A MOOC-based Model of Internet Innovation and Entrepreneurship Education System for College Students

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Abstract

In the Fifth Plenary Session of the 18th CPC Central Committee, China clearly proposed the concept of developing a new normalcy of innovation, coordination, greenness, openness and sharing and promoted the constant progress of the popular innovation and entrepreneurship strategy in China. Innovation and entrepreneurship have become the new growth point to drive China’s economic growth. As a crucial means to promote the social transformation and advancement, innovation and entrepreneurship education can effectively cultivate college students’ ability to innovate and start their own businesses. Innovation and entrepreneurship education started late in China and is still in the initial stage of development, featured with numerous major deficiencies in a number of aspects. As a result, it is difficult for innovation and entrepreneurship education in colleges and universities to exert their due functions and to cultivate professionals with excellent accomplishments in innovation and entrepreneurship. To this end, it is necessary to reform the traditional mode of innovation and entrepreneurship education. The infiltration of the MOOC education mode can effectively compensate the deficiency of the traditional innovation and entrepreneurship education, which is of vital significance for enhancing the innovation and entrepreneurship abilities of college students and promoting the all-round development of college students and society.

Keywords: MOOC Education, Innovation and Entrepreneurship, Internet Education.

1. RESEARCH OVERVIEW

1.1 Research background

1.1.1 Background of innovation and entrepreneurship education

With the continuous development of social economy, the speed of economic development has changed from high-speed growth to medium-high-speed growth. Economy in China has entered a stage of new normalcy. In the new economic normalcy, the key issue has shifted from promoting the growth of China’s total economy to adjusting and optimizing the industrial structure and has transformed from element-and-investment-driven to innovation-driven entrepreneurship. In this social context, in order to get out of the middle-income trap as soon as possible, China vigorously carries out innovation and entrepreneurship education (IEE). The idea of popular entrepreneurship and innovation has become a significant strategic goal for China’s development. In addition, from the year of 2014 to 2015, the State Council has formulated relevant policies, facilitated entrepreneurs with innovation and entrepreneurship activities and played an important promoting role by means of streamline administration and institute decentralization, macro-control, the encouragement of non-governmental organizations and market organizations. As a crucial driving force to realize the advancement of innovation and entrepreneurship activities, IEE started relatively late and is still in the primary stage of development facing numerous problems, without achieving the significance of IEE. To this end, we need to reform the traditional IEE mode and to consequently promote the progress of innovative and entrepreneurial undertakings.

1.1.2 Background of MOOC education

MOOC education, also known as large-scale open online courses, is a new online course model that emerges under the background of educational informationization. MOOC education theory originated in the 1960s and began to take shape in early 2008. Until the year of 2011, dozens of world-renowned universities have joined MOOC education, which makes MOOC education progress by leaps and bounds. In 2013, there were only 130,000 MOOC registered users in China, and in a short period of one year, the number reached 650,000. To date,
MOOC education has become an integral part of China’s education system. Its inherent superiority has played a significant promoting role in elevating China’s IEE level.

1.2 Literature review

MOOC education is a highly developed product of Internet+. This teaching method is highly consistent with the needs of college teaching and can effectively compensate the shortcomings of the traditional teaching mode. Consequently, MOOC education has become a primary direction for the development of the current teaching mode. Influenced by a variety of subjective or objective factors, the teaching model and teaching methods of MOOC education cannot be directly adopted in college teaching. Therefore, the application of MOOC education model in college IEE requires an in-depth analysis on the advantages of MOOC education and the disadvantages of college IEE, so as to effectively elevate college IEE level (Wang and Duan, 2016). Under the strategic development slogan of popular entrepreneurship and innovation, colleges and universities have attached increasing attention to IEE and numerous college students are actively engaged in innovation and entrepreneurship. However, in actual business activities, a few key problems are exposed in most cases. College students have high entrepreneurial enthusiasm but often lack the necessary innovation and entrepreneurship qualities, and their success rate is relatively low. Even successful college students have some major flaws in operations and management. In addition, a substantial number of college students have an unclear entrepreneurial direction and deficient market research abilities, which indicates that there is still a major problem for college students IEE in China (Wang, 2016). IEE reform in colleges and universities based on MOOC education is an important development direction of IEE in China. However, at present, few researches focus on the IEE reform under the MOOC education in China, and most of them remain at the theoretical level, lack practical research and are unable to play its due role. Under the background of the high development of education informationization, because of its special nature, MOOC education has become the main direction for the educational informationization progress and also an essential way to enhance the IEE level. Therefore, further research is needed on IEE reform in colleges under MOOC education so as to promote the development of IEE in colleges and to play an important role in promoting the social and economic development in China (Gong, 2016).

2. AN AHP-BASED ASSESSMENT MODEL FOR COLLEGES IEE QUALITY

2.1 Advantages and disadvantages of Analytic Hierarchy Process (AHP)

2.1.1 Advantages of AHP

First of all, as a kind of analysis method which combines qualitative analysis and quantitative analysis, AHP makes decisions according to way of thinking including decomposition, comparison, judgment and comprehension and can effectively solve some problems that cannot be solved by some existing technologies.

Secondly, in the decision-making process of AHP, decision makers’ subjective greatly affects the results of AHP and the cognitive ability of decision-makers is given full play. At the same time, in the decision-making process, policy makers can analyze the problem to improve the effectiveness of the results.

In addition, AHP has relatively simple calculation and data collection, requires less quantitative data, and mainly analyzes the linkage among different influencing factors. Thus, AHP is more acceptable (Lin and Su, 2016).

In the end, AHP has a wider scope of application, which cannot only make decisions on multi-criteria and multi-objective issues, but also conduct research on various issues such as energy, industrial structure, scientific and technological achievements, development strategies, quality evaluation and talent assessment.

2.1.2 Disadvantages of AHP

First, AHP can only conduct analysis and evaluation and cannot provide new solutions. With the characteristics of systematicness, AHP can only analyze the provided program, but cannot be optimized to generate a new program according to the original program.

Besides, AHP is influenced by human subjective factors. All the indexes in AHP are determined by decision-makers through exerting their own professional knowledge and understanding, and rely too much on subjective
judgment of human beings. Therefore, it is very likely that human factors would affect the accuracy of the final results.

Furthermore, AHP has higher randomness. For the same problem, in case of non-interference, different decision makers propose different indexes and even different computational methods, and their results would be greatly different (Zhang and Zhang, 2016).

2.2 Construct a hierarchical structure model

Figure 1 illustrates the hierarchical structure model:

![Hierarchical Model Diagram](image)

Specifically, the first layer is the target layer, also known as the highest level, which refers to the main research objectives and problems to be solved. The second layer is the criterion layer, namely the criterion of factors and decisions that need to be considered in this essential step of achieving the overall goal. The third layer is the program level, which is the main program required by research objectives or problem solving.

2.3 Structure and assignment of judgment matrix

Constructing a judgment matrix is the key and difficult point in the AHP analysis. Every two indexes in the judgment matrix should be compared with each other, and the degree of importance is scaled according to 1 to 9 (Table 1).

<table>
<thead>
<tr>
<th>Scaling</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Indicates that two indicators, I, are of equal importance compared to indicator J</td>
</tr>
<tr>
<td>3</td>
<td>indicates that an indicator is a little more important than another in comparison to the two indicators</td>
</tr>
<tr>
<td>5</td>
<td>compared to the two indicators, one indicator is obviously more important than the other</td>
</tr>
<tr>
<td>7</td>
<td>compared to two indicators, an indicator is much more important than the other</td>
</tr>
<tr>
<td>9</td>
<td>indicates that compared to the two indicators, one index is more important than the other</td>
</tr>
<tr>
<td>2, 4, 6, 8</td>
<td>The median value of two adjacent degrees</td>
</tr>
<tr>
<td>negative</td>
<td></td>
</tr>
</tbody>
</table>

After the judgment ends, 1 is applied if two indexes are equally important; 3 represents where one index is slightly more important than the other index; 5 is adopted when one index is significantly more important than the other one; 7 refers to that one index is strongly more important than the other one; 9 means that one index is extremely more important than the other one; 2, 4, 6 and 8 stand for the level of importance between these two indexes (Chen et al, 2016).
2.4 Single hierarchical arrangement and consistency test

2.4.1 Single hierarchical arrangement

Single hierarchical arrangement refers to calculating the importance of different indexes at the same level and sorting in accordance with the degree of importance. The steps are as follows:

The first step was to normalize the judgment matrix, and the formula is as follows:

$$\bar{a}_{ij} = \frac{a_{ij}}{\sum_{k=1}^{n} a_{ij}}$$  \hspace{1cm} (1)

$$\bar{A} = [\bar{a}_{ij}]$$ could be drawn from the formula. Then, $\bar{A}$, the mean of the sum of each row was calculated. The formula was:

$$w_i = \frac{1}{n} \sum_{j=1}^{n} \bar{a}_{ij} \quad (1, 2, ..., n)$$  \hspace{1cm} (2)

Based on the above formula, eigenvectors could be derived: $w=[w_1, w_2, ..., w_n]$. In the end, the maximum eigenvalue of the judgment matrix was calculated, and its formula was as below:

$$\lambda_{max} = \sum_{i=1}^{n} \frac{(AW)_i}{nW_i}$$  \hspace{1cm} (3)

In the above formula, $(AW)_i$ is the $i$-th sub-vector of $AW$ (Xiong, 2017).

2.4.2 Consistency test

The main significance of consistency test is to determine whether the matrix is reasonable. Only when consistency test passes ($CR \leq 0$), can a high degree of accuracy be guaranteed and the logic be reasonable. If the result of the consistency test fails ($CR > 0$), recalculation is required until it is qualified. The calculation steps are as follows:

First, we calculated the consistency indicator (CI), and the formula was:

$$CI = \frac{\lambda_{max} - n}{n-1}$$  \hspace{1cm} (4)

Secondly, we obtained the value range of RI (Table 2),

<table>
<thead>
<tr>
<th>Order number</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>11</th>
<th>12</th>
</tr>
</thead>
<tbody>
<tr>
<td>RI</td>
<td>0.00</td>
<td>0.00</td>
<td>0.58</td>
<td>0.90</td>
<td>1.12</td>
<td>1.24</td>
<td>1.32</td>
<td>1.41</td>
<td>1.45</td>
<td>1.49</td>
<td>1.52</td>
<td>1.54</td>
</tr>
</tbody>
</table>

In the end, its consistency ratio (CR) was calculated, and its formula was:

$$CR = \frac{CI}{RI}$$  \hspace{1cm} (5)

3. COLLEGE IEE MODEL BASED ON MOOC EDUCATION

3.1 Entrepreneurship education framework based on MOOC education

Figure 2 illustrates the framework of college entrepreneurial education based on MOOC education:
In the framework of MOOC education, IEE is divided into seven parts: curriculum summary, courseware, grading standards, assignment check, examination, discussion and resource sharing (Chen, 2017). Specifically, courseware comprises watching teaching videos, classroom learning and interactive classroom; assignment check can be classified into assignment submission and complete test; discussion mainly includes teacher answering and interaction among college students; sharing mainly refers to sharing teaching resources via QQ, WeChat, Weibo and other social software or Internet platforms. The specific content is as follows.

The first aspect is to watch teaching videos. In MOOC education, teaching content can be reflected in the form of video. The duration of each video should be controlled at 5 to 10 minutes to ensure that students can take full advantage of the fragmented time and learning relevant knowledge of innovation and entrepreneurship after school. After a period of learning, college students will naturally form a systematic knowledge framework and watch MOOC education videos according to their own needs, choices and purposes.

Secondly, knowledge is internalized and the understanding of knowledge is enhanced through homework and after-school exercises. In MOOC educational videos, some tests and practice questions can be added to each video. Students can do test and practice while watching teaching videos, which can effectively improve the internalization of knowledge points (Tian et al., 2017).

The third aspect is interactive classroom discussion. Essentially, IEE is a discipline that cultivates college students’ thinking ability and practical ability. For this purpose, simply adopting the traditional theoretic indoctrinating teaching cannot achieve the desired effect of IEE. Through interactive classroom discussion, college students can share their own learning outcomes and put forward questions that arise during the learning process. These issues can effectively enhance the overall learning abilities of college students by means of group discussions and teacher presentations (Guang and Wang, 2017). In addition, during the process of interactive discussion, college students can share their innovative thinking, which is of crucial significance for cultivating their overall multi-thinking abilities (Yu et al., 2017).

Fourthly, assignments are completed and exams are taken. Assignments and exams, as an indispensable part of classroom teaching, can effectively test and develop college students’ learning level. Setting assignments and completing exams are also of great importance in MOOC education (Huang et al., 2017). After each MOOC education video, teachers need to design the corresponding homework according to the content explained in the teaching video. In the meantime, college students should be regularly organized to take exams through the MOOC education platform so as to test their learning outcomes during a certain period. Based on their own learning defects, targeted learning is conducted, thereby achieving the objective of advancing the learning level of college students.
Fifth, forums are set up. The main function of the discussion forum is to provide college students and teachers with an Internet space for communication and learning. In this space, college students and teachers are free to raise relevant discussions and discuss the raised issues. In this way, college students can learn a substantial amount of different opinions or methods, meet learners at home and abroad, and effectively expand interpersonal relationships (Zhao, 2017).

3.2 Emphasize innovation and entrepreneurship practice

IEE is a special course highly dependent on practice. In most cases, the traditional teaching mode can only meet college students’ requirements for theoretical knowledge learning and cannot carry out practical teaching. Consequently, even with excellent knowledge of innovation and entrepreneurship, college students usually cannot combine knowledge and practice and transform knowledge into a practical innovation and entrepreneurship activity, and the practical significance of IEE is given no expression. For this purpose, IEE should focus on the practice of innovation and entrepreneurship. For example, teachers can regularly organize college students to learn the entrepreneurial experiences of other entrepreneurs and hold innovation and entrepreneurship competitions. These methods can effectively cultivate undergraduates’ knowledge of innovation and entrepreneurship and practical abilities, broaden their thinking, and play a vital role in their innovation and entrepreneurship activities (Ma and Qiao, 2015).

3.3 Construct a sound teaching team

Under the background of MOOC education, the individuality and subjectivity of undergraduates are satisfied, and the role of teachers has changed from the dominant player in the classroom to the organizer and facilitator in class. Although teachers’ status has declined, their teaching abilities are required to be higher. Therefore, it is necessary to build a teaching team with outstanding teaching abilities. On the one hand, IEE teachers should be organized to actively study MOOC education, production of MOOC educational video and application skills. On the other hand, experts and scholars in this industry should be invited to carry out training and lectures on IEE teachers and to explain the application concept of MOOC education in IEE teaching activities, which is of great significance to elevating the IEE level in colleges and universities and promoting the coordinated development of undergraduates and society as a whole (Chen, 2014).

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