Research on the Construction of Creativity Training Course in Universities in the Age of Innovation and Entrepreneurship

Xi-rong GAO, Yu TAN and Shi-yuan LI

School of Economics and Management, Chongqing University of Posts and Telecommunications, Chongqing, China

*Corresponding author

Keywords: Creativity training, Course construction, Innovation and entrepreneurship.

Abstract. Based on literature review and practical experience, this paper sorts out the current situation of innovation and entrepreneurship education in universities and finds that students' creativity training courses are generally lacking. In this way, the mode of creativity training course including student-class organize mode, creativity training technical mode, creativity inspiration mode and creativity effect evaluation mode was designed. The effectiveness of this course mode in the cultivation of students' innovative ability was verified through the application of real cases. The research results provide a reference for the design of innovation training courses in universities.

Introduction

Innovation is the primary driving force for development and also the strategic support for the construction of a modern economic system. Only by taking the path of independent innovation and relying on innovation to drive development can we build China into a modern, prosperous, democratic country. Over the past 40 years of reform and opening up, China has gradually reduced the technological gap with developed countries through the technology introduction and marketization reforms. Relying on the innovative development paths from imitative innovation, integrated innovation, and independent innovation, China has reached the leading edge of the world in the fields of high-speed rail, communications, and the Internet. Under such circumstances, developed countries are bound to strengthen technological blockade against China in order to prevent China from catching up so as to maintain its leading edge in technology. Therefore, only by taking the road of independent innovation and implementing the development strategy of innovation driven, can we break through foreign technology monopolies in key areas and eventually achieve full-scale technical overtaking.

Innovation-driven development requires a huge reserve of innovative talent as a support, but the current higher education system is still unable to undertake the task of independent innovation. For universities, it is necessary to further promote innovation and entrepreneurship education, and constantly enhance students' innovative spirit, entrepreneurial awareness, and innovation and entrepreneurship to provide talent and intellectual support for national innovation-driven development [1,2]. Innovation comes from creativity. The training of students' awareness of innovation and entrepreneurship should be taken to the training of creative ability. The construction of innovative and entrepreneurial course should be the first of the creativity training courses. Creativity training refers to the process of cultivating students' creativity and encouraging them to create creative ideas. The construction of creativity training courses helps to systematically improve the course system of innovative entrepreneurship education in universities, effectively train students' creative thinking ability, and provide an endless supply of talents for our country's independent innovation and development.

Accordingly, combined with the authors’ years of research and teaching practice, the present situation of College Students' innovation and entrepreneurship education is combed, and then the creativity training course construction mode of universities is designed.
The Defects of Innovation and Entrepreneurship Education Course Construction

In January 1997, the Tsinghua Science and Technology Association, which aims to motivate people’s entrepreneurial awareness, entrepreneurial spirit, and entrepreneurial quality, was established at the Tsinghua university's graduate organization of the computer department. It can be considered as the beginning of entrepreneurship education in Chinese universities [3]. Currently, Chinese universities have carried out a variety of explorations in the course construction of innovation and entrepreneurship teaching, and have achieved many successful practices. However, there are still some problems in the construction of innovative entrepreneurship course.

The Teaching Mode of Innovation and Entrepreneurship Education Is not Reasonable Enough

Although universities have set up some innovation and entrepreneurship courses, most of them only adopt teaching methods to teach and only focus on theoretical knowledge education. The form of one-way communication between teachers and students leads to the lack of enthusiasm and initiative in students' learning, and lacks the space for independent thinking, which weakens innovative thinking and is not conducive to the formation of students' awareness of innovation and entrepreneurship. The practical course only emphasizes the students' hands-on training. The methods and skills, conveying a kind of empirical procedural knowledge. Students only imitate the teacher's movement skills, rarely break stereotypes or try to use other methods to solve the problem, and also lack the spirit of questioning, which objectively limits the students' creative thinking and the cultivation of creativity [4].

The Course of Innovation and Entrepreneurship Education Needs to Be Improved

At present, the course setting for innovation and entrepreneurship education in domestic universities is still in a downstream state and lacks rationality. Most of the innovative and entrepreneurial education courses are drawn from the corresponding courses of foreign universities. The courses cover many aspects such as enterprise establishment, investment and financing, marketing, management, etc. The key courses include “entrepreneurial foundation”, “entrepreneurial opportunity identification” and “enterprise leadership” and so on [5]. The survey found that the development and design of innovative entrepreneurship education courses are scattered and limited in number. In addition, there is a lack of mutual penetration among the various courses in different disciplines and the number of basic courses and practical courses is very small [6]. The innovation and entrepreneurship courses in various universities are lack of related courses on the training of students’ innovative ability, and cannot meet the needs of the present stage of social development for the innovative and entrepreneurial talent.

Creativity Training Course Mode Design

In view of the problems in the educational mode and course setting in Universities, combined with the advantages of brainstorming in creativity training and the authors’ optimization research on offline and online brainstorming, the creativity training course of college students based on brainstorming is put forward. The course, with the core of college students' innovation ability training, will focus on the entire process of creativity training and teaching. The corresponding course mode will be designed from four aspects: organization, technical, inspiration and effect evaluation. The overall design is illustrated in Figure 1.
Student-Class Organize Mode

Brainstorming-based creativity training is not a training of individual students' creative abilities, but a group creativity training for creative classes, relying on the collective wisdom of groups. Therefore, the design of creativity training course mode should be first designed and planned for its organize mode. Specifically, it mainly refers to two parts: class atmosphere building and training team building including the grouping of members and team size.

I) Student training team building

The implementation of creativity training course is aimed at a team, and the team is composed of a number of members, so the group selection of creativity training objects is crucial to the effect of creativity training. The grouping principles of creativity training mainly include students' familiarity with the discussion topics and the relationship between students. Combining the experience of online and offline brainstorming experiments, students can be grouped by selecting students who are more familiar with the discussion topics and also familiar with each other in order to maximally train students' innovative ability.

This grouping approach is based on two considerations. First, students are familiar with the discussion topics can reduce related coaching and presentations, making creativity training smoother and easier to generate a lot of valuable ideas in the discussion process. Members are also easier to absorb, understand, and achieve the effective collision of creative sparks among members, thereby enhancing students' creativity training and teaching effects. Second, the mutual familiarity between members makes the discussion atmosphere more relaxed and more enjoyable. This also makes creativity training among members more efficient.

The development of creativity training course is based on a team of creative members composed of several members. The cooperation of multiple members is superior to individual thinking. But when the members reach a certain level, the effect will be reduced. That is to say, as the number of members increases, the creativity training effect will reach a peak, and then the effect begins to decrease after the peak. Therefore, the number of teams should be kept at a certain scale. If the number of people is too small, so that members do not have enough thinking sparks in the creative process, and cannot achieve a good synergy effect, which cannot produce enough creativity; the excessive number of team members will aggravate the social loafing, so that the members are inert in creative production. Combined with offline and online brainstorming optimization results, the offline brainstorming group can get the best results when the number of people is 7-9, and the online brainstorming can get the best effect among 15-20 members [7,8].

II) Class atmosphere building

The formation or inspiration of creativity is the thinking product of human brain, and thinking is also influenced by a variety of internalities such as experience, background, knowledge, etc., externalities such as the environment and the atmosphere. The internalities cannot be changed in a short term, but the externalities can be created through the design of the creativity training course.
mode. Atmosphere is a wonderful soil for creativity. It can nurture and inspire more creativity and maximize the creative potential of members. Concretely speaking, in the process of creativity training, the first is to create a relaxed, harmonious, pleasant and free atmosphere through the use of technology, art, animation and so on. Second is to inspire the creativity of members by reduce the evaluation apprehension by control the teachers' excessive participation.

Creativity Training Technical Mode

The development of creativity training is the core link in the construction of creativity training course, and is also the proof of the effectiveness of the creativity training mode. The effectiveness of brainstorming has been validated in conjunction with the optimized use of offline and online brainstorming modes. Therefore, a brainstorming-based creativity training technical mode will be developed in an offline and online manner and the specific implementation process of the course will be designed.

I ) Creativity training technology combination

The traditional brainstorming can make participants engage in direct discussion and communication face-to-face, ensured the timeliness of creative sharing and the convenience of discussion, maximized the collision of creative sparks among the members. This kind of brainstorming is also accepted by the majority of users and used in all walks of life. However, with the rapid development of mobile Internet, it has become necessary to integrate creativity training course with mobile Internet and carry out creativity training that combines online and offline. The combination of offline and online training is an effective way to encourage students to participate fully in teaching and achieve better teaching results. Offline group discussion was conducted in class, and instant messaging platforms such as WeChat are used for online discussion.

II) Creativity training process design

Based on the respective advantages of online and offline brainstorming, the creativity training mode is designed, and the order of use of offline and online brainstorming is determined according to the topics discussed. In general, taking into account the difference in the number of participants needed for the offline and online brainstorming, we should start with the online brainstorming. According to the discussion results, 7-9 members of the online brainstorming are invited to participate in the subsequent offline brainstorming. After the discussion of offline brainstorming was uploaded to the online discussion group, according to the degree of discussion, continued offline or online brainstorming. There are 3 key factors in offline brainstorming-based creativity training: team size, performance competition and time control to ensure the best training effect. In online brainstorming-based creativity training, the control of the members' attention, relevance, confidence and satisfaction should be observed in order to achieve the best training effect.

Creativity Inspiration Mode

The organizing mode of creativity training course is to effectively organize students, and the technical mode is for the effective implementation of creativity training course, while the creative inspiration mode is an effective guarantee for both. Creativity training based on any method needs to design effective incentive measures to promote and ensure the effective development of creativity training course.

I ) Relevance and incentive design.

The ARCS Model of Motivational Design Theory (According to John Keller’s ARCS Model of Motivational Design Theory, there are four steps for promoting and sustaining motivation in the learning process: Attention, Relevance, Confidence, Satisfaction) believes that establishing a correlation between a goal or a process and a member can fundamentally motivate the motivation and enthusiasm of the member to participate in the discussion. Incentives are an important means of establishing relevance between members and goals or processes. The traditional practice of using group wisdom to generate ideas is either lack of incentives or vague and uncertain incentives, which fails to create a strong correlation between the discussion of various participants and topics in the collection and stimulation of specific ideas, and thus can not motivate the members to participate in
the discussion passionately. Based on the teaching of this course, and the development process of offline and online brainstorming, the correlation established through incentives is mainly reflected in two aspects. First, through various material rewards in the process of online and offline brainstorming, the correlation between the discussion results or process and members is established, and they are encouraged to participate in the discussion. Second, through the selection and introduction of topics, the implementation and education of the creativity training methods, the incentive hints are established to enable the members to realize that participation in topic discussions can enrich their knowledge, and learning creativity training skills can enhance their innovation ability.

II) Sense of achievement and satisfaction design

According to the ARCS theory, a sense of accomplishment or satisfaction is the main influencing factor for members to participate in the next discussion. The development of creativity training course is not a single-step implementation. It involves multiple links and stages. Making the participants get a sense of satisfaction and achievement in the process of brainstorming is an important guarantee for the successful implementation of creativity training. The main sources of satisfaction and accomplishment are three aspects. First is to ensure that the participants have enough and equal opportunities to speak in the process of discussion, allowing each member to introduce and explain their ideas in detail; Second, on the basis of the establishment of the topic and their own relevance, through their own contribution to the discussion, to promote the in-depth or solution of the discussion, and then get the sense of achievement to solve the problem; The third is the implementation of the results. For any kind of discussion, the actual implementation of the discussion results, especially the usefulness of the implementation results, will give a sense of accomplishment to the participants in the discussion. Through these three ways, participants can gain a sense of accomplishment and promote the smooth implementation of creativity training.

Creativity Effect Evaluation Mode

The effect of creativity training is generally reflected in whether the final solution is formed, but it should not be used as the sole evaluation indicator. The creativity of the massive non-final scheme generated by the student discussion should also be included in the evaluation index of the creativity training effect. Therefore, the effect evaluation mode of the creativity training course will be designed from the aspects of creativity and member perception.

I) Creativity level evaluation

Whether it is brainstorming-based creativity training or other forms of creativity training, the practical application and theoretical research have reached two extremes in the evaluation of the results at the current stage: The practical application is to solve a specific problem and only pay attention to the formation of the final solution. The theoretical study explores the usefulness or ease of use of the method because it does not specifically solve the problem. Therefore, the number of creative ideas that are most easily quantified is used as an evaluation index. Both of them are unilaterally evaluating the results of creativity training, and their evaluation results are lacking in objectivity. Therefore, this paper also redesigned the evaluation mode of creativity training in the design of creativity training course. It is necessary to evaluate both the quantity and quality of ideas.

II) Member perception evaluation

Creativity training is in essence to stimulate students’ thinking and create creativity. Therefore, the result evaluation of creativity level is the most direct reflection of the training results. However, as the object of creativity training, the training of the students will also have some influence on them. Therefore, in addition to considering indicators at the creativity level, the evaluation of the effectiveness of creativity training course should also evaluate the students’ perceptions, including the perception of the creativity training mode and the creativity training results in order to obtain the effect of creativity training at the participation level of the participants.
Summary
The innovation and entrepreneurship education in universities is an important part of current higher education and an important way to cultivate students' innovative spirit and practical ability. At present, there are still some problems in the teaching mode and course setting of college students' innovation and entrepreneurship education courses, especially the lack of students' creativity training course. High-quality creativity is the foundation of success in innovation and entrepreneurship. Whether we can create good ideas is a direct manifestation of individual innovation ability. Therefore, it is necessary to systematically construct the creativity training course for college students, cultivate students' creative ideas, and enhance their innovative and entrepreneurial abilities. Creativity training course can be designed from the aspects of student-class organize, creativity training technical, creative inspiration and creative effect evaluation, and can be combined with the Internet to design innovative teaching methods so as to better enhance teaching effectiveness.

The research of this paper can provide reference for the construction of related courses in innovation and entrepreneurship teaching in Universities.

Acknowledgement
This research was financially supported by Graduate Education Teaching Reform Project of Chongqing City in 2016(YJG20163071), Education Science in “13th Five-Year” Planning project of Chongqing City in 2016(2016-GX-006).

References