A Design of Modern Management Platform for College Innovation and Entrepreneurship Education

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Abstract

As society continuously progresses, China’s economy experiences a transformation from high-speed extensive growth to medium-low-speed refined growth, and economic development faces a new normal pattern. The role of traditional industries in economic development has shown a downward trend. In order to drive China’s economy to constantly expand at a highspeed, we need to identify new economic growth points. To this end, China has put forward the idea of public innovation and entrepreneurship, which becomes the main trend of China’s economic development. Innovation and entrepreneurship education (IEE), essentially practical education, is a form of education that focuses on cultivating students’ innovative spirit and enhances students’ entrepreneurial ability, so that students can better carry out innovative and entrepreneurial activities. A management platform for college IEE is constructed to effectively improve the level of IEE, which is of vital significance to promote the all-round development of students’ comprehensive quality. For this purpose, this article first constructs a quality evaluation system for college IEE, then puts forward the design idea of the modern management platform for college IEE, and provides a reference for elevating the level of college IEE.

Keywords: Innovation and entrepreneurship, Education management, Information platform.

1. RESEARCH OVERVIEW

1.1 Research background

1.1.1 Background of IEE

The theory of IEE originates in the 1990s. At an international conference held in Tokyo, IEE was defined as a form of education that cultivates innovative pioneering consciousness and adventurous spirit and improves comprehensive abilities such as entrepreneurial ability, work level, interpersonal communication and management level. In the context of new economy, innovation and entrepreneurship has become China’s new economic growth point. Ministry of Education also puts forward the idea of IEE and argues that colleges and universities should focus on the IEE curriculum system and actively encourage students to start their own businesses. This approach holds the following advantages. First, it can reflect the core ideas of the scientific outlook on development and greatly promote the construction of a service-oriented country. Secondly, it can effectively motivate the reform of teaching system in colleges and universities and promote the comprehensive development of students’ comprehensive qualities. Thirdly, it can provide more jobs by means of student entrepreneurship so as to ease the employment pressure.

1.1.2 Background of the educational management platform

With the continuous development of information technology, Internet, database and other technologies expressively promote various traditional areas. In the field of education, the educational management platform can effectively integrate educational resources and enable students to learn and train in the educational management platform, which is of vital significance to enhance the level of IEE in colleges and universities.

1.2 Literature review

The design of college IEE system should adhere to the following principles. First, it is necessary to ensure the combination of IEE and traditional education system. Traditional education system mainly comprises of general
education and vocational education, and they have different focuses, are independent of each other, and form a complete education system. In this way, a better teaching function can be fulfilled. Secondly, the design should emphasize the cultivation of students’ innovative spirit and practical ability, a key foundation for carrying out innovative and entrepreneurial activities. Thirdly, the combination of consistency and differences should be emphasized so as to optimize the IEE curriculum system. Each student has a different innovation and entrepreneurial direction, but many elements of innovation and entrepreneurship are interlinked. (Liu et al, 2014). Teaching environment, a direct influence factor of the IEE level, should be strengthened. First of all, innovative and entrepreneurial campus culture should be constructed, so that students can be imperceptibly affected by campus culture, comprehend the significance of IEE, and actively participate in innovation and entrepreneurship. Secondly, a positive academic atmosphere should be established where students are encouraged to debate, a variety of innovative business ideas are integrated, and the diversified development of innovation and entrepreneurship is promoted. Furthermore, a sound organizational structure should be built up to comprehensively conduct educational and management activities concerning innovation and entrepreneurship. Last but not the least, it is necessary to set up a scientific management system and play an essential fundamental role in the development of college IEE (Liu and Deng, 2014). IEE curriculum in colleges and universities mainly includes a few aspects as below. The first aspect refers to general courses on IEE, which helps students understand the status quo of innovation and entrepreneurship at home and abroad and study the related legal norms and policy issues. The second aspect concerns enterprise management courses in which students acquire knowledge of enterprise management and elevate their management level. The third type involves science and humanity courses. Knowledge is the basis of innovation and entrepreneurship, and innovation and entrepreneurship with a shortage of knowledge can only become empty talks. Hence, science and humanity courses should be taken to enhance the professional level of students and to lay a solid foundation for innovation and entrepreneurship activities (Yang, 2015).

2. QUALITY EVALUATION SYSTEM DESIGN OF COLLEGE IEE

2.1 Evaluation index system of college IEE

The quality of college IEE is influenced by a number of factors and is featured with a high degree of complexity. Meanwhile, as a huge systematic project, innovation and entrepreneurship in colleges and universities require efforts from government, society, enterprises, schools and other parties. Its quality evaluation can be carried out in a variety of ways, as indicated in Figure 1:

![Figure 1. IEE Evaluation Index System Structure](image)

First, from the perspective of schools, colleges and universities are the main body of IEE and also the primary responsibility undertakers of IEE. Colleges and universities should have a favourable conception school management and a clear plan for IEE, construct the corresponding IEE curriculum system, and possess a group of teachers with innovative and entrepreneurial experience. In addition, colleges and universities should also emphasize the construction of campus culture, build a benign atmosphere in schools, encourage students to carry out innovation and entrepreneurship activities, establish off-campus training bases, improve the IEE infrastructure and play a crucial fundamental role in IEE (Wang, 2015).

Secondly, from the level of society, as a macro-environment of innovation and entrepreneurship, society can exert a profound influence on the development of IEE. Traditional ideas emphasize that students locate a stable job after graduation, rather than innovation and entrepreneurship activities, which restricts the development of
IEE to some extent. Therefore, society should actively encourage students to carry out independent innovation and entrepreneurship, to build a favourable atmosphere of innovation and entrepreneurship, and to afford innovative entrepreneurs with more praise and higher reputation. Also, enterprises should expand the support and encouragement of innovation and entrepreneurship, thereby further driving the development of IEE (Wang, 2015).

From the point of view of governments, the development of IEE generates a significant impetus to the progress of the national economy. Therefore, governments should also join the construction of IEE, enlarge financial investment, and facilitate schools to improve the construction of infrastructure and training bases, thereby cultivating students’ entrepreneurial practice level. In addition, government should reinforce policy encouragement and support for college students’ entrepreneurial activities, afford students with more help through the establishment of start-up business incubation base and other approaches, and motivate start-up enterprises to tide over difficulties faster (Wang, 2015).

From the aspect of students, students are the main receivers of IEE. The evaluation can be conducted mainly from four aspects. The first aspect is students’ innovative and entrepreneurial abilities that directly affect their entrepreneurial level. Next, innovation achievements are evaluated, which indicates whether students have found a reasonable idea of innovation and proceeded to prepare the exploration. The third aspect involves the entrepreneurial rate, namely the total number of students participating in the innovation and entrepreneurship activities. In the end, practical activities are assessed, which refers to the achievements gained by students in the innovation and entrepreneurial activities (Wang, 2015).

2.2 Construct BP neural network

It is difficult to adopt traditional analytical methods to calculate the level of IEE in colleges and universities due to its high complexity, abundant unquantified data and certain limitations of specific resources. For this purpose, BP neural network is constructed to describe the relationship among the various factors. Because of its own shortcomings, BP neural network should be optimized according to the actual situation of college IEE, and its steps are demonstrated as follows.

BP neural network is mainly composed of input layer, hidden layer and output layer. Based on the actual situation, the number of units changes accordingly. Among them, the activation function of the hidden layer in most cases is \( f(x) = (1+e^{-x})^{-1} \), but the activation function of the output unit has the following three main forms:

\[
f(x) = \begin{cases} 
1, x > 0 \\
0, x \leq 0, f(x) = (1 + e^{-x})^{-1} \\
1, x > 0 
\end{cases}
\]

(1)

Assume: the number of samples is \( n \); \( x^{(i)} \) represents its corresponding output value; \( k \) is a positive integer within the range of \( n \); \( y^{(i)} \) represents its desired output and the actual output, respectively; \( O_{jk} \) stands for the output value of unit \( i \); \( W_{jk} \) represents the weight of \( i \) to \( j \); \( net_{jk} = \sum_i w_{ij} o_{ik} \) represents the total input of \( j \); \( E_k = \frac{1}{2} (y^k - y_k)^2 \) is the error function for \( k \); \( E = \sum_{k=1}^{n} E_k \) is the cumulative error (Ma and Bai, 2015).

In the calculation process, a random value is first set as the initialized weight, \( W_{ij} \). Assuming \( k=1 \), the input formula is \((x^{(i)}, y^{(i)}) \). After entering the output learning sample, the calculation starts. The formula is as follows:

\[
net_{jk} = \sum_i w_{ij} O_{jk}, O_{jk} = f(net_{jk}), E_k = \frac{1}{2} (y_k - y_k)^2
\]

(2)

After drawing the conclusion, reverse calculation is conducted and the formula is as follows:

\[
\sigma_{jk} = \begin{cases} 
- (y_k - y_k) f'(net_{jk}) \\
f'(net_{jk}) \sum_m \sigma_{mk} w_{mk}
\end{cases}
\]

(3)

In the above formula, \( j \) stands for the output unit and the hidden unit, respectively. Then the weight is modified and the formula is \( w_{ij}(t + 1) = w_{ij}(t) - \eta \sigma_{jk} o_{jk} \). In this step, the value of \( k \) is judged. If \( k = k+1 \), the operation is redone. When \( k = n \), the operation continues. IFF \( E_k < \varepsilon \), the operation ends; if not, the operation restarts until the calculation result is available (Xue et al, 2016).
3. DESIGN OF IEE MANAGEMENT PLATFORM

3.1 Framework design of college IEE management platform

The framework design is illustrated in Figure 2.

![Diagram](image)

**Figure 2.** University Innovation and Entrepreneurship Education Management Platform Framework

There are two main branches of framework design of the IEE management platform. The first branch is college education websites that mainly carry on three tasks. The first task is to allow students to broadcast IEE courseware and download teaching resources and notes via the education website as well as to self-study in the electronic library through consulting relevant information and other means. The second task is to seek the help of teachers or students for counseling and mentoring by means of e-mail, video conferencing, BBS and other online approaches. The third task is online examinations based on college education websites (Zhang et al., 2016).

The second branch is college learning center that is primarily responsible for three tasks. The first task is to provide students with more comprehensive teaching resources of IEE, including a variety of printed materials, audio and video materials and network materials. The second task is to establish a team of teachers who answer questions via face-to-face, telephone and other approaches, guide students to conduct practical teaching, and enhance students’ learning and application level. In the end, students’ assignments or innovation and entrepreneurship achievements are graded. The third task is to assess the level of student learning and training, so that students can clearly identify their own deficiencies and make targeted exercises. In this way, students’ innovative and entrepreneurial skills can be elevated and the possible innovation and entrepreneurship risks faced by students after joining society can be reduced.

3.2 Design principles of college IEE management platform

The design of college IEE management platform should follow the following principles.

The first principle is systematicness. IEE is a systematic project involving a number of areas, so is the design of education management platform. Different functions have a certain inter-correlation. Therefore, the design of
interface among various sub-systems should be emphasized, thus forming a more compact system for the college IEE management platform.

The second principle concerns development. Compared with the traditional education, the network-based education holds a certain advantage. However, network education in China has a later start than the developed countries, a stage of exploration, a fast development speed, as well as constantly perfected functions and facilities. If the college IEE management platform design is relatively fixed, no flexible update would be available and the system design would soon lag behind and be eliminated. Therefore, this principle should be followed so as to ensure the constant updates and development of the system (Hao et al., 2016).

The third principle involves stability. Scientific and technological level is a key foundation for the development of network education. However, staff are not students and are unable to systematically learn the emerging technologies, and it takes some time to explore the skilled application. Therefore, in order to ensure the normal operation of college IEE platform, in the use of emerging technologies, the principle of stability should be applied to minimize risks.

The fourth principle is early preparation. The establishment of college IEE management platform involves enormous workload and high difficulty. If design achievements have some shortcomings or defects, substantial amount of time and effort would be consumed in the repair process, which greatly undermines the teaching level of college IEE management platform. To this end, this principle should be established. Preliminary work is put as the main emphasis to lay a solid foundation for the follow-up work, to reduce the defects in the follow-up work, and to further elevate the design level of college IEE management platform.

The fifth principle is participation. Students are the direct users of the college IEE management platform, and their usage experience embodies the design level of this platform to a certain extent. In the meantime, in the process of usage, students also have some opinions and suggestions on this platform which can effectively improve the function of IEE management platform and promote the level of IEE (Mo et al., 2014).

4. APPLICATION EFFECT OF COLLEGE IEE MANAGEMENT PLATFORM

4.1 Enhance students’ learning level of innovation and entrepreneurship

In most cases, the traditional innovation and entrepreneurship teaching in colleges and universities is carried out in the form of classroom teaching, which is more inclined to theoretic teaching. In fact, innovation and entrepreneurship is a type of practical activity which demands extremely high individual abilities of students. Talents cultivated by the traditional teaching model are often poor at practice, which is the main reason of the low traditional IEE level. The college IEE management platform attaches more attention to the cultivation of students’ practical ability, is able to effectively develop students’ innovative and entrepreneurial spirit by means of various practical cases and practical operation, and largely improves students’ learning level (Zhang, 2014).

4.2 Diversified talent cultivation concept

Traditional teaching model primarily focuses on the cultivation of talents with strong theoretical knowledge. As society constantly advances, increasing types of talents are demanded, and theory-guided talents are gradually transformed to practice-based talents. In the college IEE platform, students can employ rich innovation and entrepreneurship teaching resources on the Internet and access more excellent achievements of domestic and foreign students, which makes reference for students’ innovative and entrepreneurial activities, drives students to become diversified talents, and exerts a prominent catalytic effect (Shen, 2013).

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