

Reflections on the Problems of College Students' Innovation and Entrepreneurship in Design*

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Abstract—Innovation, creation and entrepreneurship (ICE) are important national policies for the Chinese government to guide economic development. The students of industrial design major have the advantage of design thinking in the innovation activities, that is, the design is the creative activity. Therefore, for the design college students, engaging in innovation, entrepreneurship and creation have their own professional characteristics. And the corresponding talent training methods for students are also different from the requirements of general science and engineering majors. However, there are some problems in the education methods that guide students to innovate and start a business. These problems have hindered the efficient implementation of "ICE", resulting in corresponding problems in the cultivation methods, such as lack of understanding and unreasonable curriculum settings. This paper discusses the ways and methods of industrial design for college students in innovation and entrepreneurship, and clarifies the misunderstandings. The aim is to remind teachers who are engaged in entrepreneurship education to pay attention to these problems, so as to guide design college students to correctly treat the "ICE" problems. In short, combining the professional characteristics with the realistic conditions is the necessary precondition for entrepreneurship education in design. We should take the use of the creative characteristics of design. Besides, reasonable educational methods to solve the problems are effective ways to cultivate design entrepreneurial talents.

Keywords—*industrial design; college students; innovation; entrepreneurship; education*

I. INTRODUCTION

Innovation, creation and entrepreneurship are the main theme of the times. Entrepreneurship is one of the compulsory courses for undergraduate education. School education must be combined with the general direction of the country's development policy. This is a general trend that we must recognize in the higher education sector. In the latest government work report, Premier Li Keqiang pointed out that innovation should support and lead the optimization and upgrading of the economic structure [1]. Innovation should be used as an engine to drive the overall development, and promote the integration of cultural creativity and design services with related industries. In this context of innovation

and entrepreneurship, how do we face the problems and what countermeasures we can make in the process of college students' innovation and entrepreneurship, which has practical significance in the future.

II. THE NECESSITY OF INNOVATION AND ENTREPRENEURSHIP EDUCATION

For most people, innovation is not innate. Although there are a large number of successful entrepreneurial cases, if you carefully study the success of their careers, you will find that most successful people find a way out after a lot of failures. As Mr. Ren Zhengfei, the founder of Huawei, said, it is all suffering behind the greatness [2]. Drucker's theory of innovation system tells us that innovation does not require genius, but requires training, continuous efforts under the "innovation formation mechanism" (principles and conditions of innovation) [3], the formation of innovation results is only a matter of time; the principle of innovation is mainly There are three aspects: social practice, the principle of leading future development and the rational principle of innovative subject [4]. Drucker's theory tells us that anyone can gain innovative ability through education. College students are the best time to accept entrepreneurship education, especially for industrial design students. Their ability to innovate is directly related to the quality of national survival. Higher education is a crucial place for learning and entrepreneurship. If you grasp this position, it will play a good role in the training of college students in innovative thinking and training of innovative design capabilities. Therefore, innovation and entrepreneurship are the capabilities that can be obtained through education. It is not only urgent but necessary for college students, and entrepreneurship education is the best way to achieve this goal.

III. DESIGN INNOVATION AND ENTREPRENEURSHIP

More innovation in enterprise is design innovation. As we all know, the original meaning of design is creativity, innovation, and it is methodology. American management scholar Drucker: The innovation of most successful companies is not necessarily related to technology [5]. According to the definition of modern economics, innovation is to provide consumers with new product value and new services by changing the original. Technological innovation

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is important, but most success stems from change (design innovation). In the design world, Mr. Liu Guanzhong, the father of China's industrial design, said: "The historical change from "Made in China" to "Created in China" is an important national goal" [6]; Compared with the invention of science and technology, the design puts the innovation results into practice and forms a new production capacity [7]. Practice is the cornerstone of innovation. According to Drucker's innovation theory, innovation must be combined with practice. Applying to the training of design professionals and teaching activities is the combination of design and practice (entrepreneurship).

Entrepreneurship is an advanced stage of innovation practice and the ultimate goal. It is a concentrated test of the comprehensive abilities acquired by college students during their studies at school. In the teaching plan, students are required to propose new ideas, new techniques, new materials, new programs, new designs, etc., and put them into practice, which belongs to the category of innovative practice. Innovative practice refers to those of knowing the world and transforming the world more effectively than previous practices through new discoveries or new applications of the laws, attributes, and relationships of things [8]. The entrepreneurial ability of design students is not only the design innovation itself, but also the ability to put it into practice further. This requires students to have the background of broad knowledge, the humanistic literacy and insight as the guide, the ability to coexist with vision and courage. Entrepreneurial-oriented design innovation is not the level of homework training. It should be non-virtual. It must be a real attempted behavior and has the practical significance of promoting social progress.

In summary, the relationship between design innovation and entrepreneurship is those between the front and the back. Design innovation is the foundation. Design entrepreneurship is the realization of innovation. Integrating goals and means is the sublimation stage of design innovation. Design and entrepreneurship education directly affects the success or failure of higher education institutions. New design and entrepreneurial talent training model is the only way to answer the question of Qian Xuesen.

IV. THE WAY TO IMPLEMENTING INNOVATION AND ENTREPRENEURSHIP EDUCATION

Industrial design, product design and other design majors are innovative disciplines. Compared with other engineer disciplines, the direct promotion for social and economic development is more obvious [9]. Design itself is innovation, and design has strong practicality, which makes design is a practice behavior in a certain sense. In his theory about practice, Chinese leader Mao Zedong once said that "the best way to learn war is in war [10]". The meaning of this sentence applies to the education of design entrepreneurship, is that to learn design entrepreneurship students should be in the practical platform or the design and practice base provided by the surrounding companies. Therefore, the best way to design entrepreneurship education is entrepreneurial practice.

It is the responsibility of our higher education workers to explore an educational model that enables university students to demonstrate their skills. The teaching of innovative entrepreneurial theories and methods is important, and the cultivation of entrepreneurial spirit is the core goal. The cultivation of entrepreneurship lies in guiding and demonstrating. And encouragement is inseparable from the corresponding innovation and entrepreneurship practice platform. The platform is an indispensable stage to showcase innovative and entrepreneurial talents. With platform design innovation and entrepreneurship and its educational activities, there is support for innovation and entrepreneurship on the platform. Pioneer and successful people can play a good demonstration effect and form a wave of innovation and entrepreneurship. China's current national policy is shifting from manufacturing to intellectual creation. It is becoming a big design country. The innovation platforms around the world are springing up. Guangzhou, Foshan, Shenzhen and other places have established national industrial design and entrepreneurship bases, such as Guangdong Province. Design City, Shenzhen 518 Creative Industry Base, etc., the eagerness for designing innovative talents is very urgent. The governments in these places also attach great importance to the construction of entrepreneurial platforms. It is imperative that universities and colleges carry out design entrepreneurship education effectively connect with these platforms.

V. THE MAIN PROBLEMS OF STUDENTS' INNOVATION

Judging from the enthusiasm of the students participating in the various design competitions held by the current school, the results of the competition reflect that the students' general sense of innovation is not strong, and there is a clear lack of self-confidence. They have never thought of engaging in entrepreneurial activities in the future. In the long-term learning career, what they do more is waiting for the teacher's instructions, rather than actively seeking opportunities. Worrying that the innovation will be laughed at by others, most students worry about the consequences of failure. Innovative consciousness is a new concept that can break through old thinking and open up new situations. Entrepreneurship requires exploration activities that can consciously and actively carry out new ideas, new models, new technologies and new designs. It must be driven by a high degree of innovation and consciousness. Under the circumstance, it is done strategically according to a certain program or mechanism. Due to the shortcomings of the current education system, the lack of necessary risk-taking spirit, the lack of innovation and entrepreneurship enlightenment education, the influence of the conservative effect of traditional culture, and the misleading caused by the orientation of exam-oriented education, the result is that students only follow the instructions of examination for a long time. There is a lack of originality and no subjective initiative. This situation needs to be changed urgently.

It lacks basic conditions for innovative practice provided by the school and the attention to the latest developments in design science. For example, industrial design needs to practice new technologies, new materials, and new processes

at the forefront of the era. This professional student is in great need of an understanding of the most cutting-edge situation in the industry. Industrial design is a typical interdisciplinary subject. Its knowledge structure involves sociology, folklore, engineering, science, mechanics, electronics, materials, etc. The deep integration of various disciplines is often associated with a design project. In today's rapid development of knowledge explosion, a lot of new knowledge, new technologies, and new designs would be created. If students are not paying attention to the interdisciplinary knowledge development trend, in the narrow and even closed learning environment, what they have learned can only be some outdated knowledge. By rotting, they would not master the essentials of knowledge, let alone the sense of innovation, just satisfied with the existing knowledge structure, such talents cannot have any impulse to start a business, and do not have the skills reserve and quality requirements of entrepreneurship.

There are great problems in the way of talents are evaluated. There is a lack of innovative atmosphere in the way of teaching thinking, and lack of tolerance and encouragement for innovation. For a long time, the method of talent evaluation based on the test scores and the result is a distortion of the teaching way of thinking. The current cramming teaching method in the school has formed a stubborn test-centered learning style. Taking the level of enrollment as the assessment standard, teachers are forced to inculcate knowledge rather than use independent thinking innovation as a teaching method. The so-called talent concept Most of them are measured by the level of the scores. Students are accustomed to following the study because they are afraid of denied by the teacher. The backward teaching concept and some superficial forms of innovative teaching methods have made the Chinese college students form a lifelong dependence on the system to get a civil servant or it is to find a stable and comfortable work as their ultimate goal. Such Students lack of professionalism and ambitious strategic vision to keep up with the tide of international competition.

There are not enough opportunities for college students for social practice. The general practical skills are not strong too. And there is no mechanism for the corresponding innovations to be transformed into products or businesses. The number of experienced teachers is insufficient. Due to the backwardness of the school-running forms of most design institutes, inadequate facilities, and insufficient links between the teaching practice and the society, students have limited opportunities to implement theories combined with their practice. The design goals are often some virtual topic in current stage. It has a great deviation from the actual needs of the society, which has affected the training of students' social practice skills, and the corresponding innovation results are difficult to transform.

The above is the summary of the current college students' entrepreneurial problems in design, reflecting the serious lack of entrepreneurial awareness of some students, and also reflects the shortcomings of the talent training model in college design education. The situation of China's economic and industrial transformation and upgrading has forced the

reform of the training target of innovative talents. The cultivation of innovative talents is in urgent need of an innovative education model. Taking the combination of entrepreneurial awareness, entrepreneurship and innovation ability as a breakthrough, it is not only the inherent need of designing innovative talents, but also the need to respond to the country's call for innovation and entrepreneurship to promote social and economic development. In the face of the new economic development trend, the innovation and entrepreneurship of design talents must closely adapt to this situation and adapt to the needs of the times. Only in this way can it be available to find the positioning of talent training objectives.

VI. ANALYSIS OF THE ROOT CAUSE OF THE PROBLEM

The premise of entrepreneurship is innovative practice, and the current situation is not satisfactory in design-based professional innovation practice in China's colleges.

There are not many entrepreneurial courses in the curriculum system of colleges and universities. This is almost a common phenomenon. It is related to the absence of a corresponding teacher, or the teachers lack relevant entrepreneurial experience. It's not convincing to take a business case from a book, because it is not enough to stimulate students' enthusiasm for innovation and entrepreneurship. The existing internship and training courses are mostly the verification of the inherent knowledge, far from innovation. Because the disconnection from social needs, the lack of bridges with social connections, it is difficult to form an atmosphere of entrepreneurship by such training.

The problems on Faculty serving as entrepreneurial education is also exist. Due to some historical reasons, some of the teachers were temporarily appointed and had no entrepreneurial experience. Some of the teachers are from school to school. They have no social tempering in the period. They have no attempt for entrepreneurship, and they have no courage to overcome the fear of risk, which leads the students to be cautious. To resolve this problem, it should be find the cause from the source of thought. Therefore, finding problems from the structure of the faculty and solving problems from the height of thought [11] is an important fulcrum for cultivating innovative talents.

Lack of a good atmosphere of industry-university-research cooperation, the situation is passive, and the awareness of creating opportunities is not enough. Most school teachers do not establish their own design studios. Some innovation opportunities are often made by companies, and only limited to teachers. Only a very small number of students can participate in these activities. This situation is obviously not conducive to most students' participation in social cooperation and innovation. Without training, innovation has lost its foundation. Therefore, it is necessary to establish an active social cooperation mechanism between companies and colleges and universities.

The content of curriculum in the teaching system is out of touch with the cultivation needs of entrepreneurial ability. Some art design colleges pay highly attention to hand-

painting, but the hand-painted function is put aside in the design practice. From a point view of technically, some of the relevant scientific knowledge required is also lacking. The design is an organic integration of art and science. It must be grounded and integrated with the surrounding industries. It is often seen that college students are complained by employers that graduates cannot solve any problems need resolved. We must first Introspect on whether our teaching system is in problem or not! The basic cause maybe lies in the deviation of teaching ideas about training objectives.

VII. MEASURES TO RESOLVE PROBLEMS

We should analyze the root causes of these problems, and formulate corresponding measures, finally find a good strategy for promoting design entrepreneurship education:

Teachers should to carry out the cognitive activities to enhance the teaching ideological, take the ICE goal (Innovation, Creation and Entrepreneurship) as the benchmark, start the in-depth discussion of the teaching plan and the training objectives. The guidelines here should be: Whether the rationality of the curriculum setting is conducive to design innovation, whether it is conducive to the connection with the needs of the industry in local, whether it is conducive to the smooth transition of students from school to society, whether it is conducive to the cultivation of tomorrow's economic leaders. It is necessary to determine the goal of talent cultivation, then reform the current teaching plan and adjust relevant curriculum. By aiming at entrepreneurship (following employment), teachers can promote students' initiative and clarify their learning motivation.

As a prerequisite for the cultivation of high-quality design talents, School should create a team of entrepreneurial instructors who can combine industry, education and research together. Teachers' entrepreneurial ideas will undoubtedly affect the students' thinking way. It is necessary to improve the structure of the faculty by introduce social forces. For example, school can invite business leaders and innovative successful people with practical work experience into the classroom, present their entrepreneurial stories, and influence students' entrepreneurial awareness with actual behavior. It is also necessary to eliminate students' fear of entrepreneurship and worry. School should encourage qualified teachers to participate in practical projects, and establish a platform for joint design and innovation between schools and enterprises. Also, Should enhance the construction of the teacher's studio. School should set up the studio for each professional teacher Followed the research direction respectively, cater for the work requirements and task objectives. Students could participate in the teacher's studio to study and research project to acquire credits so as to encourage themselves with enthusiasm and enhance their ability of effective innovation.

We can take the use of off-campus design practice bases. Practice is the only criterion for testing truth theory. Whether a student has the ability to complete the actual project consigned by the enterprise is a sole standard to test the

effectiveness of our teaching. The practice is an indispensable part of the teaching process. It integrates the actual project of the enterprise with the course in college. For the theory can truly links practice, school should strives to build a campus-innovative practice base outside the school. And actively develops new base beside of the consolidation of the existing practice base. Students design practice bases is an ideal place where students can actively seek opportunities to innovate internships. There are Countless reasons to strengthen cooperation with various industry associations and design industry bases. Students should keep information in a timely manner, and use the practice base as a platform for innovation and entrepreneurship. The actual social design project will effectively improve the practical skills of design, the collaborative spirit and entrepreneurial awareness.

Schools should Explore and implement the operation mechanism of the "ICE" method. IT is a great task Building a college-level results display and transformation platform. The exhibition hall in some school can be considered open to students when there is no exhibition activity. Necessarily, Utilize Internet technology to build a transformation platform for design achievements, take advantage of the economic model of regional exhibitions, and strive to establish close ties with multiple venture capital funds, these measures are reasonable. The risk mechanism, from the economic point of view, guarantees students' entrepreneurship without worries and stimulates their entrepreneurial enthusiasm. If so, we can really improve students' ability to operate socially to start their own businesses.

In addition, local exhibitions are also a possible to take advantage of. A regular exhibition of results can actively engage teachers and students to promote their ability of innovation and seek opportunities for cooperation and entrepreneurship.

Beside this, we can Make full use of the increasingly competition activities, such as the China College Challenge Cup, the Guangdong Governor's Cup, the annual three major design awards, such as Red Dot, IF, IDEA, etc., these are opportunities to promote the implementation of design innovation and entrepreneurship practice.

The world's advanced industrial countries' attempts in innovative education are worth learning. Since the 1970s, the world's top 500 companies have focused on cooperation with universities, mostly in the form of joint research and development experimental centers. If the connection, the coordination and continuity of talent training are guaranteed, the bridge for students from school to company would be constructed.

VIII. CONCLUSION

College students are the new force in the innovation and entrepreneurial team. This team needs to be trained to solve the current problems in the process of entrepreneurship education. In view of the professional characteristics of design, entrepreneurial instructors need to cultivate college students' entrepreneurial awareness under the guidance of the

concept of “innovating talents training objectives, emphasizing school-enterprise cooperation in production, study and research”, It is necessary to adopt a series of measures to infuse the entrepreneurial spirit and strengthen the innovation ability: focus on the construction of the practical platform, organically integrate the intra-curricular curriculum system, the off-campus actual work opportunities, and the divisional production-research- design innovation platform. The entrepreneurial-oriented thinking drives the sense of innovation, forming a school-to-companies linkage, and linking theory with actual work. There would truly bring a new force for innovation and entrepreneurship to achieve national social and economic development.

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