PHENOMENOGRAPHIC STUDY OF STUDENTS' CONCEPTIONS OF FORMAL RESEARCH PROCEDURES

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ABSTRACT:

In view of the current inadequacies of design research, a group of art and design researchers have urged for alternative research methodologies, which is challenged by opposing views that a formal research structure and a rigorous research should similarly be applied to design research. To address these divergent views, this paper aims to explore the potential use of formal research procedures in design research. This study uses the phenomenography method as the basis of its research design. Focusing on visual communication studies at undergraduate level, this paper is a documentation of the development and implementation of the formal research procedures on eighteen design research proposals. It shares the insight on how students experience, understand, perceive or conceptualize various aspects of design research. The findings have affirmed aspects of formal research procedures and represent a first step in explaining the different ways in which visual communication students conceive design research.

1. INTRODUCTION

The knowledge and skills in research methods have become important in undergraduate studies, as research is a fundamental foundation block for designers aspiring to stand out in the competitive creative industry and/or to persist against the challenges of graduate study (Heller, 1998). The review of knowledge and skills in research methods at the undergraduate level has uncovered four areas of concern: (a) lack of teaching of research methodology for design research, (b) lack of appropriate models of practice in research education, (c) very little or no written component for design research, and (d) lack of proper research infrastructure (Heller, 1998;

Hockey, 2007; Khoury & Khoury, 2009; Mimoso, 2011; Newbury, 1996; Siu, 2007; Tornello, 2003; Strouse & Arnold, 2009). In some ways, it might be worthwhile for educators to take a step back to understand the fundamental causes of all the above. One way is to observe the undergraduate students who have gone through a research method course and understand what are their conceptions of knowledge and skills in design research.

Considering the current inadequacies of design research, researchers such as Mimoso (2011), Siu (2007), and Yee (2010) have urged for alternative or new research methodologies for design research at the level of master's and doctoral studies. Another group of design researchers feel strongly that a formal research structure and a rigorous research process is important for conducting design research (Allison, 1992; Archer, 1995; Papastergiardis, 2002). For example, Archer (1995) stated that the subject matter may range from anthropology to astrophysics, but what matters is that the research is conducted scientifically - defined as "to produce explanations that remain valid when tested in wider and wider fields of application, and which therefore offer some powers of prediction" (p. 6). Hence, this study aims to understand whether traditional research methods of inquiry are still appropriate or no longer relevant to this changing knowledge context of higher education?

Based on the opposing views of the design researchers on design research, the purpose of this paper is to explore the potential use of formal research procedures in design research. Formal research procedures refer to the conventional approaches currently undertaken when conducting research in academic disciplines such as science and the humanities. This study uses the phenomenography method as the basis of its research design (Hasselgren & Beach, 1997). Focusing on visual communication studies at undergraduate level, this paper is a documentation of development and implementation of the formal research procedures on eighteen design research proposals. It shares the insight on how students experience, interpret, understand, apprehend, perceive or conceptualize various aspects of design research to capture the different ways in which design research is conceived by them. The study hypothesizes that the focus on original and rigorous methods of

formal research procedures would offer an innovative insight to design education in relation to creative practice.

2. METHODOLOGY

This study adopted discursive phenomenography, a research method developed by Hasselgren & Beach (1997). A qualitative research design is chosen due to its naturalistic approach that respects the context of research, and phenomenography provides insights that cannot otherwise be derived. It emphasizes on "how things appear to people in their world and the way in which people explain to themselves and others what goes on around them" (Barnard, McCosker & Gerber, 1999, p. 214). As Marton (1981) stated we cannot derive an understanding of what people think from what we know and what we can observe, Hasselgren & Beach (1997) based on Marton's observation (1994), described phenomenography as a research method designed to describe the qualitatively different ways in which people experienced, conceptualized, or understood an event, based on an analysis of accounts of experiences as they are formed in descriptions (p. 192).

Phenomenographic research was pioneered by Ference Marton, Lars-Öwe Dahlgren, Lennart Svensson and Roger Säljö in the early Seventies, and in 1981, Marton named the research phenomenography. According to Trigwell (2000), phenomenographic approach takes a second-order perspective, as the focus is on the subjects' perceptions of a phenomenon and it aims to identify variation in experience of a phenomenon (p. 77). There are five context-types of phenomenogarphic research identified by Hasselgren & Beach (1997, p. 195): discursive, experimental, naturalistic, hermeneutic and phenomenological. The main thrust of discursive phenomenography is to understand the conception rather than to find causes on why some people think differently about the same phenomenon.

In the same vein, the purpose of the study is to understand the students' experience of design research and to understand the role of formal research procedures and design process in the activities of design research. Discursive phenomenography consists of five steps (see Figure 1): the first step, *conversation*, will involve raw data collection, which takes the form of

students' descriptions of their experiences. Then the raw data will be *transcribed* and *compiled* into interviews reports, and lastly the reports will be *analysed* to produce *conceptions* (findings).

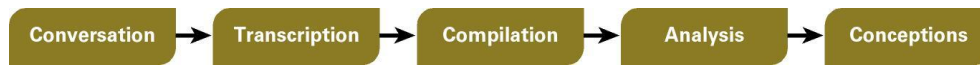Conversation → Transcription → Compilation → Analysis → Conceptions

Figure 1: Steps when carrying out Discursive Phenomenography.

2. 1. SAMPLING PROCEDURE

This phenomenographic study used purposive sampling as proposed by Marton and Booth (1997). Purposive sampling is the most common sampling technique in qualitative research and it is chosen because this study is examining a particular group of subjects (Patton, 1990), where the researcher is "working towards an articulation of the interviewee's reflections on experience that is as complete as possible" (Marton and Booth, 1997, p. 130). Moreover, the sample chosen has to be appropriate to the purpose of the study. In this instance, the undergraduates working on their research proposals would have "knowledge and experience about particular focus of the research" (Connolly and Penn-Edwards, 2005, p. 16) – which is the formal research procedure in this study.

The intended sample size was 20 Visual Communication module students from the Nanyang Technological University's School of Art, Design and Media, as a small sample size between ten and twelve was recommended for phenomenography research (Marton and Booth, 1997). The samples were selected based on the following inclusion criteria: 1) Participants must be enrolled in the research method course – DD3012, and 2) they possess a Grade Point Average of 3.0 and above before they start their final year project. As phenomenographic research uses language as a means to represent experiences, therefore selected participants have to be able to articulate their thoughts well in order to represent information-rich cases despite the relatively small sample size. Due to the drop-out of two students from the research method course, the final sample size was 18 students. The final participants were Year 4 undergraduates in the BFA visual communication programme and their age range is between 21 to 26 years.

2. 2. IMPLEMENTATION OF RESEARCH METHOD COURSE

The research method DD3012 course is an introductory course that aims to fine-tune undergraduate students' research skills and work towards increasing their understanding of the style, form and discipline of art and design inquiry. The course outline includes 1) introduction to research, 2) selecting and defining a research topic, 3) reviewing the literature, 4) preparing and evaluating a research plan, 5) selecting a sample, 6) selecting instruments for data collection and analysis, and 7) writing a research proposal.

The learning outcome of the course is to provide students with a basic understanding of the different approaches to quantitative and qualitative research, such as survey and case study designs, including the steps necessary for appropriate analysis and interpretation of results. The research method course was conducted once a week over a duration of 14 weeks. The class consisted of lectures, professional case-studies, class work, homework, oral critiques and field trips.

2. 3. DATA COLLECTION

The data collection approach of the phenomenographic study involved in-depth interviews. The purpose of the interviews is to describe the meaning of the phenomenon for the participants who have experienced it (Creswell, 2013, p. 161). All data collection was completed within three months. During the interviews, every effort was taken to ensure that the researcher "bracket" her own understanding of design research in order not to influence or direct the interview (Ashworth and Lucas, 2000). "Bracket" is defined where the researcher needs to set aside her own assumptions in order to register the participant's own point of view (Ashworth, 1996).

Data collection approach – Focus Group Interviews
The design research process, which included understanding, thinking, experiencing, and reflecting upon the research proposals, were gathered through in-depth interviews with the participants. The students were briefed about the purpose of the interview and were given the interview questions

one week before the actual interview to provide them with more time to consider and respond to request for information. Thus, the participants can provide a deeper reflection on the discussed topic (Creswell, 2013, p. 159). The students were interviewed in groups of three and four participants. An open-ended questionnaire was used for the study because open-ended interviews provide the opportunity to probe for answers triggering the need for students to explain further or build on their responses. Interview questions were focused on both how students think and feel about their research process and design process, and act in relation to their experiences. All interviews were tape-recorded with the participants' permission and the recordings were then transcribed verbatim by a research assistant and verified by the researcher, complemented by observation notes. The interviews were focused on: 1) research topic and direction, 2) evidence of research (literary/visual) and exploration, and 3) evidence of reflection.

2. 4. ANALYTIC

The study employed phenomenographic analysis to analyze the interview transcripts of the participants. Different from content analysis, the phenomenographic categories are not pre-determined and phenomenographic analysis may include the unexpected and not include the anticipated categories. Phenomenographic analysis assists in determining where the change in conceptions has occurred and also allows for comparison in development and stages of development change (McManus, 2009).

In this study, the analysis focused on "what" the students have experienced and "how" they have experienced the formal research procedures and the design process (Creswell, 2013, p. 76 & 79). The aim is to provide a means of constructing rich, multifaceted representations of the variation regarding phenomena. The study recognises that a person may hold more than one conception of a given phenomenon, as elaborated by Marton (1992, p. 259), "certain things come to the fore whilst others recede to the ground". Therefore, during analysis, the individual participant was seen "as the bearers of different ways of experiencing a phenomenon, and as bearers of

fragments of different ways of experiencing that phenomenon" (Marton and Booth, 1997, p. 114). However, the focus of this analysis is on the conceptions of the group instead of the individual participants, as the study seeks to identify the different ways in which design research is experienced by the eighteen participants.

The eight-step analysis process was adopted from Creswell (2013), Dahlgren & Fallsberg (1991) and Mauleon & Ekman (2002):
The first step was data organization. Create and organize files for data.
The second step was familiarization. The interview transcripts were read a couple
of times to ensure familiarity with the material and to make any corrections if required.

The third step was compilation. The responses of the participants were compiled under each question. Significant or unusual elements in their answers were highlighted.

The fourth step was condensation. A description was written for each answer, focusing on the important parts of the dialogue that corresponded to the study's purpose – personal experiences and the essence of the phenomenon were described through epoch. Statements were selected to provide a representative version of the qualitatively different ways in which formal research procedures and design process were thought of—in each written response.

The fifth step was grouping. Answers of the participants under similar themes were preliminarily classified or grouped together (significant statements) and put into categories (themes).

The sixth step was comparison. The categories were compared and analyzed. Sources of variation or agreement within statements selected in step 3 were identified—that is, fundamental characteristics were determined and the differences and similarities amongst them were noted.

The seventh step was naming. The categories were named based on the analysis – patterns in which formal research procedures were experienced, viewed, and described were identified.

The eighth step was contrasting comparisons. The categories were compared for differences and similarities between them. A description of the characteristics was included under each category.

3. FINDINGS AND DISCUSSION

This section presents the findings from the participants' understanding and experiences of formal research procedures in design research. The study resulted in the identification of three conceptions defining the variation in the ways in which formal research procedures is understood: process conception, meaning conception and journey conception.

Variation 1: process conception

In process conception, formal research procedure (FRP) is interpreted as a process of synthesizing separate elements so that problems are identified and questions are formed. The participants viewed FRP as a list of separate tasks, such as experiments, techniques, issues, problems, ideas or questions. The task may be conceived as, for example, identifying a research topic, narrowing it down to a feasible research problem, and then coming out with research questions. Or it may be seen as applying different techniques to creative practice and synthesizing new information. Generally, in process conception, the primary emphasis is on synthesis.

"I like to based my projects on things that I personally feel strongly for and in this case… from the observation [it] kind of branch out to [screen culture]… me being curious about how this mobile technology has affected the way we socialize, behave and then it started from there, yeah…" – TT

"my topic then was coffee drinking as a getaway for drinker… get away means or in my sense like sort of mental break free temporary… then I [start] looking into how local [drink coffee]…[I found out that they] have sort of stress level…, [and] at the same time… there was increasing trend of coffee drinking, so I thought there's a bit of relation [and] I decided to… [link]

them up together… slowly channel it towards a artistic approach outcome." – IY

"Beginning stage I went to look at broken object trying to see there is a value in keeping in this object but I realise it is lacking the human aspect that actually I want to try to portray as well. Then I'm afraid that broken object… people might not identify… in the end the aspect of scars became my focus because… it is a topic that people can relate to." – QY

"I have to look at my objective first and then I have to relate what the solution help me to fulfil or obtainment of objective. Then from the solution that I have that I have to like analyse question that help me to improve on this solution that is how I came into my research question." – QI

"the notion of thinking is very intangible… So, I need to… conduct experiments and focus group." – SL

Variation 2: meaning conception
In meaning conception, formal research procedure (FRP) can be perceived as a process of discovering, uncovering or creating underlying meanings. Emerging in the data of the review, the participants brought to light the ideas and explanations in the literature by uncovering the underlying meaning. The participants also used their own techniques to produce data, therefore FRP may also be described as a creative process, which meaning is being created, not discovered.

"You go through your research process and …find solution to what you have research so that that design will be truthful to what you have research on." – HT

"I see the need for it to be polish, so I plan to do it twice, do it once and then get it hammered and see what's wrong and doing it one more time cause my objective was to come out with something that's really visually stunning in a sense. Yeah." – AW

"looking [into] people experience, feelings, attitude about things… will actually gives me a lot of confirmation what direction I'm heading towards… at the same time, I also came out with user generated images like through my experimentation… by showing that to people, will they actually have the same thinking as me. If not, then, I probably have to sort of edit my visual style. So for me, it is really about…. the execution or the experimentation together with the research info to hand in hand." – IY

Variation 3: journey conception
In journey conception, formal research procedure (FRP) is perceived as a personal journey of discovery, possibly leading to transformation. The activities in which the participant engage in, whether or not they appear to have a direct bearing, are viewed holistically as transforming theoretical and experiential understanding of the research interest topics.

"I was doing too much research so, I couldn't take it and so, I decided to do something totally different… I just went down to flea markets and just look at objects and just analyze object about what makes them special… either by colours and all that, then I realize that became a more fluid way of research for me…" – FH

"I think it's a… self experience like kind of things, because I have been following this venerable for quite some time and then, I thought his approach propagating Buddhism is different from the traditional kind. He instead of telling you… to follow… he ask you why are you doing this? So, you know that kind of thing inspires me too like sort of affirms me that you know I should follow his footsteps…his method" – BS

"I'm working with a therapist and I'm kind of giving her what she… not giving her what she wants but like she listing out what she desires to see my project but at the same time I'm directing it myself because it's my [final year project]. So I've to come to a compromise somehow… to see how much I should take in… everything she says and her decisions and how much I want myself to like implement my own decisions. So, for me, it's always like a pull and tuck thing." – SE

In identifying the relationships between different conceptions, "phenomenographers typically postulate a hierarchical relationship, with some categories being viewed as less complex, less well developed or less sophisticated than others" (Brew, 2001, p. 281). The participants in the current study were all undergraduate students therefore it is acceptable to designate some of their conceptions as less complex or less well developed, underscoring the idea that the logic of phenomenography does not dictate the necessity of hierarchical relationships between categories.

By demonstrating variation in how formal research procedures is experienced by the undergraduate students, the paper provides a basis for understanding various phenomena relating to formal research procedures in undergraduate education that have previously been insufficiently understood (Yeo, 2012). The variations in conceptions of formal research procedures may: 1) provide a means of understanding of how to conduct research in design, 2) be used as a channel for personal learning and form enquiries to conduct a more robust and rigorous research, and 3) boost students' capabilities to apply theories to their creative practice.

4. CONCLUSION

To get a nuanced understanding of students' conceptions of formal research procedures, we collected data via in-depth interviews with students who have taken a research method course. The purpose is to understand whether the traditional research methods of inquiry are still appropriate or no longer relevant to this changing knowledge context of higher education. Findings support that formal research procedures continue to be relevant for design research and can offer an innovative insight to design education. For example, students are able to design a research proposal easily using the steps of formal research procedures, as most students have formed their research questions within six weeks of the procedures. Students have commented that the formal research procedures have guided their research process and prevented them from dealing with information overload. The formal research procedures have also brought them closer towards the path of an independent learner and thinker.

The limitations of this study are that the study is focused on using research proposal and not a full research project as research material. Further work is needed to establish if the variations are shared in a full research project. In addition, further study is needed to elucidate how reliable these variations are over time: whether the variations are likely to change from one research project to another; whether individuals choose a research topic because of the influence of their professor; or whether the participants have particular conceptions of research. A parallel study of the alternative research methodologies in design is needed to offer a better understanding of the strengths and weaknesses of formal research procedures is another possible area for future research. The findings reported in this paper, however, have thrown light on aspects of formal research procedures and represent a first step in explaining the different ways in which visual communication students conceive design research.

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