Meeting the new needs: design research education in China

Kin Wai Michael Siu
The Hong Kong Polytechnic University

ABSTRACT

Design research education is still in its infant stage in China. This situation implies not only that the overall organization of most programs is immature, but also that many programs have unbalanced objectives and content. It is a fact that research programs in some particular conventional disciplines and subjects have been running in China for a long time, with a good track record in research studies and outputs. Design, with its definitions, nature and objectives is a comparatively new discipline/subject. Since the 1990s, some universities in China have claimed that they have offered design research programs. When reviewing the program plans, objectives, content, and ways of assessment, it is not difficult to notice that most of these programs are fine-art or engineering oriented. In addition, most of these programs in China that practice exploration are still biased towards theory study, as distinct from the emphasis on practical exploration in western design research programs in recent years, which in China is rarely taken into serious consideration. Thus, this paper reviews the development and situation of design research programs in China. It then identifies the unbalance between "theory study" and "practical exploration" (sometimes called "experimental exploration") in the programs in China as compared to those in western countries. By looking at the three major aspects (i.e. policy, implementation, management), this paper advocates that only a balance in theory study and practical exploration in design research programs can meet the new needs.

Keywords: design research program, balance, theory study, practical exploration, China

INTRODUCTION

Although the traditional formats and objectives of education in China (including those that take the form of master-learner, or the traditional apprentice system) are different from those in western society, many programs in China are already running systematically (Dreyer & Dreyer, 2010; McElroy, 1996; Landowe, 2008). For example, clearly defined stages of learning and various serious ways of assessment have been well-established for more hundreds of years. Even so, under the influence the western society, the education system in China has experienced continuous changes over the past century (Dreyer & Dreyer, 2010; Dimmock & Walker, 2000; Siu, 2009a, 2009b). One of the critical changes is the new definitions and differentiation of different disciplines and subjects according to the educational nature and settings of western society. Another critical change is the definitions of levels and grades of learning into primary, secondary and university levels (Feng & Siu, 2009).

In the old days in China, arts were the most important and dominant disciplines and subjects, although China practiced invention and scientific development in critical areas such as navigation, medicine and printing (Leung, 2004; Pan, 1999). Following the advancement of western science and technology, natural science and engineering have become more popular disciplines and subjects in China. Although many scholars still maintain the great inventions of ancient China, it is a fact that natural science and engineering disciplines and subjects have affected the development of modern China for more than a hundred years (Feng & Siu, 2009; Simon & Cao, 2009; Yan, Jiang & Juster, 2004).

In recent years, there have been some changes in education systems. As the reviews of Siu (2005b) and Romans (2005), these include the general objectives of education itself, the objectives and structures of specific programs, and the appearance of some new disciplines and subjects. Among all new disciplines (sometimes called "subjects" or "areas"), design attracts the attention of a lot of people as one of the important disciplines because of its nature, objectives, values and content. In fact, design is a relatively new discipline, even in the western world (Heskett, 2004; Siu, 2005b, 2009b; Swann & Young, 2001). For example, research study in design (called "graduate study" in the North American system, or "postgraduate study" in the British and Continental systems) has only appeared in the recent decades (Romans, 2005). Compared to those research studies in conventional disciplines such as medicine, physics, mathematics and literature, research study in design is still in its infant stage. In China, design research programs are still immature in their development (Design Task Force, 2003; Siu, 2005b).

Since the 1990s, some universities and conventional academies of fine arts in China have claimed that they are offering design research programs. As stated by Leung (2004), when reviewing the program plans, objectives, content, and ways of assessment, it is easy to see that most of these programs are oriented to fine art or engineering. In other words, although some of the programs claim to be related to design, or are run in design departments, there is no significant difference between these programs and conventional fine art and engineering design research programs (Siu, 2005b). Moreover, in China, the structure of design research programs, as well as the position titles awarded are quite different from those in those in North America and

Europe (see also Goldfarb, 2001).

Even in western society, the directions in development of design research education are quite varied. Besides traditional research studies, such as research-oriented programs (that is, PhD, DPhil, MPhil), numerous higher level design programs have appeared in recent years (for example, DDes, MDes, MA, MSc). These programs take two different directions: some of them are quite general and broad in their objectives and requirements, while others are very focused on particular directions and areas (Hickman, 2008; Romans, 2005; Yan, Jiang & Juster, 2004).

Since the mid 1990s, universities in China (including tens of academies of fine arts) have offered design research programs, and some claimed to be design-related programs (Feng & Siu, 2009; Siu, 2005a, 2009a). Quite a lot of them are offered by fine art, arts, architecture and engineering schools and departments, while others are offered by design schools and departments. Since the beginning of this century, an increasing number of educational administrators and design educators in China have started to be concerned about the development of design research programs in China. Taking advantage of local and regional meetings and design events, they meet and discuss how to improve the quality of design education, including design research in higher levels of university studies (Siu, 2009a). For example, scholars, researchers and designers gather in Hong Kong every year (for example, the Business of Design Week (BoDW) Education Conference) to hear presentations and share educational experience in the global trend and development of design education (see BODW, 2009a). There have been continuous discussions about design research education over the past couple of years. In mainland China, discussions have also been conducted frequently among different design academies, although there is a lack both of more formal arrangements and high-level meetings on the overall national development and reform of design research programs in China (Leung, 2004; Siu, 2004). Nevertheless, while creative matters such as design have been increasingly considered by the policymakers in education and industry, now is a good opportunity to review and explore how design research education in China can improve benefits to educational, social and industrial development.

DEVELOPMENT OF DESIGN RESEARCH EDUCATION

As with many other disciplines, it is not easy to state a clear definition and a commonly recognized beginning for design studies within formal education (Romans, 2005). One of the major reasons is that it is difficult to define formal education in the context of the many different definitions of formal education found in different regions. According to Siu's (2009a) review on the design education development in western and Asian countries, the term "design education" was not recognized or formally documented until the late 19th Century. The beginning of higher levels of study in design is also difficult to define. The major reason is that some of the disciplines, such as engineering and fine art, claim to have creative-related elements (American Society of Mechanical Engineers, 1993; Ashford, 2004). In particular, the research topics in conventional PhD and MPhil studies are quite flexible (and sometimes quite abstract). Some graduates anchored in non-design disciplines can still claim that their studies are related to design and that their research topics are design-oriented, in the same way as some European

universities claim to have offered high level (i.e. post graduate) design-related studies before the late 19th Century. Quite a number of architecture schools in Germany and England claim that their research-based studies involve creative thinking and design elements which appeared much earlier than the formal definition of design education first promulgated in the last century (e.g. see Architectural Association, 2009). In China, some of the fine art academies have declared that their art programs are so modern in nature that a high level of design studies existed in the country before appearing in the western world (e.g. see China Central Academy of Fine Arts, 2009). Some artists and scholars claim that some kind of painting and craft training actually involved high level studies and experimentation about "design" (Leung, 2004; Siu, 2009b).

Nonetheless, common design research programs all over the world can generally categorized into two types. The first type exactly reflects the names of the programs in that they are research-oriented. This means that "research" is the major and dominant element in the programs. Another type is teaching-oriented, and has relatively fewer research elements (Allpress & Barnacle, 2009; Evatt & Jones, 1995; Gilbert, 2009; Hackman, 2008; MacDonald, 2005; Romans, 2005). Of course, those who teach or study in the latter context would never state that their programs lack research elements. Thus, instead of arguing about the amount of research elements, more researchers nowadays prefer to take another way to view the situation. They consider how many taught-elements are in each program, and the method of assessment. Some researchers would also consider whether the requirements of a research program are on a continuous equal-weighting assessment, or mainly on the assessment of a final submitted study output, i.e. a thesis (Banta, Jones & Black, 2009; Leung, 2004; Pan, 1999; Siu, 2009b; Tennant, McMullen & Kaczynski, 2010).

As stated above, it is not constructive to argue about definitions. Instead, attention should be directed to the fact that design research programs have had significant changes over the past twenty years, especially those in Europe and the United Kingdom, where the final thesis on a particular research topic has been considered the core and practically the only area for assessment (Hickman, 2008; Romans, 2005; Yan, Jiang & Juster, 2004). Many educators have questioned and criticized the conventional research programs of these kinds of programs, as they keep students in ivory towers (Berry, 2005: Weisbrod, Ballou & Asch, 2008). Their theses are their only output, which is never accessed by a wider population and the general public. There is also their concentration on philosophical argument about technical terms, which is only a debating game among a small number of so-called elites. In other words, the knowledge discovered or generated by the students does not bring significant benefits in the form of practical and critical changes to society (Bassey, 2000; Radio Television Hong Kong, 2003; Siu, 2005b).

Leaving aside the conventional structure and requirement of design research programs, educators in recent years have started to re-think the meaning of research and the objectives of research programs at the post-degree, post-graduate, or graduate level (Bassey, 2000). They consider that "research" in research programs may not be simply on a particular topic. In other words, instead of the conventional thinking that research programs train experts in particular areas, there is now more flexibility in educational goals, so that research programs can nurture

experts who have a broad and comprehensive knowledge and experience on a wide scope of related areas.

Moreover, "research" also does not only mean "theory study". Instead, in recent years, more and more educators have put a high value on "practical exploration" (sometimes called "experimental exploration") (Fry, Ketteridge & Marshall, 2009). This means that research programs are not bound to require students to obtain new knowledge from theoretical study and argument, but may also credit practical experiment and exploration through a wide range and different natures of research activities, i.e. action experiment (Dathe, O'Brien & Loacker, 1997).

Furthermore, educators are beginning to see that there is no very obvious boundary between basic research and applied research. Instead of conventionally seeing basic research as a kind of higher level or more supreme scholarly activity (i.e. of a more philosophical nature), applied research has also been recognized as a critical and important research direction (Brew & Boud, 1995; Smith & Elliott, 1995). One of the typical examples for this change is that the Nobel Prize of Physics in 2009 was conferred on the scientist who discovered the important application of optical fiber. Nearly all scientists should agree that the important scientific achievement is more a matter of applied research.

Considering design in particular, there have been two major changes and reforms over the past 20 years (Siu, 2009b). First, applied research elements have been considered important in many western countries. Taking the design research programs in the United States as example, a large number of universities consider that design research must include a high level of applied research elements (Michel, 2007; see also Boud & Lee's (2009) study on changing practices of doctoral education). These research elements are not just on philosophical investigation and discussion, but more about experimental exploration and analysis (see also Hickman's (2008) study on research in art & design education). Distinct from the traditional British style with its high level of autonomy for students to identify their research directions, titles, objectives, and methods of investigation and analysis, some universities in the United States prefer to link their students' research to particular projects. For example, the design schools of Harvard University, Carnegie Mellon University, and Illinois Institute of Technology have considered the importance of students' research projects during their doctoral studies. Students' research is more or less bound to specific topics, with specific roles in particular research labs or centers. Outcomes of applied research in research programs are highly valued, while theses become a routine end-stage report for graduation purposes, having less significance than the value of applied research (see Siu, 2009b). Second, and different from before, when top tier journals and book publishers only accepted philosophical studies and arguments on design theories, more journals and publishers have accepted writings about design process and practical applications. For example, the ten top design journals around the world have accepted more papers about applied research (see the objectives and notes for contributors in *Design Studies*, *Design Issues*, *The Design Journal*).

DESIGN RESEARCH EDUCATION IN CHINA

Reforms and changes

Since the early 1990s, there have been some reforms and changes in the higher education in China (Dreyer & Dreyer, 2010; Siu, 2009b). In tertiary education, one of the critical changes is the combination of structure reform and organized collaboration among academic institutions. In the 1990s, a critical reform was that some institutions with similar standards in general and which were located close to each other combined together to form a larger institution. Alternatively, a relatively small institution merged with a larger institution to form an overall stronger institution. For example, an art and design academy might merge with a university and then the former becomes a school or department of the university. A typical example is that the Central Academy of Art and Design merged with Tsinghua University in 1999, and then the Academy changed its name to Tsinghua Academy of Arts & Design (see Academy of Arts & Design, 2009). This kind of merging also implies the expectation of improving the standard of teaching and research in some of the conventional and smaller scale design academies (Siu, 2009b). In fact, for the past ten years, Tsinghua Academy of Arts & Design has undergone significant positive changes and improvement in research programs. Educators and researchers also agree that overall, design research programs in China have achieved change and are in step with the global development in design education.

Case studies

From mid 2003 to early 2009, case studies related to design education in China (including Hong Kong and Macao) were conducted (Siu, 2003, 2005a, 2007, 2009a). Twelve universities with design programs were selected for general program review and evaluation, while six of them were selected for focused studies. As stated above, some conventional design academies underwent critical change in the late 1990s due to structural reform. Many of these design academies were combined to form larger universities. Some of these design academies after the reform have still maintained part of their internal organization structures and also their autonomy in setting up programs, though these academies are under the umbrella of their governing universities. Therefore, some of these design academies have taken the opportunity to review and then re-design their programs, and have examined the resource and directions of their design research programs. Now that these design institutes are under the university system instead of the conventional academy system, they have gained more resources to plan and implement postgraduate programs (Siu, 2009a). Some also have gained opportunities to work with other departments. For example, some research students in design schools can work in engineering departments or with engineering students to carry out practical research projects. In addition, now that China is increasingly open to the outside world, universities (including the design academies) have more chance to have contact and collaboration with foreign universities, and at the same time, these universities also increasingly expect to establish networks with those

in China. This situation initiates (or in some cases, forces) design academies and departments in China to be much more open to change.

The case studies can be considered as two major phases. The first was conducted from 2003 to 2008 (see Siu, 2009a, 2009b), while another additional phase was conducted from 2007 to 2009. The need for the second phase was based on the findings of the first phase, which included the recommendation that an additional stage of study was necessary (Siu, 2009b). Overall, there were three major parts to the studies. Due to the resource constraints and the willingness of the selected universities, the second and third parts were only conducted in the six universities selected for focus study:

- General reviews of the academies' backgrounds and program documents (for example, program objectives, structures, graduation requirements) were conducted in the twelve universities with design research programs. One of the criteria for the selection of the universities was the reputation of the universities and the availability of design research programs in the universities.

- Interviews with the program leaders and teaching professors were conducted. The interviews were conducted in a semi-structured way in order to allow the interviewers to prompt questions that led to a more in-depth understanding. Moreover, since different design academies had different structures and requirements, a semi-structured interview format was a more appropriate and effective way to invite interviewees to give further comments on design education in China.

- Interviews with the research students were conducted. This stage of studies was added to another study had been conducted before (see Siu, 2009b).These interviews could be considered as a supplementary part of the case studies. They were undertaken because the findings of previous studies indicated that the comments of the students were necessary and essential for a better understanding of the "expectations" and "willingness" of the students themselves. This additional part was also the most difficult and time- consuming due to the varied needs, expectations, natures, topics and study structures of the students. Moreover, design research students came from different disciplines with different natures and requirements from those disciplines. All of these increased the difficulties of the study. This aspect of the study was carried out from early 2007 to early 2009, when more than 40 students were interviewed. The interviews were conducted in a semi-structured mode; sometimes some small group discussions were conducted due to the practical requirements (i.e. restrictions) of the universities and the students' expectations.

OPPORTUNITIES AND POTENTIALS FOR DESIGN RESEARCH EDUCATION

China is one of the most civilized nations (Chinese Civilization Centre, 2007; Laffitte, 1995; Makeham, 2008; Shaughnessy, 2000; Zhong & Hua, 2006). Its formal and informal cultural and social development, including its education system, has been evolving over the past five thousand years (Gao, 2008; Sanderson & Alderson, 2005). Recently, many western people have been amazed at its structures and objectives. Setting aside some critical breakthroughs in

natural sciences, most of the time, education in China has been more concerned with humanities and arts (Makeham, 2008).

Design is a diverse and quite abstract discipline that is difficult to categorize in the traditional groups of disciplines, e.g. science, engineering, humanities, arts. Its definitions, objectives and nature are also broad (Leung, 2004). Even in some countries such as those in Europe and North America with a longer development history in design practice and education, the particular nature of design and design education is still arguable.

Compared to the western countries, as stated above, design education is new in China (Leung, 2004; Siu, 2003, 2009a, 2009b). However, it does not mean that this newness hinders the development of design research programs in China. Instead, compared to many western countries, China has made dramatic progress in design research program development within its relative shorter period of development. The number of design research students has also increased rapidly for the past 10 years. The percentage of students in China who continue their studies at a higher level after degree graduation is much higher than those of many foreign countries (Siu, 2009a). It is also the reason why in recent years an increasing number of European and American countries conduct education expos in China..

According to the findings of the case studies, several key opportunities and potentials for design research programs in China can be identified:

- As a developing country with rich and diverse resources, particularly with respect to manpower in creative thinking and problem solving, the Chinese people have a higher expectation about how education can bring educational, social, cultural, economic and industrial benefits to the state. No matter whether it is correct or not, a lot of people believe as a kind of myth that that "design" can generate breakthroughs and new resources (due to its nature and characteristics) it. While research programs are commonly considered as a higher level of study in universities, people also have a higher expectation on the programs, and in turn, more resources have been injected into the programs by the government and the industry (Siu, 2009a). For example, a large number of study awards and scholarships have been provided for design students. A large portion of the internal education budget is also set aside for higher degree programs. Moreover, compared to many conventional humanities subjects, design research students are resented by those in other studies because design students have more opportunities; since they can use their research outputs (i.e. application of design theories and knowledge) to apply for design and scholarship competitions.

- In recent years, some of the conventional fine art disciplines and subjects have been criticized and have faded in popularity (Pan, 1999; Siu, 2003, 2004). Conventional engineering disciplines and subjects have lost some of their attractive characteristics for the young generation. Design has been recognized as a discipline with a creative nature and higher application value to society and industry (China Central Academy of Fine Arts, 2009; Leung, 2004). Success stories reported by mass media about creative people, many of them designers, motivate more good students to study the degree programs and stay in universities to continue their research studies. For example, since the mid 1990s, design

research study such as PhD and MPhil and taught programs such as Master of Design have become more highly valued in Hong Kong (School of Design, 2003, 2008). Since the early 2000s, more taught programs in different design areas have also blossomed. In many cities with highly regarded universities such as Beijing, Tianjin and Shanghai, higher level design programs have also become more popular since the early mid 2000s.

- Some professors -- those who graduated from other countries with a formal education in design research instead of only conventional fine art research -- have urged reform featuring new postgraduate design education with more research elements. Many of these professors have relevant experience in practical exploration through being involved in real design projects supported by industry. In addition, more degree graduates expect to stay in universities to further their studies. Such a situation further enhances the development potential of design research programs.

- Studies at higher levels in universities have become more popular, including subjects that the industry and the general public did consider serious academic qualifications (Zhang & Stephens, 1992; Zhou, 2006). For example, ten years ago, there were very few design degree students who furthered their studies after their degree graduation. Many students considered only their career development and professional practice; however, in recent years, more graduates, including those with success in business, have preferred to return to universities to obtain a higher degree. There are two major reasons: first, these graduates want to update their academic knowledge due to the rapid change in design subject matter. Second, many mature graduates with lower academic qualifications want to get a higher degree title in order to get more respect from their junior colleagues where they work. This situation is particular obvious for some senior management staff in China who are leading a team with a high academic qualifications due to the existing "qualification inflation". Even though such people may lack a basic degree, they now find it possible to study for a research degree, qualifying under special entrance requirements through their working experience. These situations bring an advantage to the programs, in that many of these students have good industry experience both through work and research. They also have strong links with the industry: when they go back to universities for further study, many of them are supported by their companies.

- Since China has been more open over the past ten years, many foreign universities want to have joint research programs with Chinese universities. On the one hand, this kind of program collaboration can allow foreign universities to enroll good students within the big pool of good students in China. On the other, since the late 1970s, under compulsory family planning, the single-child family has become a norm in China, in particular in the modern cities. This situation has made education a very good income source for foreign universities, in that a large number of single-child families can afford and are willing to pay more to allow their children to stay longer and gain a higher degree in university, particularly in good foreign universities..

ISSUES OF DESIGN RESEARCH EDUCATION TO MEET THE NEW NEEDS

As the case study findings illustrate, design research education in China is full of opportunities and potential. More than 40 issues for attention and action have also been identified in the case studies mentioned above. Among them, some key issues are essential and urgent for design research education to improve and meet new needs:

- There has not been sufficient review and discussion about design research education in China. That which has taken place is piecemeal, and done by only a few universities and academies. Moreover, the scope of reviews and discussions are not comprehensive enough. For example, some universities only consider design research programs focusing on one to two particular specialties/subjects. Most of the time, this kind of piecemeal and non-comprehensive review bias focuses only on the particular interests of an individual faculty, instead of the overall and necessary development of design research education.

- Even though some annual meetings have been conducted over the past ten years (e.g. the annual design education meeting in Hong Kong), there is a lack of coordination among design research programs in China. However, several alliances and networks have been formed among design schools and departments in universities in China these years. Even so, most of their work is only on particular project directions or conference coordination, instead of in-depth discussion and collaboration about design research programs. One of the reasons is that the number of design research students is small and they require a relatively large level of financial support from universities. This is distinct from the taught programs, which can generate a large tuition income.

- There is no commonly agreed or accepted structure of programs. The length of study for a commonly recognized degree title differs in different places, from the entrance requirements to the assessment methods. Taking the programs in Hong Kong and mainland China as an example, the education structures as well as the degree destinations are quite different (see The Hong Kong Polytechnic University, 2009). The structure and compulsory learning elements of the design research programs in mainland China are also quite different from those in foreign countries (see China Central Academy of Fine Arts, 2009).

- Applied research elements are particular lacking in many programs in China. In other words, theory-based elements mostly still dominate in the majority of the programs. One of the reasons for this situation is that many of the supervisors do not have experience to handle real-world projects, and some of them do not have a relationship with the industry. Also, some students are reluctant to find real-world projects themselves. Instead, many students take an easy and safe route by focusing on theoretical study instead of applied research.

- There is a lack of program elements that will allow design research students to enhance their knowledge and experience in applied research methods. Most of the time, students carry out their research mainly through literature review and analysis. In fact, design research students in China read a lot (Siu, 2009a, 2009b). This situation is not bad, but it

can cause two drawbacks. First, quite a lot of the readings selected by the students are in Chinese (including a large portion are translated from foreign literature). This situation means that many readings are not up to date, least of all the most recent ones. This biases the readings. The second drawback is that many students do not have chance to carry out empirical research, e.g., exploratory and experimental studies. This drawback further causes a negative ripple effect, in that students have neither incentive nor encouragement to explore and construct new applied research methods -- which is generally recognized in foreign countries as important for the development of design research education.

- Many design academies, schools and departments still run their programs like other conventional arts or fine art programs. On the other hand, some link their programs tightly to engineering programs. This means that no specific "design research" knowledge and experience can be provided to their students. The new trends of design theories and experiments (such as those in different foreign countries and regions) are also lacking in the program elements in China. For example, an examination of the thesis titles from 2006 to 2008 in twelve of the popular design academies, schools and departments in China reveals that a large proportion of the thesis titles are related to reviewing traditional philosophical thinking and ideas of art and cultural theories, and most are narrowly focused on traditional Chinese thinking and theories. Comparative studies between traditional and contemporary views on design theories, and comparative studies between the design views in China and foreign countries are very limited. Another large portion of the thesis titles are related to conventional engineering studies, even though they are application-oriented.

- Due to the lack of incentives for practical exploration, many design students' research topics cannot accommodate recent changes and meet the needs of the society and the industry (for the advantages of practical exploration, see Fry, Ketteridge & Marshall, 2009). As discussed above, the lack of exploration of new and alternative applied research methods biases the development of the design research education. Several design professors interviewed for the study indicated that design research in China seems to work inside an ivory tower, and that it does not consider and also cannot meet (or, at least not pay attention on) the new needs of the society and the industry. This situation goes against the global trend of design research (Laurel, 2003; Michel, 2007).

- Many programs are not able to go along with global educational trends. In other words, many programs cannot consider the needs of, or match with the changes to programs in other countries. This situation is particularly significant in that there is very limited collaboration among universities in China or with universities in other countries in the supervision of research students. In fact, some prestigious universities in China have a contrary policy, in that they do not recommend joint supervision with other universities. This situation not only limits the experience and development of research students, but also the overall development and resource management of the programs. Moreover, studies have highly valued the advantages of collaborative supervision (e.g. joint-supervision, co-supervision, specially-invited supervision) in research programs (Ikeda &

Takayanagi, 2001; Ujang, 2000). Collaborative supervision between industry and the university has also been a popular trend in design research education. In general, applied research requires research students to explore a wider scope of areas before going in a particular topic. Most of the time, practical exploration also expects the students to seek advice and help from relevant disciplines. As a result, the scope of knowledge of such students is not narrow and biased. Besides, collaborative supervision also lets industry know more about university research and have a closer relationship with the university, so that industry is more willing to contribute resources to university research (Scrivener, Ball & Woodcock, 2000; Siu, 2009b).

- There is a lack of experienced supervisors to guide research students, even though an increasing number of study-abroad design graduates return to China to work in universities. Some old professors still use conventional (i.e. outdated) methods to guide their students in design research. For example, many of the professors working in the design institutes and departments only have knowledge and teaching experience in other disciplines such as engineering, art, social studies. As discussed before, all these situations are particularly significant and becoming more serious so long as joint supervision is not sufficiently encouraged in China. In addition, exchange of professors and students in design discipline is also relatively less than in other disciplines such as natural sciences and engineering. This situation also deprives professors (i.e. supervisors) and students from having a better exposure to the outside world, including industry and other research labs and centers.

- Although in recent years an increasing number of students have participated in design projects during their studies, well-organized research training is still lacking (Leung, 2004). For example, there is a lack of well-planned supporting studies for the research students. Unlike the practice of foreign countries where design research programs have good linkages with other research programs, so that students can get support and enroll in the studies of other programs (School of Design, 2003), many design research programs in China are so internally bounded that the opportunity for exposure to students in other programs is quite limited. This situation has the significant drawback that the students' vision is so narrow that design research becomes slow and restricted in development (for widening scope of students' research, see also Ehrenberg & Kuh, 2009).

DIRECTIONS AND WAYS TO GO

Design research education is important (Evatt & Jones, 1995; Hickman, 2008). It is also full of opportunities and potentials to go further when it is still in its infant stage (Leung, 2004; Siu, 2009a, 2009b). According to the case studies above, good development in design research education should consider three aspects in order have a balance among theory study and practice exploration. They are, policy, implementation, and management.

First, a good and carefully considered overall policy for design research education should be established. This means that an in-depth and comprehensive review of the overall educational

policy is necessary. This review must be based on the nature, directions, objectives, and practical strengths and constraints of research education in China. With respect to overall management in terms of balance and diversity in educational development, the central educational policy unit needs to plan and establish a policy appropriate and feasible for China. Obviously, compared to other countries, China is large in its geographical aspect and other physical, social and cultural aspects (Dillon, 2009; Dreyer & Dreyer, 2010; Pan 1999; Simon & Cao, 2009). Although a plan for the overall development of the whole country is necessary, it is not wise to have a very rigid policy for design research education. Instead, while a key and core policy should be defined as guideline and framework, flexibility should be provided for implementation in the different regions and cities, and in different contexts (see Mok's (2001) and Teather's (1999) studies on education policy reform and educational changes). In short, a careful review of the balance in the research directions, contents and methods is important. Only this kind of careful review can make existing and future design research education meet the new needs.

Second, as mentioned, directions in the educational policy of design research education must be clear, but a certain degree of flexibility should be allowed in the implementation of these directions (Siu, 2004, 2009b). In particular, when design research is tightly related to social and cultural changes which change rapidly, flexible implementation allows space and prompt response of the programs to march with the changes. Flexible implementation also allows flexibility (i.e. a buffer zone) for different universities to implement programs and research directions according the universities' strengths and constraints. For example, some design universities have long and strong reputations and experience, and good research staff in specific art and design-related areas. Some may be good in basic research and theoretical analysis. Some may have a good backup of other departments for multi-disciplinary practical exploration. Some may have good collaboration networks with particular industry sectors due to the universities' particular traditions or geographical locations. It would be best if these universities take advantage of their strengths as well as their assets to develop particular research programs. This situation also gives advantages to the overall educational development of China, in that the directions of program development can be more comprehensive and not biased (Siu, 2005; Wang, 2003). It also provides chances for the universities to develop new research areas and strengths under the core direction of research education.

The management aspect is more about the quality assurance of the design research programs that are implemented. While an action approach should be adopted to guarantee a continuous quality assurance mechanism, in the same way as the implementation aspect discussed above, flexibility should be allowed in program management, in order to allow the programs to meet the new and changing educational needs (see Preedy, Glatter & Levačić, 1997; Sallis, 2005). In fact, there are plenty of studies about good management in research programs. Regarding the practical situation of the design research programs in China, two major matters demand more attention: quality assurance of student performance during their studies, and quality assurance of the final output of the studies. With respect to the first, continuous monitoring of student performance is weak in many universities. Thus, a mechanism to monitor students' research process and interval outputs is important (Siu, 2005a). For the second, the

assessment of research students' research outputs (i.e. theses) is not always conducted in an open and consistent way (see Rayment, 2007; Russell & McGuigan, 2001). This situation does not mean that there is a lack of sufficient members on the assessment panel, but rather it means that assessment must be conducted in an objective way. In particular, most of the time, there is a lack of external assessors for the students' research outputs. Today, an increasing number of design universities in China have started to consider the external assessment of the students' theses. For example, the design schools in Tsinghua University and the China Central Academy of Fine Arts have put external assessment as an important criterion. However, the arrangement of this kind of external assessment is still not conducted in a professional and well-organized way. Most of the time, external assessment is only taken as a discretionary process; there is no serious model for review and oral examination using external assessors. Regarding external assessment, another objective assessment method is the publication of research outputs in double-blind review journals. To date, publication in refereed journals or other similar objective research outlets is still the weakest point of design research education in China. When compared to the refereed publication of students in foreign countries, design students in China are particular deficient (Siu, 2009b). According to the case studies, there are several reasons of this situation. First, refereed publication is not the common practice of design research supervisors in China, and in turn this kind of practice has not been promoted. Second, nearly all high-standard design journals are published in English. However, many design research students in China are still deficient in English (Cheng & Curtis, 2010). Third, design research in China is still theory-study oriented. However, the direction of many design journals today has changed, so that more of them expect to have empirical-study papers with significant data presented in the terms of scientific evidence. The lack of practical exploration makes design research students in China have more difficulties in achieving successful publication in foreign design journals.

CONCLUSIONS

Design research education in China is new (Leung, 2004). Over roughly the past two decades, more universities have introduced different kinds and levels of design research studies (see BODW, 2009b; China Central Academy of Fine Arts, 2009). Some of them progress quickly and gain quite good international comment and recognition, while others are still standing in the same place with the result that the number of students is going down. The research outputs of the students of different programs are also varied. Some students only aim at gaining their degrees by submitting their theses that are then put on the bookshelves in the university libraries. Most of such studies in fact have offered very little in the way of knowledge and practical contribution to the academic field and society. On the other hand, some students have persisted. They have made an impact on the discipline through international publication, and are transferring their findings and experience into practical innovation and contribution to the academic, social and industrial sectors.

Using case studies, this paper examines the differences among different design research programs as well as the different contribution of students' research by looking at three major

aspects: i.e. policy, implementation and management. The findings of the case studies identify that the imbalance between theory study and practical exploration is one of the key causes of the unsatisfactory achievement of design research programs. The findings also indicate that existing design research education in China is more biased towards theory study due to traditional and practical reasons. Some relate to the traditional development of education in the country. Some relate to the planning and review process. Some relate to the program structures and ways of quality assurance. Some relate to the availability of resources and supervisors, while some relate to the intention and motivation of the students.

To obtain a balance between theory study and practical exploration, this paper advocates more consideration to practical exploration of the existing imbalance in the design research education in China. The paper also suggests how different factors such as collaborative supervision and objective assessment can work together to enhance practical exploration in students' design research. However, it does not mean that these suggestions must exist forever. Instead, as indicated above, we need to review the overall policy, ways of implementation and quality of management all the time. Only an action review and continuous reform of the programs can guarantee a higher impact and better quality of design research education to meet the new needs of society.

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