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Research Article

Research on Building a Practice Platform for Innovation and Entrepreneurship in Mechanical Industrial Design

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Abstract: In order to solve the problems existing in the innovation and entrepreneurship in mechanical industrial design, a series of approaches are proposed, so as to build a practice platform for innovation and entrepreneurship which adapts to market demand and could promote the development of comprehensive quality. In this research, the problems existing in the innovation and entrepreneurship in mechanical industrial design are analyzed in detail. Then a series of approaches are proposed including establishing the scientific curriculum system for innovation and entrepreneurship in mechanical industrial design, establishing practice base for innovation and entrepreneurship in mechanical industrial design, improving the professional level of instructors troops for innovation and entrepreneurship, creating a cultural atmosphere and strengthening the innovative consciousness and entrepreneurial spirit, establishing a sound reward mechanism of innovation and entrepreneurship and building a network platform for innovation and entrepreneurship, which will certainly have a profound theoretical and practical guiding significance. On this foundation, the research conclusion on building a practice platform for innovation and entrepreneurship in mechanical industrial design is done.

Keywords: Innovation and entrepreneurship, mechanical industrial design, practice platform

INTRODUCTION

The innovation and entrepreneurship training in China originated from the reform and openness in the late 1970s of the last century. As the member of the "entrepreneurial training" project of the United Nations educational, scientific and cultural organization, our country pilots entrepreneurial training in basic training stage as early as 1991, but the innovation and entrepreneurship training in colleges and universities started rather late. The entrepreneurship plan competition held by Tsinghua University in 1997 is the beginning of implementing entrepreneurial training in colleges and universities in China (Zhu, 2012). The decision on deepening education reform and comprehensively promoting quality education released by the State Council of the People's Republic of China in 1998, pointed out that the higher education should attach importance to cultivating students' innovative ability, practical ability and entrepreneurial spirit. In 1999 in the conference of national education work, comrade Jiang Zemin and Li Lanqing pointed out respectively that it should help the educators to cultivate the innovative consciousness, the entrepreneurial consciousness and the entrepreneurial ability and that it should explore the effective ways and the corresponding policies and measures of encouraging college graduates to become self-employed. In 1999, the plan of education revitalization action of facing the 21st century made by the Ministry of Education completely puts forward the concept of entrepreneurial training and points out that it should strengthen the entrepreneurial training to teachers and students and encourage them independently to found high-tech enterprise. In 2002, the Tsinghua University and other 9 colleges and universities are identified as the pilot colleges and universities to carry out the innovation and entrepreneurship training by the Ministry of Education, which marks the official launch of the innovation and entrepreneurship training in our country (Wang and Gao, 2012). Right until today, many schools carry out the innovation and entrepreneurship training using the form of the second classroom. School such as East China Normal University opens the entrepreneurial training course and Donghua University opens the elective course of entrepreneurship and venture capital, etc. The innovation and entrepreneurship has more and more become the focus of the social common concern (He, 2012).

"Innovation is the soul of progress of a nation and is the driving force for the prosperity of a country" (He, 2012). Throughout the development history of the motherland, the science and technology is strong and the country is strong, but the vitality of the development of science and technology derives from innovation. Current international competition is the competition of overall national strength, of which the essence is the competition of science and technology and talent, while building an innovative country and improving the level of science and technology need to cultivate a large number of talents who have innovation and

entrepreneurship ability (Zhang *et al*., 2010). Industrial design especially mechanical industrial design is an important link of national innovation and entrepreneurship system. Mechanical industrial design students not only have strong ability in science and technology, but also have good ability in art and design. They are especially suitable for making innovation and entrepreneurship. Data shows that the highest success rate in innovation and entrepreneurship among national college students belongs to industrial design students.

Mechanical industrial design students' innovation and entrepreneurship ability is relatively strong and theoretical foundation is solid and professional knowledge is broad and computer and foreign language level are all higher, but there is a widespread weakness that beginning ability is poor and engineering practice knowledge is lacking (Zhu, 1999), which shows that combining theory with practice in mechanical industrial design, especially the innovation and entrepreneurship practice is relatively weak. Strengthening the practice link of innovation and entrepreneurship in mechanical industrial design and enhancing the relationship between theory and practice is the only way to perfect the development of mechanical industrial design. So, it is imminent to build a practice platform of adapting to market demand and promoting the development of comprehensive quality for innovation and entrepreneurship in mechanical industrial design.

This study puts forward the series of approaches to building a practice platform for innovation and entrepreneurship in mechanical industrial design. Its purpose is to solve the problems existing in the innovation and entrepreneurship and make students become the new type industrial design talents which have the strong practice ability, the reasonable knowledge structure and the solid theoretical basis and satisfy the demand of employing unit in the market.

THE PROBLEMS EXISTING IN THE INNOVATION AND ENTREPRENEURSHIP IN MECHANICAL INDUSTRIAL DESIGN

Curriculum lacking scientificalness: Although society and university all realize the important significance of making innovation and entrepreneurship training and also carry out the training in practice, what is undeniable is that the innovation and entrepreneurship training has not been better implemented and supported in the whole training plan of mechanical industrial design. Many innovation and entrepreneurship training curriculum of mechanical industrial design is not science, singly. It could not be combined with the professional course learning closely. Even some universities only do the image project in carrying out the innovation and entrepreneurship training. It has not much substance content. The innovation and entrepreneurship training is basically free from the traditional normal training and mostly carries through amateur guerrilla training using after school practice, which could not effectively improve students' knowledge and skills in innovation and entrepreneurship and at the same time also affects the enthusiasm of students carrying through the innovation and entrepreneurship (Zhu, 2012).

Lack of practice base for innovation and entrepreneurship: Most of mechanical industrial design majors even do not have their own practice factory on campus. They only rely on the practice factory of mechanical engineering and automation or some other majors and have to use their equipments, which are completely not suitable for the industrial design students. A lot of good ideas of the students cannot be realized and they can only decide the students practice items by the function of the equipment. It certainly will result in lack of the ability of innovation and entrepreneurship (Zuo and Chen, 2013).

In addition, outside campus, it's really hard for mechanical industrial design major to find a right practice unit, especially in the Northern part of China. So they have no choice but to do innovation and entrepreneurship practice with other mechanical students to manufacturing enterprise. Due to the largest number of students, students can only go through the motions in the process of practice, so that the practice becomes sightseeing (Peng, 2008).

The weak instructors troops: Mechanical industrial design major is mostly put in the mechanical department. The Most of teachers of instructors troops are turned from the teachers of mechanical and electrical department and a few teachers come from the department of art design. While the teachers turned from mechanical and electrical department have not systematically learned industrial design and have also not engaged in design work, so it lacks of pertinence to guide the innovation and entrepreneurship practice; the teachers coming from the department of art design have not learned mechanical courses, thus it appears powerless to guide the innovation and entrepreneurship practice, leading to the bad effect of the innovation and entrepreneurship.

Lack of the cultural atmosphere for innovation and entrepreneurship: The innovation and entrepreneurship training can hardly do without the support of social and campus environment. At present, the innovation and entrepreneurship training has not yet created the cultural atmosphere for innovation and entrepreneurship. National culture, family culture, enterprise culture and campus culture have not yet given the leading connotation of innovation and entrepreneurship. The enthusiasm and efficiency of enterprise participating in the innovation and

entrepreneurship training is not high and the costs and is not clear, so it is difficult to deeply carry out university-enterprise cooperation. The lack of innovative culture and the low social participation restrict the innovation and entrepreneurship training to carry out (Liu, 2012).

THE APPROACHES TO BUILDING A PRACTICE PLATFORM FOR INNOVATION AND ENTREPRENEURSHIP IN MECHANICAL INDUSTRIAL DESIGN

Establishing the scientific curriculum system for innovation and entrepreneurship in mechanical industrial design: Curriculum system plays an important role in the innovation and entrepreneurship training. Systematic and scientific curriculum system for innovation and entrepreneurship could effectively improve the consciousness and ability for innovation and entrepreneurship of students (Zhu, 2012). So, we should reform the traditional training mode, adding the courses about the innovation and entrepreneurship training of mechanical industrial design, enriching students' theoretical knowledge about the innovation and entrepreneurship and establishing the scientific and reasonable curriculum system for innovation and entrepreneurship in mechanical industrial design.

Firstly, it should set up the three platforms of the innovation and entrepreneurship training, the innovation and entrepreneurship practice and the entrepreneurship incubation and then set up the course carriers on the three platforms respectively (Oyetunji, 2009). Among them the course carriers on the platform of the innovation and entrepreneurship training are the theoretical teaching, the activities, the innovation and entrepreneurship training and the cultural festival of innovation and entrepreneurship; the course carriers on the platform of the innovation and entrepreneurship practice are the practice base for innovation and benefits boundary of university-enterprise cooperation entrepreneurship in or out of schools and the college students' scientific research project; the course carriers on the platform of the entrepreneurship incubation are the entrepreneurship garden of undergraduates, as shown in Table 1. After that, it should arrange the course contents in a different way (Jia, 2012). The course should arrange real and meaningful contents, avoiding empty ones. It could arrange these contents in the form of carrying out theoretical teaching, such as the lecture hall for innovation and entrepreneurship, the hero collect of innovation and entrepreneurship and the salon for innovation and entrepreneurship, etc., to show the entrepreneurial spirit, entrepreneurial method, entrepreneurial process and law of successful entrepreneurs; it could also arrange these contents in the form of holding activities, such as the summit forum for innovation and entrepreneurship, the seminar for innovation and entrepreneurship, the report for innovation and entrepreneurship of outstanding students, the lecture of entrepreneurial successful people, the lecture of entrepreneurial experts and the lecture of famous industrial designers, etc., to make entrepreneurial successful people carry through face to face communication with students, helping students to analyze the causes of entrepreneurial success and failure and providing theoretical guidance for students and to let famous industrial designers teach students how to make product design, etc., as shown in Table 2.

Establishing practice base for innovation and entrepreneurship in mechanical industrial design: Firstly, the mechanical industrial design major must establish the practice factory for innovation and entrepreneurship which has its own professional characteristic on campus and lets students enter into the factory to learn various practical skills after learning certain theoretical knowledge about innovation and entrepreneurship (Cheng and Jiang, 2010).

Table 1: The course carriers for innovation and entrepreneurship in mechanical industrial design

Three platforms	Course carriers
Innovation and entrepreneurship training	Theoretical teaching, activities, innovation and entrepreneurship training and cultural festival of innovation and entrepreneurship
Innovation and entrepreneurship practice	Practice base for innovation and entrepreneurship in or out of schools and college students' scientific research project
Entrepreneurship incubation	Entrepreneurship garden of undergraduates

Table 2: The course contents for innovation and entrepreneurship in mechanical industrial design

Forms	Main contents
Theoretical teaching	Lecture hall for innovation and entrepreneurship, hero collect of innovation and entrepreneurship and salon for innovation and entrepreneurship, etc.
Activities	Summit forum for innovation and entrepreneurship, seminar for innovation and entrepreneurship, report for innovation and entrepreneurship of outstanding students, lecture of entrepreneurial successful people, lecture of entrepreneurial experts and lecture of famous industrial designers, etc.
Mentor guidance of innovation and entrepreneurship	Defense meeting of innovation and entrepreneurship teams and discussion meeting of innovation and entrepreneurship project, etc.
Cultural festival of innovation and entrepreneurship	Career planning competition, industrial product design competition, "innovation and entrepreneurship cup" college students debate and poetry recitation contest, etc.
Innovation and entrepreneurship training	Consciousness training for innovation and entrepreneurship, entrepreneurship simulation training, product design process training, diathesis developing training for innovation and entrepreneurship and management training for innovation and entrepreneurship teams, etc.

Secondly, it could also set up the cooperative practice base for innovation and entrepreneurship outside campus, which relies on the college, establishing the cooperation relations with surrounding related enterprise. But mechanical industrial design major and art industrial design major are entirely different. It not only requires students to understand the whole process of designing, but also to understand the mechanical internal structure, to know certain processing technology and process. Therefore the outside cooperative base for innovation and entrepreneurship should be established with two types of enterprises and one type is the manufacturing enterprise in which students could learn certain processing technology and process; and the other type is industrial design enterprise or the manufacturer related to industrial design in which students could know the whole process of designing. For some areas in which the industrial design enterprise or the manufacturer related to industrial design is rare, such as the north of China, schools should change ideas, based on long-term considering, trying to lead students to the industrial design enterprises of developed city to visit and practice. Industrial design students must broaden their horizon and have a good grasp of the latest things and only in this way can they better carry through innovation and entrepreneurship (Jiang and Cheng, 2013).

Improving the professional level of instructors troops for innovation and entrepreneurship:

- It should encourage teachers to walk out of the campus, entering enterprise to learn, so as to improve teachers' practice ability. Because the industrial design itself is a strongly practical subject and if the teachers do not experienced a lot of practice, it is very difficult to teach well the course of innovation and entrepreneurship. And it can be tried to rotate post between the teachers and the engineering and technical personnel or the designers of enterprise, such as to not only train teachers, but also let the engineering and technical personnel or the designers who come from the first manufacturing line and have rich practice experiences carry out more intensive interpretation for students, killing two birds with one stone.
- According to the characteristics of mechanical industrial design major dabbling multi-disciplinary, the existing teachers are put into two categories respectively, one kind is engineering and the other kind is the art. It is necessary to strengthen professional communication between two kinds of teachers, organizing mutual classes, learning from each other and trying to shorten the gap between the two disciplines (Jiang, 2011).

Creating a cultural atmosphere and strengthening the innovative consciousness and entrepreneurial spirit: The formation of innovation and entrepreneurship idea could not fully rely on the traditional training activities, but need the long-term edification of campus culture and enterprise culture. It not only needs the correct guide of school, but also needs the active cooperation of student. To the mechanical industrial design major, it must make the transition from the pure knowledge training, employment training to the comprehensive quality training of innovation and entrepreneurship in the managerial guiding ideology and gradually build the new training idea of taking the innovation and entrepreneurship practice as the core. The main body of innovation and entrepreneurship practice is still student and how to change students' concept of traditional learning and employment is the key of the success or failure of the innovation and entrepreneurship. Therefore, schools should make full use of campus network, radio, window and other propaganda position, to increase publicity, establish model, build the atmosphere of innovation and entrepreneurship on campus, let students feel the innovative consciousness and entrepreneurial spirit since enrolled and encourage students to become self-employed. It may also employ well-known industry experts and entrepreneurs as the visiting professor to regularly hold the special lecture on entrepreneurship for students. It could motivate students' consciousness of innovation and entrepreneurship through their precept (Ding *et al*., 2009).

Establishing a sound reward mechanism of innovation and entrepreneurship: To motivate and encourage college students to do innovation and entrepreneurship, schools should set up "special scholarship to do innovation and entrepreneurship", rewarding students and teachers for outstanding contribution in the aspect of innovation and entrepreneurship. It should offer certain spiritual and material rewards to the students and teachers who do well in innovation and entrepreneurship or achieve excellent result in taking part in the national innovation and entrepreneurship competition (Eludire, 2011). Only perfect reward mechanism can attract more teachers and students to participate, can make more and more innovation and entrepreneurship talents stand out and can inspire college students' enthusiasm of doing innovation and entrepreneurship (Zhang *et al*., 2010).

Building a network platform for innovation and entrepreneurship: Many British universities actively build network platform for innovation and entrepreneurship and achieve very good effect, which is worth our learning and lessons. Building a network platform to connect politics, production, learning and research and drawing support from the effective and economic means internet to integrate all kinds of resources in or out of schools and set up the information sharing and information exchange mechanism of

multiple parties including university, entrepreneurial college students enterprise, society and others (Rad *et al*., 2012), could provide effective support and guidance for students' innovation and entrepreneurship activity.

CONCLUSION

The innovation and entrepreneurship has an important significance to improving mechanical industrial design students the professional literacy and ability of integrating theory with practice, but building the practice platform for innovation and entrepreneurship is a difficult task. Aiming at the problems existing in the innovation and entrepreneurship, subject group carries on the thorough research and proposes a series of approaches, aiming to build a practice platform for innovation and entrepreneurship in mechanical industrial design which adapts to market demand and promotes the development of comprehensive quality, thus making students become the new type industrial design talents which have the strong practice ability, the reasonable knowledge structure and the solid theoretical basis and satisfy the demand of employing unit in the market.

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