Study on College Students’ Innovation and Entrepreneurship Education Practice Based on Professional Tutorial System

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Abstract

Although China has carried out innovation and entrepreneurship education in colleges and universities for years, the actual achievements made is slightly inadequate. Besides such disturbing factors as finance, resource, technology, and venue, the lack of highly professional guidance tutor is the most fundamental cause. In view of this, this paper centers on professional tutorial system to probe into the specific needs of undergraduates in innovation and entrepreneurship education. Meanwhile, it uses the linear regression model of mathematical function to introduce the expected goal completion of the professional tutorial system, so as to identify the actual effect of professional tutorial system in the innovation and entrepreneurship education of colleges and universities. The paper is expected to provide theoretical reference for colleges and universities to improve their ability of innovation and entrepreneurship and to cultivate innovative and pioneering talents.

Keywords: Tutorial System, Innovation and Entrepreneurship Education, Function Model, Linear Regression.

1. RESEARCH BACKGROUND

1.1 Literature Review

Tutorial system has long been adopted as one of the three major modes of education (the other two being class system and credit system). The greatest advantage of the tutorial system is that it strengthens the connection between professional tutors and students, and improves the teaching philosophy (Qian et al., 2014). The tutor-student relationship thus formed facilitates the teaching of targeted content. Innovation and entrepreneurship education has been vigorously launched in major colleges and universities in China. However, the results is not as good as expected (Zhang, 2014). For one thing, students do not have enough entrepreneurial practice opportunities during their school years and it is difficult to understand the risks and grasp the essence of entrepreneurship merely by attending lectures. For the other, although China has invested great manpower and material resources in innovation education in colleges and universities (Huang, 2014), it has not yet established a comprehensive and systematic cultivation mechanism. When choosing fields to start a business, students find their innovative abilities to be a short board that severely restrained their effectiveness and efficiency in this process.

1.2 Purpose of Research

Based on the analysis of various factors, the primary cause for insufficient practice lies in the lack of targeted education guidance (Jiang and Zhu, 2015). Given all the practical problems in innovation and entrepreneurship education, the tutorial system can provide targeted guidance and has become the primary direction of research. To this end, based on the teaching planning of professional tutorial system, this paper conducts systematic analysis and mathematical statistics on some innovation and entrepreneurship projects (Hang et al., 2015). It also analyze the relationship between the variables through mathematical function model, so as to figure out the implementation of professional tutorial system in current higher learning institutions, enhance the practical effect of innovation and entrepreneurship education, and turn out innovative and entrepreneurial talents with the characteristics of the new era for our country.

2. INNOVATION AND ENTREPRENEURSHIP EDUCATION DEVELOPMENT NEEDS ANALYSIS

While investigating the innovation and entrepreneurship education in our country, the paper also collected related literatures and expert advice, and designed the questionnaire for the survey. It mainly takes three aspects into consideration, namely, student needs, needs of higher learning institutions, and project needs, as is shown in Table
2.1 Student Needs Analysis

The survey finds that students concern themselves much with innovation and entrepreneurship education, especially such aspects as innovation awareness, entrepreneurial ability and practice (Zhang and Wu, 2015), among which innovation awareness accounts for 86.95%, indicating students' high recognition of innovative education. As the student feedback shows, the demand for innovation education also increases, and the main problems are uneven allocation of education resources, and inability to provide students with practice opportunities. Despite their strong desire for starting a business, due to the irrational allocation of resources, students find it hard to obtain resources they need.

2.2 Higher Learning Institution Needs Analysis

The substantive issues of innovation and entrepreneurship education mainly involve the return on investment, costs for operation and scientific research, and the timeliness of research results. For start-up projects, the investment risk is high, and without educational content of practical solutions, it is also very difficult to create entrepreneurial practice opportunities for students (Liu, 2015). It not only shows the lack of demand and supply, but also the inadequacy of college education resources.

2.3 Project Needs Analysis

The most critical demands, which are also the contradictions difficult to be solved at this stage, are technology, capital and manpower. First of all, technology is indispensable for colleges and universities to carry out innovation and entrepreneurship projects. Although some research projects are very forward-looking, they do not received the corresponding technical support and guarantee in actual operation. While in most colleges and universities, the research project itself has a low technical content, let alone the cultivation in innovative abilities. The fundamental reason for this phenomenon is that technical indicators can not be fully guaranteed. Second, despite the large amount of funds invested, special funds in higher education is limited (Zeng et al., 2017). As higher learning institutions can not expand their sources of funds themselves, the proportion of investment in innovation and entrepreneurship projects will also be affected. In the absence of follow-up funding, the development most innovation and start-up projects are restrained. Last but not least, it is the ratio of professional tutors to students. Despite the large base of students, tutors assigned for innovation and entrepreneurship are inadequate. Moreover, as professional teachers do not have the ability required for innovation and entrepreneurship education, and non-professional teachers are arranged for this task, making the guidance not so professional either.

3. CREATION OF MATHEMATICAL FUNCTION MODEL BASED ON THE NEEDS OF INNOVATION AND ENTREPRENEURSHIP EDUCATION

3.1 Model Definition and Design

The survey finds the demand mainly comes from students, higher learning institutions and projects. Analyze this finding with linear regression and we can get the corresponding demands and critical values. Based on this research methods, we can sum up the linear regression model of entrepreneurial progress and cultivation demands:

\[ Y = aX^2 + b \]  

(1)

In this formula, Y is the linear regression trend of the relationship between innovation projects and demand, \( X^2 \) represents the proportion of capital and material inputs, while a refers to the level of novelty, and b, the progress.
Bring corresponding research results into this equation and we can get the regression trend, and analyze how the demand and innovation and entrepreneurship education strategy match with each other, thus clarifying corresponding deduction results, as is shown in Figure 1.

![Figure 1. Defining the Form of the Model in Curve Regression](image)

### 3.2 Model Test and Analysis

In this regression model, data is used to analyze and calculate the stage trend of the curve, and to compare the progress achieved and the time of completion, and then the focuses of innovation and entrepreneurship education at the present stage between the established and the expected results before analyzing the gap between the proportion of demand and the actual result. In Figure 2, Parabola A represents the expected values, while Parabola B represents the actual result of research of innovation and entrepreneurship education (Lin and Liu, 2017). Excluding the error of operation engineering, when the two parabolas are coincident or close to each other, the regression equation is more salient, that is, the innovation and entrepreneurship education works. However, in this survey, there is a big gap between the actual results of the two parabolas. There are two reasons: One, initial education is not effectively connected with the expectation, and there is redundancy of time in the allocation of fund and tutors. Two, the intended target 5/5 is not completed, nor is the hypothetical project targets. This is mainly because of the graduation and internship period for students participating in the study. Freshmen, in particular, lack guidance in specialization and especially innovative awareness and entrepreneurship, and that explains why the results are opposite to the expected target.

### 3.3 Mathematical Model with Professional Tutors as Reference Variable

This paper mainly analyzes the effect of professional tutorial system in innovation and entrepreneurship education. In most higher learning institutions, there is a great correlation between student development plan and professional tutorial education mode. Assuming that there are professional tutors that are equipped with the knowledge and experience required for innovation and entrepreneurship education (Luan, 2017). Then in the absence of educational resources and project funding, can they effectively support the staged development of students? Based on the ratio of the progress and the completion time of undertaking project, a linear regression model on the effect of innovation and entrepreneurship is designed as follows:

\[
b = \frac{\sum_{i=1}^{n} x_i y_i - n \bar{y} \bar{x}}{\sum_{i=1}^{n} x_i^2 - n \bar{x}^2}
\]

\[
a = \bar{y} - b \bar{x}
\]

In it, x represents a feasibility program for professional tutors, Y represents the progress. Then the figure can be approximated as a linear regression line for the relationship of tutors involved and the progress, which can be used to analyze the practical effect of professional tutorial system in university innovation and entrepreneurship education (Wang et al., 2017). Through Formula 1, we can get the quantitative standard of the professional tutors’ support in meeting students, higher learning institution and project demands, and Formula 2 verifies to which degree the project is completed (2). Then analyze whether the professional tutorial system can guarantee the completion of educational tasks within a given time or even over-fulfill the stated objectives.
4. NEW PATHS TO LAUNCH INNOVATING AND ENTREPRENEURSHIP EDUCATION AROUND THE PROFESSIONAL TUTORIAL SYSTEM

The above research shows that the professional tutorial system can be adopted to analyze the present situation of students’ ability development, and improve the teaching plan accordingly. The fact that the theoretical model can generate linear regression results close to the expected ones proves that professional tutorial system can facilitate the cultivation of students (Wang et al., 2016). Although the fundamental problem of innovation and entrepreneurship education can not be solved in a short period of time due to the lack of project funding, educational resources and technical support, the general effect of education can be improved with targeted training of professional tutors. In view of this, this paper propose education planning recommendations on the following three aspects.

4.1 Open Innovation and Entrepreneurship Training Bases, Develop Rules for Fund Application

In carrying out professional tutorial system in innovation and entrepreneurship education, training bases are the most basic support. However, without corresponding criteria, it is difficult for the professional tutorial system to be implemented, and without guidance and teaching by professional tutors, it is difficult for students to apply the right method or achieve the expected goals. Therefore, the premise of the introduction of professional tutorial system is also to open innovation and entrepreneurship training bases, and provide students with the appropriate learning environment and resources. Given the large number of research topics reported by major universities and colleges, further verification of the feasibility and ROI of their innovative and pioneering projects is the most effective way at present (Ju and Liu, 2016). Research funding programs should also be advocated in line with the actual conditions of major universities and colleges, and external funds introduced to make up research fund deficiencies. For example, apply to research and development-oriented enterprises for financial subsidies and provide research results on a regularly basis. By so doing, funds and research topics are matched both ways and the expansion of application rules will support the continuous financial support of corresponding innovation and entrepreneurship projects (Zhang, 2016). In the linear regression analysis, it is found that most of the research topics are designed to be completed within 720 days. However, in reality, it is difficult to achieve the expected results due to the lack of follow-up financial support. In view of this, professional tutors are not purely instructive instructors, but also bridges the gap between enterprises. Providing stage results is also a necessary means to promote the gradual acquisition of supporting funds. Therefore, when implementing the research, we should make the academic and research nature of the innovation and entrepreneurship project the core and try our best to ensure the full complement of follow-up funds, so as to achieve the objectives set.

4.2 Expand Innovative Training Programs, Combine with Academic Contests

The research results of innovation and entrepreneurship education in China over the years show that in the absence of innovative research topics, it is difficult for students to grasp innovation and entrepreneurship knowledge through theoretic study. The implementation of the professional tutorial system also need corresponding activities. Therefore, when launching professional tutorial system, colleges and universities should set up training programs according to their actual conditions. Take freshmen as the talent base to optimize the design of the basic contents of innovation and entrepreneurship projects, and illustrate to students the most basic research direction and the latest research achievement. Guide students’ interest in the project, and foster certain theoretical basis and innovative ideas in them. For sophomores, introduce specific content of innovation and entrepreneurship to cultivate innovative awareness and guide their entrepreneurial ability. Theoretical study and practical learning remain the basic task for them, and sound teaching plans are needed to guide their growth and lay a solid theoretical foundation for the research in the third year. For juniors, tutors can lead them to participate in appropriate simulation trainings (Ji et al, 2013). In the commercial sand table exercise, divide the students into several topic groups to compare their progress and completion of the study. Launch discipline competition activities, when students can find their own shortcomings, as well as the advantages of other competitors, so as to assess their development feasibility and goals for improvement goals. Tutors should be well prepared in data to construct hypothetical market conditions close to the real scenarios to support students to complete the project objectives and get good practical abilities.

5. CONCLUSION

In summary, the lack of funds and educational resources is the fundamental issue in launching innovation and entrepreneurship education in colleges and universities. The introduction of a professional tutorial system can weaken the adverse effects of resources deficiency. To this end, this paper suggests universities and colleges
expand their professional tutorial system for innovation and entrepreneurship education according to their actual conditions. The specific implementation plan is determined by tutors of innovation and entrepreneurship education in each school, while paying attention to improving the following two aspects: One is to open innovation and entrepreneurship training bases and expand fund application rules to achieve the most basic indicators. Second, expand innovative training programs, and launch academic competitions to enrich teaching content and supplement research resources.

ACKNOWLEDGMENTS

This work was supported by the Hebei Social Science Foundation of China in 2017. Project number: HB17JY081, project name: Study on Innovation and Entrepreneurial Education of College Students from the Perspective of Professional Tutorial System.

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