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# INCORPORATING COMPETITIONS INTO THE LEARNING PROCESS OF DESIGN TALENT CULTIVATION - A CASE STUDY OF THE STUDENTS FROM FAR EAST UNIVERSITY OF SCIENCE AND TECHNOLOGY

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Abstract

Previous studies have pointed out that the learning method of education integration competition helps learners to operate in a simulated real environment, and can gain new knowledge and accumulated experience from it. This article focuses on case studies of design talent. The subjects of the survey are students from Far East University of Science and Technology. The "Construction of Design Teaching Model Integrating into Competition Learning" constructed by this study was verified through case studies. The survey is conducted mainly through interviews and participation observation methods, supplemented by relevant quantitative data. The purpose of this study is to analyze the feasibility of this teaching model in universities of design education and its effectiveness in design talent cultivation. This article discusses the research results of analyzing the learning performance and feasibility after the students accept this teaching model. There are two results: Firstly, “Feasibility” can be verified after learning process. The case obtained a total of Five Achievements, including a patent achievement, a silver medal in an international invention exhibition, a bronze medal in a national thematic competition, a seminar paper published, a finalist in the German Red Dot Concept Competition, and a journal paper. Secondly, in terms of the effectiveness of design talent cultivation, according to the feedback from individual interviews, the education and learning experience of this teaching model has grown significantly in terms of their sense of learning achievement, professional knowledge and design practical skills. In conclusion, it is verified that the "design teaching model integrated into competition learning" has positive significance to the design education of university students. Therefore, it is suggested that this teaching mode can be used as a reference for the design talent cultivation planning in the future.

Keywords: Competition Learning; Design Education; Teaching Model

## Introduction

Design is defined as a creative activity that involves the actual realization of novel and useful things (Reswich, 1965). Design education focuses on the cultivation of aesthetic professional knowledge and design practical ability. Emphasis on training students' abilities includes: analysis planning skills, professional technique, design practical experience, and design management capabilities, and then to communicate and publish on the basis of theory and practice. Purpose of design education is to train learners to be expert to meet the needs of industry and market. Whether the capabilities of design graduates can meet the needs and expectations of the industry is also a concern of global topic (Evans & Wormald, 2005; Liu, 2005; Yeh, 2003). Therefore, how to achieve the goal of cultivating design talents through appropriate planning in the teaching process is the scope of this research.

Recently, in the design teaching field, there were many design teaching methods and strategies had been developed and been applied to teaching courses or teaching models. However, there are few discussions on evaluation of design teaching achievement and learning performance. How to provide appropriate opportunities for learning in the teaching process to enable students to simulate practical operation, and accumulate the relevant practices, and effectively evaluate performance of teching and learning, Competition is a feasibility. Competitions have a positive impact on learning performance, goals and learning motivation (Lam, Yim, Law & Cheung, 2004). Researches indicate confidence of learner has improved significantly after learning experience through competition (Schindler, 2009). In addition, students participating in competitions through courses have a significant positive correlation with the improvement of learning effectiveness. Therefore, this study attempts to integrate competition learning into the cultivation of design talents, and probe into the effectiveness of competition learning theory in design talent cultivation.

## Literature Review

The following discusses the related research of design education, competition learning and three-creativity education, and teaching history theory.

### *Design Education and Teaching in Practice*

The purpose of design education is to train future designers with expertise (Cahalan, 2011). At present, the teaching method of design education often adopts the studio-based teaching method (Reimer & Douglas, 2003), which is one of the most commonly used teaching methods in design education (Schön, 1987). In this method, learners gain practical knowledge from practical design operations to solve design issues (Budd, Vanka & Runton, 1999; Reimer & Douglas, 2003), and accumulate experience. Smith et al. (2009) pointed out that in the teaching of studio, learners can obtain two types of learning experience; one is to learn design method, which is obtain through the methods

used in design procedure; to gain design knowledge and have overview of concepts through actual design activities. The main characteristic of the studio-based teaching method is to emphasize learning by doing, and the operation mode is similar to that of actual design firms (Cameron, et al., 2001). This is able to accumulate personal design experiences of practice and vocation, which is helpful for learners in the design field. However, the studies pointed out that when design graduates are employed in the early stage of the workplace, the work troubles encountered include "insufficient knowledge of industry-related", "Insufficient Knowledge of Technique or Procedure", "Insufficient Experience of Design", "Inadequate Ability of English", "Lack of Persuasion Or Diffidence ","Working dependent "( You, Yang & Luo, 2014). School provided learners with narrow support in design practice which had pointed out in research by Sohn and Eune (2003). Usually designers have had to spend 2 to 3 years in working training after employed. The result of research also is to use for reference of introspection what is current studio-based teaching method has offered simulation training for experiential learning, but whether it should be improvement. As well this encourages educators in design to think about how to improve students 'learning effectiveness through effective teaching strategies and methods. Research indicates that participation in competitions is an effective means for learners to provide feedback on learning effectiveness (Verhoeff, 1997), or a teaching method that can help learners to accumulate practical experience as a way to enhance the performance of design talents in the workplace.

### *Competition Learning and Sanchuang Education*

Competition learning means learning from the course of participating in the contest and obtaining feedback from it. Previous studies have pointed out that learners acquire positive benefits of teaching activities integrated into competition learning (Schindler, 2009; Verhoeff, 1997). That competition depends on self-esteem needs and achievements, and has a positive incentive effect on students' learning motivation. In short, competition activities have a positive impact on learners (Fisanick, 2010).

The Far East University of Science and Technology that researcher teachs at is committed to the implementation of Sanchuang Education. The so-called sanchuang education consists of three aspects: creativity, innovation and entrepreneurship, and to encourages teachers and students to participate in relevant competitions to verify teaching effect. Creative education is a process of training students to think creatively through "patent application" and "patent application"; Innovation education focuses on "learners can do" and train students to commercialize concepts through "participation in international invention exhibitions"; Entrepreneurship education is to enable "learners to sell" and "entrepreneurship" to train students in the process of marketing goods. As far as design education is concerned, design learning focuses on acquiring professional knowledge and skills training through practical procedure (Schön,

1987), so that learners have four integrated design abilities of creativity, skills, knowledge, and problem solving (Chen, 2005). There is a high degree of similarity between Sanchuang Education and Design Education.

According to Gagné (1985), teaching is defined as the expected results of different learning, and appropriate learning conditions are arranged to support the operation of the learning process. Therefore, this study intends to try to design teaching arrangements integrated into competition learning to assist learners in acquiring relevant design knowledge. In addition, in order to inspire the possibility of multiple thinking, through the participation of international competitions, practical thematic competitions, etc., learners are encouraged to accumulate learning experience related to design practice closer to the current state of the industry.

*Teaching History and Model Establishment*

Education is "teaching" activities plus "learning" activities. In other words, it is the interaction between students, teachers, and teaching resources, which requires proper planning of relevant elements and activity strategies, as well as various forms of interaction between teachers and students to achieve valuable learning goals. As far as teaching process in design, that the teaching achievements should be included "enhancing ability of design planning", "learning the design process", "improving proposal skills", "inspiring participate in the ability to find and discuss problems", and "increasing ability to self-evaluation". As stated above, teaching progress of design which according to the definition of Glaser (1962) can be divided into four parts that included analysis of "Teaching Goals", diagnosis of "Starting behavior", design of "Teaching Activities", and "Teaching Evaluation". In view of this, this study develops a design teaching model that incorporates competition learning, as Figure 1. below.

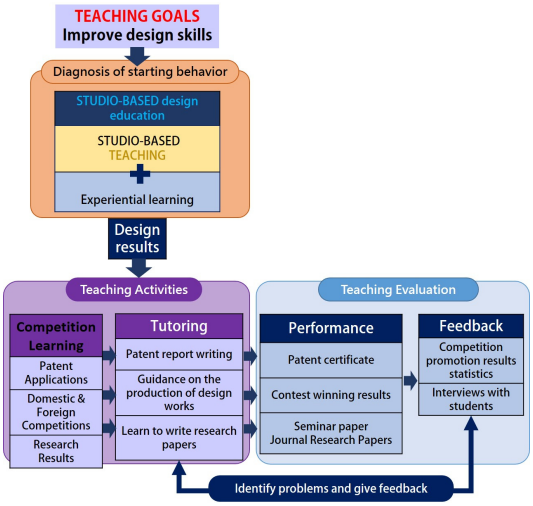


Figure 1 Design teaching model

*Sub-Summary*

The impact of competition learning on the design education of university students and the effectiveness of competition learning in the cultivation of design talents are two major purposes of this study. Based on stated above, this study selected the competition of innovation and creativity as the main competition learning activity, and constructed a competition teaching model with design knowledge and entrepreneurial learning. Figure 1 as a reference for design teach-

ing, and to use this to guide study case for design education and training.

## Research Design

### *Method and Sample*

The main purpose of this study is to discuss the process of competition learning integrated into the cultivation of design talents by case study. This study is conducted through participatory observation and interview methods. Choosing the method of case study is to understand the subject of the study in depth, identify the problem, and then find a solution out. The aim of method is to analysis of special events, rather than studying many individuals at the same time. Therefore, the students of Far East University of Science and Technology were selected as the subject, and the member included 1 female undergraduate who was 20-year-old. Duration of research survey is one year and three months which from September 2018 to December 2019. The content of the survey is the learning performance which research subject accepted the design teaching model integrated into the competition learning. The investigation process is recorded by the method of participatory observation and method of the post-event interview. Then analyze the results to verify the teaching performance and feasibility of this research theme.

### *Research Process and Implementation*

The progress of this study is divided into seven stages. Figure 2 is research flow chart. This study was conducted in a qualitative way. The feasibility of this issue has been established by tutoring students on the course and performance of participating in the competition, and comparing the results of research surveys and data collection and analysis. After case study was selected, the design teaching model integrated into the competition learning was implemented for research subject. There are two ways to conduct research. Firstly, implement participatory observation. In the educational process of the research subject, the learning content of competition learning and competition participation is implemented. The criteria of participated competition learning are divided into national and international. Part of the national competition is a systematic innovation project competition. For international competitions, the International Invention Exhibition and the German Red Dot Concept Competition are selected as the scope of the competition. Next, consolidating the results of design research, and then published in seminars and journal papers. During the process, the researcher gathered statistic the performance of patent achievements, competition results, and essays; meanwhile, observe and record the learning performance of the research subject. Then, the interview method is used to collect the post-mortem opinions of the research subjects. Finally, the data of the above survey are analyzed and compiled statistics, and then conclusion is made.

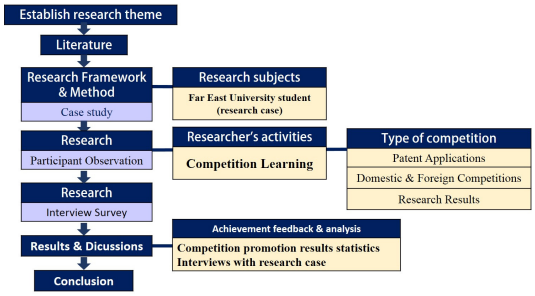


Figure 2. The research flow chart

## Results and Discussion

### *The implementation of Competition Studies*

The implementation of this study of competition learning is to assist students in designing achievements, participating in patent applications, competitions, and publishing research papers. In the aspect of patent application, assist learners in the process of concretizing creative concepts through the patent application process. And this learning process supplied the learners with practical experience, such as industry-related information, technology or processing knowledge, as Figure 3.

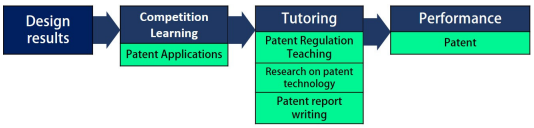


Figure 3. Design of patent application activities for competition learning

Through participating in competition, such as the International Invention Exhibition, the German Red Dot Concept Competition, etc., the learners will be trained for design concepts and practical experience is increased. As shown in Figure 4. Competition Learning is used as a verification of individual learning effectiveness, inspiring students' attempts and improving personal learning skills. The feedback of such activities can be used as a reference for the adjustment of teaching work in future.

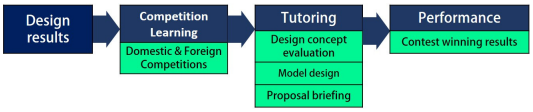


Figure 4. Activities of Competition

Aspect of the publication of research results, the paper summarizes the research procedure of design results and the innovative design proposed by the research findings, verification of academic contributions is brought out. Meanwhile, this learning experience enhances the abilities of foreign languages and independent task, as shown in Figure 5.

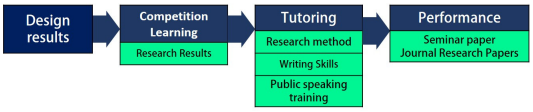


Figure 5. Activities of Publish Research Results

### *Achievement feedback and analysis*

After the implementation of "design teaching model integrated into competition learning", the feedback and interview results of learners are used to discuss and analyze teaching performance. Aspect of patent application, learners apply for a new type of patent from the Intellectual Property Bureau of the Min-

istry of Economic Affairs of the Republic of China using the "Tea Brewing and Separating Rotating Structure of Tea Set Function", which after examination, get permission approval; Approval date is February 14, 2020 and Application patent number is M596011 . The certificate of patent is as Figure 6.


中華民國專利證書

新型第 M596011 號

新型名稱：茶具功能之茶水沖泡分離旋轉結構

專利權人：遠東科技大學

新型創作人：游淑斐、王珂穎

專利權期間：自2020年6月1日至2029年10月15日止

上開新型業依專利法規定通過形式審查取得專利權
行使專利權如未提示新型專利技術報告不得進行警告

經濟部智慧財產局 局長 洪淑敏

中華民國 109 年 6 月 1 日

Figure 6. Patent license certificate

Aspect of competition performance, the research case joined in the "2020 Systematic Innovation Seminar and Project Competition" with the design theme "integrated tea making device". She won the bronze medal in the category of Systematic Innovation for Process Improvement or Business Management in the thematic competition, as Figure 7 shown. Meanwhile, she published a seminar paper on "Integrated Brewing Device Product Design and Development", which was included in the manual of the 12th Systematic Innovation Symposium in 2020. And she obtained the international Journal of Systematic Innovation accepted paper submission. The paper will be posted after revision of replied comments.


中華系統性創新學會 The Society of Systematic Innovation
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銅牌

『2020 系統性創新研討會與專案競賽』專案競賽獎
類別:(IV) 系統性創新用於製程改善或商業管理
題目:一體化泡茶裝置
作者:王珂穎、游淑斐、陳玉崗

大會主席 大會議程主席

2020 年 1 月 17~18 日

Figure 7. Bronze Medal of Systematic Innovation Project Competition in 2020

Furthermore, the research cases participated in the 2019 Seoul Invention Exhibition in South Korea and the 2020 German Red Dot Concept Competition in international competitions. The Seoul Invention Fair in South Korea is an international famous invention exhibition recognized by the Intellectual Property Bureau of the Ministry of Economy and has credibility. The Red Dot Concept Competition in German is one of the largest design competitions, and has the most influence on the world today. Both of the stated above are indicative international design related competitions. The research case participated in the competitions that mentioned above with the design theme "Integrated Brewed Tea Vessel". As the invention fair, the silver medal was given, as shown in Figure 8. In the other hand, the Red Dot

competition is currently in the finals, and has been entering the final stage.


SEOUL INTERNATIONAL INVENTION FAIR

Silver Prize

presented to

Yu, Shu-Fei / Lee, Kuo-Long / Wang keying

from

TAIWAN

in recognition of excellent and creative efforts to invent

Integrated Brewed Tea Vessel

exhibited at the
Seoul International Invention Fair 2019
organized by the
Korea Invention Promotion Association
in Seoul, KOREA
November 27th - November 30th, 2019

Koo Cha-yol
Chairman
Korea Invention Promotion Association

Koh Joou-ho
President
Korea Invention Promotion Association

Figure 8. Silver medal of Seoul International Invention Fair in 2019

Regarding the achievements mentioned above and the results of the interviews with the students, summary described as following. Aspect of feedback on interviews with students, the research case shows that there is a positive improvement in personal self-confidence, learning achievement, design practical experience, and professional knowledge. The results of this study are the same as previous related studies (Verhoeff, 1997, Lam, Yim, Law & Cheung, 2004; Schindler, 2009). The research case gave feedback on individual competitions, and meanwhile, she also expressed that through "patent application" that helps to accumulate knowledge about industry-related manufacturing and design. Aspect of participating in the competition and publishing research results, besides cultivating ability of independent task and accumulating design experience, their ability of foreign language has also been improved through the competition experience mentioned above. Comparing this result with previous research, it is pointed out that graduates in design are suffering from work difficulties when they enter the workplace firstly (You, Yang & Luo, 2014). It also verifies the positive benefits of competition learning in design education.

## Conclusion

Learners solve actual or simulated problems with practical procedures (Budd, Vanka & Runton, 1999; Reimer & Douglas, 2003) to gain design expertise and cumulative experience. In other words, Current design teaching methods focus on practical operation to acquire professional knowledge and training skills (SchÖn, 1987). From the perspective of design education integrated into the competition, this study provides learners with the design knowledge and practical experience of related industries through competition learning. The study was conducted with the students of Far East University of Science and Technology as a case study. The effectiveness of learning was verified through students participating in different types of competition learning, and the effectiveness of integrating competition learning into design talent cultivation was verified. The results show that the "design teaching model integrated into competition learning" proposed in this study is a feasibil-

ity, which will be used as a reference for future design talent cultivation.

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