Exploring the Development Model of Instructors in Innovation and Entrepreneurship Education

Yan LU\textsuperscript{a}, Yue REN\textsuperscript{b} and Bin-Ge CUI\textsuperscript{*}

Shandong University of Science and Technology, China

\textsuperscript{a}luyan@sdkd.net.cn, \textsuperscript{b}yue_ren@sdust.edu.cn, \textsuperscript{*}cuibinge@sdust.edu.cn

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Abstract. Innovative talent training is an important topic in higher education in all countries of the world, and excellent innovation and entrepreneurship education is inseparable from the healthy development of the instructor team. Based on the relevant analysis method, this paper empirically analyzes the significance of instructors in innovation and entrepreneurship education, and suggest to develop full-time instructors of innovation and entrepreneurship education. The paper also discusses the problems of the instructor team at present and explores the development model of the instructors. Related work can provide reference for the construction of the instructor team in innovation and entrepreneurship education.

Introduction

With the advent of knowledge economy society and the competition of national comprehensive national strengthen the cultivation of innovative talents has gradually become an important issue in higher education. In order to effectively develop innovative talent resources and vigorously carry out the reform of the education system for innovation and entrepreneurship, countries around the world have implemented many effective reform measures \cite{1, 2, 3, 4}. Since the 18th CPC National Congress, China has also continuously attached importance to the cultivation of innovative talents. Vigorously cultivating innovative and applied talents has become a major decision and deployment of China.

Colleges and universities are the main institutions for the cultivation of innovative and entrepreneurial talents \cite{5}. Innovation and entrepreneurship education has characteristics such as integration and practicality. However, due to its own factors such as limited classroom learning knowledge and inadequate practical experience, it is difficult for university students to transfer and comprehensively use their knowledge. This requires innovative and entrepreneurial instructors' guidance and counselling, therefore a good innovation and entrepreneurship education is inseparable from the scientific formation and healthy development of the instructor team. Based on the analysis of the current research status of innovation and entrepreneurship education instructors, and summarizing the problems existing in the construction and development of instructors, we try to explore the development model of instructors in innovation and entrepreneurship education, and give suggestions for the construction of full-time instructor teams.

Significance Analysis of instructors to Innovation and Entrepreneurship Education

Is mentoring indispensable or indispensable in innovation and entrepreneurship education? We try to use scientific methods to analyze the significance of instructing teachers in the innovation education.

Data Sources

In order to encourage university students to innovate and discover innovative talents, there are more and more innovative competitions organized for college students at home and abroad. The enthusiasm and results of university students’ participation in innovative competitions can indirectly reflect the level of students' innovation ability. We use Shandong University of Science and
Technology's students' participation in the competition from 2015 to 2018 as the source data to analyze the necessity and significance of instructors for innovation and entrepreneurship. Because there are many types of competitions, the number of participants and the number of winners are also very different. We selected six types of competition data for analysis. The selection principles are: (1) the nature of the competition is innovative and close to the subject of this article; (2) the contest has a large number of participants, which can avoid the chance of winning. Selecting contests with more winners can make the analysis more reliable. The specific data is shown in Fig. 1.

![Figure 1. Competition Types and Winners.](image)

**Correlation Analysis Results and Conclusions**

We use SPSS software to conduct a correlation analysis of the competition's awards and its instructors, verify the significance of the instructors, and further analyze the influence of the instructors on the award level, thereby confirming the importance of the dual innovation instructors. Table 1 shows the average number of award levels, the number of winners and the number of instructors, the standard deviation and the amount of data.

| Variable            | Average | Standard Deviation | Quantity |
|---------------------|---------|--------------------|----------|
| Number of winners   | 4.873   | 10.6448            | 379      |
| Number of instructors | 3.778  | 10.0766            | 379      |
| Award level         | 2.757   | 0.9423             | 379      |

We consider that the award level may affect the relationship between the number of award winners and the number of instructors. We use partial correlation for correlation analysis and significance detection. We set the award level as a control variable, and the number of winners and instructors as variables. Before the analysis, it is impossible to know the significant difference between the number of winners and the instructors. Therefore, a two-tailed significance test was used in the analysis. Table 2 shows the results of partial correlation among the three variables, where the correlation coefficient is the Pearson correlation coefficient.

It can be concluded from Table 2 that with the absence of a control variable, the correlation coefficient between the number of winners and the number of instructors and the award level is -0.063, and there is a relatively low negative correlation. It is generally believed that a correlation coefficient of 0-0.09 means no correlation, 0.1-0.3 means weak correlation, 0.3-0.5 means medium correlation, and 0.5-1.0 suggests strong correlation [6]. Therefore, in the absence of control variables, the absolute value of the correlation coefficient between the number of winners and the number of instructors and the award level can be considered irrelevant between 0-0.09. When controlling the award level variable, you can see that the Pearson correlation coefficient in Table 2 is 0.961, which...
shows that with the control of the award level variable, there is a positive correlation between the number of winners and the number of instructors. Instructors have an important influence on the number of winners in innovative competitions.

| Control Variable | Number of Winners | Number of Instructors | Award Level |
|------------------|-------------------|-----------------------|-------------|
| No               | 1.000             | 0.961                 | -0.063      |
|                  | Saliency (two-tailed) | 0.000                 | 0.220       |
|                  | degree of freedom  | 0                     | 377         |
| Number of instructors | 0.961             | 1.000                 | -0.026      |
|                  | Saliency (two-tailed) | 0.000                 | 0.610       |
|                  | degree of freedom  | 377                   | 0           |
| Award level      | -0.063            | -0.026                | 1.000       |
|                  | Saliency (two-tailed) | 0.22                  | 0           |
|                  | degree of freedom  | 377                   | 0           |

In order to verify the influence of the instructors on the number of winners in innovative competitions, this article also performs spearman, Kendall's tau-b correlation analysis on innovative competition data, as shown in Table 3. Both correlation coefficient values are about 0.8, which shows that there is a strong correlation between the number of winners and the number of instructors, which confirms the instructive significance of instructors in innovative competitions.

| Type               | Number of Winners | Number of Instructors |
|--------------------|-------------------|-----------------------|
| Kendall's tau-b    |                   |                       |
|                    | Correlation coefficient | 1.000             | 0.789       |
|                    | Saliency (single tail) | .                     | 0.000       |
|                    | total              | 379                   | 379         |
| Number of instructors | Correlation coefficient | 0.789             | 1.000       |
|                    | Saliency (single tail) | 0.000                 | 0           |
|                    | total              | 379                   | 379         |
| spearman           |                   |                       |
|                    | Correlation coefficient | 1.000             | 0.848       |
|                    | Saliency (single tail) | .                     | 0.000       |
|                    | total              | 379                   | 379         |
| Number of instructors | Correlation coefficient | 0.848             | 1.000       |
|                    | Saliency (single tail) | 0.000                 | 0           |
|                    | total              | 379                   | 379         |
Research Status and Existing Problems of Teaching Teams in Innovation and Entrepreneurship Education

We used Citespace software to visually analyze the keywords in the 2000 articles published in the related fields of innovation and entrepreneurship instructors in the CNKI and Web of Science databases from 2010 to 2019, to understand the research status and hotspots of innovation education instructors at home and abroad, and the problems existing in the construction of innovation and entrepreneurship education instructors. The analysis found that the current research hotspots of innovative and entrepreneurial instructors in universities at home and abroad all cover aspects such as teaching ability, professional development, and performance evaluation. At home, great attention is paid to strategy, teaching efficacy, evaluation index system and incentive mechanism, while at abroad, the focus is on education reform, teachers' knowledge reserve, self-efficacy, attitude and entrepreneurship.

With the increasing attention paid to the construction of the teaching staff in domestic universities, the level of innovation and entrepreneurship education has made a breakthrough in recent years. However, the innovation and entrepreneurship education in China started relatively late, and there are still some problems in the construction of instructor teams. (1) There is no full-time instructor position in innovation and entrepreneurship. At present, most of the instructors for innovation and entrepreneurship are professional teachers, college counselors, or part-time teacher of employment department manager, with varying levels of guidance ability and level [7]. (2) The instructors' experience in innovation and entrepreneurship and social practice work are generally poor, and lack of learning and training related to innovation and entrepreneurship [8]. (3) The composition of the instructors is unreasonable. There is no professional team system, and no reasonable team sustainable development plan. (4) The evaluation mechanism is imperfect. Innovative and entrepreneurial education instructors cannot receive recognition and rewards for workload and performance, so they cannot effectively stimulate work enthusiasm [9].

China's innovation and entrepreneurship education is still in the development stage. There is still a certain gap compared with developed countries such as Europe and the United States, where research on innovation and entrepreneurship education was conducted earlier. Instructors also need to continuously learn more theoretical knowledge and practical experience in the development of innovation and entrepreneurship education.

Promoting the Construction of Full-time Instructors in Innovation and Entrepreneurship Education

In order to improve the training level of innovative talents in colleges and universities, it is urgent to build scientific teams of instructors in innovation and entrepreneurship education. In view of the current situation and existing problems, we also explore the development mode of innovation and entrepreneurship education instructors.

Establish full-time instructor positions for innovation and entrepreneurship education, and develop a full-time instructor management system. The development of full-time instructors can effectively avoid the shortcomings of part-time teachers in current colleges and universities. Full-time instructors can understand their own roles in innovation and entrepreneurship education clearly, and use their professional expertise, innovation and entrepreneurship experience or social practice work experience to provide students with innovation and entrepreneurship guidance and recommendations. Colleges and universities should improve the policy system and develop a full-time instructors’ management system. The appointment system for full-time instructors shall be implemented, and the selection, supervision and assessment management of full-time instructors shall be strengthened.

Establish innovative concepts, improve the ability of instructors, and pay more attention to continuing education and learning. Instructors have different academic backgrounds, specialties, and experiences. They need to set up targeted career development plans for personalized continuing education and training. We can adopt the method of "coming in and going out." "Coming in" refers to
invite well-known experts, scholars, and outstanding entrepreneurs in related fields of innovation and entrepreneurship to come to the school to make innovation and entrepreneurship reports; "going out" refers to encouraging instructors to practice and technical train in school and social enterprises to expand relevant skills. Encourage instructors to go out for further studies, learn from the experience of successful innovation and entrepreneurship at home and abroad. Create convenient conditions for the improvement of the ability of innovation and entrepreneurship instructors.

Improve the construction of full-time instructors’ teams in innovation and entrepreneurship education. In the process of constructing a full-time instructor team, it is necessary to give full play to the team collaboration ability of the full-time instructor, form a stable and reasonable professional team, and set up a reasonable team development plan. Strengthen the communication among the instructors in the team, share their innovation and entrepreneurial experience and new ideas, learn from each other, and form a high-quality full-time instructor team. Specifically, the following two methods can be used: (1) regularly carry out work reports on innovation and entrepreneurship education. The work report is a way to effectively check the recent work progress of the full-time instructor and share the working process with others, and promote the communication between the full-time instructors. At the same time, through the work reports of others, they can continuously learn advanced theoretical knowledge and teaching methods of innovation and entrepreneurship education to improve their professional development. (2) The group building activity has been proved to be an effective way to enhance team collaboration and communication. Organize group building activities for full-time instructors regularly, promote communication among full-time instructors, increase the feelings and common vision among instructors, and build quality teams.

Establish a scientific and institutionalized evaluation and incentive mechanism. Establish a set of evaluation and incentive mechanism applicable to full-time instructors, and set reasonable quantitative evaluation indicators in annual evaluation, appointment evaluation, workload calculation, performance salary and title evaluation, etc., to provide scientific and reasonable institutional guarantee for full-time instructors of innovation and entrepreneurship education. Establish a scientific evaluation system which is mainly based on students, with actual results of innovation and entrepreneurship, such as contest awards, etc., as the supplement, led by management departments, and supervised by experts. At the same time, in order to enhance the enthusiasm of full-time instructors, certain rewards should be given to those instructors who have outstanding work performance and good evaluations.

Summary

Instructors are very important in innovation and entrepreneurship education. By analyzing the current problems in innovation and entrepreneurship education, we give suggestions for setting up full-time dual-innovation instructor positions, and explore the construction model of full-time instructor teams. Relevant work can provide reference for the research on the development mode of instructors in innovation and entrepreneurship education.

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