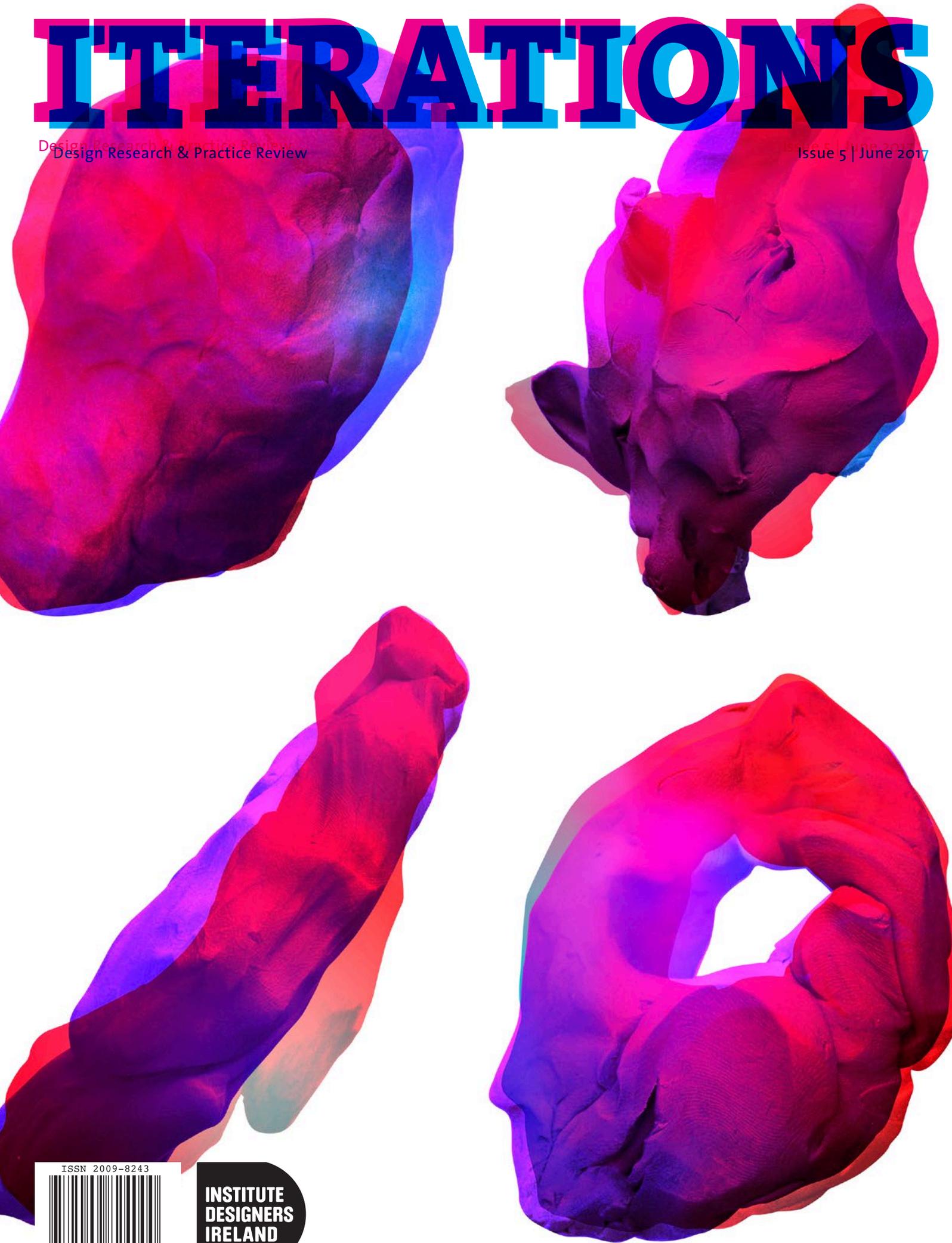


ITERATIONS

Design Research & Practice Review

Issue 5 | June 2017



ISSN 2009-8243



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**INSTITUTE
DESIGNERS
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Grant funding / Academic Research Fund (AcRF) Tier 1, Ministry of Education Singapore &
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Conceptions of Design Research:

discursive phenomenography in undergraduate Visual Communication Design research

This article adopts discursive phenomenography as a viable qualitative approach to identify the different conceptions that visual communication undergraduate students have of design research. Phenomenographic method was described by Limberg (1999) as an exploration of the world's phenomena through the different encounters and comprehensions of people and societies. The phenomenographic findings map four qualitatively different ways, namely, Conception A: Process-focused Experience; Conception B: Knowledge and Skills-focused Experience; Conception C: Socially-focused Experience and Conception D: Self Awareness-focused Experience. The research results established an early step in understanding one aspect of the collective conceptions of design research in visual communication design. The findings are of interest to design educators who seek to know more about design research in order to equip design students with the relevant skills contributing to the field of design.

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Introduction

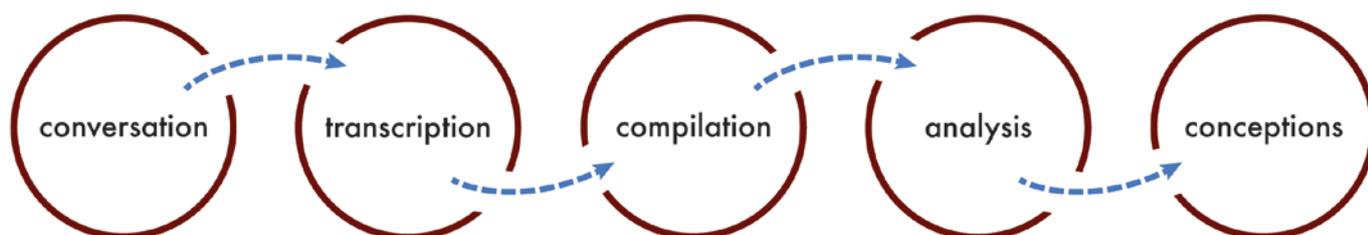
There is growing consensus amongst educational researchers on the importance of research in higher education in the field of art and design (Mimoso 2011). In view of this, major design groups, such as AIGA Design Educators Community (2016) and Design Research Society (2015), have organised international design conferences that accommodate to the growing interest of design research. Design educators also started to introduce the application of research theory into undergraduate design projects, particularly the final year project. This shift of emphasis from traditional vocational skills training to a focus on research being integral to the course, has signalled a global transformation in higher education in the field of design (Yeo 2014). Tim Brown (2012, p.20) remarked that the traditional design process needs to be changed, and designers need to engage a more scientific methodology because it enables them "to ask more of the right questions, come up with better hypotheses, design effective experiments and most

importantly, share our learning". Then again, according to Mimoso (2011), research training in 'art and design is at a formative phase', so do design students know what are they doing when they conduct design research? What kind of knowledge do they need to conduct a good research? What kind of topic areas interest students more? It is thus necessary to understand how undergraduate students experience and conceive design research when they perform it. This article aims to present what design research means to undergraduate students, in the area of visual communication design.

Research design

The research framework

Hasselgren and Beach (1997), described phenomenography as a research method designed to capture the qualitatively different ways by which people experience, conceptualise, or understand an event, based on analysis of accounts of experiences as they are being formed in descriptions. The study therefore draws on the strategy of



discursive phenomenography by Hasselgren & Beach to investigate the experiences of undergraduate students who have carried out year-long final year research projects, in order to capture and analyse their experiences of design research. Discursive phenomenography engages five procedural steps, illustrated in Figure 1. The first step of the phenomenographic study, conversation, is the process of raw data collection, which takes the form of students' descriptions of their experiences. Following raw data collection, the second and third steps are transcription and compilation, where raw data is transcribed verbatim, following which the transcriptions are read, organised and labelled accordingly. In the fourth step, analysis, the labelled transcriptions are analysed thoroughly to extract findings. These findings form conception, the last step of discursive phenomenography.

Participants

The selected sample size was 30 visual communication students from Nanyang Technological University. This sample size was suggested by phenomenographers such as Bowden and Green (2005), who proposed that a sample of 20 to 30 participants would meet the criteria of (i) ensuring sufficient variation in views, and ii) in keeping the amount of data manageable. A systematic random sampling was used to select the 30 students out of the cohort of 72 students. Of the final participants, 19 were female and 11 were male, ranging from 21 to 26 years of age.

Data collection approach

The data collection involved the administration of focus group interviews. To encourage in-depth and detailed sharing, the study used "mini-focus groups" that consisted of 2 to 4 participants, a term used by Krueger (1994). The students were given the interview questions 3 to 4 days before the actual interview to allow them to engage in thorough reflections on the discussion topics. All data collections were completed within 9 months from the first

interview with audio and video recorded, and then subsequently transcribed.

Analysis process

Phenomenographic analysis assisted with determining what changes in conceptions had occurred, and also allowed for comparison in development and stages of developmental change (2009). This article adapted and developed an eight-step analysis process:

- Step 1 (data organisation): Folders and files were created for data collected
- Step 2 (familiarisation): The interview transcripts were read over several times to ensure familiarity with the material and to make any corrections if required
- Step 3 (compilation): Once a general consistent understanding of the data had been acquired, all the participants' responses were compiled under each question, highlighting significant or particular elements in their answers
- Step 4 (condensation): A description (code) was assigned for each answer, focusing on the important parts of the dialogue that corresponded with the study's purpose. Then statements were selected from each written response to provide representative accounts of the different ways in which students assessed their design research process
- Step 5 (grouping): Answers of participants were evaluated on the basis of similar themes and preliminarily classified or grouped them together (significant statements) and assigned them into categories (themes)
- Step 6 (comparison): The categories were analysed and compared. Variations or similarities between the statements determined the fundamental characteristics and the differences and similarities existing amongst them were also noted
- Step 7 (naming): The naming of the categories was based on the analysis—they identified patterns by which design research were experienced, viewed and described

Figure 1: Steps when carrying out Discursive Phenomenography, adapted from Hasselgren and Beach (1997).

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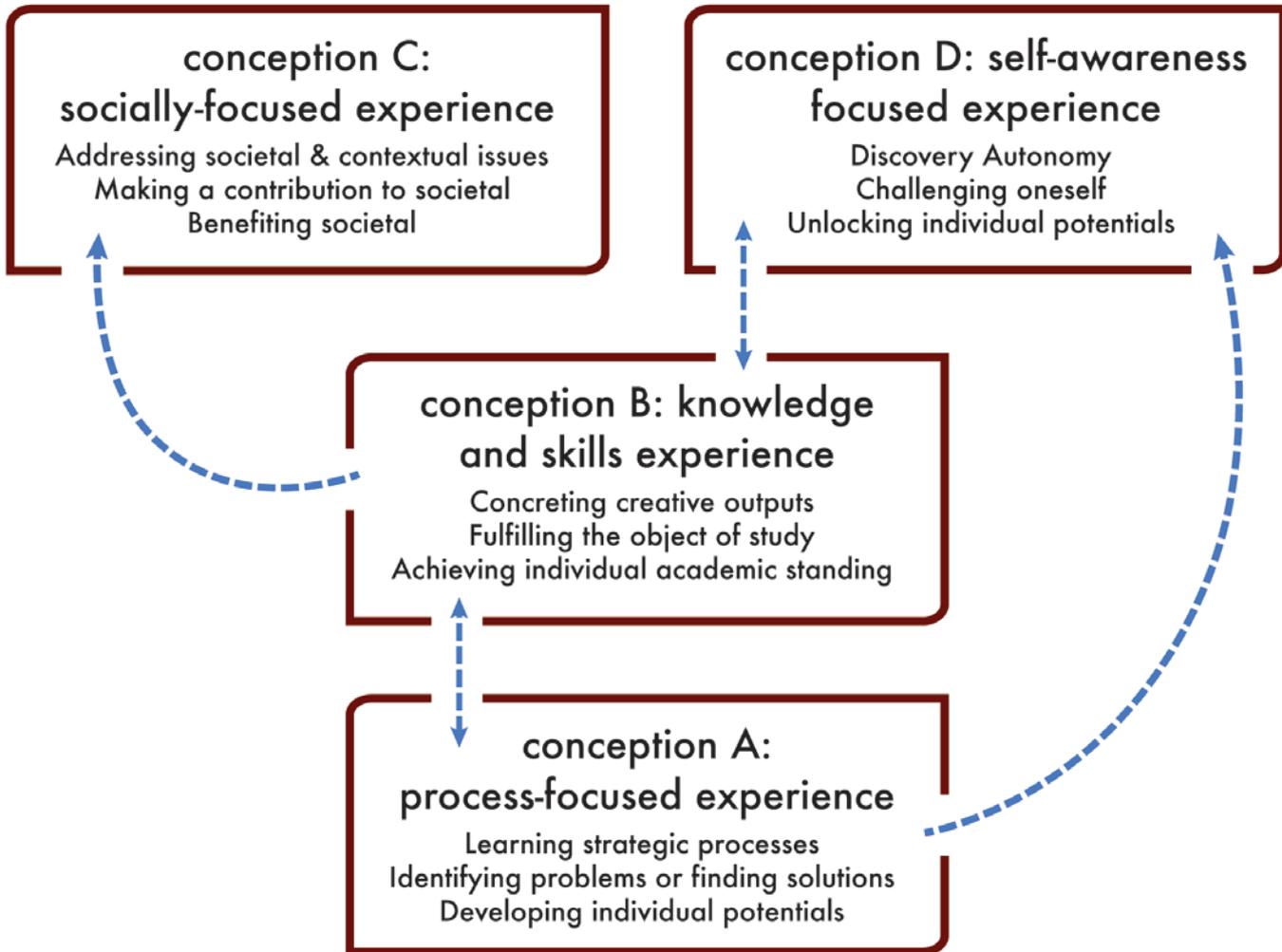


Figure 2: The categories of conceptions

- Step 8 (contrasting comparisons): The categories were compared again for differences and similarities between them. A formulated description of the characteristics under each category was included

The emphasis of the analysis was to be on the collective conceptions of the group rather than of individuals, as this article sought to identify the different ways in which the 30 participants had experienced design research.

Results and discussion

The conceptions of design research The findings from the phenomenographic analysis of the data identified four different ways of conceiving design research:

- Conception A: Process-focused Experience
- Conception B: Knowledge and Skills-focused Experience
- Conception C: Socially-focused Experience
- Conception D: Self Awareness-focused Experience

Each specific conception draws on the visual communication students’ descriptive accounts of how they had conceived design research. With each conception, considerations were given to what implications are drawn from the ways visual communication students relate to design research and how the conceptions potentially relate with the other research studies.

Design research as process-focused experience

One of many aspects of design research that students perceived to be valuable was that it enabled them to bridge their knowledge gaps and to have a first-hand experience in sourcing for information. Generally, visual communication students conceived process experiences in various ways, such as specifying, researching or design making, applying different techniques to test new grounds, or refining design directions. The stages of formal processes that participants conceived, corresponded with the design model which Dillon and Howe (2003, p.289) described “as a series of processes: specifying,

researching, making, testing, refining and evaluating". Participants reported for example, that without engaging any methodical processes, they would not have known where or how to start projects or how to justify their decisions or how to put different aspects of a research together.

ET: Without this research design process, I would do research and interview here and there, but I would not know how to put it together and make it work.

SL: My project is all about creativity risk taking. I have zero idea on how to convey those abstract contents into visuals. It is through the process of research and reflection that make me learn about taking creative risks and try to be confident and positive about the end product.

This indicates the importance of knowing how to use research strategies to guide research studies. Given that undergraduate visual communication education has been moving from vocational skills training towards the focus on value-added ideas and innovation (Brown et al 2010; Heller 2006), design research procedures can serve as a process that allows students to think critically so as to test new grounds and explore innovative design directions. Design research as such, can be deemed as an active constructive process of creating new meaning from engaging process experiences.

Design research as knowledge and skills focused experience

The concept of design research was expressed in terms of students being engaged in a learning journey to hone their skills sets in order to perform better, and also to build up their knowledge base by strengthening learning and performance. The observed experiences concentrated on the acquired knowledge and skills that would enable participants to achieve goals specific to their projects and attain their full potential as designers.

SA: Through my research process, it struck me to think that my project should be a project that led me to try and experience new things and then I can actually expand my skills sets.

JM: This knowledge and skills that I have achieved from this project would enable me to be a better designer, who can see things from a different perspective.

The findings on knowledge and skills focused experience were in line with the work of Glanville & van Schaik (2003) and Yee (2007), which suggested that knowledge and skills be seen as key intangible assets to design practices. One could argue that although students continuously sought to improve themselves and to develop self-confidence in order to fulfil life-long learning aspirations, they could be merely knowledge-users rather than knowledge-makers. It is understandable that students experienced learning as users of knowledge first, before learning to become creators of knowledge. In valuing productive creativity, there is a need for design research to promote competencies in learning and the acquisition of new knowledge and skills.

Design research as socially-focused experience

Visual communication students viewed design research as generating communicable knowledge to contribute to the good of mankind, at both the social and the individual levels. In this category of conception, participants described research experiences as a potential means for them to be ethically responsive to society in different ways. Some participants felt that it was a designer's responsibility to identify and address community issues, or to educate the young. The research experiences could also help students to develop intellectually and emotionally.

The current trends in the field of visual communication identified the social and ethical responsibilities of designers as priorities to the end users and thus of primary importance to the design process (Forlizzi and Lebbon 2006). This finding confirms the previous research; it shows that students were concerned with possible contributions to what was considered as common good, as well as the understanding of human actions and values within given social contexts (Marshall and Newton 2000).

YT: There is very little emphasis given to the wellbeing of caregivers. For example, when you see someone with a patient, people usually ask how is the patient doing instead of asking the wellbeing of the caregiver. With the increasing aging population, this is an issue that I want to touch upon.

YJ: Social media platforms are very popular with many people right now. I wonder whether it's one of the main distractions

that affect the rate of procrastination in the strawberry generation.

In addition, this category of conception acknowledged important aspects of visual communication, as conceptualized in the review of literature, such as being socially conscious while producing designs capable of serving intrinsic purposes (Sanders and Chan 2007). Participants recognised the needs of addressing real-life social issues and they aimed to find solutions to those issues of concern.

SN: Design research is review literature, doing surveys and coming up with your point of view. But when I'm doing my project I think that another important thing to have is empathy. For instance, when designing something like Braille, you have to understand who you are designing for, what is important to them to give the design a soul. Empathy is important I think.

SE: After talking to a therapist, I realise that small issues, such as needle pain or anxiety or stomach stress, are real problems that children face and it's not just about death and loss. One has to make sure that the work is practical and useful to them.

This is in line with the views of several authors such as Buchanan (1989, p.94), who stated that “*design is an art of thought directed to practical action through the persuasiveness of objects and, therefore, design involves the vivid expression of competing ideas about social life*”. The findings of the current study on the role of design research in influencing students to become socially conscious have significant social implications, namely in the larger role that design education can play in the social sector. Students should be encouraged to rigorously examine social issues and to consider the impacts of their design outcomes on marginalised communities and society at large. This third aspect of conducting research as a socially-focused experience, demonstrates that design research could enable students to grow from being ‘decorators of messages’ to being influential designers able to produce socially impactful designs (Forlizzi and Lebbon 2006). Design research, as such, generically concerns enabling constructive change.

Design research as self-awareness focused experience

Visual communication students were found to relate to design research as experiencing personal discovery, which might have led to a conscious knowledge or better understanding

“Students should be encouraged to rigorously examine social issues and to consider the impacts of their design outcomes on marginalised communities and society at large”

of one's own personality, propensities and desires. Participants described the journey of discovery in a number of different ways. Activities that participants engaged in, whether intentionally or not, were viewed holistically as transforming theoretical and experiential understanding of research topics that were of interest to them. Participants reported these experiences as being intrinsic, involving the exploration of aspects of their personal contexts, the enhancement of their personal understanding and their ability to step into the unknown. Findings in this category showed that the students' conceived design research as enabling them to attain higher self-efficacy.

ZI: I never embark on such a large-scale project that requires so much intensive research. It's a challenge to me to accomplish something that I have never done before and I wish to be a sort of visionary for the contemporary, for my generation.

AW: My project was going into a more commercial direction and I no longer believe in it. One of my objectives was to do very good work. So, a friend asked, "How likely do you think you can do very good works, given that you no longer believe in your project?" After that, I sacrificed the whole commercial aspect and just do something that I felt very strongly for to maximize my odds of producing something that was really good.

In the extant literature on visual communication, there is hardly any mention of a designer's prospects for growth and development. Even when Forlizzi and Lebbon (2006, p.54) stated that designers must work beyond words and images, the essence was still on "the interaction between audience, the content of the communication, and the outcome of the design". Hence, the findings on self awareness-focused experience contribute to the emergence of a new domain of exploration in the field of visual communication. Self awareness-focused experience implied that design research was seen as a process for students to develop and strengthen their understanding of themselves as designers, which in accordance with Keedy's (1997) was a driving notion of design education. However, this development was also tightly connected to the practical intention of facilitating and situating one's future career opportunities. Design research therefore, provided opportunities for students to understand and challenge

themselves to attain excellence in their outcomes and to secure their future careers.

JL: I would like to use this opportunity to explore illustrations so it might help me in the future as an illustrator. That's why I decided to concentrate on illustration, for this one-year project.

The four conceptions mentioned reflected how undergraduate students perceived the nature of design research. They viewed it as a process that enabled, i) the creation of meaning from different process experiences; ii) the acquisition of new knowledge and skills competently; iii) the development of ethical responsibility to society in different ways and iv) opportunities to understand, challenge, push beyond and develop oneself. These findings are in line with attributes associated with the inherent structure of design research suggested by Gray and Malins (1993). For instance, the first two basic perceptions of design research as 'the creation of meaning from different process experiences' and 'the acquisition of new knowledge and skills competently', would occur in the steps of collecting, selecting, analysing and synthesizing the data and critically examining known visual and human responses, outlined by Gray and Malins (1993). The third basic perception, 'the development of ethically responsive to society in different ways', relate to their concepts of human intuition and emotion must come into play in design research. The fourth basic perception regarding 'opportunities to understand, challenge, push beyond and develop oneself' shares their identification and articulation of art and design research, where one of the main objectives was personal development. In their study, Gray and Malins analysed the context of design research through aspects of science and social sciences approaches and artistic methods to identify common factors derived from creative, scientific and artistic procedures. The empirical findings as such, aim to contribute to the extant knowledge in design research. In doing so, the findings contribute to establishing the epistemological suitability of the inherent structure proposed by Gray and Malins.

However, it is not the intent of this article to propose any definitive structure applicable to all research in the field of design. This article simply aims to deepen the understanding of the nature of design research from the perspective of undergraduate students.

What does design research mean to visual communication undergraduates?

By surfacing the variations in how design research was conceived by the undergraduate students, the above sections provide a basis for understanding various phenomena relating to design research in undergraduate education, namely those areas that had not been sufficiently explored, concerning designer research behaviour (Cross 2007). This subsection concludes the discussion by highlighting salient aspects of the four categories of conception for design educators who are interested in making suitable pedagogy arrangements to enhance the teaching and learning of design research.

Conception A: *Process-focused Experience* and Conception B: *Knowledge and Skills-focused Experience*, showed an emergence of awareness on how students' search for and obtain information, acquire knowledge and skills, and apply them all to their design problems and processes. Visual communication undergraduates, whose views were within these two conceptions, saw design research as a tool to provide a good grasp of research processes to fulfil the objectives of their studies. Students took a sequence of steps from information exploration to design solutions, moving from concrete bases to more abstract stages of thinking. The findings of both Conception A and B suggest that students had not only learned more about their subjects of study, but had also further enhanced critical thinking skills by knowing more about research processes while constructing solutions to problems. For visual communication students, design research offers the possibility of facilitating their application of knowledge, problem-solving skills and critical thinking to tackle real design problems. In addition, students realised that it was up to them to choose the direction to follow in moving their projects forward. This equipped students with autonomous skills and abilities applicable to their future professional careers or their advanced postgraduate studies.

Category of Conception C: *Socially-focused Experience*, involved the awareness associated with societal issues. In this category, visual communication undergraduates viewed design research as an opportunity to work on issues they intrinsically valued and cared about. This means that students expanded their learning beyond their core disciplines of

knowledge and had begun to take on larger contextual societal focus. Design research as such, offered visual communication students opportunities to influence and shape society, while encouraging them to become more sensible and responsive agencies. Students were equipped with soft skills that would enhance their values, attitude, communication skills and emotional intelligence. Lastly, in Category of Conception D: *Self Awareness-focused Experience*, design research provided opportunities for students to develop propensities to discover their innate design abilities and potentials. This experience helped students clarify career paths, establish goals and gain better personal autonomy. In summary, all four conceptions can be viewed as both surface and deep learning oriented, as the Learning Experiences set foundations for the processes of Decision Making and Personal Growth. They are essential to strategic pedagogic approaches, which are fundamentally valuable in developing individual learning (Kleiman 2007).

Conclusion

Knowing how to conduct research is a requisite in the academic world, fundamental to all levels of higher education. A focus on enhancing undergraduate students' propensity to conduct design research is critically needed, more so in this era. Research is a fundamental foundation for designers aspiring to stand out in the competitive creative industry and/or to overcome the challenges encountered in post-graduate studies.

The findings of the study provide an understanding of design research through the viewpoints of undergraduate students. The study corroborates the literature on 21st century education, advocating that the knowledge of research can prepare students to become responsible and creative design thinkers in this dramatically changing world (Khoury & Khoury 2009). With this understanding, the findings provide basic aspects for design education to foster a platform for lifelong learning, as well as encouraging socially and ethically responsive design ideas.

The four categories of conception of the study enable us to understand the basic aspects of performing design research, focusing on the foundation of creating meaning from different process experiences, competently acquiring new knowledge

and skills, enabling constructive change, and being able to understand, challenge, push beyond and develop oneself. These basic aspects of performing design research contribute to a structure of design research, which has not yet been made implicit in the discussion of design research literature (Papastergiadis 2002).

In this study, it has surfaced that the experiences gained from conducting design research did indeed provide students with greater opportunities to engage in forms of experiential learning. Although this learning approach is closely aligned to a disciplinary practice, it has allowed students to unravel potentials and abilities hitherto unknown to them, which can be applied to their future professional practices in the evolving design industry. In conclusion, this article presents an initial foray into understanding the collective conceptions of undergraduate students on design research in visual communication design. Though modest, this article provides a stepping stone towards a broader understanding of how design research is conceived and experienced. This article also contributes to the area of design research and design higher education, by supporting the development of a solid research, learning and teaching culture in an emerging and rapidly evolving field.