proactive organization of entrepreneurship education activities can effectively drive economic growth and enhance the quality of companies’ supply-side reform and talent development (Sun, 2017). However, in the context of the supply-side reform, vocational colleges’ innovative entrepreneurship education activities still have problems such as unclear positioning, incomplete curriculum systems, unreasonable faculty structures, improper education models, and lack of supporting systems (Wu and Zhu, 2016). Therefore, on the basis of the supply-side reform, it is proposed that vocational colleges should transform innovative entrepreneurship education, education contents and the education environment in particular (Liang, 2017). It’s found that the transformation of vocational colleges’ innovative entrepreneurship education contents and environment can help improve vocational colleges’ education level and students’ entrepreneurship qualities and levels.
1.2 Research purpose

Currently, China’s vocational colleges’ innovative entrepreneurship education reform is shifting from entrepreneurship education to innovative entrepreneurship education. Innovative education, as a new means of education, refers to education activities with the goal of developing, protecting, encouraging and improving innovative qualities, and its core is about developing students’ innovative capabilities and entrepreneurship qualities, helping students to succeed in the workplace, and providing a solid theoretical basis for their innovative entrepreneurship (Chen et al., 2017). Driven by the national development strategy of “mass entrepreneurship and innovation”, traditional innovative entrepreneurship education at vocational colleges can no longer meet the demand for the economic reform. Thus, based on the supply-side reform, vocational colleges have fundamentally transformed innovative entrepreneurship education, course activities and contents, curriculum system, education environment, and practice venues in particular (Han and Gong, 2016). Innovative entrepreneurship education at vocational colleges has become an important driver behind their enhancement of talent development quality and comprehensive competitiveness. How to establish a strategic system for vocational colleges’ innovative entrepreneurship education, achieve the alignment of talent supply with social and economic development, and further comprehensively improve vocational colleges’ education levels against the background of the supply-side reform has become an important mission for vocational colleges’ research and development of innovative entrepreneurship education (Xue, 2016). On the basis of the above analysis, the paper analyzes vocational colleges’ reform of innovative entrepreneurship education against the background of the supply-side reform and evaluates the reform results in the hope of providing good experience for vocational colleges’ future transformation of innovative entrepreneurship education (Sun, 2016).

2. CHINA’S VOCATIONAL COLLEGES’ INNOVATIVE ENTREPRENEURSHIP EDUCATION TRANSFORMATION AGAINST THE BACKGROUND OF THE SUPPLY-SIDE REFORM

2.1 China’s vocational colleges’ transformation of innovative entrepreneurship education activities and courses

Activity-oriented courses, as an important part of vocational colleges’ innovative entrepreneurship education activities, have been innovated and transformed to a certain extent against the background of the supply-side reform, which is mainly manifested in the following aspects (Cao, 2016). First, the contents of lectures are enriched. For example, successful entrepreneurs are invited to give lectures to share experience and provide guidance on entrepreneurship. Through such lectures, vocational colleges can provide students with wider access to knowledge and diversify channels for vocational college students’ knowledge acquisition to some degree. Second, students are encouraged to participate in volunteer activities. Students can participates in events such as product release conferences, e-commerce expos and tourist product promotion conferences to provide translation, information and consultation, site maintenance and trade fair organization services. During such processes, students can broaden their horizons, develop organization capabilities, accumulate hands-on experience, and enhance cooperation skills to build a solid teamwork foundation for future innovative entrepreneurship. Third, students are provided with part-time work opportunities on campus. Vocational colleges, through the provision of a diversity of part-time jobs on campus, have helped to further improve students’ adaptability to the society and provide greater opportunities for students’ career development. Fourth, campus culture festivals are held. Through a variety of campus culture festivals, vocational colleges can stimulate students’ innovative thinking, develop their hands-on skills, and facilitate their application of theoretical knowledge and skills into practice. Fifth, entrepreneurship competitions are organized. The main purpose of entrepreneurship competitions is to provide students with a platform to showcase themselves, practice their skills and create a positive environment for students’ proactive engagement in entrepreneurship activities.

2.2 China’s vocational colleges’ transformation of the innovative entrepreneurship education environment

Different from activity-oriented courses and contents, environment-oriented courses have their uniqueness, which is mainly about using constant changes in the surrounding environment to facilitate students’ understandings and perceptions. Therefore, on the basis of the supply-side reform, vocational colleges’ innovative entrepreneurship education transformation is carried out in the following ways. On the one hand, through the production of posters, excellent graduates’ successful entrepreneurship experience is communicated to inspire students to proactively participate in innovative entrepreneurship. Besides, in classrooms where innovative entrepreneurship courses are given, celebrities’ mottoes about entrepreneurship and innovation are posted, such as “Knowledge Can Change One’s Fate”, “Entrepreneurship Is the Key to the Future”, and “It's Important to Have a Dream about Entrepreneurship, as You May be Able to Accomplish It!”, to further arouse
students’ passion for entrepreneurship (Zhu, 2017). On the other hand, a series of measures conducive to students’ innovative entrepreneurship is developed to ensure students’ success in carrying out innovative entrepreneurship activities. In addition, during students’ innovative entrepreneurship activities, teachers fully play their role to provide good examples for students’ innovative entrepreneurship activities. The transformation of the above-mentioned course environment helps to further develop students’ awareness of innovative entrepreneurship and form their entrepreneurial thinking and concepts, thus creating a good environment and atmosphere.

2.3 China’s vocational colleges’ transformation of major participants in innovative entrepreneurship education

The essence of educational activities is about achieving interactions and mutual influence between people, and vocational colleges’ innovative entrepreneurship education activities are particularly outstanding in this regard (Yu, 2017). Hence, to better respond to the national policy of the supply-side reform, vocational colleges have made some adjustments to the major participants in innovative entrepreneurship education, and formed a new management model featuring three major players as a whole as shown in Figure 1. In terms of management teams, vocational colleges’ management teams comprise two parts, namely, academic management and administrative management. The entrepreneurship education research institute plays a major part in academic management, and its major work responsibilities include organizing students to participate in different academic activities and exchanges and building an influential teaching and research team to make intellectual contributions to vocational colleges’ innovative entrepreneurship education. The administrative management team is mainly composed of entrepreneurship managers, entrepreneurship guidance centers and entrepreneurship guidance committees, and is mainly responsible for students’ entrepreneurship guidance and entrepreneurship park management. In terms of the faculty team, vocational colleges attach great importance to the development of innovative entrepreneurship education faculty team by sending teachers to participating in innovative entrepreneurship training programs and encouraging teachers and students to launching e-commerce entrepreneurship via the Internet to improve the faculty team’s experience in real-life entrepreneurship situations. Furthermore, through entrepreneurship activities participated in by teachers and students, vocational colleges have further identified an effective model featuring cooperation between teachers and students on the basis of entrepreneurship activities to develop teachers providing entrepreneurship education and guidance. In terms of students, vocational colleges have proactively designed new entrepreneurship guidance courses, and provided innovative entrepreneurship education courses at their tier-2 colleges to further increase the audience and improve the effects of innovative entrepreneurship education.

![Figure 1. Model for the Transformation of the Major Players](image)

2.4 China’s vocational colleges’ transformation of practice venues for innovative entrepreneurship education

Practice venues for vocational colleges’ innovative entrepreneurship are an important platform where students apply their theoretical knowledge into practice and an integral part of the basic supporting system that enables students to enhance their innovative entrepreneurship skills. Without practice venues for vocational colleges’ innovative entrepreneurship activities, entrepreneurship education would be like a tree without its root or water without its source, and it would be impossible to achieve long-term success of students’ innovative entrepreneurship activities. Therefore, during the early stage of innovative entrepreneurship education,
vocational colleges have created practice venues for students to launch entrepreneurship activities to ensure successful implementation of students’ entrepreneurship activities. Moreover, with the effective organization of on-campus innovative entrepreneurship education activities, vocational colleges will provide a better environment for students to participate in real-life entrepreneurship activities by constantly improving venues and facilities for students to practice entrepreneurship skills. Furthermore, vocational colleges have proactively entered into college-enterprise cooperation agreements with many companies in the hope of providing students with better practice venues for entrepreneurship and better meeting students’ need for the development of practice venues for innovative entrepreneurship (Wang, 2016). Last but not least, vocational colleges have organized external training programs in addition to developing many excellent students into successful entrepreneurs (Zhao and Chen, 2017).

5. EVALUATION MODEL FOR CHINA’S VOCATIONAL COLLEGES’ INNOVATIVE ENTREPRENEURSHIP EDUCATION AGAINST THE BACKGROUND OF THE SUPPLY-SIDE REFORM

Based on the above-mentioned transformation of vocational colleges’ innovative entrepreneurship education, the author uses Peng Gang’s four dimensions to define the dimensions of the innovative entrepreneurship reform and develops the evaluation questionnaire in an effort to understand and evaluate the current innovative entrepreneurship education of vocational colleges in China. Questions 1 to 5 are about innovative entrepreneurship courses, and questions 6 to 10 are about the innovative entrepreneurship education environment. Questions 11 to 15 focus on major players, and question 16 to 29 are about practice venues. On a scale of one to five, where 1 represents “extremely dissatisfied”, and 2 “slightly dissatisfied”, 3 “basically satisfied”, 4 “relatively satisfied” and 5 “extremely satisfied”, statements are rated to indicate the results of vocational colleges’ transformation of innovative entrepreneurship education against the background of the supply-side reform.

During the field survey of the transformation results, the author uses spss22.0, \( \alpha = \frac{k}{k-1} (1 - \frac{\sum S^2}{S^2}) \), and Cronbach’s alpha to examine the evaluation questionnaires, and the scale credibility \( \alpha \) equals 0.956, which is more than 0.6. Therefore, it is clear that the evaluation questionnaires are reliable. On such a basis, the author investigates the results of vocational colleges’ transformation of innovative entrepreneurship education, and use the regression analysis to analyze the above-mentioned four dimensions and obtain the transformation results.

Dimension 1: Transformation of Innovative Entrepreneurship Courses

<table>
<thead>
<tr>
<th>Model</th>
<th>R</th>
<th>R^2</th>
<th>Adjusted R^2</th>
<th>Standard Error</th>
<th>Standard Coefficient</th>
<th>Sig</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0.843</td>
<td>0.721</td>
<td>0.723</td>
<td>1.839</td>
<td>0.837</td>
<td>0.000</td>
</tr>
</tbody>
</table>

As shown in Table 1, values of R, R^2 and the adjusted R^2 indicates that the bigger the value of R^2, the bigger the impact of the variable, innovative entrepreneurship courses, on vocational colleges’ innovative entrepreneurship education. In Table 1, R^2 equals 0.721, indicating that the impact of innovative entrepreneurship courses on innovative entrepreneurship education has reached 72.1%. Meanwhile, from Table 1, it can be known that the significance level Sig =0.000<0.005, suggesting that there’s a remarkable linear correlation between the transformation of innovative entrepreneurship courses and innovative entrepreneurship education and that innovative entrepreneurship education courses has a significant impact on innovative entrepreneurship education.

Dimension 2: Innovative Entrepreneurship Education Environment

<table>
<thead>
<tr>
<th>Model</th>
<th>R</th>
<th>R^2</th>
<th>Adjusted R^2</th>
<th>Standard Error</th>
<th>Standard Coefficient</th>
<th>Sig</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>0.911</td>
<td>0.823</td>
<td>0.812</td>
<td>0.29887</td>
<td>0.892</td>
<td>0.000</td>
</tr>
</tbody>
</table>

As shown in Table 2, R2 equals 0.823, indicating that the impact of the innovative entrepreneurship education environment on vocational colleges’ entrepreneurship education is more than 80% and that the innovative
entrepreneurship education environment has a huge impact on vocational colleges’ entrepreneurship education reform. In addition, Sig is 0.000 and less than 0.05, further suggesting that the education environment transformation has a remarkable impact on vocational colleges’ transformation of innovative entrepreneurship education and that the education environment transformation has achieved some satisfactory results.

Dimension 3: Major Players in Innovative Entrepreneurship

Table 3 Model for Major Players in Innovative Entrepreneurship

<table>
<thead>
<tr>
<th>Model</th>
<th>R</th>
<th>R²</th>
<th>Adjusted R²</th>
<th>Standard Error</th>
<th>Standard Coefficient</th>
<th>Sig</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>0.931</td>
<td>0.864</td>
<td>0.867</td>
<td>0.241</td>
<td>0.934</td>
<td>0.000</td>
</tr>
</tbody>
</table>

As shown in Table 3, R² equals 0.864, indicating that the impact of the transformation of major players in innovative entrepreneurship on vocational colleges’ entrepreneurship education is 86.4%. Besides, Sig is 0.000 and less than 0.05, implying that the transformation of major players is significant and can have influence the transformation of vocational colleges’ innovative entrepreneurship education to some extent.

Dimension 4: Practice Venues for Innovative Entrepreneurship

Table 4 Model for Practice Venues for Innovative Entrepreneurship

<table>
<thead>
<tr>
<th>Model</th>
<th>R</th>
<th>R²</th>
<th>Adjusted R²</th>
<th>Standard Error</th>
<th>Standard Coefficient</th>
<th>Sig</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>0.765</td>
<td>0.581</td>
<td>0.534</td>
<td>0.441</td>
<td>0.767</td>
<td>0.000</td>
</tr>
</tbody>
</table>

As shown in Table 4, R² equals 0.581, indicating that the impact of the transformation of practice venues for innovative entrepreneurship education and that the education environment transformation has achieved some satisfactory results.

In the end, the paper uses Matlab to measure and evaluate the aforementioned four dimensions, and the specific process is as follows.

\[
\begin{align*}
    w &= \left[ \frac{\sum_{j=1}^{n} r_{1j}}{\sum_{i=1}^{n} \sum_{j=1}^{n} r_{ij}}, \frac{\sum_{j=1}^{n} r_{2j}}{\sum_{i=1}^{n} \sum_{j=1}^{n} r_{ij}}, \frac{\sum_{j=1}^{n} r_{3j}}{\sum_{i=1}^{n} \sum_{j=1}^{n} r_{ij}}, \frac{\sum_{j=1}^{n} r_{4j}}{\sum_{i=1}^{n} \sum_{j=1}^{n} r_{ij}} \right], \text{ where } \frac{\sum_{j=1}^{n} r_{1j}}{\sum_{i=1}^{n} \sum_{j=1}^{n} r_{ij}}, \frac{\sum_{j=1}^{n} r_{2j}}{\sum_{i=1}^{n} \sum_{j=1}^{n} r_{ij}}, \frac{\sum_{j=1}^{n} r_{3j}}{\sum_{i=1}^{n} \sum_{j=1}^{n} r_{ij}} \text{ and } \frac{\sum_{j=1}^{n} r_{4j}}{\sum_{i=1}^{n} \sum_{j=1}^{n} r_{ij}} \text{ represent the transformation of courses, the transformation of the education environment, the transformation of major players, and the transformation of practice venues, respectively, and } w \text{ represents the transformation of vocational colleges’ innovative entrepreneurship education.} \\
\end{align*}
\]

According to the calculation results, \( w = \frac{1}{n} - \frac{1}{2a} + \frac{\sum_{j=1}^{n} r_{ij}}{na}, i = 1, 2, \ldots, n, a \geq \frac{n-1}{2} \), further signifying that the transformation of courses, education environment, major players and practice venues can help to fuel the transformation of vocational college’s innovative entrepreneurship education and further drive the transformation of vocational college education.

6. CONCLUSIONS

From the above-mentioned evaluation of the transformation of the courses, education environment, major players and practice venues for vocational colleges’ innovative entrepreneurship education, it can be concluded that vocational colleges’ transformation of the courses, education environment, major players and practice venues for innovative entrepreneurship education can facilitate the positive development of vocational college education against the background of the supply-side reform. Besides, through an analysis of vocational colleges’ innovative entrepreneurship education, it is further concluded that any transformation of innovative entrepreneurship education models is not done at a single stroke. Instead, it requires great efforts to achieve transformation and breakthroughs in different aspects to improve vocational colleges’ overall education levels. In addition, vocational colleges’ transformation of innovative entrepreneurship education needs to meet the
needs for social and economic development, and accomplish shifts from the production of skilled talents to the development of innovative talents, and from the education audience’s passive acquisition of innovative entrepreneurship knowledge to positive acquisition. Last but not least, vocational colleges’ innovative entrepreneurship education should keep up with the times to make desirable contributions to China’s economic development.

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