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Postgraduate design research: serving the society and the industry

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Abstract

Postgraduate design research has received more attention over the last two decades. Two of the major objectives of research in recent years are serving the society and the industry. Due to the time constraint and the physical resource provision and setting of research, most students' research cannot serve the objectives inclusively. Instead, sometimes these two objectives are mutually exclusive. From 2007 to 2009, a case study on postgraduate design research was conducted. The methods included in-depth review on the details of the students' study objectives and activities. Students were interviewed at different stages of their studies in order to understanding their progress, difficulties and achievements. This paper briefly reviews and advocates the importance and needs of serving both the society and the industry by postgraduate design research. Based on the case study in a postgraduate design research programme, the paper discusses how a balance of the two objectives can be obtained. The paper also identifies the difficulties, limitations, opportunities and possibilities for researchers and educators as reference for programme implementation and further investigation in order to bring a better quality of postgraduate design research.

Keywords: Postgraduate design research; society; industry; design education.

1. Introduction

Since "design" became a more formal discipline and as a form of formal education programme in the early part of the 20th Century, various kinds of design programmes have been offered in "schools" to meet different educational goals and objectives. In recent years, some of the design programmes have also merged or linked with other disciplines (e.g. arts, fine art, engineering, business, social studies) to form new programmes in order to match with the changing needs of the society and the industry. Design programmes originally were only offered at lower levels, such as secondary programmes and degree programmes. While the postgraduate level of studies have become more popular over the past several decades (Kell & Vogl, 2007; Powell & Green, 2007; Siu, 2009a), postgraduate design research programmes (such as PhD and MPhil in design) have also attracted more attention from the education policymakers and programme planners (Siu, 2009a, 2009b).

The objectives of design practice and design research have caught the attention of more people. Different topics of discussions on the purposes of design have been prompted over the past several decades. Hundreds of international conferences, seminars and meetings have been conducted since the early 2000s. Among all concerned

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topics, some researchers consider whether design research should be more application oriented in that the research outcomes must generate concrete designs to strengthen the development of the industry. Some researchers take another perspective that design research should not only be a tool for the industry as well as businessmen. Instead, design research must consider the overall well-being of the society, in particular more concerning the needs of minorities and the deprived (Clarkson, 2003; Keates & Clarkson, 2003; Siu, 2002, 2009c; Stephanidis, 2001).

Goals and objectives of postgraduate design research have become a red-hot topic in the discipline for the past ten years. As design is claimed to be creative and innovative oriented, people consider how research can bring creative and innovative outcomes to benefit different aspects, areas and parties (Balcioglu, 1998; Institution of Mechanical Engineers, 2001; Liddament, 1991). In addition, and the same as other disciplines of postgraduate research, postgraduate design research is supported by the society; i.e. the entire society as well as taxpayers. People expect research can give benefit to the society, but not in a biased way (Allen, Bonous-Hammarth & Teranishi, 2006; Barton, 2006; Keller, 2008; Ottaway, 1998; Siu, 2009c; Whiteley, 1993). In other words, people regard postgraduate design research as not only a tool of a small number of people or particular groups, such as politicians and businessmen (Siu, 2009a, 2009b). Of course, some people from another perspective argue that postgraduate design research should not go to the extreme end so that it only focuses on the needs of the "deprived" but neglects other important needs of the society, e.g. commercial, industrial, and economy developments (see Siu, 2009c; Srölin & Vessuri, 2007).

Among all key considerations as well as topics of argument, researchers and educators in general agree that postgraduate design research should serve both the society and the industry (Siu, 2009c; regarding particular research methods to meet this expectation, see also Jerrard, Hands & Ingram, 2002). In fact, as Sir James Hamilton (1982) claimed about the relationship among education, industry and society, it is not easy to have a clear definition on these two educational objectives as they are related to and overlapped with each another (see also Barton, 2006; Bray & Koo, 2004; Connell, 2007; Culley, 2001; Keller, 2008; Ottaway, 1998; Stepulevage, 2009; Tomlinson, 2005). Some design researchers also claim that the industry is part of the society and the industry has significantly affected the development of the recent modern society. Nevertheless, considering these two objectives in a more specify way, most people would confine that the former relates more about the social needs while the latter more relates to the development and applications to the industry as well as the economy (Siu, 2005; see also Leong & Clark, 2003; Margolin & Margolin, 2002; *Shaping the Future*, 2003).

This paper aims to discuss the issues identified above based on the findings of a case study of a postgraduate design research programme. The paper briefly reviews and advocates the importance and need of serving both the society and industry by postgraduate design research. It then identifies the difficulties, limitations and possibilities in the implementation of these twin objectives. It aims to provide researchers and educators a reference for programme implementation and further investigation in order to bring a better quality of postgraduate design research.

2. Case study: a postgraduate design research programme

In early 2005, international design researches and educators participated in an international annual educational expo conducted in Hong Kong. Some of them raised some critical questions concerning the meaning of current research education. They considered what were the directions and ways of study in terms of the meaning of research education. During the discussions at the expo and further discussions later, some design researchers and educators identified some topics for further investigation and discussion. One of the topics was whether postgraduate design research should more focus on serving the needs of the society or the development of the industry.

While at that moment the city was promoting the creative (and innovative) industry (see *Policy Address 2005*, 2005; *Policy Address 2006-2007*, 2006), in the discussions some people drew attention to how postgraduate design research could generate directions, insights and outcomes to assist the development of the creative industry. People working in the industry also started to urge the postgraduate research students to have better connections with the industry, and research topics as well as expected outcomes should match with the overall local and regional development and/or generate information to support the local industry to meet the local, regional and international needs.

On the other hand, and the same as the past practice of design research in Hong Kong, some people took another perspective to look at the issues and they more preferred the postgraduate design research to serve the needs of the society in terms of the particular local social, cultural and community needs. Some of them also stated that, due to

the limited resource in the educational sector, postgraduate design research had to be focused (Siu, 2009a). Instead of serving the industry which received a relatively larger amount of resource in research and development, postgraduate design research should take up a higher level of mission to serve the people and sectors with fewer resources, i.e. minorities and the deprived.

Some people would like to take the middle road to see how a balance could be achieved so that postgraduate design research could serve both objectives. However, this kind of view was only based on an expectation of gaining the advantages from both sides. However, how to gain this advantage was another question. In fact, there has been no in-depth study on the topic in the city. References from other countries that could fit a particular educational environment and setting were also very limited. Therefore, a case study on postgraduate design research was conducted in Hong Kong from 2007 to 2009. The major objective of the case study was to review and explore the core and fundamental values and objectives of postgraduate design education. To have an in-depth understanding on the particular topic, the scope of the study was confined to see whether and how postgraduate design research could serve the needs of the society and the industry.

2.1 Qualitative approaches and methods

Qualitative approaches and methods were adopted in the case study. One of the reasons was the limited number of postgraduate design students in the city. Another major reason was that the study expected to carry out in-depth exploration and analysis on the topic to generate insights for further investigation, discussion and application (for the advantages of in-depth case study on the similar topics, see Mills, 2009; Simons, 2009; Yin, 2009). The same as other case studies, the study did not aim at generating a golden rule and permanent objectives for the planning and implementation of postgraduate design research programmes. Instead, it endeavoured to explore the topic and then identify the issues and factors affecting the consideration and decision that these obtained findings and experience would be able to apply in other situations and later generations of programme reform. This was because the research team believed that design research as well as research programmes must continually change to reflect the times.

2.1 Detailed methods

The major informants of the research included the programme coordinators of design and design related programmes, postgraduate design research students, supervisors and graduates. The detailed research methods are as follows:

- Background review of the history and development of postgraduate design research.
- Review of the goals and objectives, structure and practice of existing postgraduate design research programmes.
- Review of the past postgraduate design topics, research objectives and activities, and outputs.
- Review of the existing postgraduate design topics, research objectives and activities.
- Small group discussions among postgraduate design research students. (This method could release the anxiety of the students and the responses of students could stimulate others to give their opinions.)
- In-depth interviews with the programme coordinators and leaders. (One of the core members of this study was the person who coordinates the postgraduate design research programme, his view was carefully considered and analysed in an objective way. In addition, programme coordinators of other design related programmes (of other departments) were invited to give views related to the research topic.)
- In-depth individual interviews with the postgraduate design research students. (The research methods included semi-structured interviews and un-structural interviews. The topics were about the views and opinions on postgraduate studies, their major directions and objectives of their studies, difficulties and possibilities for their studies to give benefit to the society and the industry.)
- In-depth individual interviews with the supervisors. (The interviews were carried out in a relaxed and casual manner. The supervisors provided their views and opinions on postgraduate design research, and their expectations of their postgraduate students.)

- In-depth interviews with several graduates who had studied postgraduate design research before. (Although the available interviews were quite limited in the city, the interviewees were selected from different disciplines and their job natures were different.)

3. Importance and Needs

According to the findings of the case study, in principal the programme coordinators and leaders, students and supervisor agreed that it was important that the needs of postgraduate design research should serve both the society and the industry. In particular the programme coordinators and leaders pointed out that it was also the major trend of postgraduate research programmes around the world today (see Barton, 2006; Conney, 2007; Moore, 2004; Ottaway, 1998). However, most of the interviewees also pointed out that it is not easy and sometimes impossible to require a design research student's research to serve both objectives with equal weightings on each. Instead, they would prefer to see whether students would put the importance of these two objectives in mind, and were willing to put effort in to achieve it.

The findings regarding the importance and needs of postgraduate design research serving the society and the industry are as follows:

- Design is an application-related discipline. Applied research in recent years has been highly valued. Among all other disciplines, design can give the greatest and most direct benefit to the industry, and help and care to a wide scope of people and other subjects in the society, including the deprived and minorities.
- Design is a discipline that works well with other disciplines. On the contrary, some other subjects may not find it easy to meet this educational goal, such as some arts, fine art and pure sociology disciplines. Thus, postgraduate design research students have high potential as a catalyst to work with other research students to generate practical outcomes to benefit the society and the industry.
- One of the core natures of the design discipline is that its content is highly related to the development of the society. Thus, postgraduate design research most of the time relates to the matters of the society; and in turn it is direct and has high potential to generate outputs that contribute to the society.
- Due to its applied research nature, compared to quite a lot of disciplines, postgraduate design research has a relatively higher potential to serve the deprived and those of less concern in the society.
- Industry development today needs a high degree of creativity and innovation, while design is a creativity and innovation oriented discipline. Thus, the industry development has a very direct and logical linkage with design research.
- Postgraduate design schools should not be ivory towers any more. They should maintain a good connection and relationship with the outside world, including the society (i.e. the general public) and the industry.
- Postgraduate design research having a good connection with the outside world can enable the goals and objectives of postgraduate design research to be more closely related to the actual needs and preferences of the society. In turn research in higher education can bring benefit to the society and the industry.
- Postgraduate design research having a good connection with the outside world from another perspective can let the society and the industry have updated and prompt feedback to the research programmes.
- The significance of postgraduate design research highly relates to the applicability of findings to the society and the industry.
- The accuracy of findings most of the time needs the verification and validation by both the society and the industry, in particular now the industry has (and requires) a close relationship other social sectors.
- Regarding the particular nature of the design discipline, both social and industrial supports are important for the success of postgraduate design research. For example, the difference between design and some disciplines such as history or arts subjects is that postgraduate design research always needs information provided by the industry.
- Postgraduate research in recent years has needed more physical support from the society (e.g. information, participation, collaboration) and the industry (e.g. financial support, equipment, technical and expert advice) (see Altbach & Johnstone, 1993; Higher Education Funding Council for England, 2007; Massy, 1996). In particular, regarding postgraduate research in the design discipline, support from different social sectors and the industry is sometimes crucial to the success of research implementation. The society and the industry in

turn also have expectation on research that research can serve back the society and the industry though they may not expect or allow it to have high interference on the details and final views of research results.

- A significant number of design research graduates will work in the social and industrial sectors. While the industry has closer relationship and more collaboration with different social sectors, postgraduate design research students' research topics related to the industry and social matters can benefit the future work of the students.

4. Difficulties and limitations

As stated by the interviewees, there were quite a lot of advantages — importance and needs — to aim at promoting and implementing postgraduate design research to serve the society and the industry. However, they also pointed out that there were many difficulties and limitations to reach such a "balance" in the objectives of the programmes. The key identified difficulties and limitations can be categorised into three levels/areas and are as follows.

4.1 Policy and planning level

- Many postgraduate research programmes have a high degree of freedom for the study objectives of the students. In particular many of the universities are still based on the conventional British (and European) systems; there are no strict requirements for the objectives and application directions of students' research.
- It is still a debatable (and arguable) topic whether postgraduate design research should serve the society and/or the industry. It is not easy for the programme planners to fix very rigid requirements to the programme coordinators, supervisors and students.
- Supervisors may have their personal or particular agenda behind their supervision of students. This situation significantly affects the objectives of the students' research. For example, some supervisors (and also students) may like to tackle some particular topics and areas related to social issues, while some may like to meet the industrial needs. Sometimes it is not easy for programme coordination staff to strike a balance among all supervision staff.
- Research aiming at serving the society (e.g. particular communities and social sectors) and the industry most of the time needs their support and assistance. Sometimes arranging particular collaboration with the industry and/or obtaining their support for some particular topics of research are not easy. However, it does not mean that the un-supported topics are not worth researching. On the other hand, social sectors such as social organisation and governmental social departments are always bounded and restricted to work with the external parties (such as universities) due to the policy and ordinance.
- Time is one of the critical constraints in applied research to serve the society and the industry. In general, three to five years is the time duration for doctoral research study. Due to the resource constraints, this study requirement has had to be stricter about these years. However, aiming at serving a particular social sector or the industry may generate more difficulty to the students to complete their study on time (i.e. within the normal or maximum study period). This situation causes further problems to the overall planning and resource management to the programme coordination.
- In recent years, other elements, requirements and study activities have been added in the programme structure and requirements, e.g. taught subjects and other assessment requirements beside final thesis. Such new programme requirements hinder the programme planners and coordinators in requesting and motivating the students to have a balanced consideration on the needs of the society and the industry.
- In recent years resources supporting postgraduate design research are more biased on the industry side. More external advisors (more coming from the industry in recent years), university senior management and programme coordinators tend to expect more applied outputs to gain the recognition and more support from the industry. This situation has a drawback in that fewer design students consider the needs of the society, in particular the deprived and minorities.
- There are still some students that are willing to do research to bring benefit to the society (e.g. the deprived and minorities), yet most of the time they gain little support, in particular support in hardware and equipment.

4.2 Supervision level

- Instead of only supervising students to conduct research on a particular topic and writing a thesis, aiming at requiring students to put effort on considering their research to bring benefit to both the society and the industry sometimes increases the load and pressure of supervisors. In turn some supervisors may not like to do it, or at least they do not put serious effort into it.
- Nearly most of the supervisors may agree that serving the society and the industry is important. However, some supervisors have a kind of thinking that there is no need to have a balance between the two objectives, or it is good enough to meet only one of the objectives, in particular time limitation for study is a critical constraint. Thus, quite a lot of supervisors prefer their students to focus on one particular objective, i.e. research findings and results giving advantages on social matters or industrial matters.
- Supervisors may have their personal agenda in recruiting and supervising students. Funding for supervisors (and programmes) sometimes also has particular reasons, e.g. associated with particular funded research or consultancy projects. Supervisors sometimes have difficulties to consider a balance in considering social and industrial matters.
- Many social and industrial related research (and projects) is time consuming. Sometimes some research projects may last for more than five years, in particular when the projects are related to in-depth qualitative study and/or user participation. Thus, if a research project needs to consider both social and industry matters, the degree of difficulty in coordination and supervision would further be increased.
- Some projects may need a large number of research personnel. Yet, these kind of projects most of time lack funding support to recruit assistants and helpers. All these factors cause difficulties to the supervisors in supervision or providing physical support to the supervisors to recruit assistants to take up part of the research work. Thus, quite a lot of supervisors prefer to ask their students to skip/prevent these types of difficulties, or neglect a balance in social and industrial consideration.
- Industrial collaboration and networking is an important factor for the success of research serving the needs of the industry. Some supervisors do not like to put effort into it.
- Paper publication is still considered as the most important output of research studies. If postgraduate research students put too much or significant effort on generating applicable outputs, more or less it would affect the "paper production" of students. Many supervisors prefer their students to focus their effort on papers instead of some practical results and outputs.

4.3 Research study level

- Quite a lot of postgraduate design students do not have a firm or confined research topic at the beginning of their studies. Many of them cannot fix it until the middle of their study. However, applied research most of the time needs collaboration and a long term plan. Thus, a time constraint most of the time hinders the choice and serving targets of students.
- Industrial collaboration is an important factor for the success of research serving the needs of the industry. Time requirement (and constraint) of studies is limited. Sometimes students do not have sufficient time to secure industrial collaboration.
- Graduating is the most important goal of research students. Many students like to take an easy route to finish their programmes. Adding more objectives and requirements (such as aiming at serving particular parties) may not be the preferences of students.
- Students have their own agenda in their future work and study. For example, students may not be interested in considering the needs of social sectors if the students plan to engage in future work in a particular area of the industry which does not need to cater to the needs of the social sectors. On the contrary, some students are interested in academic theory research and they may not be interested in working with and for the industry. In turn these students have low motivation to consider the needs of the industry and plan to generate research findings and outputs to serve the industrial needs.
- Research in universities is more flexible if the research does not have any coherent relationship and bonding with the outside parties. On the contrary, working with external parties means a more rigid nature in research. Thus, some design research students prefer their research topics to be more independent and "relationship-

free". It is more flexible for their studies, in particular for them to have changes in direction, scope, objectives and activities if necessary.

- Applied outcomes sometimes do not guarantee a good thesis and refereed papers. The current format of assessment mainly focuses on the quality of thesis and papers, yet many students put less effort in considering the meaning — applicable findings and outcomes — of their research projects.
- In recent years, more elements have been added to the programme structure and requirements. Such kind of new programme requirements frightens or demotivates students to consider enabling their research directions and outcomes to service the society and the industry.
- The background of some students cannot allow them to have a balanced consideration on and contribution to the social and industrial matters. The available project opportunities, funding and equipment also hinder and limit the students to make a choice.
- Students' research directions, topics and objectives are more or less guided (or affected) by the willingness of their supervisors. Sometimes students face difficulties in aiming at some directions that are different from their supervisors. For example, some supervisors may like their students to consider the needs of their potential funding providers or project collaborators in other projects. However, students may consider their personal interests or their future career roles.
- Applied research always becomes the excuse of supervisors when asking their students to take up projects. Sometimes these kinds of so-called projects may not be directly related to the students' own focus and area of study. Such a situation causes difficulty to students, and makes students reluctant to participate in "projects".

5. Opportunities and possibilities

- The industry in recent years has considered the needs of the society (including the needs and preferences of the deprived and minorities) in that the needs have high potential and good direction for the industry development. In other words, more industrial sectors put social matters as kind of elements that are important for their business development.
- The social sectors (such as social organisations) consider the industry as a good working partner in that they can work together to generate mutual benefit and development.
- Universities are more willing to have collaboration with the industry and different social sectors. In recent years, design research collaborations with social sectors and the industry have not been done in a separate and isolated way. Instead, most of the time collaborations are required to have the involvement of the social sectors and the industry together.
- External funding from the industry is necessary for the development of the universities (and the development of postgraduate research).
- Government support on applied design research is increasing.
- The participation of different social sectors (and organisations) provides great support and information for postgraduate design research, e.g. user participation.
- Programme structure of postgraduate design research is more flexible. That is, time does not become a critical constraint in research progress. Students can change or tune their direction, scope, objectives and activities of their studies easier than before.
- Directions and requirements of design research programmes have been more diverse in recent years. Universities also like to see their students have more contribution to the society and the industry by generating more applied research outputs, instead of only producing conventional research outputs. Senior management also take a more flexible role in planning of the design research programmes.
- Special grants and supports from an increasing number of funding bodies and organisations are available for postgraduate research design. Students can gain more support for their research if the topics are related to social and industrial matters.
- More supervisors, in particular young supervisors, are willing to work with students on research projects related to the needs of the society and the industry.
- Assessment on postgraduate research in most of the disciplines has undergone many changes, including design disciplines. "Application" is considered as a key objective of research, and applied research outcome is

recognised as a kind of significant research output. In other words, thesis and paper are no longer the only means to assess the quality of students' research.

- Students with more diverse backgrounds like to enrol in design research programmes, and in turn students' research topics and objectives are more diverse. This situation increases the chance of students participating in social and industrial related research projects.
- Instead of only staying in labs or universities to work as academics, more postgraduate design research students tend to work outside the universities, e.g. social organisations, private design companies. This situation makes and motivates more research students to confine their research topics to practical social and industrial matters, and tries to generate applied research outputs.

6. Conclusions

As in the discussion above, the major objectives of research in recent years are serving the society and the industry. Due to the time constraint and the physical resource provision and setting of research, most students' research today still cannot serve these two objectives inclusively. According to the findings, the situation is due to the difficulties and limitations that appear at three different levels: planning and policy, supervision, and research study. To overcome this situation, researchers and educators need to take a serious review and then tackle the problems from these three levels.

Regarding the planning and policy level, programme planners and coordinators need to consider how to maintain a more encouraging and flexible planning, supervision and learning environment for programme coordinators, supervisors and students. Having a positive view on motivating students to carry out research to serve the society and the industry is critical, and providing more resource for these kinds of social and industrial related research projects is essential. Assessment on postgraduate research is another critical aspect. It cannot be denied that students are worried about graduating. Thus, instead of only focusing on thesis and paper outputs, assessment should also consider the application value and knowledge contribution to the social and industrial sectors.

Regarding the supervision level, supervisors' background and their willingness are important. This is because supervisors affect the students directly. Supervisors should be the supporters, facilitators and motivators for the students to consider social and industrial matters in their studies, instead of discouraging the positive and good vision of the students. Moreover, supervisors should help and give directions to establish networks with the social and industrial sectors in order to gain their support. In fact, without the support of the social and industrial sectors, students may find it difficult to go further with their research and to serve the needs of the society and the industry simultaneously.

For students, they should recognise the change in the meaning of postgraduate research. There is no more only a production of thesis and papers on the library bookshelves. Students cannot hide them inside the "ivory towers" and neglect the fundamental purpose of research in that it should bring real benefit to mankind. Therefore, postgraduate research students are required to re-think their roles of how to bring design research to serve the social and industrial development, in particular those that are deprived and minorities who always have less benefit and care.

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