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INTEGRATING ENTREPRENEURSHIP EDUCATION INTO DESIGN EDUCATION: TOWARD AN EMBEDDEDNESS MODEL BASED ON DESIGN THINKING

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ABSTRACT
Talent cultivation needs to meet requirements of the market, so in the process of design education, it is necessary to combine the three elements of market, design and innovation. Traditional models in design education focus on developing individual knowledge and experience of most universities in China. The purpose of this paper focuses on professional competence training, strengthens quality education with entrepreneurship growth as the main line, and integrates entrepreneurship courses and practical projects in the whole process of design education. This study tends to build a new training model which can achieve the interoperability of professional talent training and entrepreneurship education goals, the complementarity of teaching resources and the integration of teaching content. The proposed model is composed of three parts: environmental embeddedness, organisational embeddedness, and bilateral embeddedness. The new model connects interdisciplinary with practical application, professional teaching with innovation, and cultivate professional design talents based on the embeddedness theory. The effectiveness of the model is practiced by a new course named design-thinking method as an "integration start point" and tested in second-year fashion design students through workshops.

Keywords: Entrepreneurship education, design education, embeddedness model, design thinking

1 INTRODUCTION

The design major consists of multiple directions, such as visual communication design, fashion design, and arts design. Design education can be defined as a design study which gets its origins from creativity [1]. Due to the strong applicability of the design major, it is especially suitable for students to carry out innovation and entrepreneurial activities. However, most traditional teaching models in design education focus on developing individual knowledge and experience. These ways form more obvious professional barriers due to different design objects and professional categories. It is a period of necessary change in design education, practice, or research. Design education needs a foundation for a "new academy" of arts and design. The reasons for the current situation in design are to be found mainly outside of the field of design [2]. During the design education process, the important factors are the creative and entrepreneurial skills [3]. Drucker (1986) took entrepreneurship as a discipline and can be transferable [4]. Entrepreneurship can be seen as an "entrepreneurial perspective", it should help individuals for their career with the necessary knowledge, skills and competencies for starting, managing and growing their business and enhance the ability of individuals to discover, evaluate and exploit opportunities. Therefore, entrepreneurship education is the deepening and concreteisation of professional education.

In the background of emphasising innovation and entrepreneurship, most universities with design majors have already established entrepreneurship education courses. However, there are some following problems:(1) entrepreneurship education is still at the level of theoretical guidance, and there is no deep integration based on the characteristics of the design profession;(2) most of the research on the teaching reform of the entrepreneurship education curriculum in the design category lacks the enforceability and cannot be integrated into the existing design professional curriculum

system;(3) entrepreneurship education is mostly carried out in the form of extracurricular activities, which makes students more passionate and less effective. In this perspective, this study tries to contribute to the following three problems: (1) What kind of theoretical model could be used as a basis and creative support for design education? (2) What is an appropriate method to integrate design education with entrepreneurship education? and (3) How to practice the integration of entrepreneurship education with design education?

Because design education has strong application characteristics, and the process of education will be influenced by technology, culture, policy, etc., and embeddedness theory can be a good combination of education subject with social network, so it is suitable as the theoretical basis of education integration. This paper builds a training model that integrate entrepreneurial abilities into the talent training objectives of design education, adopt a curriculum system that combines general, professional and entrepreneurial courses, and open innovative guidance courses from professional perspectives and incorporate compulsory credits. With the newly opened curriculum: design thinking and methods as the entry point of integrated education, practice and evaluate the teaching effect.

2 EMBEDDEDNESS MODEL DESIGN

2.1 Theoretical basis: embeddedness theory

Polanyi (1944) first proposed the concept of "embeddedness" and applied this concept to economic theory analysis. He believes that the economy as an institutional process is embedded in economic and non-economic systems [5]. The concept of "embeddedness" has had a profound influence on later studies in economic sociology. Granovetter (1985) described how social relations affect the behaviour and institutions and concern economic action embedded in structures of social relations. He divided "embeddedness" into relational and structural embeddedness. According to Granovetter 's research, Zukin and Dimaggio (1990) extended the concept and proposed that embeddedness is divided into four types, (a) structural embeddedness, (b) cognitive embeddedness, (c) cultural embeddedness, and (d) political embeddedness. In economic activities, the relationship and structure between subjects determine the form and outcome of subject behaviour. Social network embeddedness plays an important role in shaping and sustaining business. The educational process is similar to the economic activities of the enterprise. Different subject relationships and structures also produce different forms and outcomes. So, this research analyses the integrated education based on the social embeddedness theory, try to build a theoretical framework and analyse the embedded mechanism.

2.2 The “E-O-B” embeddedness model design

According to the embeddedness theory, first of all, in the integration of entrepreneurship education into design education, it is necessary to determine the cooperation relationship between the subjects. Then, it should to determine the position and role of each subject, that is, the network node in the network formed by this cooperative relationship. It is also important to consider the factors affecting this status and role. In order to more accurately determine the main body of integrated education and its relationship, this study got a new understanding of an effective boundary of the design education after integrating entrepreneurship education. The most widely accepted effective boundary of integrated education is, therefore, a new logical structure of the design education process is the following:

- Effective design education should be a system;
- The designer and the market are part of the system; and
- The system is not only affected by internal factors, but also by external factors.

Therefore, the main body of the design education is not the only university, teachers, students but also external customers. These subjects cooperate with each other to build a platform for collaborative education. On this platform, the university formulates training objectives, curriculum and practical systems based on market demand. Teachers take the market demand as the guide and the students as the centre to carry out the reform of teaching methods and mean. Students establish a market-centred cognitive attitude and form a habit of thinking through the training of courses and practice, and then influence their own mobility. The education focusses on the cultivation of design professional competence and strengthening the growth of entrepreneurship ability. In this process, the goal of professional talent training and innovation and entrepreneurship education collaboration, the complementarity of teaching resources and the integration of training content would come true. Since

integrated education is influenced by external factors such as technology, policies, and culture, this study should take account of the environmental factors. In the process of knowledge creation and sharing, it also involves cooperation between organisations and establishing a platform-like partnership. The model is divided into environmental embeddedness, organisational embeddedness to produce the coordination effects and design and entrepreneurial-driven bilateral embeddedness for learning effects. The first letter of the three parts names this model (Figure 1).

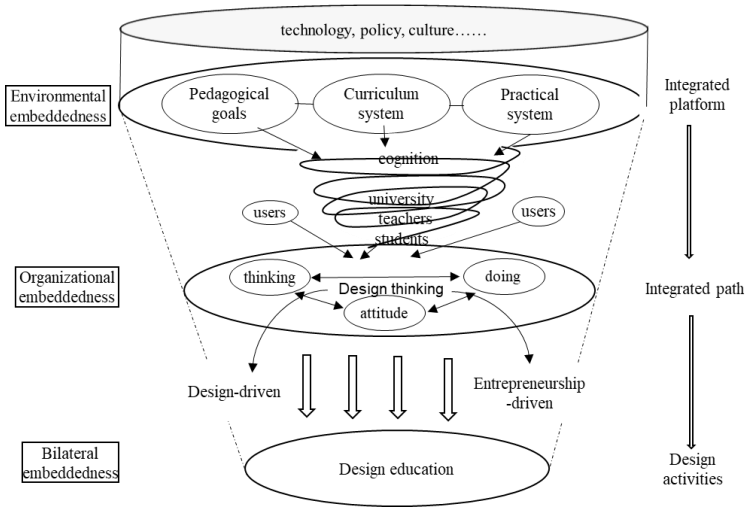

Figure 1." E-O-B" embeddedness model for integration

2.3 Environmental embeddedness: building an integrated platform

The purpose of the environmental embeddedness is to build an open integrated platform where the main bodies will form a collaboration body. Design education should adjust the pedagogical goal, the curriculum and practical system after integrating entrepreneurship education. These behaviours would help to make more chance for the integration.

2.3.1 Changing cognition

Design education is not a lonely process, and it locates in a social network. Therefore, cognitive changing must be clear about the connection between entrepreneurship and the profession firstly, and also the impact of the external environment on the quality of education when integrating entrepreneurship and professionalism. The students can ignore the professional boundaries of ideas, starting from the market, and cutting into the design training of entrepreneurial projects from the perspective of new products or services to meet market demand. The research should extend the boundary of the design education and consider external factors such as technology, policy, culture and so on. For example, students in fashion design majors develop mobile fashion information apps; students which major in arts and crafts can develop ceramic toys. Breaking through the professional boundaries of ideas, combining other professional knowledge and combining innovation is the most effective way to integrate entrepreneurship education into professional education.

2.3.2 Building training platform

The cognitive embedding of professional restriction, the teaching objectives, curriculum and practice system of design education will also change after the integration of entrepreneurship education. First of all, in the design of teaching objectives, Nigel Cross says, "Everything we have around us has been designed. Design ability is, in fact, one of the three fundamental dimensions of human intelligence. Design, science, and art form an 'AND' not an 'OR' relationship to create the incredible human cognitive ability" [6].

- Science — finding similarities among things that are different
- Art — finding differences among things that are similar
- Design — creating feasible 'wholes' from infeasible 'parts'

Therefore, the pedagogical goal can be divided into three aspects: knowledge goals, ability goals, and quality goals. The goal of knowledge is to cultivate professional and technical knowledge, as well as to master the knowledge of professional management and entrepreneurship. The ability goal requires

students to have specific professional skills and innovative spirit, and to combine theory with operational skills. The quality goal is cultivating a good work ethic to meet the employment and entrepreneurial needs of future career development.
According to the adjustment of teaching objectives, the model will increase the electives and compulsory courses of entrepreneurship and develop courses that can reflect professional knowledge while cultivating innovative ability. For example, students in fashion design can rethink their professional knowledge from other perspectives. What kind of value can be created except for designing clothes; students in graphic design can discover new things besides designing CI, advertising, binding, etc. It is also possible to discover new market gaps. Through modularisation, project-based and experiential teaching, students' |entrepreneurship and professional design level will be cultivated.
Try to use your own professional knowledge to break through the conceptual boundaries of the business and carry out entrepreneurial practices around original things. Interactive teaching of entrepreneurship education and professional education cannot just stay in the classroom, it requires students to practice entrepreneurship and exercise their practical ability through some entrepreneurial competitions. By participating in internships or visiting design companies' specific design activities, comparing classroom knowledge with actual design, identifying relevant problems, analysing problems and solving problems, thereby improving students' comprehensive design practice ability.

2.4 Organisational embeddedness: integrated path design

In this organisational embeddedness level, its purpose is to design an integrated path that combines teaching objectives, curriculum, and practice. The integrated path is to guide students transform consciousness to attitude, then professional and entrepreneurship knowledge convert to thinking, and practical experience to doing. Through this path, the goal of design education can be better achieved.

2.4.1 Finding integrated "entrance point"

The process should think about how to merge entrepreneurship into design education during the teaching and learning process. There are two kinds of curriculum, professional and platform curriculum. The previous two parts of education and training were out of touch. General education courses are not effective because of the professional barrier, so the model should develop some new courses that will open up these entrepreneurial general and professional courses. The process of the design education should find some courses as "entrance point".
Design thinking is appropriate in uncertain, complex situations. Schon's early work was seminal in that it emphasised the significance of design thinking and the role of cognitive studies and empirical research in studying design pedagogy [7]. Nowadays, design thinking is not only an idea or mindset but also a process of business development. Sometimes it mentioned in passing as part of a problem-solving or start-up creation. The teaching fellows of the Centre for Innovation and Entrepreneurship for Enterprise Educators UK (EEUK) explored definitions of design thinking and how those are integrated into teaching; sometimes this is dedicated, explicit, and extensive, sometimes implicit or mentioned in passing as part of a broader process of problem-solving or start-up creation [8]. Design thinking is used to enhance learning and promote creative thinking, teamwork, and student responsibility for learning. Therefore, design-thinking training is suitable as an entrance point, one side connecting with design education, another side connecting with entrepreneurship education, the "entrance point" is a start point which can integrate entrepreneurship into design education.

2.4.2 Using Design-thinking as doing integrated process

The barrier was removed and turned into a through-embedded body. With design thinking as the entrance point, the content of the general course was opened by the entrepreneurial project system and imported into professional curriculum. Therefore, these integrated courses will form a dynamic circle system. Then the traditional T model changed into a "T" culture model (Figure 2). Hence, in design education majors, a course like design thinking is offered as a compulsory course, focusing on students' professional advantages, developing their thinking horizons, improving their entrepreneurial ability, encouraging students to participate in R&D practice projects, and gradually realising this integration from attitude to thinking and doing path.

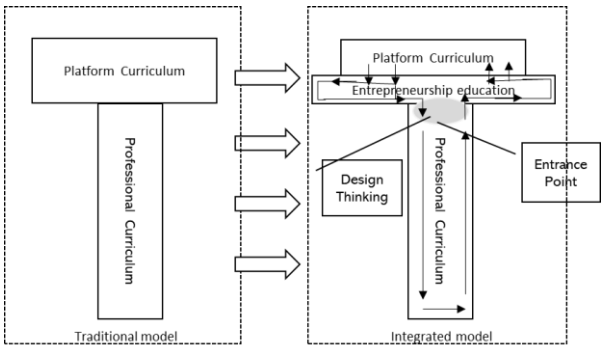

Figure 2. Change into a new integrated mode

2.5 Bilateral embeddedness: integrated activities

The organisational form, teaching form, institutional form, spatial layout form, and other entrepreneurial education culture are integrated into the whole process of designing professional education to form a two-way driven embedded mechanism. One is design-driven, using professional skills to promote student design skills; the other is entrepreneurship-drive, emphasising the importance of external factors for design education such as market, user, management, risk, etc. The purpose of bilateral embeddedness is to shape the cultural ecology suitable for the integration of entrepreneurship education and design education, and to reflect the role of soft environment in talent cultivation.

3 DESIGN-THINKING WORKSHOPS FOR THE INTEGRATED PRACTICES

In Dalian Polytechnic university fashion design profession, the major has opened a new course named design thinking and methods, three professional teachers set up a group to teach it. The practices desire to understand design thinking through workshops, improve students design ability and apply it in the process of design.

3.1 The process of the design-thinking workshops

The purpose of the design-thinking workshops is guided up to a point how to hold successfully tested prototypes and cultivate student' business mindset, to take user need as design start point. Their major were clothing and apparel design. Some of the participants are also registered in the entrepreneurial principles and practice course. There were 22 participants which were divided into four groups and each group has 5-6 person including male and female. The workshops were carried out 8 times, 3 hours each time, totally 24 hours. They consist of three stages: preparing and two main tasks (Table 1).

Table 1. The workshop processes

Stage	Content	Schedule
Preparing	• Learning some basic knowledge about design and entrepreneurship; • Innovation method; • Precautions during the process of the workshop.	1 time
Task1	• **The purpose**: Test prototypes thinking about what the users' want from a designer perspective, or even design from their own perspective • **Task:** 1) guided by market demand, finding for a market problem in a design product or work; 2)based on the problems to carry out a design and improvement; and 3) discuss marketing and product management issues • **Presentation:** 20 minutes to show the results • **Questions:** How to get the feedback of the prototypes from the users?	3 times

Task2	• **The purpose**: understand business operations and be familiar with the business plan • **Task:** 1) according to the characteristics of the clothing profession, the relevant clothing companies are established, and the service targets are mainly all departments and students of the school; 2)set up a team to determine the division of labour; and 3) a business plan, including finance, marketing, human resource management, risk and so on. • **Evaluation:** 1) group presentation: 20 minutes 2) the quality of the business plan	4 times

3.2 The evaluation of the design-thinking workshops

At the end of the workshops, students have a concept for the user-centre, some of them use Wechat or QQ to collect the feedback from the users, then improved their design prototypes, all these four groups created new ideas, and among them, one group designed a type of stitching clothes with zipper, the works attended school-level innovation and entrepreneurship competition and won the first prize. The evaluation also set a questionnaire to test the business knowledge related entrepreneurship from product, market, finance and risk management aspects, the results show that 83% of them have known some basic business knowledge than before, and 92% agreed they felt interesting to learn them, and all the students hope to have more chances to learn about them.

4 CONCLUSIONS

Based on the embeddedness theory, the article built an EOB talent training model. Taking the design thinking and method courses as an entry point, the study tried to connect entrepreneurial general with professional courses and practice through workshop. While the integration of entrepreneurship education and design education should go deeply into the whole process of talent cultivation. To truly promote the development of design education, it is necessary to realise the renewal and transformation of the educational concept and attach importance to the ideological. The integration of entrepreneurship education and design education may have a time-lag effect, how to better practice, how to train the teaching staff and other issues are the problems to be solved in the future.

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