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REVIEW OF CREATIVITY FACTORS IN FINAL YEAR DESIGN PROJECTS IN CHINA

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ABSTRACT
This paper focuses on investigating a common phenomenon that emerges in the reformative process of China's design education system from the traditional to 'creativity-directed'. The investigation is explored through the following aspects: the circumstance of conducting Final Year Design Projects (FYDPs) in China, with a review of relevant pedagogical theories of Project-based learning (PjBL); and a review of cross-cultural understanding of creativity. Through conducting the literature survey, it is proposed that some product design students' lack creative abilities that could affect their learning performance in FYDPs. It is proposed that this is evident through their difficulty in applying subject specific knowledge in an effective way. Analyses suggest that underpinning the problem might be the educational and social cultures within China's product design programmes and how the final year projects are implemented. In conclusion it is suggested that design students' creative abilities are influenced by the adopted problem solving processes that involve knowledge application.

Keywords: Design education, Project-based learning, Product design, Knowledge, Problem-solving, China.

1 INTRODUCTION

1.1 Research field

A common practice in most design programmes internationally is a major final year project supported by project-based learning (PjBL). The expectation is that students will be able integrate and apply their knowledge, skills and values within one extended design project. Thus, the focus is on the students to demonstrate their abilities, skills and knowledge. However, within the context of China's Design Education system, students of Product Design programmes are observed to depend highly on their tutors' suggestions in the progression of final year design projects (FYDPs), such that, 'the design work reflects the teacher's intentions to a large degree, because the most important decisions are often made by their teachers' [1]. Thus pedagogical issues explored here relate to the effectiveness of the final year design projects conducted in product design programmes in China, which is part of a larger survey study of FYDPs implementation in product design programmes in China's universities. The aim is to develop an understanding of what elements contribute to an effective way of knowledge application that may improve students' creative performances during the FYDPs processes.

1.2 Purpose of this research

The objective of this study is to investigate the phenomenon that emerges in the process of conducting final year design project (FYDP), that of perceived dependence. More specifically the research is attempting to explore the potential causes and provide a practical solution for improving the taught process and moving from lecturer centred to student centred learning mode. This research does not aim to examine the quality of FYDP products, whereas emphasises on obstacles that students faced in the implementation of FYDP. We are more concerned about the difficulties the students have during the FYDP rather than just the results of FYDP because the results may not reflect the true performance of the students but 'the teacher's intentions to a large degree' [1]

This paper consists of three parts: 1) Identification of the problem through investigating the process of conducting FYDP within China's design education and relevant pedagogical theories; 2) A review of creativity literature from the viewpoint of cross-culture; 3) A discussion for developing a hypothesis.

The literature survey forms the main contribution of this paper. The research problem is identified by looking into the implementation process of the final year project activities and comparing against the expected theoretical requirements. Secondly, the potential cause for this phenomenon will be briefly discussed and analysed through investigating the cross-culture literature on creativity.

2 DEFINING THE PROBLEM IN FYDP PROCESSES

Forms of FYDP are set in almost all universities that provide Product Design degree programmes. The FYDP is more often than not the culmination of the degree - it gives students an 'open' environment to demonstrate all they have learned throughout an entire programme.

2.1 Status quo of conducting FYDP in Product Design programme in China

In China, FYDPs usually begin in the fourth academic year and lasts for one term (6 months). It has been observed that students tend to be educated with a solid foundation of what is perceived to be relevant knowledge through series of course modules including a range of arts history, design methods, market strategies and creative design training, apart from those cited as traditional design courses[1]. Curricula of product design programmes in the top 10 design colleges[2] in China provided generic stages to complete projects with estimated durations. There are generally 5 stages as follows:

1. Select supervisor (about one week);
2. Determine the topic/problem (about 6 weeks);
3. Resources; collection of data including literature reviews and surveys (about 8 weeks);
4. Detailed design including visualising ideas (about 4 weeks);
5. Implementation and evaluation (about 6 weeks).

A report [2] conducted into the delivery of FYDPs from Guangxi Normal University showed that 41% of Art and Design students in that university experienced difficulty in determining the design topic. Upon investigating the situation of Art and Design students' FYDPs, Chen and Ma state that it is common for students to continue asking questions like, 'what should I do next?', 'Can I apply this in my project?' etc. [3] It implies that the main difficulty that design students face when carrying out their FYDPs is the lack of independent thinking which is essential in accomplishing any design work. These difficulties are generally applied to all the design students including those of product design.[3]

Similarly, Ghassan and Bohemia [4] research suggests that this phenomenon is also present within design schools based in the UK. They suggested that it is the tutor's pedagogical practices which make students rely on their judgments and that this can lead to tutor-led rather than student-led learning.

The FYDP examines students' subject specific knowledge and skills. The purpose is to assess whether they are ready to transition into profession. It can be seen as a bridge between students' university education and career development. However, already discussed some of Chinese design students are weak on 'problem-solving, designing, critical thinking, and complex problems analysis based on individual abilities', which are the requirement of the talents cultivation issued by the 18th CPC (Communist Party of China) National Congress Reports (2012). This is also what FYDP is expected but fails to deliver. It also implies that potential causes of phenomenon in the implementation of FYDP would probably be more crucial and need to be addressed, which would help generate deep insight to improve educational practices, such as revising the curriculum, improving teaching skills, etc.

2.2 Pedagogical theory of Project-based Learning

The key elements (keywords) of FYDPs contained in the reviewed modules include 'project', 'long-term', 'problem/topic', 'student conducting', etc. [5], in general terms this aligns with teaching and learning strategies like Problem-based (PbBL) and Project-based (PjBL). In design education, design projects are widely regarded as the core activity of Product Design, and it represents an activity that

[1] By overviewing the curricula of Product Design Programme in the top 10 Design Colleges in China, traditional design courses emphasise design representations focusing on cultivating students' skills of 'Colour painting, Sketch and Form (two-dimension, three-dimension of shaping, and forms of colour)'

[2] The Rank is issued by China Academic Degrees and Graduate Education Development Centre (CDGDC), Jan. 29, 2013

[3] According to the latest 2011 Discipline Catalogue Degree Conferring and Talent Training (DCDCTT) issued by Ministry of Education, China, the Product Design is clarified to Level II Discipline, which is embraced in the list of Level I discipline Art and Design.

lends itself well to the problem oriented approach because of the applied nature. Distinct between PbBL and PjBL is in the knowledge being acquired, as Savin [6] concluded, 'forms of knowledge' and related 'type of activity'. Moreover, Prince and Fedler [7] stated the emphasis of PbBL is on the 'acquisition of knowledge', which emphasises the new knowledge or skill delivering through a specifically designed problem; while the emphasis of PjBL is believed to be on the 'application of knowledge', which is not new knowledge, but more application and reinforcement of prerequisite knowledge. Moreover, it is argued that the differences in types and range of problems used in these two approaches in terms of the scope, holding that 'a project typically has broader scope and may encompass several problems' [7].

The root of project-based learning can be traced back over a hundred years with the foundation formulated by John Dewey, who indicated, 'it is human experience that brings action and creativity together', and who emphasised the interaction between person and environment and with it being intrinsically related to human activity in and with the world [8]. PjBL has a strong link with the fostering of creativity also reflected in developing educational concepts like 'discovery learning', 'learning-by-doing', 'experiential learning', and 'student-centred learning' [9]. Among these constructivist learning and teaching approaches, student-centred learning can be said to be a key feature of project-based learning [7]. Brown [10] has summarized three essential features of student centred learning: freedom of choice, students' responsibility for self-learning and the creation of a supportive environment in which students can develop their potential. In more detail, Blumenfeld [11] pointed out students have the opportunity to 'exercise choice and control regarding what to work on, how to work, and what products to generate'. Seen from the cognitive perspective, choice and control are critical to enhance students' motivation in their learning [11], and learner control also provides students with the opportunity to utilise their prior knowledge and experience [7].

PjBL, therefore, provides an opportunity to nurture a teaching and learning environment as an incubation space for creativity. In addition, according to Blumenfeld [11], the essence of PjBL is that a question or problem serves to organise and drive activities; and these activities culminate in a final product that addresses the driving question, which makes PBL itself in a form of problem-solving process.

One key principle is that the outcomes of the problem solution should not be predetermined so that students are left with insufficient room to develop their own approaches to the problem solutions [11]. In project-based learning, the problems should be open-ended so that students can take some if not total responsibility for designing their own solutions and construct and apply their knowledge in this process [11]. Therefore, human traits like curiosity and the sense of mastery and self-determination should be activated to facilitate creative performances. To conclude, the PjBL strategy can be said to be purposeful in facilitating students' creativity from both its theoretical essence and its form. It provides students with a 'congenial' environment for improving their creative performance.

2.3 Defining the questions

Comparing the pedagogical principles and features of PjBL with what has been investigated in China's FYDPs, two problems have been identified:

1. PjBL aims at 'application of knowledge'. The circumstances clearly indicate that Chinese students find difficulty in applying prior knowledge efficiently to progress their project work.
2. Student-centeredness is generally believed to be a strength of project-based learning as well as other similar constructivist approaches. However, the status quo in China shows some students lack the abilities to conduct projects independently, thus teachers largely intervene.

Chinese students tend to fail to achieve the learning outcomes of PjBL. As PjBL is specifically designed to foster the creativity of students, the question is when applying PjBL in China, is there a failure to boost the creativity the main underlying reason for the perceived issues?

3 UNDERSTANDING OF CREATIVITY FROM THE VIEWPOINT OF CROSS-CULTURE

Creativity is a term mainly used in the western world. Some researchers [include couple references to work of these researchers] argue that creativity can be understood differently by different cultures as there are indeed different perspectives on what is considered 'creative'. Understanding the cross-cultural aspects on creativity is therefore important in understanding educational directions.

3.1 Creativity research in Western and Oriental culture[4]

Creativity is considered a complex phenomenon to explore. To get a more holistic map and in-depth understanding of creativity however, perspectives from different theories of creativity have been categorised namely: person, product, process, place, referred to as, 'the 4p's' [12]. Because of the broad nature of creativity, there is a focus on a certain part of creativity. Cropley research [13] has collected outcomes of creativity research on these four aspects, which is briefly outlined below: creative individuals consider a series of abilities that are significant for creativity including 'flexibility, curiosity, independence, tolerance for ambiguity, trust in one's own senses, and ability to restructure problems'; these personal abilities are expected to improve a creative process that involves a range of activities like 'problem recognition and construction, ideas generation, and decision evaluation'; the environment of 'openness, flexible, freedom, stress less' is suggested to enhance motivation like 'risk-taking, willingness to ask many unusual questions/to display results/to go beyond the conventional'; the end product is used as a measurement to define the outcomes of creative activities, where common criteria includes 'originality, relevance, usefulness, complexity, pleasingness'. Murdock and Puccio [14] recommend that researchers might enhance the generalizability of their findings by studying creative behaviour in the combinations or interactions of the 4p's's with the implication that the creative abilities and creative process mutually influence each other.

Acknowledging the complexity of social context and environmental variables, creativity might be understood differently from culture to culture [15], and with different cultures having different perspectives on what is 'creative'. Therefore, creativity can be considered as 'culture relative' [16]. Creativity studies have been ongoing in China since the 1980's, at which time the development of creativity research was set up and based on the achievements from Western countries. Fu, one of a number of Chinese pioneer researchers on creativity, first identified and located the word 'creativity' into the local context, and pointed out that the awareness of being creative in China has a long history and proposed that educators need to seek for its origination from 'philosophical perspectives' rooted in Chinese culture [17]. Lubart also believes that religious/philosophical perspectives would be relevant and important for forming the perspectives of creativity [16], and how this concept is understood in the current 'social' and 'political' context, in order to better connect with and absorb those theories from western cultures. The main differences of 'philosophical perspectives', 'social and economy' and 'political' context between both cultures are given in Table 1:

Table 1. Summarised differences between Western and Chinese

	Religious/Philosophical perspectives	Social/Economic context	Political context
The Western	Christianism	Capitalist developed Market economy	Individualism, Capitalist
The Oriental	Taoism, Confusions Marxism	Developing Socialist market	Collectivism Socialist

Understanding the philosophical differences on perspectives of creativity between Western and Chinese culture is important as these differences ultimately drive educational goals. For example, Dineen and Collins [18] stated 'Chinese society has traditionally valued the collective and conformity over the individual and the novel'. Some research claimed the creative abilities are hard to form in the collectivist society compared with individualist society [16].

Although creativity reflects the culture context from some specific aspects, Fu, Niu and Sternberg [17] [19] believe that Western and Chinese cultures do share some universal core characteristics of creativity. Some cross-culture studies indicate that the Eastern creative process share similar form with the Western concept - the basic four stages for problem-solving: 'preparation', 'incubation', 'insight' and 'verification' [16].

3.2 Design creativity

Clearly Design is ultimately a creative process thus many design researchers consider design to be aligned with creativity research [20]. So, there is no surprise that product design as a 'problem-

[4] Western within this paper means European or a mix of European and American cultures, and Oriental within this paper is based on China, mainland culture.

solving' process is also a commonly accepted concept of a creative process. Therefore, we centre the concept of 'problem-solving' as the principle to define design creativity within the context of China's product design education system.

Creativity processes involve divergent thinking [12], which is a key factor in generalising creative ideas. Supported by this perspective, numerous tests for divergent thinking have been developed. Guilford argued that, 'No creative person creates in a vacuum or with a vacuum.' [12] And it has been observed by Lawson [21] that '…essentially the more you have seen, experienced and absorbed, the more points of reference you will have to help you decide which direction to take: your frame of reference expands.' That is, what individuals learn and experience, the knowledge base and its diversity, plays a significant part in a successfully creative process.

Recently the focus has changed from developing a stage-based model for solving problem to exploring the interaction between each stage, especially how divergent – convergent interactions occur [22] and the development of cognitive models to describe creativity as a constant oscillation between divergent and convergent thinking.

In contrast to the process evolved in Western cultures, emotional, personal, and intrapsychic elements have more emphasis in the Eastern creative process, which echoes its notion of 'a self-growth process' [16] connecting with its traditional and philosophical origin. Indeed, design and emotion as a concept is only a recent direction in Western design practice. Western and Chinese cultures do however share some universal core characteristics of creativity, such as the form of a creative process with 'problem-solving' accepted by both. The development of a sound knowledge base plays a key aspect to cultivate 'talent' in the Oriental culture, to accumulate knowledge from very young age has been emphasised in China from ancient times and is believed to provide abundant resources for the process of 'self-growth'.

3.3 Findings

The final year project curricula so far reviewed, involve a 'problem-solving' process, concurrently implied within general creative and design processes and which is universally accepted by both cultures as a fundamental requirement. Some of China's product design students' performances in the final year project are aimed at reflecting their abilities of flexibility, curiosity, independence, tolerance for ambiguity, trust in their own senses and restructuring problems, but most of are deemed weak. It is suggested that this is because creative abilities are hard to form in the collectivist society compared to individualist society. Secondly, although both Eastern and Western cultures accept 'problem-solving' as creative process, the emphases are different. While the Western emphasis is on the 'divergent – convergent' process, the Eastern emphasis is on the 'knowledge base'.

4 CONCLUSION

Although sharing the concept that creativity is a 'problem-solving' process, Western cultures appears to pay more attention to developing methods for educators in facilitating a 'divergent – convergent' thinking process. There is little direct focus on the knowledge base as it is considered as fundamental for divergent thinking. The focus is merely on identifying how many kinds of knowledge types should be included [23]. Eastern culture pays more attention to enhancing the motivation to facilitate this process [24]. This kind of method is suitable for those students with creativity relevant personalities, with such traits as self-confidence and self-esteem, which may be easier to nurture in western countries with an 'individualism' perspective.

The underlying issues of cultural difference can result in perceived performance issues in China's product design students' final year project. Students' inherent creative abilities can influence the problem solving processes driven by knowledge application. Exploring the interactions between various types of knowledge and how it is reflected in creative processes provided potential for future research. By understanding cultural differences an effective way of developing specific and personal knowledge application techniques may be supported.

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