Knowing Inside Out – Experiential Knowledge, Expertise and Connoisseurship

International Conference 2013 of the Design Research Society
Special Interest Group on Experiential Knowledge

Conference Proceedings

EKSIG 2013

Knowing Inside Out – Experiential Knowledge, Expertise and Connoisseurship

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Editors: Nithikul Nimkulrat, Kristina Niedderer, Mark Evans.

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Index

EKSIG 2013

Knowing Inside Out – Experiential Knowledge, Expertise and Connoisseurship

Editorial

Nithikul Nimkulrat, Kristina Niedderer, Mark Evans

EKSIG2013: Knowing Inside Out: experiential knowledge, expertise and connoisseurship aims to provide a forum for debate about expertise and connoisseurship by professionals and academic researchers, exploring the role and relationship of generating and evaluating new and existing knowledge in the creative disciplines and beyond.

These proceedings contain the papers accepted through double blind review for the EKSIG2013: *Knowing Inside Out* held on 4th and 5th July 2013 at Loughborough University. The papers presented by the keynote speakers will be available on the conference website at a later stage.

Conference Theme & Call

The issue of expertise and connoisseurship has come to the fore in recent years as professionals and scholars from many disciplines negotiate the tension between the explicit justification required by research and the tacit appreciation and judgment that expertise and connoisseurship entail.

Expertise is considered the highest level of skill acquisition and knowledge within professional practice, being based on experience and tacit understanding and an intuitive grasp and judgment of its processes and situations (Dreyfus & Dreyfus 1986). Much expertise operates without conscious effort and the tacit knowledge that sustains expertise is not generally made explicit nor is it easily articulated. Deliberate practice and extended experience result in automaticity and immediate intuitive response. For example, a pianist's hand movement, a designer's choice of material, a radiologist's instant diagnosis, etc.

In contrast, connoisseurship can be defined as the external judgement or "the art of appreciation displayed in any realm in which the character, import or value of objects, situations and performances is distributed and variable" (Eisner 1998: 63), and which relies on experience and tacit knowledge. For example, curators utilise their tacit expertise and connoisseurship together with their explicit

knowledge in museology and conservation to make judgements on which artefacts are suitable for collections or exhibitions. This raises the question, for example, how inquiry into the practice of curatorship may accommodate the requirements of the practice of research and how we judge academic and creative output.

In many disciplines, expertise and connoisseurship pervades all parts of practice, including processes, the creation of artefacts and/or other kinds of physical manifestations and finally the interpretation through other professionals, such as curators, critics, historians, gourmets etc. While knowledge and experience generated from within creative and professional practice have extensively been disseminated in the research context as a written text and artefacts, the expertise and connoisseurship of professionals have rarely been considered in this context. However, this seems key to understanding, for example, procedural inquiry, using the role of creative output within any inquiry as an illustration or demonstration of the researcher's knowledge or any embedded meanings (e.g. concepts, function, user behaviour, etc.). How professionals develop their expertise and connoisseurship and how these forms of tacit judgement facilitate explicit justification in research, including the generation, evaluation and communication of knowledge therefore remains open to questions and debate.

This conference therefore explores the roles of the researcher's professional knowledge and the different ways in which it can be utilised and communicated within the framework of research. This may include, for example, investigations into the nature, aims, evaluation, and/or necessity of different forms of expertise and connoisseurship as well as modes of communication and exchange for experiential and procedural knowledge.

Questions of interest are, for example:

- What are the current understandings of expertise and connoisseurship?
- Why might professional expertise be important for any research conduct?
- How can a researcher's professional expertise and connoisseurship benefit research into that particular discipline, or another?
- How can expertise and connoisseurship be utilised within the framework of research?
- How can we articulate skills which are tacit and embodied within the process of research?
- What frameworks are there to guide the reception and

interpretation of professional practices or artefacts within research, for example research exhibitions, performances, etc.?

- What frameworks are there to guide the communication of procedural knowledge?
- How can skills in different professional disciplines be shared and/or applicable to one another?
- What differences are there between the articulated first-hand experience of an expert practitioner, that of an amateur and that of a researcher?
- What issues evolve from criteria of research such as repeatability and transferability for the foregrounding of tacit knowledge in research in the creative disciplines?
- What means and methods can be utilised to transfer and replicate tacit knowledge?
- Is connoisseurship involved in knowledge transfer/replication?
- How can the judgmental power of connoisseurship be integrated and utilised within the framework of research?
- What differences/relationships are there between research-driven judgment and judgment driven by connoisseurship?

Responses

As in previous years, the conference call received a great international response with submissions from 16 countries including Australia, Belgium, Canada, China, Denmark, Finland, Germany, Hong Kong, Ireland, Republic of Korea, South Africa, Spain, Sweden, Taiwan, UK and USA.

Submissions were interdisciplinary and stem from a variety of disciplines and discipline areas including fine art, applied art/craft, architecture, performance and drama, film, product/industrial design, graphic & communication design, knowledge management, education, philosophy and social sciences.

For the conference, contributions were selected in a two-stage process, comprising abstract and full paper selection, through a double blind review process by the conference's international review panel. From the contributions, the following eight strands emerged:

Strand 1: Expert's Embodied Knowledge

Strand 2: Understanding & Articulating Experience

Strand 3: Objects, Expertise and Connoisseurship

Strand 5: Performativity & Research Process

Strand 4: Nature of Experiential Knowledge

Strand 6: Design Expertise

Strand 7: Contemporary Connoisseurship

Strand 8: Experiential Knowledge & Education

The first two strands centre on knowledge and experience: the first focusing on the embodied knowledge gained by experts through their experience, the second on the articulation of experience. Strands 3, 5, 6 and 7 explore expertise and connoisseurship within the design perspective, investigating the nature of experiential knowledge generated from within various design practices and artefacts. Strand 4 concerns the experience of the body, motion and space as related to the research process, encompassing perspectives from dance, performance and social practice. Strand 8 deals with the value and influence of experiential knowledge on art education.

The conference is opened by the first keynote by Professor Paul Greenhalgh, Director of the Sainsbury Centre for Visual Art at the University of East Anglia, UK. Greenhalgh examines skill in relation to the development of tacit knowledge and the conjoining of physical and cognitive realms directed toward specific tasks. In his view, skill has always been and will be central to the next phase of modernity.

His keynote is followed by two parallel strands (1 and 2). Strand 1 focuses on the expert's knowledge creation through experience from within professional practice. James Self, Hilary Dalke and Mark Evans examine the influence of contextual attributes of design practice on the designer's knowledge, understanding and use of tools of design representation (e.g. sketching, CAD, rapid prototyping, etc.). Ann Heylighen explores how the participation of impaired users in architectural evaluation can provide structured data collection to support architectural decision making. Catherine Dormor's research seeks to establish a matrix of knowledge production, focusing upon means and ways that knowledge gained through practice can be expressed from within that practice itself.

Strand 2 addresses the understanding and articulation of experience through appropriate means. Todd Robinson's paper focuses on different ways of engaging experiential knowledge. Hélène Day Fraser and Keith Doyle seek to develop an understanding of the various methods, strategies and principles employed when engaged in design and art research through practice. Claire Lerpiniere

investigates experiential knowledge and technical expertise in both drawing and the production of textile artefacts.

Strand 3 looks at expertise and connoisseurship in relation to the object and aesthetic experience. Anders Haug seeks to develop a model that helps to understand aesthetic affection produced by an object. Maria Georgaki examines a design archive in order to discuss “handling” objects as a research methodology for design history. Paul Denison’s research attempts to establish the potential for a reconsideration of a modified connoisseurial approach and the further evaluation of the role of design history at the service of sustainability.

Parallel to Strand 3, Strand 4 focuses on the experience of motion and space as related to the research process, based on perspectives from dance, performance and social practice. Helen Smith raises the question of how an artist may empower the community in social, economical and/or cultural level through her own practice. Astrid von Rosen develops a method called “dance-writing” which demonstrates how knowledge can be produced from a performative exchange with archival practices. Helena Oikarinen-Jabai presents material for debate and reflection regarding how second generation immigrants through arts-based participatory practices can be given a voice and visibility.

Day 2 begins with two parallel strands (5 and 6), both exploring expertise and connoisseurship within the design perspective and addressing the nature of experiential knowledge generated from within various expert design practices. Strand 5 begins with Young-ae Hahn and Heidi Uppa who investigate into the designer’s experiential and theoretical knowledge and how both types of knowledge are linked, forming a model of design expertise that supports design research, analysis and synthesis processes. Mark Evans, Ian Campbell and Eujin Pei explore cultural and professional differences between industrial and engineering design practice and develop tools to achieve the explicit communication of tacit knowledge. Harah Chon’s research investigates the retail’s user experience within a cognitive context and highlights the retail structure as assuming the role of the connoisseur and becoming the access point to knowledge. Helen McAllister mapped the interdisciplinary practice-based research against the notions of the expert/connoisseur and researcher, exploring the experimental methodology that can meaningfully contribute to “changed” design knowledge.

Strand 6 expands the conference theme, specifically focusing on the understanding of design expertise and the notion of “expert”. Michael Harkins discusses etic and emic with regard to the outside observer's knowledge of type design versus the designer’s internal knowledge or “expertness”. Peter-Willem Vermeersch and Ann Heylighen study the non-visual experiential knowledge of vision-impaired persons and its potential in architectural design processes of multisensory space. Georgina Palmer and George Torrens seek to develop a framework for charting the expertise involved in craft, or more specifically pot throwing. Melehat Nil Gulari investigates the visual and cognitive metaphors of expertise in order to understand the nature of design expertise and to decode tacit knowledge.

The above parallel strands are followed by a keynote by Professor Janet McDonnell, Head of Research at Central Saint Martins College of Arts and Design, University of the Arts, London. She expands Greenhalgh’s theme through her analyses of design taking place in either controlled or natural settings. The analyses illustrate pictures of design expertise and collaborative skills embedded in design processes. Her contribution is complemented by the closing keynote about the design of contemporary educational media by Professor Michele D. Dickey, Professor of Instructional Design and Technology at the Department of Educational Psychology at Miami University, USA. Dickey suggests a connoisseurship model of inquiry that allows designers, educators and technologist to get inside into educational media by incorporating insights, skills and techniques from various disciplines.

In between the two keynotes, Day 2 offers the final two parallel strands (7 and 8). While Strand 7 explores connoisseurship in design and media, Strand 8 focuses on experiential knowledge and its influence on art and design education.

Strand 7 begins with Matt Sinclair who provides insights into the nature of luxury goods, focusing on the Swiss watch industry as a vehicle for discussing connoisseurship generally and specifically in the case of modern successful manufacturing such as Apple products. David Gerrard, Ann O’Brien and Thomas Jackson introduce a philosophical discourse on experience, connoisseurship, regulation of emotions and educated behaviour in the public sphere of museums and social media. Blaize Neaves and Yuanyuan Yin research brand recognition through sensory stimulation as an effective way of engaging customers in clothing retail environment.

Asta Raami starts Strand 8 by presenting her research on the development of intuition and the utility of intuitive thinking in teaching and learning in higher education. Mari Lecanides-Arnott emphasises the development of intuitive thinking that can be gained through the criticism of creative processes in design foundation studies. Bronwen Wade-Leeuwen presents an approach to the study about how pre-service primary art teachers need to learn the tools of creativity.

In Summary

The conference aims to share different views on expertise and connoisseurship and their role on generating, evaluating and articulating new and existing knowledge in the creative disciplines and beyond.

The outstanding response to the call for papers has brought together theoretical perspectives and case studies as well as emerging models and practices in a number of discipline areas, including industrial design, engineering, service design, graphic design, design history, fine art, performing arts, craft, media, art and design education and knowledge management.

Papers examine the integration of expertise and connoisseurship of professionals within a research context. The issues discussed are key to understanding procedural inquiry and serve as forms of tacit judgement that facilitate explicit justification in research. The papers also demonstrate a strong interest, development and consolidation in the understanding of experiential knowledge and its various modes of communication. The response to the call may be seen as an indicator that experiential knowledge is a maturing field and recognition of the inter-disciplinarity of related research.

The EKSIG Conference 2013

EKSIG2013: Knowing Inside Out, International Conference 2013 of the DRS Special Interest Group on Experiential Knowledge (EKSIG) was hosted by Loughborough University and held at Loughborough Design School and co-organised by the University of Wolverhampton.

EKSIG is part of a program of Special Interest Groups set up by the Design Research Society (DRS) to facilitate international exchange and advance in relevant areas of design. EKSIG is concerned with the understanding and management of knowledge in research and professional practice in design and design related disciplines in order to clarify fundamental principles and practices of using

practice within research, both with regard to research regulations and requirements, and research methodology.

The EKSIG conferences are part of a regular programme of the EKSIG group. They serve to bring together researchers and practitioners from different disciplines and to promote understanding and best practice concerning the integration of different forms of knowledge within design research and practice. EKSIG promotes a multidisciplinary approach to engender multi-vocal debates and cross-fertilisation between the creative disciplines and other practice-led disciplines, including contributions from the design disciplines (design, engineering, craft, media etc.), philosophy, education, health and knowledge management that are concerned with methods and methodology in research and in creative and professional practice; with the nature, role, and management of knowledge within research; and with the role and use of creative practice (both as process and outcome) as a means by which to develop and manage experiential/tacit knowledge within research.

EKSIG 2013

Knowing Inside Out – Experiential Knowledge, Expertise and Connoisseurship

Keynote Speakers

- Prof Paul Greenhalgh
- Prof Janet McDonnell
- Prof Michele Dickey

EKSIG 2013: Keynote Speakers

Prof Paul Greenhalgh

Sainsbury Centre for Visual Art, University of East Anglia, UK

Prof Paul Greenhalgh is the Director of the Sainsbury Centre for Visual Art at the University of East Anglia has had a long and distinguished career as a curator, author, and lecturer on art and ideas in the modern period. Greenhalgh previously served as the Director and President of the Corcoran Gallery of Art and Corcoran College of Art and Design in Washington DC, as President of NSCAD University (Canada), and as the Head of Research at the Victoria and Albert Museum, London. He has lectured and taught in many institutions, internationally, and has been an arts advisor to numerous public bodies in Europe, North America and the Far East.

His specialist areas are the visual arts of the modern period, and he is known especially for his work on late 19th Europe, Modernism in design, the history of exhibitions, the history of ceramics, and modern and contemporary craft. His books include *Ephemeral Vistas* (1989), *Modernism in Design* (1993), *Art Nouveau 1890-1914* (2000), *The Persistence of Craft* (2003) and *The Modern Ideal* (2005), *Fair World* (2010), *Art Nouveau: The Artists of Modern Life* (2013).

Skill and the Next Phase of Modernity

Abstract

It was jut under a century ago that members of the newly-formed Surrealist movement proudly proclaimed that ‘we have no skill’, and in so doing they exemplified a moment of young defiance in which new ways of thinking about art and its role in the world were forcing their way onto the international stage. From the perspective of parts of the twentieth century avant-garde, skill, in the way the Surrealists elected to define it, implied a limiting factor on the imagination, and something that hampered their idea of creative process. In the twenty-first century, the presence or absence of skill is once again becoming a central issue among the young, but from a very different perspective, and not simply as a determinant in art, but also a wider the socio-economic arena.

Skill, or the publicly organized use of talent, implies the development and use of tacit knowledge, the conjoining of physical and cognitive realms, the rarefication and perfection of ‘eye’ and ‘hand’ as tools geared toward specific tasks. The dematerialized nature of online life, of course, makes the entire concept far more ambivalent, but for my purposes here, skill will be taken to mean that component in the creative process that allows human ingenuity to realize the production of physical works of all types. It is fundamentally empirical, and a result of the coming together of cognitive and tactile realms. The normative assumption is that it in the individually talented person, skill emerges through the enhancement of innate ability with training.

In some respects the idea of skill ran counter to the ideological thrust of the last phase of modernity: it didn’t sit comfortably with previous conceptions of progress or Utopia. Nevertheless, the paper will argue, it is core to the functioning of society, and should remain so not simply in the cultural and economic realms, but in terms of the stability of society itself. Skill has always been - and remains - the key to civilization. It will be central to the next phase of modernity and will clearly differentiate it from the last.

EKSIG 2013: Keynote Speakers

Prof Janet McDonnell

Central Saint Martins College of Arts and Design, University of the Arts London, UK

Prof Janet McDonnell is Head of Research at Central Saint Martins College of Arts and Design, University of the Arts, London and is Professor of Design Studies. Originally educated and trained as an electrical engineer (Imperial College London), she became a chartered engineer in 1982 before holding a series of academic posts. She has a masters degree in Computer Science from UCL and a PhD from Brunel University. She is editor-in-chief of the peer reviewed journal *CoDesign* (published by Taylor and Francis Group) and she is a member of the UK's Arts and Humanities Research Council peer review college. She has been a Fellow of the RSA since 1988. Her recent publications include an edited collection of studies of naturally occurring design meetings (*About Designing* J. McDonnell and P. Lloyd (eds), Taylor and Francis 2009); and two papers in *Design Studies* on collaboration practices in fine art and in the design of software (Impositions of order: A comparison between design and fine art practices 32 (2011) pp. 557-572 and Accommodating Disagreement: A Study of Effective Design Collaboration 33 (2012) pp. 44-63).

Looking in the Right Place: What the Study of the Micro-Structures of Design Activities Tells us about Design Expertise and Collaboration Skills

Abstract

This talk presents some of the findings from fine-grained analyses of design taking place in either controlled or natural settings. Each study contributes to a richer picture of what designing entails; some contribute to a more subtle picture of the skills at work in constructive collaboration. Some of the findings put into question commonly held assumptions about designing and design collaboration. Together, they contribute to an agenda which seeks to move beyond the narrow perspective of rationality which classifies the justification of choices as either compelling or arbitrary, towards the older one in which rationality is defined as the ability to provide acceptable reasons for ones choices or actions.

EKSIG 2013: Keynote Speakers

Prof Michele Dickey

Department of Educational Psychology, Miami University, USA

Prof Michele D. Dickey is Professor and Coordinator for the Instructional Design and Technology program in the Department of Educational Psychology at Miami University. She teaches graduate and undergraduate courses (traditional and online) in interactive educational media design, game-based learning design and digital literacy. Much of her scholarship has focused on how aesthetics in popular game design can inform the design of interactive educational media. Her work covers the span of game design, game-based learning, and the integration of popular games for learning. Her most current work focuses on the use of connoisseurship as a mode of inquiry to inform the design of interactive educational media. One of her most recent book chapters (Aesthetics and Game-based Learning: Applying John C. Belland's Connoisseurship Model as a Mode of Inquiry) focuses on how the use of the connoisseurship model (as proposed by John C. Belland in Paradigms Regained) can provide an arts-based alternative to the science-based paradigms of inquiry in how we study the design of educational media. Too often science as the prevailing mode of inquiry misses the impact and influence of the aesthetics, but the use of connoisseurship provides a means for critiquing and "getting inside" of media design.

Connoisseurship and the Design of Contemporary Educational Media

Abstract

During the past decade the prevalence of digital technologies has altered and forever changed the dimensions of educational media. Educational media is no longer limited to being an artifact or object for a learner to view or read, but has now emerged as processes and experiences that transcend time and space. New tools and technologies provide untold opportunities for re-defining contemporary educational media as eLearning environments, mobile learning environments, and game-based learning environments. Contemporary educational media provides more opportunities for experiential learning. This is important because much of what we learn about the world is based on "first-person non-symbolic" experiences (Winn, 1993); however, traditional educational media tended toward providing "third-person symbolic experiences" in which first-person experiences were abstracted, codified, reduced and replicated. This transformation presents designers with intriguing challenges in how to view, critique, understand and evaluate these learning environments. Contemporary educational media are dynamic spaces constructed of multiple influences from the arts and sciences, and too often science as the prevailing mode of inquiry misses the aesthetics and the nuances necessary for the design of these environments. It is important for designers, educators and educational technologists to look for new methods to understand and evaluate the design. Connoisseurship provides a means of reviewing educational media without the need for elaborate mechanisms of qualitative or quantitative inquiry (Belland, 1991). Connoisseurship is "the art of appreciation" and an "act of knowledgeable perception" (Eisner, 1998). A connoisseurship model of inquiry allows designers, educators and technologist a means of "getting inside" of educational media by incorporating insights, skills and techniques from various disciplines and provides a new lens for looking at interactive learning environments.

EKSIG 2013: Speakers Index

Strand 1: Expert's Embodied Knowledge

- **Designerly Ways of Knowing and Doing: Design Embodiment and Experiential Design Knowledge**

  James Self, Ulsan National Institute of Science and Technology, Republic of Korea

  Hilary Dalke, Kingston University London, UK

  Mark Evans, Loughborough University, UK

- **Transferring Disability Experience to Design Practice**

  Ann Heylighen, University of Leuven (KU Leuven), Belgium

- **Matrixiating Knowledge**

  Catherine Dormor, Middlesex University, UK

Strand 2: Understanding & Articulating Experience

- **Bringing Action into View: Provocation and Ambiguity in Touch and Talk Sessions**

  Todd Robinson, University of Technology Sydney, Australia

- **DnA: Design and Art Research Methodologies – Understanding the Way We Work**

  Hélène Day Fraser, Emily Carr University of Art + Design, Canada

  Keith Doyle, Emily Carr University of Art + Design, Canada

- **Drawn Threads: Drawing as a Visual Methodology to Enhance Qualitative Studies**

  Claire Lerpiniere, De Montfort University, UK

Strand 3: Objects, Expertise and Connoisseurship

- **Aesthetic Experience and Design Expertise**

  Anders Haug, University of Southern Denmark, Denmark

- **Developing Expertise and Connoisseurship through Handling Objects of 'Good Design': the Example of the I.L.E.A./Camberwell Collection**

  Maria Georgaki, Camberwell Chelsea and Wimbledon, University of the Arts London, UK

- **Design History, Connoisseurship and Sustainability: Object Lessons and Collecting as Learning Tools for Designers**

  Paul Denison, Teesside University, UK

Strand 4: Performativity & Research Process

- **Generating Space to Articulate the Value of an Artists' Practice**

  Helen Smith, Robert Gordon University, UK

- **Accessing Experiential Knowledge through Dance-Writing**

  Astrid von Rosen, University of Gothenburg, Sweden

- **Participatory Art Based Research as a Tool to Restructure Notions of Participating Second Generation Immigrant Youth**

  Helena Oikarinen-Jabai, Aalto University, Finland

Strand 5: Nature of Experiential Knowledge

- **The Interplay between Experiential and Theoretical Knowledge in Service design**

  Young-ae Hahn, Aalto University, Finland

  Heidi Uppa, Aalto University, Finland

- **Making the Tacit Explicit: Developing Tools to Support Collaboration During Industrial Design and Engineering Design Practice**

  Mark Evans, Loughborough University, UK

  Ian Campbell, Loughborough University, UK

  Eujin Pei, De Montfort University, UK

- **An Investigation of Spatially Fluid Knowledge within the Retail System**

  Harah Chon, The Hong Kong Polytechnic University, Hong Kong

- **Knowing: Inside/Insider Knowledge, Outside/Outsider Knowledge**

  Helen McAllister, National College of Art and Design, Ireland

Strand 6: Design Expertise

- **The Expertness of Accounts of Typeface Design: Locating the Emic and Etic**

  Michael Harkins, University of Portsmouth / Central Saint Martins School of Art and Design, University of the Arts London, UK

- **Rendering the Tacit Observable in the Learning Process of a Changing Body**

  Peter-Willem Vermeersch, University of Leuven (KU Leuven), Belgium

  Ann Heylighen, University of Leuven (KU Leuven), Belgium

- **Crafting Expertise**

  Georgina Palmer, Loughborough University, UK

  George Torrens, Loughborough University, UK

- **Metaphors in Design: An Analysis of How We Represent Design Expertise**

  Melehat Nil Gulari, Robert Gordon University, UK

Strand 7: Contemporary Connoisseurship

- **Connoisseurship as a Substitute for User Research? The Case of the Swiss Watch Industry**

  Matt Sinclair, Loughborough University, UK

- **Controversy and Debate within Social Media: Can Museums Improve 21st Century Democracy?**

  David Gerrard, Loughborough University, UK

  Ann O'Brien, Loughborough University, UK

  Thomas Jackson, Loughborough University, UK

- **Improving Brand Recognition through Sensory Design: A Case Study of H&M**

  Blaize Neaves, Winchester School of Art, University of Southampton, UK

  Yuanyuan Yin, Winchester School of Art, University of Southampton, UK

Strand 8: Experiential Knowledge & Education

- **Experiences on Developing Intuitive Thinking among University-Level Teachers**

  Asta Raami, Aalto University, Finland

- **Developing Intuitive Thinking in Designers: Creative Process and Criticism in Tertiary Foundation Studies**

  Mari Lecanides-Arnott, Cape Peninsula University of Technology, South Africa

- **Global Creativity: Intercultural 'Hands-On' Workshops for Pre-Service Primary Art Teachers**

  Bronwen Wade-Leeuwen, Macquarie University, Australia

EKSIG 2013: Organisation

EKSIG 2013 is organised by members of the DRS **Special Interest Group on Experiential Knowledge,** and supported by the **Design Research Society**. The conference is hosted by **Loughborough University** and co-organised by the **University of Wolverhampton**. The conference is further supported by **Cumulus Association** and by the **Design & Culture Journal.**

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Designerly Ways of Knowing and Doing: Design Embodiment and Experiential Design Knowledge

James Self, Ulsan National Institute of Science and Technology, Republic of Korea

Hilary Dalke, Kingston University London, UK

Mark Evans, Loughborough University, UK

Abstract

From divergent, conceptual design through to design convergence and specification, the designer employs a variety of tools of design representation (TDRs) in the development and communication of design intentions. This study investigates how the rich context of design activity influences designer attitudes towards and use of TDRs. A sample of designers of varying levels of expertise in the use of TDRs was identified and semi-structured interviews conducted. Qualitative content analysis was then used to analyse the resulting interview data. A coding frame identified emergent themes relating to the designers' knowledge, understanding and use of TDRs in the embodiment and communication of design intentions. These themes were included in the coding frame as data-driven sub-categories. The final coding frame was then applied to the interview data and the coded segments of discourse were analysed to consider the nature of experiential design knowledge as it is exercised in the use of TDRs. The study contributes to an understanding of the designer's perceptions of TDR use as these perceptions are themselves influenced by the context of design practice and the skills and experiences of the designer. Experiential design knowledge exists as part of a rich and complex contextual activity. Any attempt to understand this knowledge must take account for the ways in which it is embedded within the designer's own engagement with and understanding of this rich context.

Keywords

designerly tools; design activity; design knowledge

Introduction

A key requirement of industrial design is the representation, development and communication of the designer's intentions towards the 'yet-to-be' (Nelson and Stolterman, 2012; Cross 2007). In order to effectively frame (Schon 1991) the often ill-defined design problem (Rittel, 1972; Goel & Pirolli 1992; Cross, 2011), the designer generates numerous solution conjectures. It is through the deployment and reflection upon these solutions (Schon op cit) that the designer is able to both explore the design problem and suggest solution ideas (Cross 2000). Within this process of exploration, development and suggestion the designer will employ tools of design representation (TDRs) to communicate, develop and reflect upon design intent (Visser, 2006; Goldschmidt & Porter, 2004). Pei (2009) identifies 32 digital, analog and hybrid TDRs used in contemporary design practice through the taxonomy of sketches, drawings, illustrations, models and prototypes. Within design's rich context these designerly tools play a critical role in supporting an open, explorative,

conceptual design activity through to the more constrained, convergent and detailed specification of intent prior to manufacture (Ulrich & Eppinger, 2003).

Figure 1 illustrates a generic model of the industrial design process based upon the divergent/convergent activity of design, as proposed by Cross (2000).

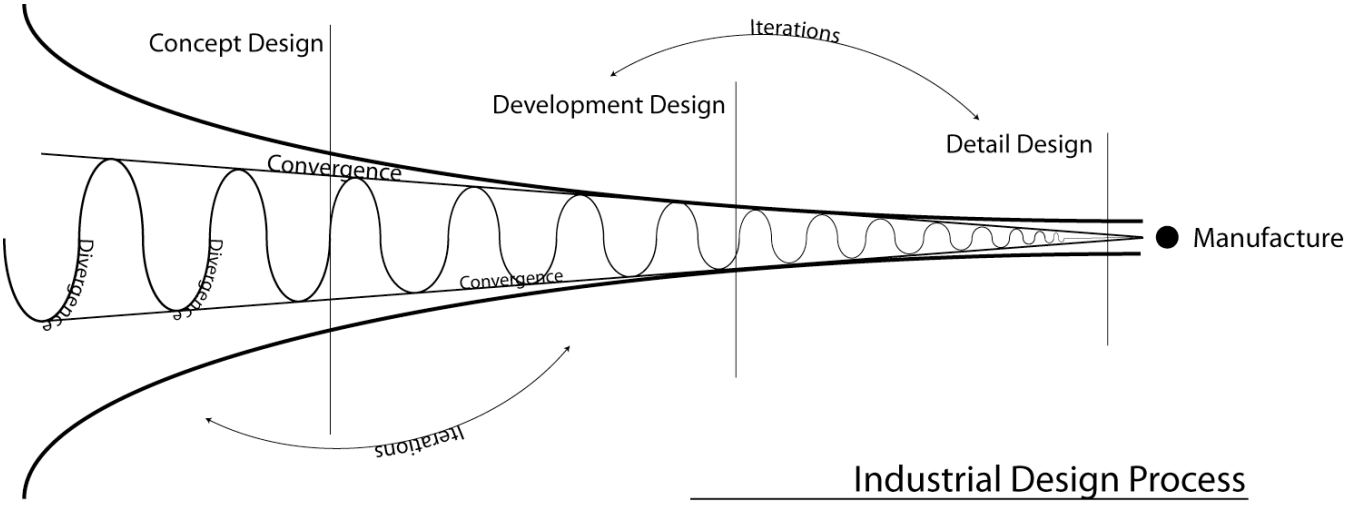

Fig 1. Generic model of industrial design process

Although a simplification of what is in reality a complex and rich activity, Figure 1 illustrates the nature of design as it relates to the often dynamic requirements of the design process. At a conceptual front end in practice design is characterised by a less committed, more exploratory design activity (Ulrich & Eppinger, 2003). Divergence, ambiguity in design embodiment, a required lack of detail and the unspecific character of design representation characteristics associated with conceptual design (ibid). As design moves from concept to development, design intent becomes more fixed, explicit and constrained. Thoughts become clearer and a design direction develops (Fish, 2004).

There exists a growing body of work aimed at understanding the role and affordance of TDRs in the complex and rich context of design practice. This research has often employed methods that simulate the design process to generate data on tool use (Goel, 1995; Purcell & Gero, 1998; Bilda and Demirkan, 2003; Fish, 2004; Jonson, 2005; Menezes, Arquitetura & Lawson, 2006; Dorta, 2007). This results in a focus upon the affordance and constraints of individual design tools rather than the designer's motivations for their approaches to design activity, choice and use of TDRs. This is of course understandable. To study any complex phenomena steps must be taken to simplify and isolate its component parts (Simon 1996). However, a drawback of this approach is that it necessarily simplifies what is in reality a rich and complex design activity (Stolterman, 2008b).

In contrast to these tool-centric studies Stolterman, McAtee and Thandapani (2008a) illustrate how practicing designers actually view and use designerly tools. Through a small sample of designers, Stolterman et al. (2008a) investigated designerly tools as their use relates to the purpose of design practice; the activity required to achieve that purpose and the tool(s) seen as best supporting the design activity. Similarly, this study attempts to balance tool-centric approaches to the study of design tools and their use with a more

holistic description how design tool use relates to and is informed by the rich context of real-world design practice.

Research Aim

This investigation aims to go beyond an analysis of individual design tools to explore how designer perceptions of the contextual requirements of design activity inform TDR (Tools of design representation) use. To this end the study aims to address the following research question: How does the rich context of TDR use influence the ways in which designers employ TDRs during design activity?

In addressing this question the study aims to develop a more holistic understanding of the principles and influencing factors that inform the designer's use of TDRs, and so contribute to an understanding of experiential design knowledge.

The human activity of design is complex. In an attempt to map this complexity before moving to investigate its component parts, Activity Theory (AT) was identified as a strategy to underpin the study of design activity. Specifically, AT was used as a means to guide research methods in the design of research instruments (interview) and the theory-driven dimensions of a coding frame used in the coding and analysis of interview data.

Design Activity & Activity Theory

In the most simplistic terms, AT is a framework for the study of activity as a process of interaction with the environment (Baber, 2003; Engeström, Miettinen and Punamäki, 1999; Kuutti, 2001). Engeström (1999) proposes a model of AT that describes a number of co-related principles (Figure 2).

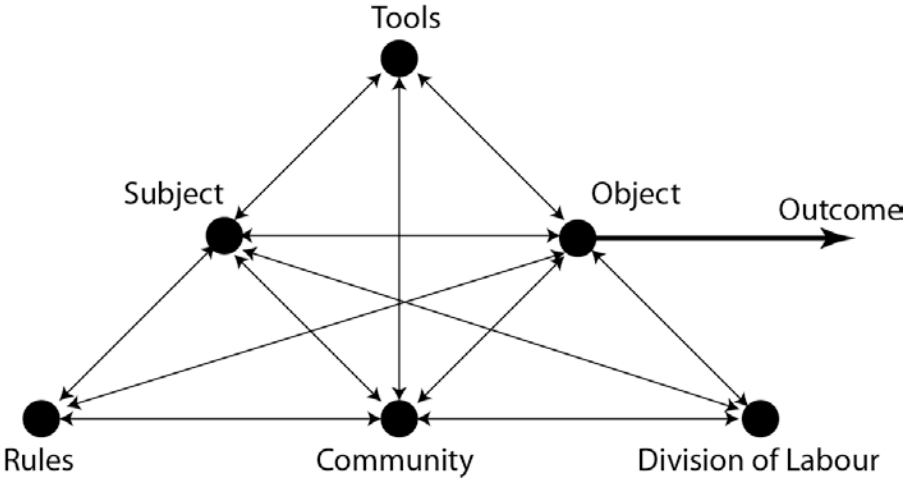

Fig 2. Engestrom's (1999) model of Activity Theory

Engestrom's (ibid) model presents a number of concepts that together inform activity: the context within which the activity takes place (Rules, Community, Division of Labour) the subject performing the activity (Subject), the objectives of the given activity (Object) and the mediating tools (Tools) used to support activity and so achieve the object and final outcome.

Engestrom's (op cit) focus upon environmental context was of particular relevance for this study's aim of exploring the rich context of design practice and its influence upon the ways in which TDRs are employed during design activity.

As a pragmatic example to illustrate Engestrom's (ibid) model, consider the activity of picture hanging. The subject uses a tool (hammer) for the purpose of hammering a nail at the right angle and level to hang the picture (Object), with the goal of hanging the picture at the required height and location (Outcome). However, within this picture-hanging activity contextual rules and conventions also apply (Rules, Community, and Division of Labour). The picture is hung at head-height and centred in relation to adjacent walls; family portraits climb the stairs; images of boats and water are located in bathrooms. A more extreme example of cultural context as influence upon the activity of picture hanging can be seen in the Democratic Peoples' Republic of Korea (DPRK). In the DPRK (North Korea) all houses must by law have two portraits of the North's first communist president Kim Ill Sung, 'the great leader' and his late son Kim Jung Ill, 'The Dear Leader' located prominently in every home, office, factory or school classroom. The portraits are required to be positioned above head height and adjusted at such an angle so that the top of their frames sit off of the wall (Oberdorfer, 2001).

Design activity and the activity of picture hanging are very different in many ways. AT uses the assumption that activity is directed towards a known goal or outcome. As previously discussed, design activity often involves the exploration of ill-defined problems where the outcome or goal state is not and cannot be known (Rittel, 1972). However, a discussion of the strengths and limitations of AT as a means to explore design activity are beyond the scope of this paper. Rather than concerning itself with a validation of AT as a means to explore design activity, our study employs Engestrom's (1999) model, and the principles suggested within it, as a guide for the design of interview questions and subsequent coding of responses. Any limitations of such an approach, although acknowledged, are not further discussed here.

Research Methods

Although the observation, recording and analysis of activity can provide insight into design activity (Cross, Christiaans & Dorst, 1996), these methods are less well suited to research aiming at exploring the individuals thinking and motivations for a given activity as it relates to a real world context. Romer and Pache (2001) argue that observation cannot afford the kind of understanding required to develop knowledge of the individual's thinking behind tool appropriation and use, 'simply observing users does not tell the researcher enough; it must be discovered what the user is thinking'. Malone (in Nardi, 2001) notes that behaviour cannot be understood without reference to intentionality. Nelson & Stolterman (2012) consider that experiment and observation may not be entirely appropriate to the study of design knowledge as it relates to design activity as principles of observation cannot transcend their own context.

In contrast with observational studies or protocol experiments, social research methods are often used to explore respondent attitudes and reasoning (Miranda, Peters & Harrie, 2007; Robertson & Radcliffe, 2009; Argument & Bhamra, 1998). Because this study aims to investigate motivations and perceptions of TDR use, we employ semi-structured interviews to generate qualitative data which is subsequently subjected to a qualitative content analysis.

Sampling

Interviews where sought from design practitioners at various stages in their careers and the researchers' personal contacts within industry were utilised to identify potential interviewees. Individuals were then contacted to secure interview dates. In choosing the interview sample the authors used two decision criteria. First, interviews were sort from practitioners that described themselves as product and/or industrial designers. Second, interviews were sort from designers working within different contexts, SMEs (Small & Medium sized enterprises), corporate environments as well as less experienced final year design students. Here the intention was to gather data from a broad cross-section of working contexts and levels of expertise, rather than to specify any particular context of practice or level of experience.

The Dreyfus and Dreyfus (1986) model of Stages of Skills Acquisition was deployed to classify the interviewees' levels of design expertise. Designers with limited experience of practice outside design education were classified as 'Advanced Beginners' (0-1 Years experience); those with 1-3 years in practice were categorised as 'Competent'; 4-8 years as 'Proficient'; and 9 years or over as 'Expert'. The attributes of the interview sample are presented in Table 1:

Designer	**Level of Expertise**	**Type of Employment**	**Job Title**	**No. of years experience**
AC01	Proficient	SME	Designer	4
AD02	Expert	SME	Designer	16
CL03	Expert	Corporate	Design Director	19
EG04	Proficient	SME	Snr Designer	7
K05	Expert	Corporate	Design Manager	11
TT06	Proficient	SME	Designer	5
St07	Advanced Beginner	Education	Intern	1
St08	Advanced Beginner	Education	Intern	1
St09	Advanced Beginner	Education	Intern	1

Table 1. Interview Sample

Although the interview sample was relatively modest each interview was conducted over a period of between 45 and 80 minutes. This resulted in 99 pages of transcribed interview data. Responses were then segmented using a thematic criterion, resulting in 1075 segmented commentaries or units of coding. The amount of data generated from the interviews was sufficient to both achieve the requirements of exhaustiveness, through the assignment of each unit of coding to at least one subcategory in the coding frame, and saturation; the ability of the data to account for all dimensions in the frame.

Interview Design

A semi-structured approach to interview was used as its qualitative nature is particularly effective in gathering data based on emotions, experiences and attitudes (Bryman, 2008; Robson, 1993). The interviews employed a set of 9 open questions (Table 2), allowing flexibility in response (Robson, 1993). This approach enabled interviewees to speak widely of their attitudes towards design activity and use of TDRs (Denscombe, 2003).

Interview Questions	
Q1: Many design academics have used a three stage model to describe the 'problem solving' phase of ID practice. What do you think of this model in terms of your own experience of practice?	
Q2: What design tool(s) do you use most during conceptual design work?	
Q3: Could you suggest reasons why [XXX] tool(s) are used most during conceptual design work?	
Q4: What design tool(s) do you use most during development design work?	
Q5: Could you suggest reasons why [XXX] tool(s) are used most during development design work?	
Q6: What design tool(s) do you use most during detail design work?	
Q7: Could you suggest reasons why [XXX] tool(s) are used most during detail design work?	
Q8: In terms of visualization and modeling abilities, what do you look for in a graduate designer's portfolio when considering them for employment in your organization?	
Q9: Given the abilities you have suggested, could you say why it is important for a designer to have these abilities?	

Table 2. Interview Questions

Question 1 attempted to establish a context for discussing design activity and use of TDRs. Questions 2 to 7 were included to generate discussion on the interviewee's understanding of the context of TDR use and their approach to design activity. Questions 8 and 9 were designed to facilitate discussion of design skills and knowledge as it relates to the activity of design and the context of TDR use.

Interview Data Coding and Analysis

Qualitative content analysis (QCA) was employed as a method to analyse the raw interview data. QCA was used ahead of other qualitative methods, such as semiotic analysis, because the study aimed to identify and describe concepts and principles within the data. In order to

analyse the raw interview responses a part data, part theory-driven coding frame was constructed. The principles illustrated in Engestrom's (1999) model of AT (Figure 2) were used as the 4 dimensions or main categories of the coding frame. Sub-categories were then identified through an initial analysis of the interview data for emergent themes. As themes were identified, sub-categories were formed and added to each of the frame's 4 dimensions. This process continued until no new themes were identified. The final coding frame is illustrated in Figure 3:

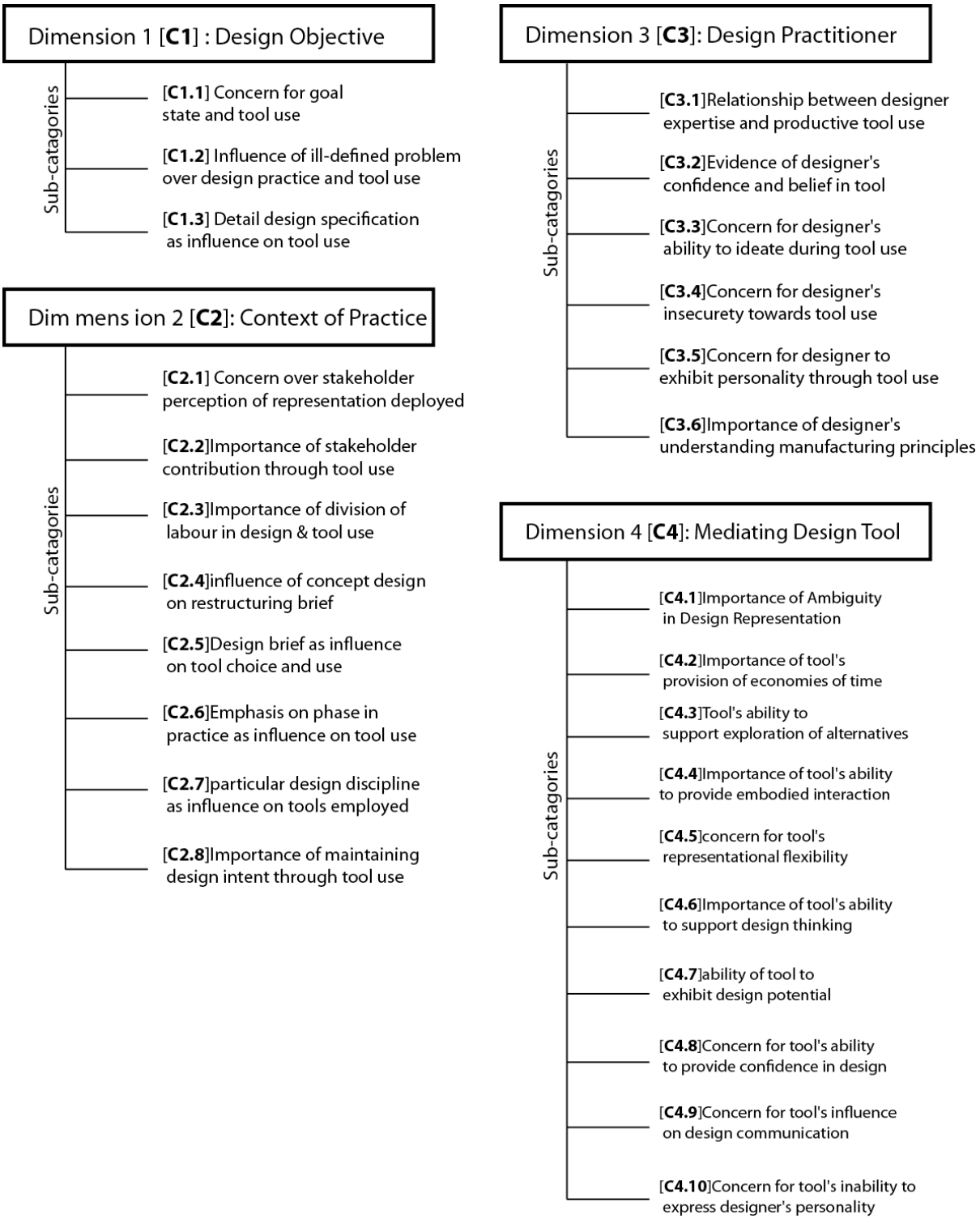

Fig 3. Coding frame

Following the construction of the coding frame the interview transcriptions were segmented using thematic criterion. With the coding frame in mind, the coder segmented interview data into units of coding according to utterances that had a common point of reference. The segmentation of the 9 interview transcripts resulted in 1075 units of coding. A pilot analysis of the coding frame was then performed and the coding frame applied to the first page of each interview transcript. As a result adjustments to sub-categories, their titles and descriptions were made, with some sub-categories being collapsed together. Finally, a main analysis phase applied the revised frame to the 1075 units of coding. After the main analysis phase was complete, in order to check reliability, the frame was again applied to a sample of the segmented units of coding at a separate point in time. The coding from the main analysis and reliability check were then compared for consistency.

Results

The coding frame, the ways in which the interview transcripts were segmented and coded and apparent agreement and difference between interviewees were analysed. The following sections present results in terms of the frame's 4 dimensions. Each section illustrates those sub-categories for each dimension that received an absolute frequency of coding greater than 50. This is followed by a comparison of coding between the three levels of expertise represented by the interview sample (advanced beginner, proficient, expert, Table 1).

Dimension 1 [C1] Design Objective

Dimension 1 [coded as C1] was assigned units of coding that referred to AT's concept of 'Objective': the influence of the objective of an activity upon the activity itself. Three themes were identified within the interview data as referencing design objectives (Figure 4).

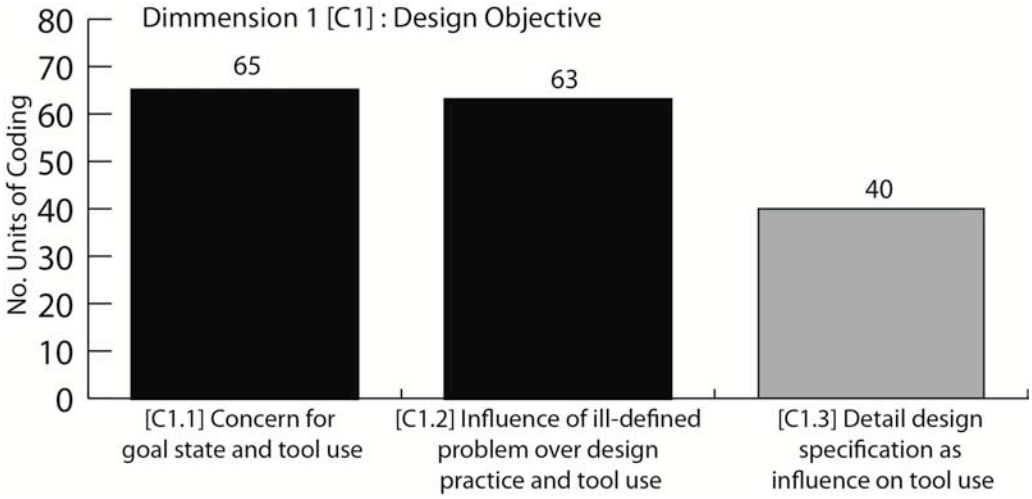

Fig 4. Absolute frequency of coding for 3 sub-categories

Subcategories C1.1 and C1.2 received absolute frequencies greater than 50. C1.1 was assigned to units of coding whenever a designer referenced a goal state as influence upon design activity. Subcategory C1.2 was assigned when designers referenced the design problem as an influence on design activity and TDR use. Tables 3 and 4 illustrate these 2 sub-categories with examples of units of coding assigned to C1.1 and C1.2.

[C1.1] Concern for goal state and tool use	Description
instructions for manufacture are, you have them in mind very early on so that almost might sometimes start in the concept design stage because, I did a lot of work on medical products so the components were tiny. They were very small, very precise. So, when you're dealing with mouldings that small, even if you are coming up with a concept design for a mechanism, you always have to keep in your mind these bits have to be made. (AC 01)	Concern for process of manufacture
As long as it's clear in a project document and a proposal to them, that it's deliverable, suits their budget and their expectations, so there are no surprises (AD 02)	Concern for final outcome and costs
Even though we haven't detailed it we can say, well if you choose this we know that's probably going to be more expensive or that's going to be more difficult to achieve so we'd flag those things up on annotated sheets but often it's best to talk to people. (EG04)	Concern for budget and costs as influence upon design communication

Table 3. Coding assigned to C1.1

[C1.2] Influence of ill-defined problem over design practice and tool use	Description
But hand sketching is much easier. So, if they do conceptual thing in 3D. What they do, they found one idea and then stop for about 3 hours. And then they found another idea and then stop for about three hours. At the end of the day, two days later OK, Do some conceptual work individually and then come back to me. And all my designers come back. With the first designer, he comes back with two concepts with the shiny 3D graphics, the other guy's hand drawn, really rough. He takes a different method and says hey, it looks like this, a different approach. So, I think, He has ten varied ideas and the two shiny ideas. (K05)	Influence of requirement for exploration of ill-defined problem and use of hand sketching and other tools.
so this is where you're coming up with lots of different concepts of vague ideas [indicating concept design]. And scribbling things down. And just noting everything down that comes out of my head and kind of picking ones that works or talking about them then developing those ones and looking into different ways of doing one. (St 07)	Influence of requirement for exploration of design problem on design activity and tool use.
If the brief is quite open then we'd probably, defiantly sketch because there might be too many variations that we could come up with to explore properly in CAD. (EG 04)	Influence of ill-defined design problem upon activity and tool use

Table 4. Coding assigned to C1.2

Although design activity is often described as dealing with ill-defined problems and un-known solutions, sub-category C1.1 (Concern for goal state and tool use) illustrates the ways in which the designer may consider future goal states during practice. For example, in Table 3 AD02 expresses a concern for clarity in terms of deliverables at the start of the design process. An analysis of coding assigned to C1.1 indicates that these concerns often relate to pragmatic considerations, *'suits their budget and their expectations, so there are no surprises'*. This suggests the ways in which designers take account for the final goal of design development, not by envisioning any final goal solution, but rather by framing the design problem within pragmatic constraints. Related to C1.1, sub-category [C1.2] indicated the ways in which the ill-defined design problem results in the designer's concern for exploration. In Table 4 EG04 describes the ways in which the design brief and its criteria influence choice and use of TDRs, '*If the brief is quite open then we'd probably, defiantly sketch'.*

These findings suggest, although the outcome of design activity is often unclear or unknown, the designer is guided by an awareness of an eventual goal state and perceptions of a best or right way to proceed. Within this an Ability to explore seemed an important principle in the designer's conception of an ability to develop ideas and so progress towards design objectives.

Design Objective & Influence of Expertise

In terms of level of expertise and the designer's engagement with design objectives, findings suggest how experience may influence the designer's perceptions of objectives. Figure 5 illustrates the absolute frequency of coding across the 3 subcategories for dimension 1 for each of the 3 levels of expertise represented in the interview sample:

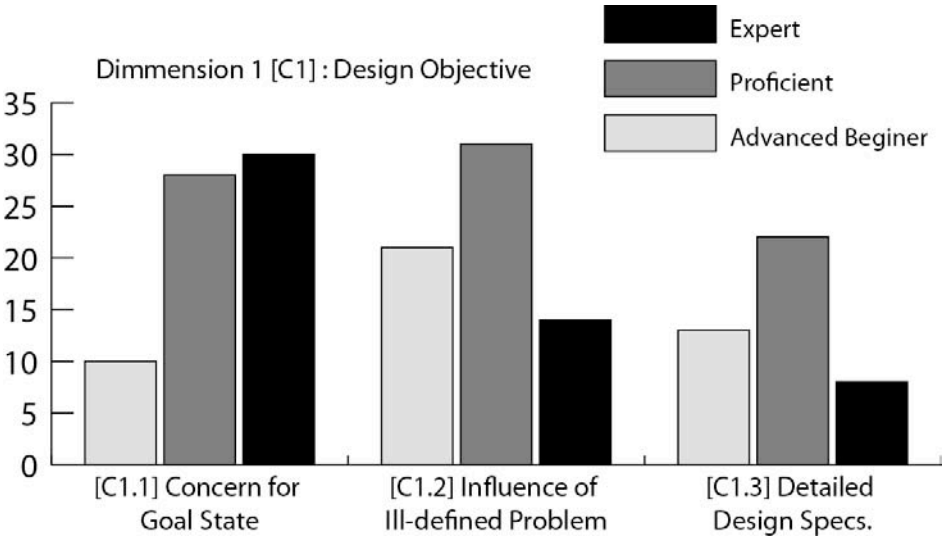

Fig 5. Absolute frequency of coding for each level of expertise

Both the expert and proficient designers recoded higher frequencies of coding than the advanced beginners for the subcategory Concern for Goal State [C1.1]. However, for both Influence of Ill-defined Problem [C1.2] and Detailed Design Specifications [C1.3], the interviewees classified as advanced beginners received a higher frequency of coding than the experts (Figure 5). It may be that more experienced designers tend to consider goals and objectives when engaged in design activity compared to those with less experience of practice. If this is the case this may indicate a relationship between expertise and an

awareness and understanding of goals and objectives, and that this understanding then informs the designer's use of TDRs.

Dimension 2 [C2] Context of Practice

The dimension Context of Practice [C2] refers to the designer's consideration of context as influence on design activity and tool use (Figure 6).

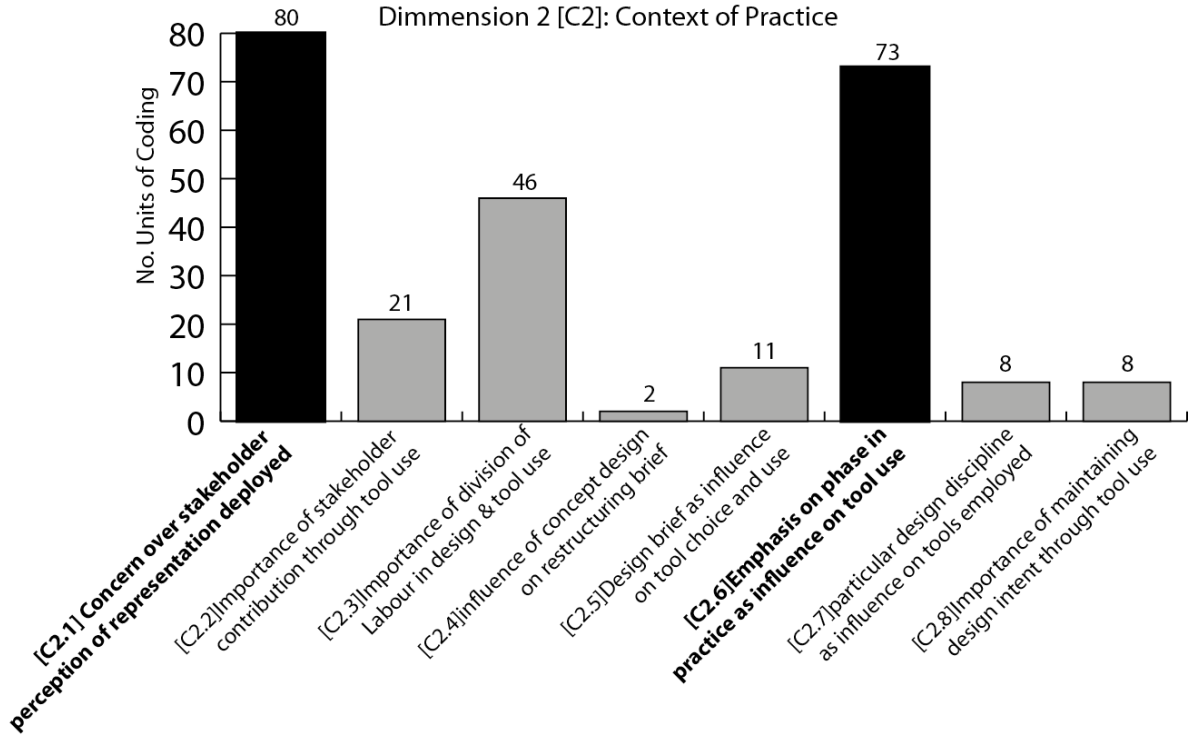

Fig 6. Absolute frequency of coding for 8 sub-categories

Of the 8 sub-categories 2 received absolute frequencies of coding greater than 50 (Figure 6). Representative samples of segmented utterances coded as C2.1 and C2.6 are presented in Tables 5 and 6.

[C2.1] Concern over stakeholder perception of representation deployed	Description
So you need real bits in your hand. Even if it's only in a crude way, you need to show a client that when you twist the button something moves which then engages with something else. You need to show the mechanism for real. (AC 01)	Discussion of the importance of modeling and prototyping for communication of intent to stakeholders
Because, although the two, you could argue, were equally well or not so well resolved, the fact that they are communicated differently, people's reaction is different. (AD02)	Concern over the tool's influence on representation and the resulting communication of ideas to stakeholders
And equally the other down side is, showing them something like that and they think it is done. Therefore they're thinking that's great, let's go to tooling. Well actually, it can't look like that at the end of the day.' (CL03)	Concern CAD's influence upon the communication of design intentions to stakeholders

Table 5. Coding assigned to C2.1

[C2.6]Emphasis on phase in practice as influence on tool use	**Description**
Usually we try to be pretty quick at this point [concept design], so we don't spend too long on it (EG01)	The character of concept design as influence on the ways tools are used during design activity.
we often have the mid-term-model, as we call them, which is we send data to model maker. This stage is the same process (pointing to development design). But it won't have all the detail, like buttons and all that, just the basic proposal. For this one we have one or two pieces and then spray it to give colour (K05)	Stage of development (development design) as influence on the character of design representation.
But, sort of, while this is all going on, from, sort of, halfway through the concept development, well from the start of development I suppose, while I'm halfway through my sketchbook and even up to using Solidworks I suppose, I'm also making MDF models, in the workshop. (ST07)	Discussion of stage in practice as influence upon the kinds of representations made.

Table 6. Coding assigned to C2.6

Results indicate the designers' concern for stakeholder perceptions of their own design intentions (C2.1, Table 4) and phase in practice as a reference point for discussing the nature of their design activity (C2.6, Table 5). It appears the kinds of representations of design intent made are dependent upon the designer's concern for and understanding of stakeholder perceptions. AD02 indicates this when commenting that, '*although the two [design representations], you could argue, were equally well or not so well resolved, the fact that they are communicated differently, people's reaction is different.'* AD02 indicates concern for stakeholder perceptions of the TDR used. It appears the designers' perception of the use of TDRs is particularly influenced by how they believe they may communicate design intent to others.

Related to this, the findings indicate the ways in which the designers used phase in practice as a reference point for discussing the nature of their own design activity and the kinds of design representations employed in support of their own practice, *'Usually we try to be pretty quick at this point [concept design], so we don't spend too long on it' (EG01)*. This appears indicative of the designers' perception of a correct way to engage the various phases in design practice and the TDRs best suited to do so.

Context of Practice & Influence of Expertise

With respect to the influence of expertise upon an understanding of contextual influences during TDR use, a number of contrasts between interviewees classified as expert, proficient and advanced beginner were seen (Figure 7).

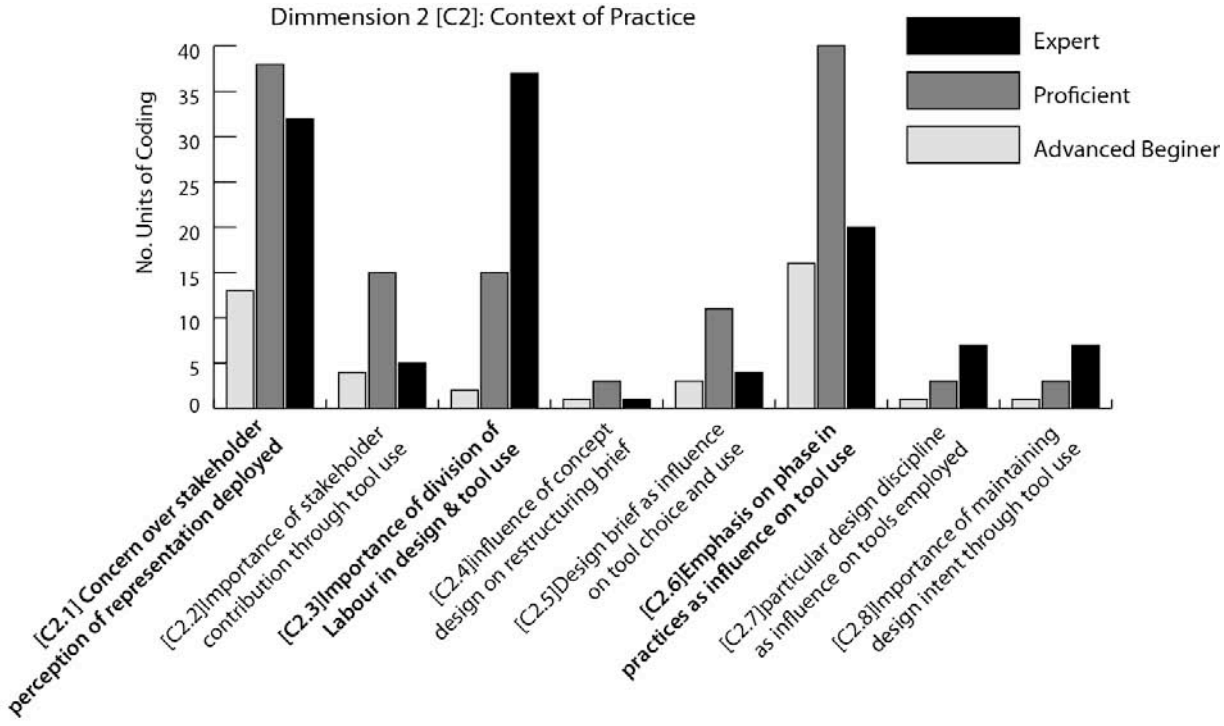

Fig 7. Absolute frequency of coding for each level of expertise

In particular subcategories C2.1, C2.3 and C2.6 showed noticeable differences in the frequency with which each subcategory was used to assign units of coding across the three levels of expertise present within the interview sample. Results suggest designers with more experience of practice may be more inclined to consider stakeholders' perceptions of the design representations employed in the communication of design intent (C2.1, Figure 7). The expert designers, and to a lesser extent the proficient designers may also be inclined to consider division of labour as influential in the use of TDRs during practice (C2.3). It was interesting to note that C2.3 was of particular importance to the experts, who were also directors of their own design consultancies or, in the case of interviewee K05, a design manager at a large corporation. Subcategories C2.6 received higher frequencies of coding with interviewees described as proficient in practice compared to both those interviewees classified as expert and advanced beginners.

It is unclear as to why the expert designers were inclined to discuss phase in practice (C2.6) as an influence upon the use of TDRs. It may be that the advanced beginners have less experience of design in the context of a commercial setting. This may then account for their

fewer references to the influence of design context across the coding frame's 2nd dimension (Figure 7). That is, in all 8 subcategories of dimension 2, both experts and proficient designers received higher frequencies of coding than the advanced beginners. It may be that a holistic awareness of context as an influence upon TDR use develops with experience. And thus less experienced designers are not inclined to consider context when deploying TDRs in support of their design activity. In contrast, and with experience, perceptions of context develop along with an awareness of how context may relate to TDR use.

C2.6 (emphasis upon phase in practice as influence upon tool use) saw a higher frequency of coding among the proficient designers only (Figure 7). This could indicate a heightened awareness of, and interest in, stage in practice as it relates to TDR use compare with the experts. If this is the case it may be that designers with middling levels of expertise have stronger perceptions of and interests in TDR use as it relates to the pragmatic requirements of design. This could indicate a relationship between the role and responsibilities of proficient designers and the ways in which responsibility influence perceptions of TDR use during studio practice. That is, those designers classified as proficient are more inclined to consider how use relates to the design process. This may tell us something of the responsibilities of these mid career designers. It could be that a heightened perception of TDR use as it relates to a design process is evidence of the proficient designers' day to day engagement in design activity. This may be in contrast to less experienced advanced beginners, who are yet to develop their experience and with experts who now see their role evolve into more advisory and managerial duties.

The significant differences between frequency of coding for expert and proficient designers for subcategory C2.3 (importance of division of Labour in design and tool use) may indicate the importance experts place on this division. This could again suggest the expert designers' responsibilities in managing the use of TDRs across a number of individuals. That is to say, the experts' role as design manager or director influences their consideration for how, where and by whom TDRs should be used.

Dimension 3 [C3] Design Practitioner

Dimension 3 [C3] was assigned units of coded data related to perceptions of the designer as influence upon the use of TDRs. 6 data driven sub-categories were identified as relating to the dimension (Figure 8).

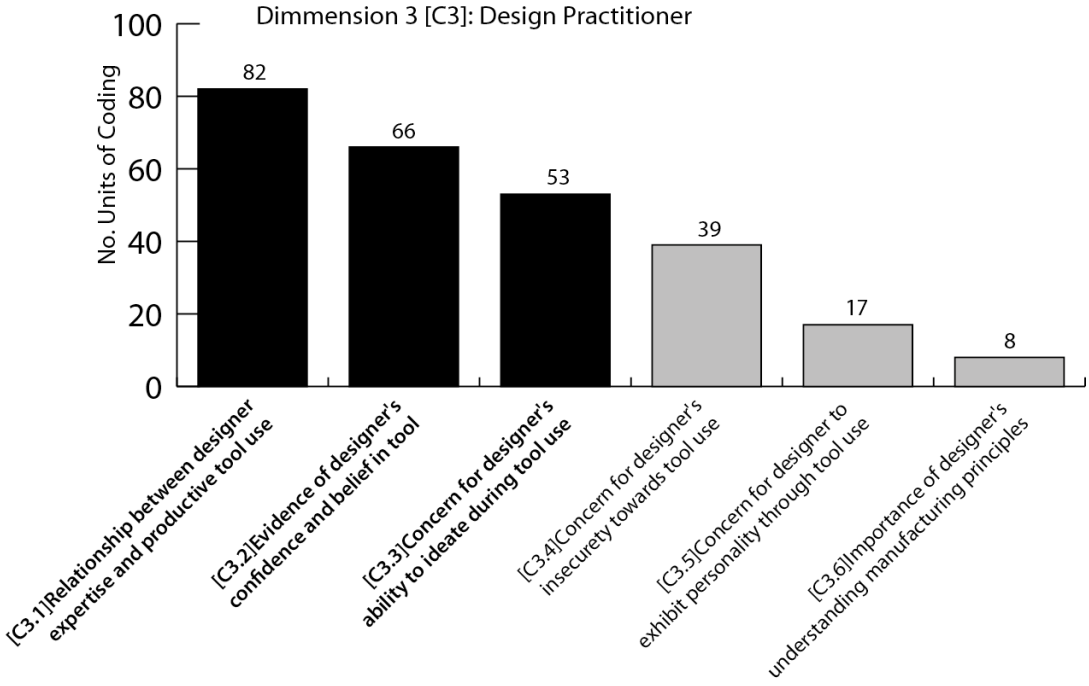

Fig 8. Absolute frequency of coding for 6 sub-categories

Of the 6 sub-categories, 3 received an absolute coding frequency of more than 50 (Figure 8). Tables 7, 8 and 9 provide representative examples from these 3 sub-categories.

[C3.1] Relationship between designer expertise and productive tool use	Description
because we, myself and my college, became very proficient in, in CAD, that became very fast as well (AC01)	Relationship between skilled tool use and efficiency of work and time during design activity.
But you've got to have that ability to see through a very snazzy, zippy render and actually question, not good design, you know? And there are too many students that all come out being able to do 3D renders but the design itself is horrible, you know? It's just not, it's either not relevant or it's clunky or it's just not been thought through (AD02)	Concern for the unproductive use of design tools by less experienced designers resulting in poor design.
you know, how you represent it obviously is important, but if the ideas aren't there, then you're not going to be able to give them that. You can teach them modelling, maybe on the computer, you can get somebody else to model it up for them, if they can't do it, but you can't teach them to be a good designer (CL03)	Discussion of difference between ability to deploy design tools and ability to design

Table 7. Coding assigned to C3.1

In terms of the design practitioner's influence on design activity and tool use, results indicated the designers' consider design ability as existing prior to or separate from the skilled use of tools. Unites coded as [C3.1] (Relationship between designer expertise and productive tool use) indicated the designers' emphases on design ability as a driver for innovative design and productive use of TDRs. Expertise in design activity appears to be seen as possible only through an ability for good design which then

underpins the use of TDRs, *'And there are too many students that all come out being able to do 3D renders but the design itself is horrible' (CL03).* Here the interviewee describes a relationship between TDR use and limited design ability. Related to this, findings also indicate the designers' strong belief in TDR use in support of design activity ([C3.2] Evidence of designer's confidence and belief in tool, Table 8).

[C3.2] Evidence of designer's confidence and belief in tool	Description
So yes, certainly anything that would involve, or furniture or something like that. That involved direct human contact or interaction then I think, yes physical models have got to be done at some point, certainly (EG04)	Emphasises the importance of physical modeling in the representation of design intentions
So 3D is important but hand sketch is not just bonus it's the way to, anyway to [stressing 'anyway'] the first filtering down from the concept. (K05)	Discusses the importance of hand sketching and its ability to support concept design.
Whereas the sketching is like, well I don't really like that, you know. Can you do, you know, can you change this? Can you change that? And then, if you've got your sketchbook there, you can do a sketch right in front of the client and say, do you mean like this? And again you'll go yes I know (St08)	Emphasises his confidence in sketching as a means to support the effective communication of design intentions.

Table 8. Coding assigned to C3.2

Expressions of confidence in a tool's ability to support a given design activity were found across the sample of designers. The findings indicate the designers hold strong, perhaps deeply rooted and often personal opinions of the TDRs they use and the ways in which they may support design activity. Related to this, results also illustrated the designers' concern for an ability to explore and ideate during design activity ([C3.3] Concern for designer's ability to ideate during tool use).

[C3.3] Concern for designer's ability to ideate during tool use	Description
It just flowed better [when sketching]. I think that the CAD it would have been more constricting because you would have spent so much time designing the components, going down a particular rout, designing the components in a particular way. Maybe it would have been a hindrance rather than an aid because you were kind of then in a certain pattern of thinking (AC01)	Concern for designer's ability to explore and ideate while using some design tools
If in the middle of a sketch he has moved onto his next idea because he's finished with that one. Whereas there's a tendency to present, 'Oh I'm going to really finish off this design, I really like. I'm going to do this sketch and then get onto the next one'. But if you see the rough sketches, you see that he has already worked out that that was done and dusted and he's put on some new machine, and again, as a designer, they've moved it on. (CL03)	Evidence of the designer's concern for design activity and tool use that affords exploration.
And what's good as well is that, what's good to see when they're using sketches or CAD or whatever, to show that they don't just think in one particular way' (EG04)	Discussion of the importance of divergent design thinking during design activity.

Table 9. Coding assigned to C3.3

The emphasis placed upon a designer's ability to ideate indicated a concern for exploration as a means through which design ideas develop. The findings suggested the importance the designers place upon an ability to engage in design activity that might be described as divergent and explorative, indicating the importance placed upon exploration as a core design competency.

[C3] Design Practitioner & Influence of Expertise

Figure 9 illustrates differences in the frequency of coding along the 3rd dimension of the coding frame between the interviewees' 3 levels of expertise.

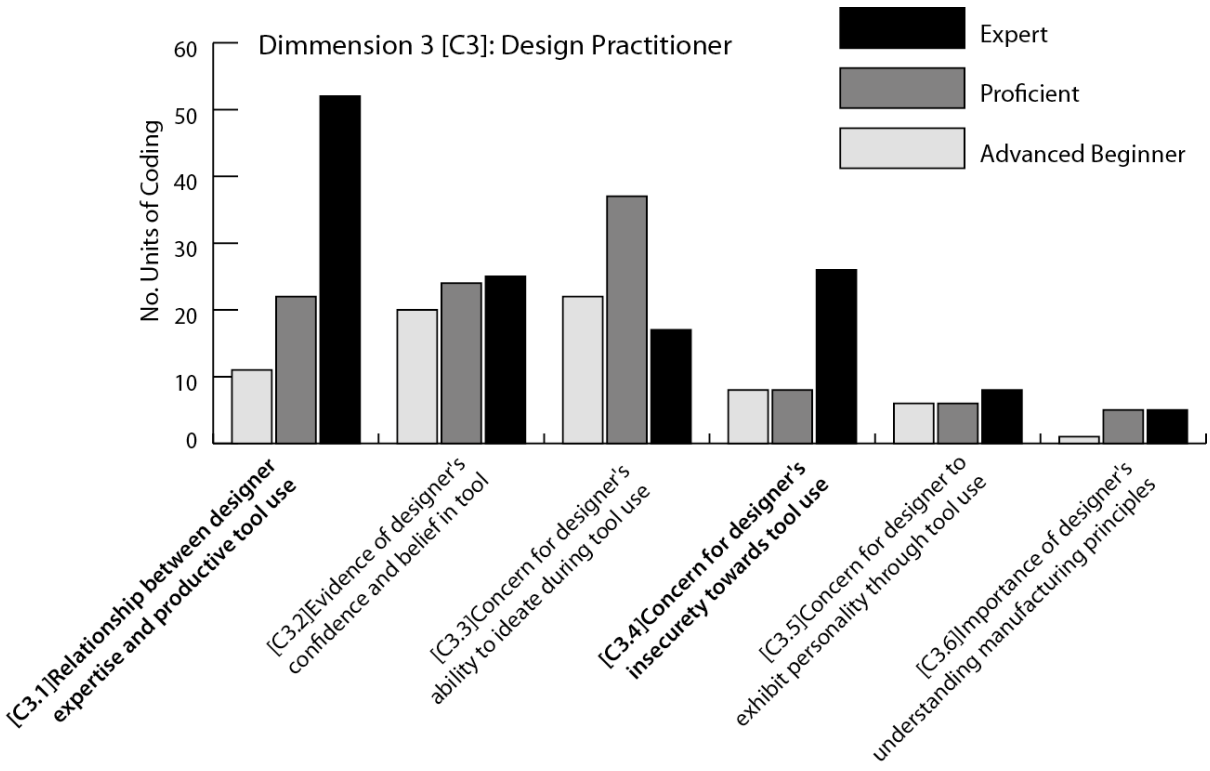

Fig 9. Absolute frequency of coding for each level of expertise

Two subcategories in particular were used more often by one or more of the three levels of expertise present in the interview sample. Those interviewees described as experts were more inclined to discuss TDR use in terms of a relationship between expertise and tool use compared to the advanced beginners or proficient designers (Figure 9, C3.1). This was also true for subcategory C3.4 (concern for designer's insecurities towards tool use). The designers classified as experts had progressed in their careers to positions of authority in relation to human resources and management. As such, they were more inclined to discuss the abilities of less experienced designers and their own requirements in terms of the skills and expertise they look for.

> And I want to see that when they sketch, they can understand form. So if that just means a section lined through the side of the body of the car, it means on that they're describing that shape to me (Interviewee CL03)

This may indicate a relationship between developing design expertise and perceptions of the role and importance the individual designer plays in their choice and use of TDRs. It may be

that very experienced designers (classified as expert within the Dreyfus & Dreyfus model of expertise) are more inclined to consider the influence of the practitioner on the role and use of TDRs. And that their high frequencies of coding is evidence of this tendency. It may be that very experienced designers have a heightened awareness of the role of the practitioner as influence upon TDR use. It could be that these expert designers have responsibility for hiring potential employees. As such they are particularly sensitive to the skills and abilities the designer may bring to their use of TDRs. This indicates the ways in which the designer's particular circumstances, stage in career and levels of expertise all play a part in informing perceptions of TDR use.

Dimension 4 [C4]: Mediating Design Tool

A 4th dimension of the coding frame related to the concept of mediating design tool as influence on TDR use (Engelstrom 1999, Figure 10).

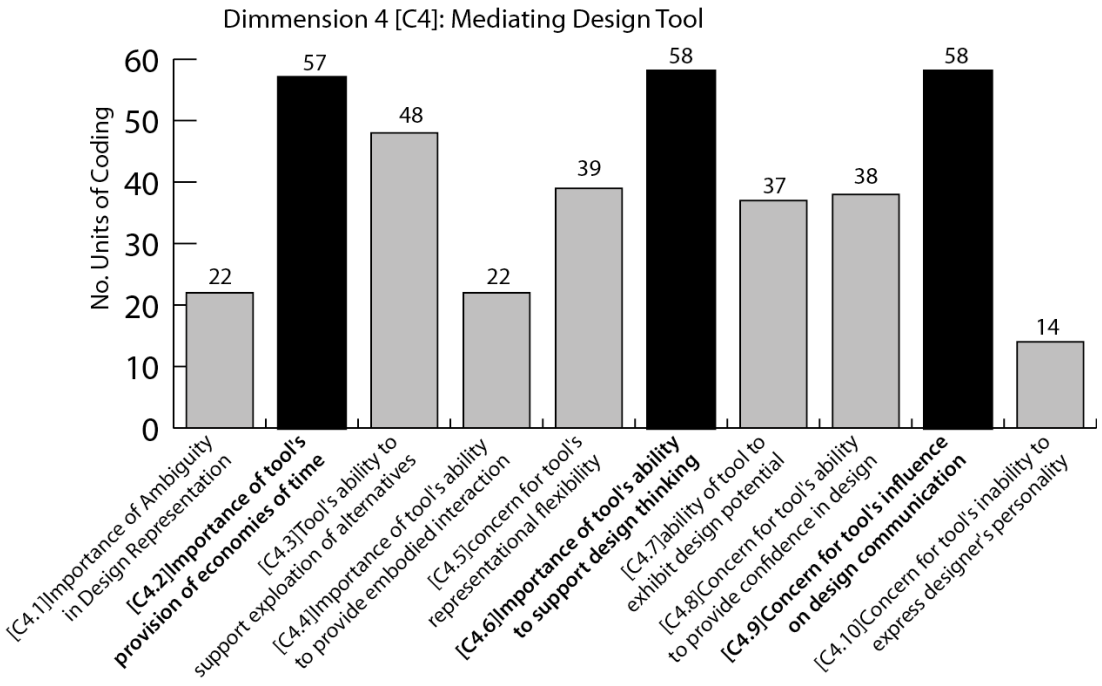

Fig 10. Absolute frequency of coding for 10 sub-categories

Of the 10 sub-categories, 3 showed absolute coding frequencies greater than 50 (Figure 10). Tables 10, 11 and 12 provide an indicative sample of units of coding assigned to the 3 subcategories together with descriptors.

[C4.2] Importance of tool's provision of economies of time	Description
I'm always quite worried about using computers for things like concept development, because they're quite slow in the way you can get your ideas down quickly (ST08)	Concern over implications of tool use for speed of design development.
No we wouldn't [use 3D printing in support of concept design]. We wouldn't because it's, it's quite time consuming. Say, to print out maybe a cordless telephone handset. That will take about ten hours to print. So, you know, you've got to model it first. So you can spend, maybe a day modelling then you've got a whole day to print, that's two days already (TT06)	Concern for economy of time and tool use during design activity.
without going into the third dimension, which then can start clocking up more time (AD02)	Discussion of how tool choice and use may result in reduced time economy

Table 10. Coding assigned to C4.2

The results indicated how pragmatic and economic considerations influence the designers' perceptions of design activity and their use of TDRs. ([C4.2] Importance of tool's provision of economies of time). The designers' expression of concern for economies of time related to budget and costs is an indication of how financial considerations exist as a constant pressure upon design activity. The design tool's ability to meet and overcome this pressure was an emergent theme within the designers' discussion of their design practices. Results also suggested the designers' concern for the tool's ability to support the thinking through of design intentions. That is, the designers tended to consider the affordances of design tools in terms of their ability to support such things as the generation of and reflection upon solution ideas, in short, the tool's ability to support a reflective, thoughtful activity of design (Table 11).

[C4.6] Importance of tool's ability to support design thinking	**Description**
I think the thinking through of any design work is, I would argue, it's a combination of both, but is at that sketch stage. It's understanding what that project, what that new product should be. (AD02)	Discussion of the development of understanding and the tool's role in the facilitation of development.
And I want to see that when they sketch, they can understand form. So if that just means a section lined through the side of the body of the car, it means on that product [pointing to picture of 'razor' on wall], they're describing that shape to me. (CL03)	Expression of importance of an understanding of design form through the use of tools of design representation.
Sketching is always; you can always use it to make a record of thoughts and to explore different ideas (EG04	Emphasis on recoding or cataloging thought through tool use.

Table 11. Coding assigned to C4.6

This was particularly evident as the designers discussed their use of sketching, '*but is at that sketch stage. It's understanding what that project, what that new product should be' (AD02)*. Here AD02 discusses the ways in which the act of sketching helps him in the thinking through of design intentions. This would agree with existing work related to

the role of sketching as a means to support design thinking (Cross 2007, Fish 2004, Goel 1995).

[C4.9] Concern for tool's influence on design communication	Description
If we've working closely with them and we've got their trust, we generally feel we don't need to wow them particularly with great imagery. Like that. A lot of them will ask for, further on they'll ask for a render which is photorealistic, for example' (EG04)	Concern over the appropriateness of the design representation in communicating design intent.
When we present to a final customer we make more of the same method of designing. So it should be Ok you do 2D, you do 2D you do sketch. I say Ok at this stage we're presenting the sketch. Then we have one or two days so we. I say this, this and this concept and then this presenter will have in hand sketch format. So in two days these will be the people bringing the reworked hand sketches.' (K05)	Concern for the tool's communication of design ideas and stakeholder perceptions.
Existing clients, I think, get how we work. But, I have seen new clients get confused. At this stage you've done 3D [pointing to start of development stage in model of practice] they see 3D. You've got visuals, it's, you know. Designs virtually done, you know, what else do you need to do? They don't really understand the other elements so much. But there is that risk. But it depends on the client if they're aware of our working process.' (TT06)	Discussion of the relationship between the tool's communication of intent and the designer's relationship with stakeholders.

Table 12. Coding assigned to C4.9

Results indicated the designers' concern for the tool's communication of design intent as an influence upon choice and use of TDRs (Table 12). That is, the designers appear to use their own guiding principles concerning the ways in which design ideas must be communicated to stakeholders and how this relates to the affordances and limitations of the TDRs. For example, EG04 discusses the relationship between TDR use and his own perceptions of client expectations, *'If we've working closely with them and we've got their trust, we generally feel we don't need to wow them particularly with great imagery.'* It appears the use of TDRs is understood in terms of perceptions of the ways in which they communicate design intent to various stakeholders. That is, the designer understands tools as having the ability to communicate in various contexts of practice, and that this understanding is synthesised along with knowledge related to client expectations.

[C3] Mediating Design Tool & Influence of Expertise

Figure 11 illustrates frequency of coding for dimension 4 of the coding frame between the 3 levels of expertise present in the interview sample.

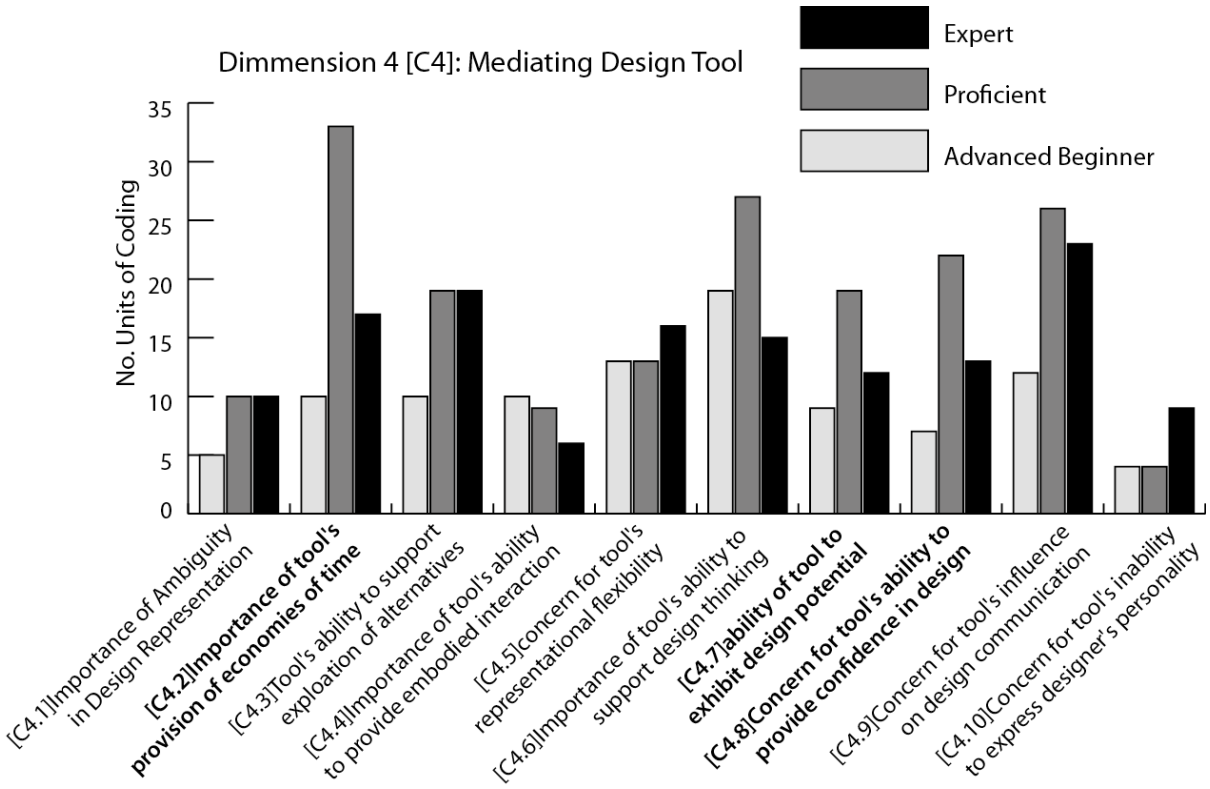

Fig 11. Absolute frequency of coding for each level of expertise

Subcategories C4.2, C4.7 and C4.8 indicated differences in the frequency of coding across the 3 levels of expertise identified in the sample. In terms of consideration for economies of time [C4.2], the proficient designers' responses were coded more often than both the advanced beginners and experts. In the case of the advanced beginners, it may be that economies of time are considered less at an early stage in their career where pressures and responsibilities for the design development related to time and cost are less influential. The expert designers also received a higher frequency of coding for C4.2, but less so than the proficient designers (Figure 11). It may be that the experts are less lightly to have responsibility for use of TDRs in their more managerial roles compared to the proficient designers. As such, this is reflected in their discussion of tools in relation to economies of time.

For subcategory C4.7 (ability of tool to exhibit design potential) the designers classified as proficient registered a higher frequency of coding compared to both the advanced beginners and experts. This may indicate that those interviewees described as proficient in their design expertise are also most concerned with the TDRs ability to exhibit design potential. That is, there is a relationship between this level of expertise and perceptions of TDR use in terms of their ability to communicate design intent.

Indeed, across all 10 subcategories of the coding frame's 4th dimension seven of the ten saw the greatest or equally greatest frequency of coding for those designers classified as proficient in their level of expertise (Figure 11). It may be that those designers at a mid stage in their career are more able to articulate their relationship to TDRs and the ways in which they are employed in support of practice. These results indicate the TDRs role and influence on design activity is foremost in the concerns of a particular level of experts. It may be that proficient designers are more inclined to reflect upon the TDRs they use compared to novice or more expert design practitioners. This tendency could be the result of regular engagement with TDRs as part of their professional studio practice. This is in contrast to both advanced

beginners, who lack experience, and experts, who are less lightly to make regular use of TDR due to directorial responsibilities. If this is the case, it appears expertise and critical use of TDRs is related, but that the nature of this relationship is also dependent upon the designer's role and responsibilities within their work context.

Discussion

This study was undertaken to investigate the role and influence context has upon the designer's approaches to design activity, TDR (Tools of Design Representation) choice and use. Results support the notion of design as a rich and complex activity as proposed by Stolterman (2008b). In order to develop a more holistic understanding of the relevance and importance TDRs play in supporting design activity, it is necessary to investigate how TDR use is influenced by this rich context. The results presented in this study make a number of important contributions to an understanding of the interface between the designer's perception of context, their design activity and TDR use.

Although the designers expressed concern for the importance of an understanding of and engagement with ill-defined design problems (Rittel 1972), results also indicate the designers' use of goal states as reference points for TDR use during design activity. Results suggest these goal states are not related to the designers' perception of what the final design solution may be, rather they relate to the designers' understanding of a correct way, to communicate design intent. These guiding principles often appeared to relate to the rich context of tool use (stakeholder requirements, importance of exploration, phase in design development), rather than the inherent properties of the TDRs themselves.

Results have also indicated the designers' concern for stakeholder perceptions of the design representations employed. Findings suggest designers relate TDR choice and use to the ways in which design intentions are communicated and the influence this may have upon stakeholder perceptions of design intent. The designers appear to perceive the affordances of TDRs through the tool's ability to meet a requirement to communicate ideas to stakeholders in a particular style, fidelity or level of abstraction. Related to this, results also suggest the importance of the designers' perceptions of phase in practice as an influence upon the kinds of design activity undertaken and TDRs used. Here results indicated the designers' awareness of design as a process of progressive development. The kinds of design activity undertaken and the ways in which TDRs may be used is dependent upon the designers' perceptions of the requirements of a given phase in design development. However, the designers' understanding of what constituted correct TDR use at a given stage in practice differed between the three levels of design expertise represented in the sample: advanced beginner, proficient and expert designers.

Perceptions of TDRs and the context of their use appear to relate to the designer's level of expertise in a number of ways. First, the expert designers were more inclined to consider goal states and objectives in their choice and use of TDRs. That is, the more experienced designers where better able to critically discuss the rational for TDR use in terms of goals and objectives compared to designers with less experience. These goal states often included discussion of client expectations and their influence upon the use of TDRs along with pragmatic issues of cost and time related to design and manufacture. This heightened awareness of context appears to contradict the notion of a more experiential, unconscious understanding of design practice (Lawson and Dorst, 2009). The experts and proficient designers were both clear and articulate about the influence of context, its affordances and constraints. For example, designers classified as proficient and expert (Dreyfus and Dreyfus 1986) were more inclined to discuss stakeholder influence on their use of TDRs compared to the advanced beginners. This suggests a relationship between expertise and TDR use.

Moreover, in terms of the concept of context as influence on use (Engeström 1999), division of labour was most often discussed by the expert designers compared to both advanced beginners and those described as proficient. This may indicate the ways in which the role and responsibilities of individuals influences their perceptions of TDR use. As design directors and managers, the experts concern themselves with where and by whom TDRs are used within studio practice, rather than a more situated, pragmatic use of TDRs .

Results indicate the more experienced designers, particularly those at a skill level of proficient, understand the use and effectiveness of TDRs in terms of their ability to provide economies of time and an ability to communicate design intentions in a way that they perceive as correct. Here the results indicate a relationship between expertise and a more critical use of design tools. This agrees with Stolterman et al's (2008) notion of a tool-first vs. activity-first approach to TDR choice and use (see also Heidegger 1962). It appears the more experienced designers consider the affordances of TDRs in terms of the requirements of a given stage in design development. In contrast, designers with less experience are less inclined to consider the characteristics of TDRs as they relate to their context of use.

The findings indicate some of the specific concerns and perceptions design practitioners have in terms of context of TDR use, influence of the tool user, the TDR's role and perceived effectiveness and some of the ways in which TDR use is influenced by perceptions of objectives and goal states. An analysis of differences between designers of differing levels of expertise also provided an indication of the relationship between expertise and perceptions of TDR choice and use. In particular, results indicate perceptions of and critical engagement with TDRs is not only dependent upon level of expertise, but also the responsibilities individual designers have in their day to day practice.

Conclusion

Design activity and TDR (tools of design representation) use is often investigated through methods which focus upon the use of tools during simplified design tasks (Goel 1995, Cross, Christiaans and Dorst 1996, Alcaide-Marzal et al 2013). These studies have greatly contributed to our understanding of the use and effectiveness of TDRs and the nature of design activity. However, the methods employed in these studies do not well account for the richness and complexity of design activity (Stolterman 2008b). This study provides evidence for the importance of context as it informs the designer's perceptions of design activity and the role TDRs play within it.

In particular, findings indicate the designers do not perceive design tools outside of this context, rather they understand their use of tools only as use relates to the competing requirements of the design activity. Designers understand the effectiveness of a tool insofar as it is employed within a rich and complex context of use. This study has started to explore and make explicit how concern for context informs the designer's notion of and orientation towards the principles by which they evaluate effective TDR use. Rather than being centred upon the tools themselves, the designer's guiding principles appear to be informed and developed through perceptions of how TDR use relates to the rich, contextual requirements of design practice: stakeholder requirements, pragmatic concerns over economies of cost and time, phase in design development, the nature of design problems, idiosyncratic belief in and use of design tools. This is in contrast with less experienced designers who indicate limited critical engagement with TDR use and its rich context.

With a greater focus on the rich context of design activity and the ways that context is perceived and engaged by designers of differing levels of experience and responsibilities, we will be better placed to develop strategies to effectively support the use of TDRs in

design. These findings have implications for design pedagogy in developing curricula for the teaching of tool use that fosters understanding of the rich context of use as it relates to and informs the activity of design. Future research is now needed to further develop understanding of the role this rich context plays in design activity, TDR use and the acquisition of experiential design knowledge.

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Transferring Disability Experience to Design Practice

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Abstract

Through their bodily interaction with the built environment, disabled people can detect obstacles and appreciate spatial qualities architects and other designers may not be attuned to. To some extent, disabled people can thus be considered as *connoisseurs*: they are able to differentiate and perceive variables in their body or the surrounding world that are meaningless to others. In architectural practice, however, disability experience is rarely considered a valuable source for design: building codes consider accessibility of buildings as something taken care of by professional experts, instead of something people are attached or exposed to, leaving disabled people as seemingly incapable of joining the dialogue because they are supposedly no experts in the field. This paper reports on a field experiment set up to explore whether and how disabled people's bodily experience of space can be shared and transferred to inform architects' design practice. Five buildings and one building site were visited by one or more teams, each composed of a disabled person and two architecture students (31 disabled people and 47 students in total). During these visits, a particular dialogue developed which is embodied in nature and unfolds *in situ*. Students reported the insights gained during this dialogue in a way that is non-normative—it informs designers about how disabled people experience the building/site rather than prescribing how to (re)design it—and narrative—it respects the intricate relatedness of things in how people experience space. The paper documents how this approach enables latent understandings to develop into alternative and richer appreciations of a situation, by 'giving voice' to people who are rarely heard in design practice, cultivating various perspectives on a building/site and encouraging a reflexive stance by those involved. Through these local interactions and involvement, professional prejudice is overcome and transformed into empathic concern that could inform future design.

Keywords

architecture; connoisseurship; design practice; disability experience

To what extent can disabled people's bodily experience of space be shared and transferred to inform architects' design practice? In this paper, I report on a field experiment set up to address this question. The experiment was triggered by the observation that, through their bodily interaction with the built environment, disabled people can detect obstacles and appreciate spatial qualities architects and other built environment professionals may not be attuned to. Yet in architectural practice, disability experience is rarely considered a valuable source for design. After introducing the background for the field experiment, I present its aim, methods and participants, and describe and document the insights it has yielded. In addition, I discuss how these insights are received and the impact they have so far. To this end, I draw on reports, field notes and pictures taken during participation in the field experiment, and written and oral accounts of people involved in or affected by the field experiment.

Introduction

Throughout history the human body has been used as source of proportion and measurement in architecture: it was used to derive divine proportions in classicist anthropomorphism, over mathematical-physical laws in modernist organicism, to functional dimensions in contemporary ergonomics (Van Herck & De Cauter, 2004). Today the human body is still mainly applied by architects to derive mathematical proportions or functional dimensions. By using sources like the *Metric Handbook* (Adler, 1999) or *Architects' Data* (Neufert & Neufert, 2000), designers introduce alleged ideal measurements in architecture (Imrie, 2003), which say little about how a building is bodily experienced explicitly.

This mathematical approach also characterises the way in which architects consider and relate to disability. In architecture and beyond, conceptions of disability tend to be dominated by a medical discourse, which considers disability as an individual, physiological, disorder to be treated or cured. The disorder is situated in the person and the solution to the problem caused by the disorder lies in treatment or cure to restore the body's function. In this view, disability is defined by means of measurable criteria and arbitrary thresholds. In its *International statistical classification of diseases, injuries and causes of death*, the World Health Organization (WHO, 1993) defines when a person is disabled based on measurable aspects of the human body. Once measured, a threshold can be chosen when this specific aspect contributes to the person being disabled. Visual impairment, for instance, is defined as having a visual acuity of less than 3/10, and blindness as having a visual acuity of less than 1/20 and/or a field of vision of less than 10°. Accordingly, accessibility norms or guidelines translate accessibility into measurable facts (or indicators and averages) by fixing maximum heights of thresholds, minimum widths of doors, or minimum levels of colour or luminance contrast.

Critiques of such medical conceptions of disability place the body in its socio-material context and stress the role of environmental determinants in performing day-to-day activities and fulfilling social roles (Fogeyrollas, 1995). The social model of disability therefore distinguishes conceptually between disability and impairment. It sees the former as socially constructed on top of the latter (Corker & Shakespeare, 2002), and places the explanation of disability's changing character in the organisation of the society in which it is found (Butler & Bowlby, 1997). Referring to the definition of blindness, for instance, Ruth Butler and Sophia Bowlby (1997) argue that the threshold at which a person considers oneself visually disabled varies across individuals and may also differ from how others perceive them. This move to embrace disability as a social issue can be traced in the WHO's (2001) International Classification of Functioning, Disability and Health. The latter recognizes disability as a complex phenomenon reflecting an interplay between features of a person's body and features of the environment s/he lives in. It distinguishes between an "impairment": a problem in a body function or structure; an "activity limitation": a difficulty encountered in executing a task; and a "participation restriction": a problem experienced in involvement in life situations. In the WHO's (2001) words: "Disability is not something that only happens to a minority of humanity. The ICF thus 'mainstreams' the experience of disability and recognizes it as a universal human experience."

In the context of architecture (and other design domains), this recognition of the two-way relationship between disabled person and his/her environment, has led to the development of design approaches like Universal Design (Mace, 1985, as cited in Imrie, 2012), Inclusive Design (Clarkson, Coleman, Keates, & Lebbon, 2003), and Design for All. These approaches focus on issues of social inclusion in that they aim at "designing environments that facilitate people's emancipation from artefacts that restrict or prevent their ease of mobility and access" (Imrie, 2012). Despite their appearance, however, these design approaches also have "vestiges of a medical model underpinning its value-based, and clinical and physiological rather than cultural (social) criteria appear to be defining and

shaping its design mentalities and approaches" (*ibid.*). In line with Newton D'Souza (2004) and Jim Tobias (2003), Rob Imrie (2011) points at the positivist predisposal of these approaches towards the propagation of universal principles, their normative prescription of rules defining what good design is or ought to be, and their instrumental and pragmatic character in seeking to influence the usefulness or utility of designed artefacts. As such, they seem to fit into a "problem-solving paradigm", whereby the design problem is posited as an objective entity that, through the development of applications and standards, will result in the correct outcomes (*ibid.*).

In reality, design outcomes are interpreted and experienced by people in ways that may considerably differ from the designers' intentions (Crilly, Maier, & Clarkson, 2008). This holds in particular for the experience of disabled people: through their bodily interaction with the designed environment, they can detect obstacles or appreciate qualities that designers may not be attuned to (Heylighen, 2008). For a person who is blind, for instance, a room that seems coherent from a visual perspective, may be experienced as multiple spaces (see Fig. 1). In the absence of sight, the part of the room that is lit by direct sunlight is an entirely different space than the part in the shadow, because of the difference in temperature. To some extent, the perspective of disabled people may thus be considered as an example of *connoisseurship* (Gibson, 2000), a form of expertise that develops through perceptual learning, *i.e.* discovering distinctive features and invariant properties of things and events. As a result of this perceptual learning, experts are able to differentiate, in their body or surrounding world, variables that are meaningless to novices. A sommelier, for instance, is able to discern various types of bitterness in wine, which remain unnoticed to an amateur wine drinker. Yet, these types of bitterness do contribute to the taste of the wine, and thus to the pleasure it offers the amateur wine drinker. Besides by professional activities, the development of *connoisseurship* may be triggered by other embodied factors, such as cultural elements or—the focus of this paper—disability.

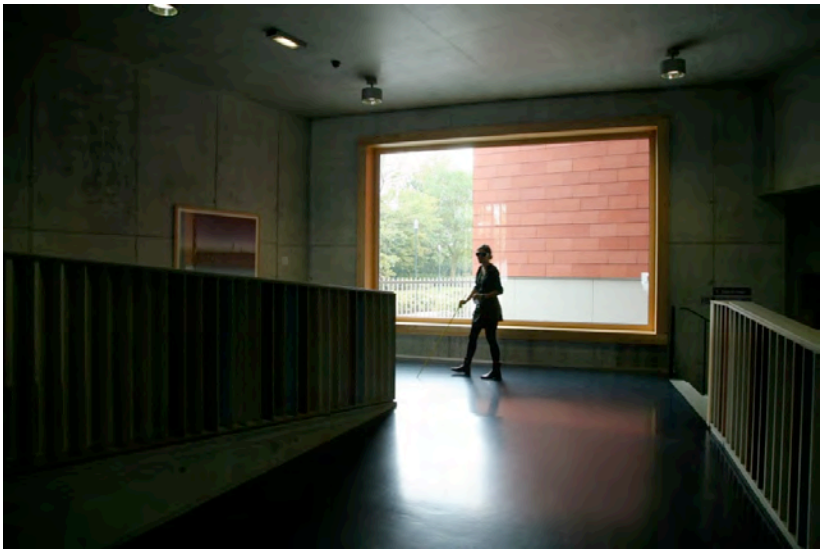

Fig 1. In the absence of sight, the part of the room that is lit by sunlight is an entirely different space than the part in the shadow, because of the difference in temperature (© Rob Stevens)

In architectural practice, however, disability experience is rarely recognized as a form of expertise. Accessibility of the built environment often is considered as a matter of fact (Latour, 2005), as something taken care of by professional experts, instead of something people are attached or exposed to. In line with a medical conception of disability, building codes translate accessibility into facts, which can be objectively measured by professional accessibility advisors. These are felt by designers as restricting their creativity and removing

the challenge to come up with intelligent design solutions (Gray, Gould, & Bickenbach 2003), while offering little insight in why a building feature may be problematic or appreciated. Moreover, rendering accessibility to the realm of matters of fact leaves those affected by it—disabled people themselves—as seemingly incapable of joining the dialogue because they are supposedly no experts in the field (Heylighen & Nijs, 2011). As a result it limits the scope in which disability experience can be considered a valuable source for design. The field experiment reported in the remainder of this paper, was set up to address these limitations and to explore whether and how disabled people's bodily experience of space can be shared and transferred to inform architects' design practice.

Aim, methods and participants

The idea to conduct the field experiment arose at a point when our university, in its role as building owner, decided to obtain expert advice from an official accessibility office on the accessibility of its building patrimony. By way of trial one university building was subjected to an accessibility audit. The audit was performed by a professional accessibility advisor—a specialised architect—who assessed the building based on a standardised checklist, and formulated a proposal to address the problems identified in a phased way.

The approach adopted in the field experiment is intended not as an alternative for, but rather as complementary to professional approaches like the accessibility audit. Instead of imposing certain solutions upon architects, it aims to inform them or at most make suggestions to them, offering a hold in making design decisions while leaving the actual design up to them.

Most of the buildings considered in the field experiment are protected buildings on our university's campus, and were selected in consultation with architects of the university's technical services. Preference went to buildings for which works are planned in the near future. So far five buildings have been considered: the *Van Dalecollege*, a 16th century college accommodating the university's student services and student housing; the *Arenbergkasteel* [Arenberg Castle], a 16th century building housing the architecture department; the *Pauscollege* [Pope College], a late 18th century college used as a dorm for 180 students plus a branch of the university restaurant; the *Leo XIII seminar*, a 19th century building complex currently also used as student dorm; and the *Hollands College* [Dutch College], a 17th century college that has been preserved exceptionally well and is currently used as a meeting point for the academic community. In a slightly different version, the approach explored in the experiment was also applied to the *Grote Aula* [Big Auditorium], a 19th century auditorium used for lectures and music events and, outside the university premises, to the site of a town hall to be replaced by a new administrative centre.

Each building or site is analysed by one or more teams. Every team is composed of one or two user/experts and two architecture students (or, in some cases, researchers). The term 'user/expert' was introduced by Elaine Ostroff (1997) to denote "anyone who has developed natural experience in dealing with the challenges of our built environment". User/experts involved in the field experiment include students, staff and visitors with a mobility impairment (using a wheelchair, having difficulty walking), a sensory impairment (blindness, low vision, hearing impairment), or a diagnosis on the autistic spectrum. So far, 31 user/experts, 47 architecture students and four researchers have participated in the experiment.

Teams visit the building or site considered and identify its qualities and weaknesses from the perspective of the user/expert in the team. Based on an earlier experiment with professional architects, we expected that during these visits a particular dialogue would develop between the user/expert on the one hand and the architecture students on the other hand: a dialogue

that is embodied in nature, unfolds *in situ*, and involves a particular knowledge transfer (Heylighen & Nijs, 2011).

In terms of output, the architecture students write an analysis report summarising the major insights gained during the visit of their team. The report is not normative in that it informs architects about how the user/expert in the team experiences the building visited, rather than prescribing what should be altered. It is narrative in that it addresses the building's spatial qualities and obstacles in a way that respects the intricate relatedness of things in how the user/expert experiences it, rather than point-per-point (as in say a standardised checklist). The report is documented with photos and graphical material that resonate with architects' visual way of working (see Fig. 2).

Reports are shared and discussed with the other teams analysing the same building, thus augmenting their validity, and with architects and other built environment professionals involved in the (re)design of the building or site under consideration.

Fig 2. Graphical documentation of the route taken by a blind student in trying to navigate the courtyard of the *Arenbergkasteel* (© Joke Claeys & Karen Happaerts).

Findings: From latent understandings to richer appreciations

When our university, in its role as building owner, decided to subject the *Van Dalecollege* by way of trial to an accessibility audit, expectations were that the college would be declared inaccessible because of the multiple differences in levels and the cobblestones, which are difficult to negotiate for wheelchair users. However, the visits accompanied by user/experts offer a much more nuanced appreciation of the situation in and around the college—and the other buildings and site visited afterwards, revealing issues that may be easily overlooked or that built environment professionals may not be attuned to. Besides highlighting unforeseen

issues to address, the field experiment also reveals unforeseen qualities of the buildings and site visited.

Sensory clues

To start with, the visits accompanied by user/experts highlight the key role played by the senses in how a building or site is appreciated. Through smell, vision, hearing and touch the user/experts discover distinctive features that offer clues to understand and navigate a building or site, but also affect how it is experienced.

When visiting the *Van Dalecollege*, a visitor who is blind manages to locate the reception in part through its **smell**: when passing by the door to the reception, she notices a smell that reminds her of libraries and journals. Once inside the building, it strikes her that the spaces smell unpleasantly, which she ascribes to poor ventilation. Similarly, in the *Hollands College*, a blind woman and a man with autism both point to specific smells, which they find disturbing.

In the *Pauscollege*, several user/experts complain about the (lack of) light (see Fig.3). The architecture students visiting the building with a student with low **vision** notice that the transition from dark to light(er) spaces—and vice versa—constitutes a considerable threshold for her. As her eyes need to adjust, she walks less swiftly and less spontaneously through the building. The recognisability of building elements diminishes considerably in dark spaces. For the architecture students it does not make a difference in which corridor they are walking, yet they sense that the user/expert walks more cautiously through the darker corridors. A student with autism also mentions the lack of (sufficient) natural light in the *Pauscollege*, which he considers especially problematic in the long windowless corridors along the student rooms. Deprived of contact with outside, he does not know on which side of the building he finds himself. Interestingly, the only corridor he finds beautiful, does have sufficient light. This enables him to better see how the space is finished. Another space he finds beautiful is the hall with the old staircase. The hall is light and spacious, and the rustic wood offers a beautiful contrast with the white painted walls.

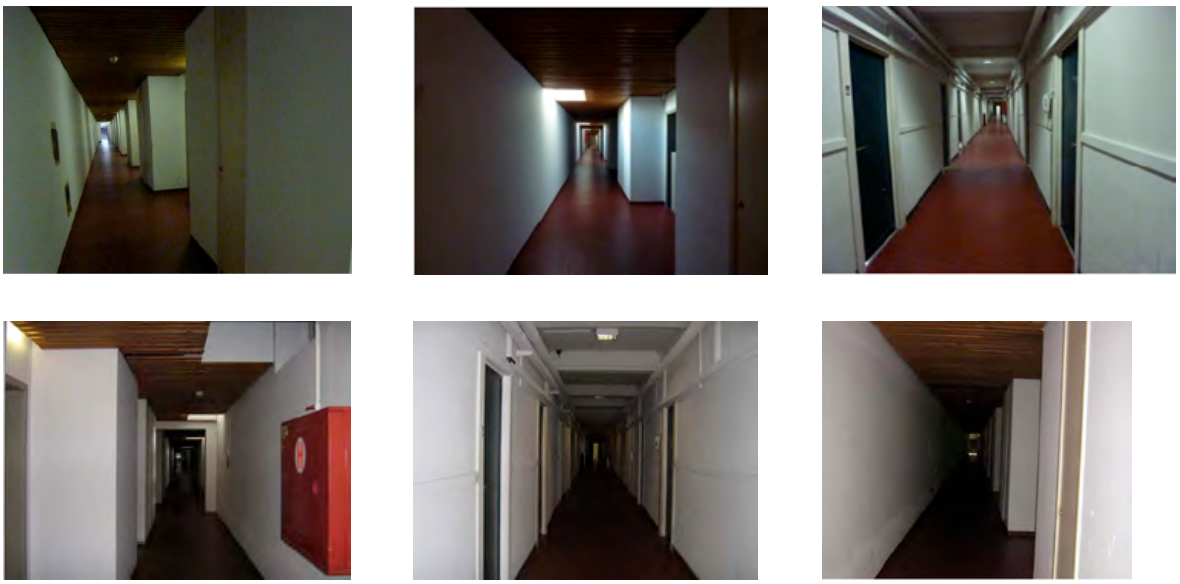

Fig 3. In the *Popecollege*, several user/experts complain about the (lack of) light (© Inge Belis, Anton Draye & Adelheid De Muynck).

The amount of light, and especially the kind of light, also seems to play an important part in the appreciation of the *Hollands College*. Based on their visit with a visitor with autism, two architecture students distinguish three different types of rooms in terms of lighting (see Fig. 4). The first type are rooms with an authentic interior (*c.q.* the salons and the library) and are illuminated by an old crystal chandelier, a single direct light source which reflects the light multiple times. These reflections and the glimmering may result in an overload of stimuli. In the second type of rooms (the garden room and the canteen), the lighting is better for the person with autism because different ways of illuminating the room are available. These rooms have different contemporary light sources that each can function separately: indirect light, direct light and spots. By choosing the amount of artificial light you want and where you want it, you can create a different atmosphere in the room. Several ways of lighting are possible also in the chapel, but here the luminaires are from an older type. The third type of lighting is found in the hallways, which are illuminated indirectly. This offers enough light without too many stimuli.

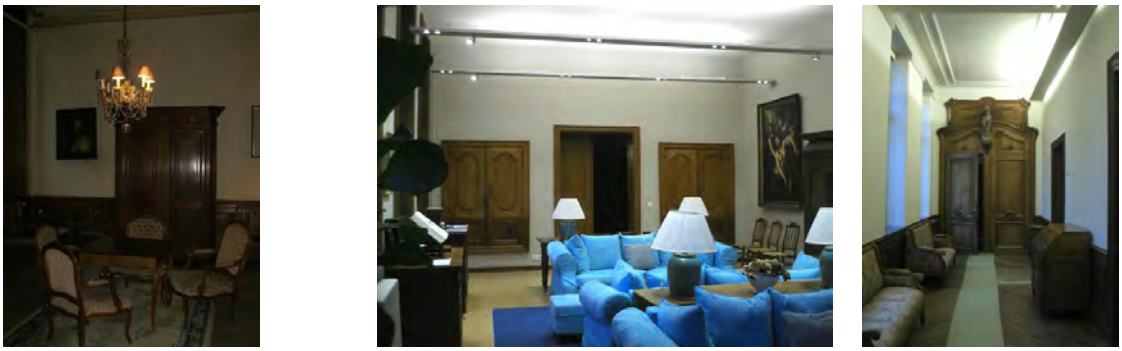

Fig 4. In the Hollands College, three different types of rooms can be distinguished in terms of lighting. (© Jonathan Denoiseux & Eline Rens)

When entering the main entrance of the *Arenbergkasteel*, a blind student is relatively quickly on to the fact that the building is structured around a courtyard (see Fig.2). He derives this from what he is **hearing**. He describes the covered entrance as a passageway in between two buildings (he notices an echo), which is followed by an open space. The rectangular shape of the courtyard makes it easy for him to orientate himself. When leaving the *Van Dalecollege*, a blind visitor manages to find the entrance gate thanks to the sound of the traffic on the street. Inside the building, she notices that the rooms do not sound pleasantly: there is way too much resonance. In the *Pauscollege* a student with autism does not find the entrance hall a pleasant place to wait, as the noise of the vending machine and of the people passing are too disturbing for him. Sound is also brought up by a blind visitor during the visit of the building site for a new administrative centre. At the front side of the site, heavy traffic on the main road through the town causes a loud continuous noise, so loud that it makes having a long conversation tiresome. The road at the back of the site has a more rural character with almost no traffic. The sound level of the traffic thus gradually diminishes across the site and is replaced by the sounds of birds singing.

Besides smell, vision and hearing, also **touch** plays a role in the user/experts' understanding and appreciation of the buildings visited. In the *Van Dalecollege* a blind visitor immediately notices that she enters the courtyard, since the air displacement changes when leaving the arched doorway. The *Van Dalecollege, Arenbergkasteel* and *Pauscollege* each have a courtyard covered with cobblestones. Their unevenness causes problems for several user/experts: for the persons having difficulty walking it makes using a cane more difficult and increases the risk of stumbling; for the wheelchair users, it provides a bumpy ride; and

for the blind participants it makes walking with a white cane difficult—cobblestones lying in the same direction cannot be felt as a guiding line. By contrast, a positive element that is found in several of the buildings visited, are the old staircases. In the *Arenbergkasteel*, for instance, a staircase in the porter's lodge is praised for its comfortable dimensions and its handrail. The handrail does not only offer good grip, its banisters make the staircase clearly recognisable as such to a blind student. Also in the *Pauscollege* one particular staircase is described as very comfortable and its handrail as offering good grip.

The examples above demonstrate that disabled people's knowledge about the built environment involves *multiple* sensory modalities. The different senses do not operate in isolation, however (see *e.g.* Ingold 2000). The building and site visits with user/experts also show that these sensory modalities *overlap* and *interact* in the bodily interaction with the environment. The entrance hall in the *Pauscollege*, for instance, has large windows which let in a lot of light. Yet, for a student with autism, these visual qualities seem to disappear to the background because of the disturbing noise of the vending machine. Vice versa, during the visit of the site for a new town hall, the attention of a blind woman is drawn to the olfactory qualities of a particular spot. The pleasant character of the spot associated with a more quiet acoustic space characterized by birds singing rather than heavy traffic passing shifts attention also to the smells of fresh-cut grass.

Use and users

Besides highlighting the role of sensory clues in how people appreciate a building, the visits with the user/experts also allow to discover distinctive features with regard to how the building is used and how that use is organised.

When visiting the *Van Dalecollege*, two vision impaired user/experts point at the lack of clear organisation. A student with low vision has the impression that the building complex was not designed as a whole. He finds that having to search for a room is not very user-friendly, and increases the importance of inclusive signage. A blind visitor, for her part, finds the building inconveniently arranged. For her to use it independently would require a clear explanation of its appearance, location, orientation and structure. Nevertheless, she is able to find the reception by herself because it is near the entrance, where she would seek intuitively (and because of its smell, as mentioned above). The arrangement of the ground level seems relatively convenient to her, yet overall, she characterises the building as a true labyrinth requiring supreme concentration to navigate. A student with autism also has trouble with the lack of clear organisation. Except in places he is familiar with (because he has been there before), it is difficult for him to locate at which point in the building he finds himself.

In the *Arenbergkasteel*, a blind student points out that the secretariat of the department accommodated by the building is located in an illogical spot: while he would expect it close to the main entrance, it is located in a side wing. Moreover, the path he follows to navigate the courtyard (see Fig.2) makes clear how the placement of bicycle racks complicates an otherwise convenient building layout. A staff member having difficulty walking suggests changes to the castle's organisation as well. The entrance to the porter's lodge would be much more accessible to him when using the back door instead of the door giving on to the courtyard. The same applies for the seminar rooms. By considering the entrance via the current secretariat as a full entrance to the seminar rooms, people are not obliged to cross the bumpy cobblestones in the courtyard.

For a student with autism, the experience of a space seems to be influenced by its use considerably. I already referred to the fact that he does not like the entrance hall of the *Pauscollege*, in part because of the people passing by. Similarly, the big spaces in the *Arenbergkasteel* used by architecture students as design studios, probably would not be very suitable for him to work. These spaces may be very busy, with students and staff

running in and out. When entering the room you are directly confronted with the people present. For him, he says, the design studios perhaps would be better subdivided in smaller, structured spaces that are more or less separated from each other in terms of view and sound.

The role of how a building is used also applies to the user/expert him/herself. For instance, a staff member who has difficulty walking, sometimes uses a wheelchair, but visits two university buildings (*Arenbergkasteel* en *Pauscollege*) on foot. During these visits, he sometimes points at aspects that do not raise a problem at this point, but would if he were using his wheelchair; or vice versa. For example, slopes are very handy when in his wheelchair, but on foot he prefers a well dimensioned staircase to a slope, because on the latter he has more difficulty keeping his balance. Whether or not he uses a wheelchair in visiting a building, changes his body configuration and, by consequence, the building features he appreciates or finds problematic.

Impact: Broadening accessibility

The field experiment was motivated by the rich knowledge disabled people have about the built environment. This knowledge, however, is largely tacit in that they are not always aware of it. During the building and site visit, however, they find themselves in a reflexive stance, reflexive about their own experience. The visit accompanied by architecture students or researchers makes them more aware of their own bodily experiences. Moreover, unlike building codes or standardised checklists, the approach adopted in the field experiment allows participants to express their experiences in their own wordings. For instance, a blind visitor finds the *Pauscollege* “not cosy at all.” It is “way too big” and there is “not much order”. A student with autism has the impression that “lumber is lying everywhere” which he finds disturbing. After the visit, he is happy to be outside again because he dislikes the interior of the building and has an oppressive feeling inside. Asked what he finds unpleasant, he refers to the “prison corridor”. This specific corridor is more spacious than the other ones, but because the “prison feeling” prevails, he finds it particularly unpleasant. Worth mentioning is also that the analysis reports of the building visits include building aspects that are *valued* by user/experts, and not only those that are criticized by them. This enables architects designing inclusive solutions to build on a building’s strengths instead of focusing on its faults and weaknesses only.

The architecture students and researchers too find themselves in a reflexive stance—reflexive about prevailing ways of understanding and designing space in architecture. Because of the presence of the user/expert, they perceive the building or site differently. The user/experts point at elements or qualities the students/researchers are not always aware of or attuned to. One student, who visited the *Van Dalecollege* together with a blind visitor, formulates it as follows:

Her description of architecture is so much different than ours: where we recognize paintings and ornaments on the wall, and thus see a filled up space, she hears an unpleasantly echoing room, which is poorly ventilated and unpleasant to stay in.

Moreover, during the visit, some of the students/researchers start paying attention to aspects that they think would be of interest to the user/expert. Through the particular dialogue with user/experts *in situ*, *i.e.*, in the building or on the site under consideration, the attention of the architecture students is being trained. They learn to be affected in new ways by the same matter (Latour, 2004).

Feedback from built environment professionals working on design projects related to the buildings or site visited suggest that they value the outcome of the field experiment considerably. As one architect formulates it: “I found the […] analyses highly interesting and in many respects they actually taught me more than the objective analysis of the accessibility office. I find the added value thus very high.” Compared to the accessibility audit conducted by the professional accessibility advisor, the architect especially seems to appreciate the nuanced approach adopted in the field experiment:

An important aspect is the broadening of the term accessibility by including very diverse disabilities, also and above all those whereby the person is not “entirely” blind or chained to the wheelchair. The experience of the person with autism surprised me in the most positive sense: he uncovered in a very direct way problems (…) which we all do sense but never can point to that well.

Another architect suggested that the usefulness of the analysis reports would even increase if the architecture students would use some kind of template. However, her colleague stressed that such a template should not go too far, since the added value of the reports is precisely that they are not a checklist, and thus provide other insights.

Moreover, the field experiment had a major impact on local decision making. The insights gained through the visits meanwhile have motivated and informed built environment professionals to implement alterations in some of the buildings visited. The *Grote Aula* underwent several interventions to improve its acoustic comfort, which are directly motivated by insights gained through the analyses with user/experts. The outcome of these also played a crucial role in the negotiations with and convincing of the conservation authorities. The lack of organisation in the *Van Dalecollege* pointed out by several user/experts inspired major organisational interventions to rearrange the student services more logically in the available space such that all students can consult them, and yet interventions which require touching the historic fabric remain limited. Moreover, the numerous complaints about the cobblestones inspired the university’s technical services to set up another field experiment. On one of its sites, they are implementing a test strip, whereby the idea is to break out a number of cobblestones, sort them, and make a more accessible strip by grouping the flattest stones.

Conclusion

In this paper I have reported on the insights gained so far in the context of a field experiment set up to explore whether and how disabled people’s bodily experience of space can be shared and transferred to inform architects’ design practice. The approach adopted in the field experiment does not present accessibility of the built environment as a *matter of fact*. Rather, through analyses of buildings and sites in collaboration with user/experts, it is made perceptible in the public sphere and gradually becomes a *matter of concern* (Latour, 2005; Callon, 2005). It allows for a group of people to become concerned with or attached to the accessibility of the built environment—architecture students, researchers, disabled students, staff and visitors, and built environment professionals. By giving voice to people who were not heard before, cultivating various perspectives on a task and encouraging a reflexive stance by those involved, the approach enables latent understandings to develop into alternative and richer appreciations of a situation. Through these local interactions and involvement, professional prejudice is overcome and transformed into empathic concern that could inform future design.

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Ann Heylighen

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Matrixiating Knowledge

Catherine Dormor, Middlesex University, UK

Abstract

This paper focuses upon means and ways that knowledge gained through practice can be expressed from within that practice itself.

The matrix of knowledge proposed draws on the intertwining of text, textile and *techne*[1]. These notions share etymological roots, but are also formative processes that together establish an interwoven structure in which writing and art-making are brought together in knowledge-production.

When Roland Barthes suggests that "*Text* means *tissue*" (Barthes, 1973, p. 64) he highlights a material-conceptual interplay between text, tissue and truth and draws attention to the generative activity of creating the text/textile.

This generative mode is the focus here and will be drawn upon to establish a matrix of knowledge-production involving signifiers, signifieds, materiality and concepts. The matrix proposed offers a form of knowledge-production that dissolves boundaries between theoretical and practice-based approaches, or what Bracha Ettinger refers to as "borderswerving" (Ettinger, 2006).

The matrixial structuring will focus upon three processes: folding, fraying and seaming.

Folding offers a focus upon ways in which the communication of tacit knowledge within practice initiates and generates new understandings and expressions of that tacit knowledge.

To think of **fraying** cloth is to envisage its construction re-vealed. Here the concept of fraying will be considered in terms of breaking down resistance at the edge, enabling a porosity between tacit and explicit knowledge.

Seaming will consider how the tacit knowledge of making is brought into relationship with written and aural modes of communication. The material processes of seaming suggest a generative and communicative conceptual-material model.

These three models offer a materialisation and matrixiation of Barthes text, suggesting that the material activities of writing textile and making text are allied and intertwined modes of knowledge-generation. In this the tacit is communicated and the communicable is simultaneously integrated within the tacit.

Keywords

text; textile; matrix; seam; fold; fray

1 craftsmanship

In this paper I want to focus upon means and ways that knowledge gained through textile practice, material-conceptual tacit knowledge, can be expressed through textile processes and technologies derived from that practice itself.

Sarat Maharaj writes of Janis Jefferies' articulation of her relationship with textile practice and theory as "The drenched-in-voice quality of [her] think-speak-write sequences, their soaked-in-oral feel signals the pivotal element of her expression – unscriptedness" (Maharaj in Mitchell, 2000, p. 8). In this Maharaj highlights oral-practice-textual interplay. In consciously drawing upon textile-rooted language here, I want to actively highlight the specifics that such processes refer to in terms of form and function, whilst opening themselves up metaphorically. In this they share that "drenched-in" quality that Maharaj finds in Jefferies' writing practice.

The framework or matrix of knowledge that I will be proposing and outlining here draws particularly on the relationships and intertwinings between text, textile and techne (craftsmanship). These notions not only share etymological roots, but also formative processes and technologies that together establish an interwoven structure in which writing and art-making are brought together as concomitant partners of knowledge-production.

To think of matrixiating knowledge is to draw upon two understandings of the matrix simultaneously. The first is its sense as a mathematical tool for the study of problems in which the internal relationships are important and to be maintained. The second draws upon the word's etymology; matrix stems from the Latin "womb" or "source" and has become a feminist psychoanalytical strategy, particularly developed by the artist-theorist Bracha Ettinger who proposes the matrix as a thinking apparatus that enables (inter)relationships and thus affectivity between body and body, body and psyche and psyche and psyche (Ettinger, 2006).

The matrix proposed here posits language and text as modes of practice alongside and in mixture with material-based textile practice suggesting writing textile and making text as emergent forms of articulating text-textile-techne interplay. This also serves to preserve the relationship between theory and practice as one in which practice articulates theory at the same time as theory or text materialises meaning.

Matrixial Space

In *The Pleasure of the Text* (1973) Roland Barthes suggests a distinction between "readerly" and "writerly" textual forms (*texte lisible* and *texte scriptible*), the first offering pleasure through knowledge acquisition, the latter offering bliss (or orgasm) for the reader through the confluence of reader and writer as if in the act of intercourse. Through this intertwining of reader with writer as lovers, Barthes highlights the role of *techne* within the making of text in his unpacking of the (inter)relationships between text, tissue and truth:

> *Text* means *tissue*; but whereas hitherto we have always taken this tissue as a product, a ready-made veil behind which lies, more or less hidden, meaning (truth), we are now emphasising, in the tissue, the generative idea that the text is made, is worked out in a perpetual interweaving; lost in this tissue – this texture – the subject unmakes himself, like a spider dissolving in the constructive secretions of its web. Were we fond of neologisms, we might define the theory of the text as an *hyphology* (*hyphos* is the tissue and spider's web). (Barthes, 1973, p. 64)

In drawing upon textile-based language, Barthes foregrounds the intimate relationship between warp and weft as metaphor for the interplay between readerly and writerly textual forms. This is useful here in that it offers a mode by which to access and reveal textile-based approaches to practice-theory research, a way into that charged intimacy between two, where it could be said that tacit knowledge resides.

In his opening sentence, Barthes establishes an intimate association between text and textile, but that is not the end of the matter. Here Barthes draws attention not only to the generative activity of creating the text/tissue/veil/textile, but further he suggests that through this generative activity the subject, author, weaver *and* artist delivers their power of meaning-making over to the reader/viewer. In this making-unmaking hyphology, the study of the tissue, Barthes foregrounds the processual nature of intertextuality: the in-between aspects of text[ile] construction. Nancy K Miller suggests that such *hyphology* privileges "the mode of production over the subject" creating the text/tissue (Miller, 1986, p. 273) but I would argue that it is in the adverbial form and the bliss achieved here that such generative activities operate and thus there exists generative continuity between subject and object. It is within this continuity between making and unmaking of textile that a matrix of intertwined and intertwining signifiers, signifieds, processes, and the raw material for all three is generated.

In a return to the processes of generating or constructing the tissue/text, the matrix shares Barthes' focus on structural properties alongside creating a metaphor. This foregrounds the way in which the making of language and meaning are not linear processes but rather developed through the (inter)relationship of the warp with weft of language and of fibres. It is at the points of intersection (or intercourse) within that relationship that hidden or tacit knowledge emerges from within and behind the veil: a revealing of the text-textile-*techne* spectrum through the intertwining of language and practice. This sets the role of language and text as associated modes of practice-theory in which metaphors and metonymic language are vital, most obviously those relating to textile, textile structure and textile production. In this the inflected ideas of writing textile and making text serve to foreground these associations and establish a model that privileges such language.

Thinking in terms of metaphorics opens up a space within the material-conceptual matrix for the literal and observable to come together with signification to produce meaning[2]. Such thinking, in capitalising upon the difference between what a statement states and what it alludes to or suggests, invites the reader-viewer to explore possibilities and potentialities of and for meaning between the two. Metaphorics shift the focus from a fixed signifier-signified relationship to one which foregrounds slippage and fluidity of meaning and understanding.

Through this, signification enables and establishes a matrix of meaning(s) that is structuring and generative, suggesting multiple-reflexivity between making, material and meaning. As the warp and weft intertwine in their intimate and interdependent relationships: one over the other over the other in repeated gesture, so the matrixial relationship reveals itself as an emergent space. Artist-theorist Bracha Ettinger allies with Barthes' notion of bliss found within the "writerly" text, suggesting that:

> In the matrix a meeting occurs … consist[ing] neither in fusion, nor repulsion, but in a continual readjustment of distances, a continual negotiation of separateness and distance within togetherness and proximity. (Ettinger, 2006, p. 14)

From within this material-conceptual matrixial space, tacit knowledge is revealed as a form of knowledge production and transfer that actively negotiates the boundaries between theoretical (explicit) and practice-based (implicit) approaches to art-making and thinking, or

2 This is to distinguish metaphoric from illustrative or substitutive language, which only offers meaning through literal and observable/descriptive means.

what Ettinger refers to as “borderswerving” (Ettinger, 2006, p. 14), continually negotiating the ground between.

In order to develop these ideas further and to explore how and by what mechanisms these boundaries are negotiated, I want to consider three textile practice-based processes: folding, fraying and seaming, which together form an interlinked and process-led mode of thinking across tacit-explicit, practice-theory, textile-text borderlines. To think of a folded material matrix is to think of practice-theory, textile-text (inter)relationships as labyrinthine in the sense that it does not suggest a linear process of thinking, making and knowing, where A leads to B, leads to C, but rather one whose pathway leads to apparent “dead ends” and false leads, which the require a doubling back or a reversal of steps. To think of fraying cloth is to envisage its construction re-vealed. It is also a term drawn upon by Gyatri Spivak as a space of both production and danger where the edges language break down (Spivak, 1993, p. 178) and it is in this sense that it is useful here as a model for situating and revealing tacit knowledge. The notion of the seam is primarily thought of in terms of its function as a joining mechanism or technique for fabric, and it is in this sense that it will be considered here as a mode or model for the formation of the material-conceptual matrix and thus for enabling tacit knowledge to be revealed.

Folding

The notion of folding as a means by which to think about and reveal tacit knowledge from within and across the material-conceptual matrix derives from Gilles Deleuze and his focus upon the role of the Baroque in the work of Leibniz (Deleuze, 1988). This is a process that actively and confidently celebrates those twists and turns inevitable within an exploratory practice where some of the knowledge generated is held hidden within the intimate relationship between artist, materials and tools. Thinking across tacit-explicit, textile-text (inter)relationships in terms of folding rather than as crossing borderlines, suggests a form of borderswerving that celebrates the journey at least as much as the arrival, hence the use of the term “folding” rather than “the fold”, which could imply stasis or permanence.

As a mode for revealing and expressing tacit knowledge, folding offers, through the labyrinthine and processual, a relationship between the activities of art-making and the activities of writing art-making that is not about translations or exegeses of the tacit by the explicit, but rather about creating and discovering new foldings, unfoldings and enfoldings that point towards the tacit. Ontologically practice might initiate a written/theoretical discussion or a written/theoretical discussion might initiate practice, but within a folding material-conceptual matrix both provoke movement away from themselves as other subjective/tacit elements impinge and impose themselves and thus become folded within and alongside, or themselves enfold. In producing the artwork *(within)* (2011) (Fig. 1), the initial thinking was a consideration of the interactions between the threads within a woven cloth and how they give way one unto the other and thus refute Deleuze & Guattari’s description of the warp and weft as fixed and mobile respectively (Deleuze and Guattari, 1980, p. 524). In trying to establish and express this mutual sharing of space between the two threads, I looked to scale up the situation and thus locate the viewer physically within the structure, to understand and experience that relationship physically, corporeally. This path towards expressing the intimacy of threads within the cloth’s structure involved much trialling of ideas and testing of constructions, which drew on knowledge already held about relationships between the different elements, materials and processes being used. In the thinking and re-thinking of the interplay between these material concerns and the initiating ideas, a re-visiting and re-tracing of steps, other options emerged to open out the internal structure: the use of mirrors to create a sense of scale and intimacy, which themselves then

set off a series of new questions and theoretical perspectives that drove the art-making/research forward into a new space.

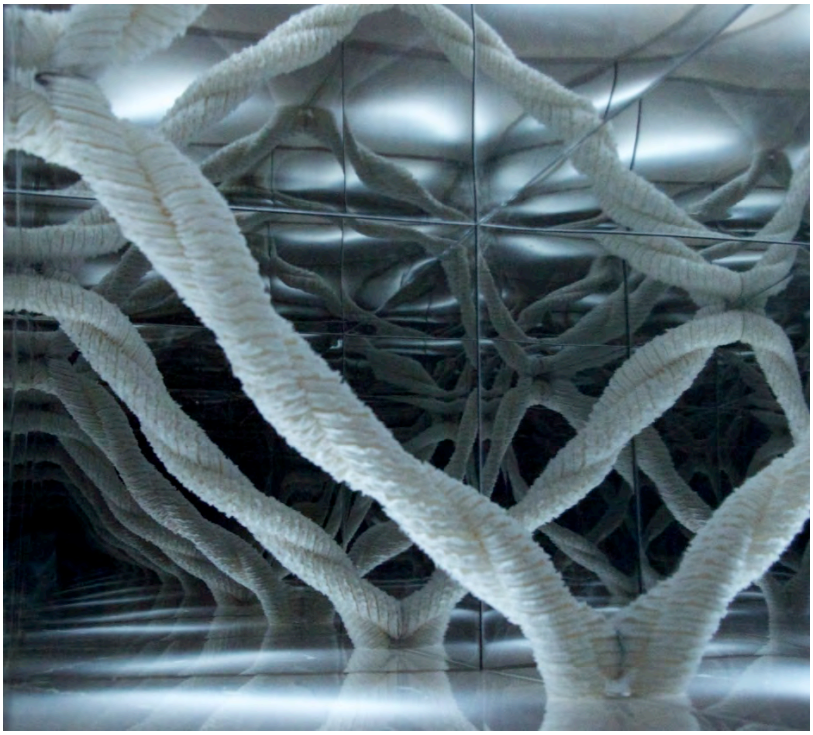

Fig 1. Catherine Dormor, *(within) I* (2011) acrylic, silk faux chenille, mirror, 60 x 60 x 60cm

In this example what has taken place is a journey from intention to outcome via a series of foldings, unfoldings and refoldings between materials and concepts, theory and practice, tacit and explicit knowledge, which come together at the coalface of the artwork, informing, directing and revealing each other across and within the material-conceptual matrix. Thus, what emerges from within this mode of practice-research is an expression of the continual movement of the fold's point of inflection: that infinitesimal point where one fold momentarily ends and another begins (Fig. 2) and the whole cloth performs an arabesque. As the nomad-artist navigates this ever-shifting terrain, the inevitable side-alleys and dead-ends mean that a new direction must be selected: an unfolding that leads not only to refolding, but also to new foldings to be explored.

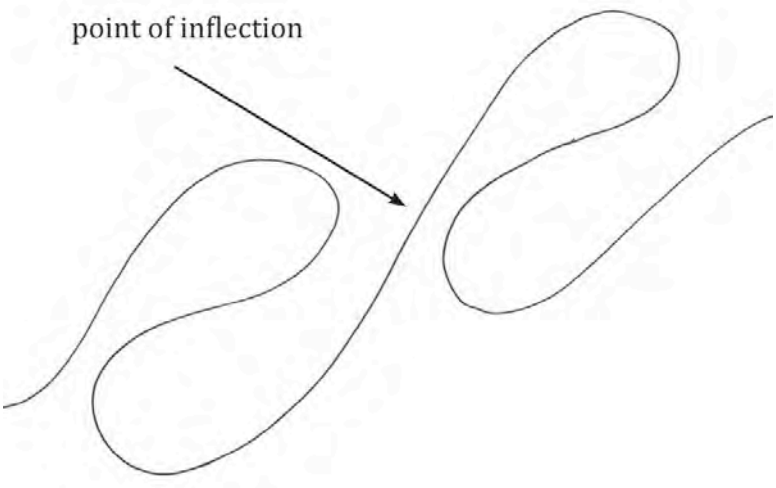

Fig 2. Diagram to show a fold's point of inflection

In the same way as Deleuze's fold is the manifestation of one's relationship to oneself or the production of subjectivity, so the notion of folding as a mode for revealing tacit knowledge is also one of self-reflexivity and inflection. Folding in this way then differs from a linear path or passage in that the cloth-base fold is an impermanent and ever-changing form of expression of art-making processes: the fold can be shaken or ironed out, thus removing evidence of the folding action or activity, it may only be a memory of the activity that remains. In this sense then folding is a mode which foregrounds affective action upon the subsequent self alongside other affective actions secreted within the folding itself. Thus the repeated action is never equal to its forerunner as its forerunner and associated outcomes (folds perhaps?) affect the action before it is even begun. In the space of the previous folding, knowledge gained (both tacit and explicit) and errors discovered are deposited. Within and across the shifting landscape of practice these deposits will be encountered again and again, but each encounter will differ and will be manifested as different forms and folds. This enables new knowledge to come into being and emerge as the fold unfurls in front of, or the landscape folds beneath the feet of, the nomad practitioner-researcher).

Fraying

The psychoanalytical notion of *frayage* is drawn upon by Spivak as a space of both production and danger where the edges language break down (Spivak, 1993, p. 178). In this sense it is a translation into French of Freud's *Bahnung*, often translated as "facilitations" in English. *Bahnung/frayage/facilitations* refer, in Freudian terms, to the resistance experienced by neurological excitations as they pass between neurons. The pathway forged by overcoming this resistance then provides the favoured route for subsequent excitations (Laplanche and Pontalis, 1988, p. 157).

When cloth is woven on the loom, the shuttle carries the weft thread to and fro between the raised and unraised warp threads. As it exits the "shed", the warp is closed behind and reopened in a new arrangement, a new shed, for the shuttle to re-enter. The weft wraps itself around the outer warp threads. Back and forth the shuttle goes, exiting and re-entering repeatedly. For Walter Benjamin, the fragment is the gateway to the whole (Benjamin, 1977), and so the selvedge[3] formed by the wrapping of weft around the outer warp threads becomes not an endpoint, nor delimiting line of the cloth, but a space for entrance and re-entry. A space of cloth's becoming … a passage between centre and edge of the cloth.

When that edge, the selvedge, breaks down this passage becomes disrupted and yet it also enables a porosity, a path for excitations, to take place between the cloth with its internal structure and the external. Here is the potential for Benjamin's gateway to and from the whole.

Tacit knowledge and explicit knowledge can often be considered as separated modes of knowing and understanding. The tacit is seemingly hidden within the bodily memory and not readily articulated: a mode of knowing that can be learnt and taught kinaesthetically but that slips and slides away from words and text.

The notion of frayage or fraying cloth as a mode by which to reveal and release tacit knowledge from within the material-conceptual matrix lies in the breaking down of the structuring elements: the warp and weft. In this breaking down of resistance at the edges and the enabling of porosity there is a reaching out and towards, of parts, within the relational interplay. Part-objects, part-words and part-processes pointing the way towards

3 The word selvedge comes from the early modern Dutch selfegghe, literally self-edge.

the tacit without pinning down and binding the fluidity and intuition held within the body, without re-forming the selvedge.

In this broken, frayed and fraying space at the boundaries, where there is the ever-present danger of complete disintegration of the matrix, there is also held the potential for production. As outline, this frayed edge or fragment is a space of the partial, where separating elements and structure are revealed, something that is best explicated through modes of partial language: metaphorics and poetics. This is a form of language that proffers essences of that tacit knowledge rather than trying to pin down meaning into sentences and narratives. It offers entry into and onto the material-conceptual matrix by parts and indications, rather than discrete routes through or across the space.

I want here to exemplify this by focusing upon a video installation *skin-flow* (2009-11) (Fig. 3). As the viewer enters the installation, they are met by a "screen": layers of soft, near transparent silk chiffon. Onto those is projected water, undulated footage of printed silk satin, gently billowing. As the silk rolls towards the viewer, printed images of skin on silk, silk on silk, image on image, are repeating and repeated across the installation, so screen and image flow into each other and synthesise in the darkness.

Fig 3. Catherine Dormor, *skin-flow* (2009-11) video installation, dimensions variable

This installation incorporates multiple processes: photography, digital printing, layering of fabrics, video recording, editing and projections, each process affecting and effecting the others such that matter and process, together with abstraction, bring about what could be thought of as cloth's plasticity. It is the folding and enfolding between processes that results in the work's layered, filtered and filtrated resonance. Here, the material and haptic are brought together to intertwine with the visual imagery such that traditional hierarchies of visual over tactile are challenged and broken down. Here the quality and materiality of the screen(s) coalesce with the projected imagery of cloth. At this point textual analysis frays and breaks down:

folds falling

skin rising

active

passive

intertwining

seaming

fold upon fold upon fold

within

between

expansion

contraction

of space

of time

of here

of now

The ambiguity that *skin-flow* presents, of skin as cloth and cloth as skin decentres and destabilises certainty of meaning and denies singular “truth”. Here, through fraying language, at the borderline of understanding, meaning becomes re-located within the relational interplay of image, cloth, matter and idea: at the fraying edge the structure is revealed and tacit meaning seeps out without needing to be made explicit.

Seaming

When two pieces of cloth require joining a seam is the most usual method by which to achieve this. At its most simple and straightforward the two pieces of cloth are placed right sides together, edges aligned and a row of stitches is made a short distance from those edges (Fig.4). The resultant seam is then pressed open and all of the raw edges are secreted on the inside of the “new” cloth. In order to construct this type of join the pieces of cloth both have to be prepared in advance with an extra allowance of cloth, known as the seam allowance, added onto any calculations or pattern cutting.

Fig 4. A plain seam

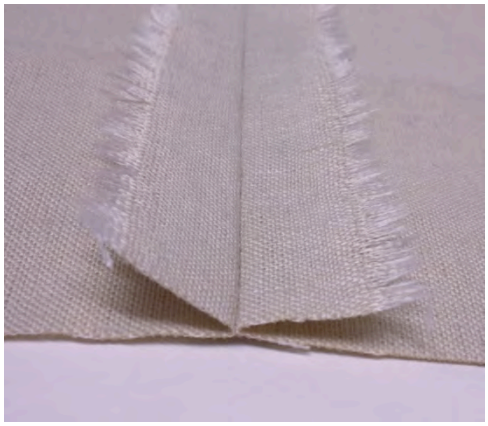

Fig 5. A French seam

The construction of a plain seam, in terms of the material-conceptual matrix, gives a mechanism for different and differing aspects from practice and theoretical perspectives to be brought together, whilst acknowledging that some of the information or knowledge will be held within the resulting structure's seam allowance: hidden from view, but vital in holding the matrix together. As the needle and thread pass to and fro between the two pieces of cloth, tacit and unspeakable aspects from each are drawn into and through the other in a reflection of art-making-writing processes. In many ways this seam as a model for bringing elements together in the creation of the material-conceptual matrix illustrates the way in which researching, making and writing are all processes of continuously defining and re-defining the parameters of the project in hand, something that often comes about as a result of "straying" beyond those boundaries, evaluating and analysing one's location in relation to the project and stepping back within. This space of boundary setting is one way of regarding the seam allowance and it is the stepping over and back across that seam-line that gives space for the seaming thread to bring elements together in new ways.

Another form of join between two pieces of cloth that presents itself as a useful material-conceptual model is that of the French seam[4] (Fig. 5). Here again a seam allowance must be accounted for, but in this case the two pieces of fabric are laid wrong sides together, stitched and then the cloth is reversed so that the right sides are together and stitched for a second time. This second stitching secures all of the raw, fraying edges between the two rows of stitching, leaving the join smooth inside and outside of the structure. This seam is particularly useful when constructing items from delicate fabrics or those that fray uncontrollably. This is also the seam used for making items that sit intimately to the body, such as lingerie, where the seams need to be smooth so that they do not rub or irritate.

In the French seam the delicate and easily frayed edges of the elements within the matrix are brought firmly under control to avoid them spinning off in innumerable and unmanageable directions, but it also, and most importantly here, enables the different forms of knowledge and meaning, tacit and explicit, to be brought together even when their connections could be considered to operate at a tangential or fragile level. This form of joining could be seen as potentially speculative in nature. In the structure of the French seam the necessarily larger seam allowance means that points of convergence or correlation further back are brought together and the elements at edges are secreted and secured within, allowing them space to co-mingle generatively and iteratively – allowing meaning and understanding to cross and slip between the two pieces of frayed cloth.

4 It is interesting to note here that the French call this type of seam couture Anglais or English seam, both terms referencing the inversion of the seam and thus offering the other nationality as its nomenclature.

This seaming space of co-mingling within the structure of the material-conceptual matrix brings together tacit and explicit knowledge across their individual borderlines, continuously negotiating "separateness and distance within togetherness and proximity" (Ettinger, 2006, p. 14). This is a space beyond binarism in which tacit and explicit collide and collude, but without elision. In this seaming space the tacit is enabled expression beyond the language of the explicit, a form of *becoming*-explicit or *becoming*-articulated, framed not by strict and rigid signifier-signified interplay, but rather by sliding planes of multiple signifier-signified (inter)relationships, where the bracketing of (inter) reinforces the between-ness and fluidity abounding between language, meaning and understanding.

Thinking in terms of *becoming*-explicit or *becoming*-articulated requires a return to Barthes and "writerly" textual forms:

Becoming is processual; it works not on a linear or sequential time-scale, but rather it is non-unitary, multi-layered and dynamic. As the needle passes through the cloths, so past, present and future knowledge are fused, affecting and effecting change.

Becoming is about creating alliances and involves involutions or invaginations, but its quest is to reveal:

> A becoming is not a correspondence between relations. But neither is it a resemblance, an imitation, or, at the limit, an identification … To become is not to progress or regress along a series. (Deleuze & Guattari, 1980, p. 262)

Becoming is a system of eternal returns by the nomad-practitioner, running in direct opposition to the idea of an arrival at a static space of identity.

> The different stages of levels of becoming trace an itinerary that consists in erasing and recomposing the boundaries between self and others. (Braidotti, 2002, p. 119)

Becoming then is about the borderline and seaming; not constraining nor policing, but a process that enables the bringing together of elements such that distinction between is rendered meaningless differentiation.

Becoming, like seaming, denies and defies fixity of meaning and inertia. The nomad, moving between, is ever in flux, always observing and experiencing change.

Matrixiating Knowledge

Henry Moore, in his essay "The Sculptor Speaks" (1966) wrote that:

> It is mistake for a sculptor or a painter to speak or write often about his work … By trying to express his aims with rounded-off logical exactness, he can easily become a theorist whose actual work is only a caged-in exposition of conception evolved in terms of logic and words. (Moore, 1966, p. 62)

This is a concern within the text-textile-*techne* (inter)relationship I have been addressing here: whichever viewpoint taken for this relationship there remains an imperative to ensure that none becomes a dominating force, in order to avoid a text that seeks to explain the practice, a practice that is illustrative of theory or craftsmanship devoid of expression or meaning. It is key to establish ground within the text-textile-*techne* relationship on which the three are brought together and operate together interdependently and with fluidity between.

This interdependency is affected by the way(s) in which the three perspectives are brought together and, in this sense, the triadic model of folding, fraying and seaming functions as the organisational principle. By this I am suggesting that these are the ways and means by which the Barthes' text-tissue is formed as a matrixial system of generative and communicative (inter)relationships.

In seeking to capitalise upon the rich language and concepts from within textile practice, production, behaviour and materiality, one of the aims of this paper has been to reveal modes for communicating tacit knowledge gained through practice-based processes and technologies.

These modes: folding, fraying and seaming, are necessarily complex and *com*plicated[5] in that they focus not just on the gathering and processing of knowledge gained from a range of sources within practice, but they also operate as modes for articulating that knowledge. I use this word both in terms of its writing and speaking sense, but also in the sense of the way that the different aspects of knowledge revealed are jointed or brought together.

This triadic model of folding, fraying and seaming, then, considers not only that these are modes for revealing tacit knowledge from within practice, but they also, together, emphasise the manner and process of that revelation. The seam makes space for, and uses, the fraying edges and folding as a mechanism and/or process that holds those raw and unsecured edges alongside one another, such that the revealed structure/knowledge is offered space for articulation, through unfolding metaphorics, metonymy and poetics within the text.

Thinking in terms of the (inter)play between text, textile and *techne* as a means to enable the transfer of language, understanding and knowledge across the borderlines between tacit and explicit, opens up the possibility of a model which actively considers the folding of the cloth back onto itself, the frayage at the edges or boundaries of that cloth and the points connected by the stitching of the seam. That these foldings, frayings and seamings are simultaneously metaphorical and material suggests material-based modes of thinking-speaking-writing textile that reveal and articulate the tacit alongside, and in conjunction with, the explicit. It is within this triadic model that the strength of folding-fraying-seaming as an organising mode for bringing into being the material matrix of text-textile-*techne* becomes highlighted.

In a return to Barthes, then, the tissue and the text are brought together, through a folding-fraying-seaming material matrix, as generative and communicative modes of practice in which the activities of writing textile and making text are constantly in the process of becoming embedded. These activities are simultaneously Barthes' text *and* tissue, "writerly" and "readerly". As the one unmakes itself and reveals its structure, the other engages in self-generation. Unlike Nancy K Miller's reading of this as about "the mindless work now performed by women" (Miller, 1986, p. 289), I would suggest that it can be thought of in terms of the revelation of tacit knowledge held by the maker, a reading that draws together both the activity of the maker(as-lover) and the product(as-lover) that is brought into being by that activity, secreting and accreting the tacit within the material-conceptual matrix.

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5 The verb "to complicate" stems from the Latin complicātus, a combination of com- (meaning with) + -plic- (from plecāre, to fold). Emphasing com-, here, stresses the idea that these three modes are folded with one another, forming a system of inextricable links between them.

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Catherine Dormor

Awarded her PhD by creative practice and thesis, Catherine is a practicing artist, researcher and lecturer. Her particular area of research is concerned with bringing together the materiality, imagery and language of textile to develop practice-based modes of thinking, making and writing. She regularly exhibits both across the UK and internationally and has artworks in collections in the UK and US. She has published in a number of journals and reviews books and exhibitions for Textile: the Journal of Cloth & Culture. She has recently been appointed Lecturer in the Art & Design School at Middlesex University.

Bringing Action into View: Provocation and Ambiguity in Touch and Talk Sessions

Todd Robinson, University of Technology Sydney, Australia

Abstract

This paper presents a research approach to investigate the body styles, embodied engagements and physical activity that designers bring to their creative work. The approach utilizes a set of designed objects in the context of the study termed “provocative artefacts”. These are under-determined three dimensional artefacts designed to elicit designerly ways of acting and moving in participatory research situations called Touch and talk sessions. This approach is grounded in shared knowledge of both the researcher and participants within the research sessions.

The paper raises questions to be addressed by this approach in relation to a designer’s embodied ways of knowing: What is the body style designers utilise when they engage in the interpretive work of design? And secondly, what is the significance of this body style to the iterative, projective and interpretive work of designing? The broader aim of the study is to extend understanding of design action as embodied ways of knowing that are distinctive to the creative work of design. By placing emphasis on what designers do, that is the physical interactions with designed objects and how they interact with other designers in naturalistic research situations, the research brings into focus the inseparability of bodily comportment, practical activity and emergent understanding within the iterative projection of design possibilities.

Keywords

body styles; provocative artefacts; interpretation; participatory research

Introduction

Research into the thinking processes of designers has been a focus of Design Research for a quarter of a century. This has generated representations of design as concerned with unstructured problems following solution-focused approaches to complex problems. Although this body of research is varied in focus; for example key texts by Cross (2006) proposed “designerly ways of knowing”, Dorst and Cross (2001) developed the notion of co-evolution of problem and solution, while Lawson and Dorst (2009) proposed expertise and levels of design thinking, it forms a generalized picture of design as a cognitive style or way of thinking in relation to complex problems. While this body of research provided important understandings of design as a professional activity there is a need to investigate embodied ways of knowing in relation to design. This paper concerns approaches to investigate designer’s physical interactions with designed things as aspects of a particular way of understanding and interacting with objects that is distinctive to creative work.

Making transpires through the coordination of bodily movements. Movements encompasses a range of bodily movements from direct handling and manipulation of materials directly. When interacting with designed objects the designer may be entirely absorbed in flow of

activity or they may engage in more detached or reflective modes of thinking. Designers are constantly active when designing, sketching, drawing, manipulating or examining materials or objects, looking to relevant information, either individually or collaboratively.

Reference to current practice in many areas of design would suggest sketching features in early phase of design projects. For example product designers, architects, fashion designers use sketching as generative tool. A sketch is quick, economical and flexible. Prototypes also play an important role in early phase design as well. Goldschmidt (2003) found ambiguity or "fuzziness" to be a critical feature of designer's sketching. The lack of resolution of sketches enables designers to "read off" visual information and interpret the sketches in ways other than the original intention. According to Goldschmidt this new information feeds back into subsequent iterative sketching. Lim, Solterman and Tenenberg (2008) conceptualisation of prototypes also highlights the feature of ambiguity in generative phase of projects. They see prototypes serving two aims. One as "tools for traversing a space in which all design alternatives are held open and the rationales explored' and the second as, "purposefully formed manifestation of the design idea". (2008, p. 7:3)

A three dimensional object unlike a sketch brings specific characteristics into consideration, such as appearance, size, weight and function. Designer's examine and explore the designed object via the body's tactile perception including kinaesthetic and proprio-perception as the object is handled. The prototype may be used and in the case of interactional devices utilized in role-playing or body storming type activities. This kind of interpretive and playful interaction enables the designer to consider the potentiality of the object.

Given a prototype's ambiguity they remain open to interpretation. Iterative design development and the interpretive work that accompanies it in this sense hinges on the designer interacting with prototypes, models, materials and any other material thing that stands in for a projected design outcome. The designer needs to fashion these materials and objects into a design projection. Coyne and Snodgrass (1997) argue this iterative activity associated with design describes a hermeneutic circle and design is itself an interpretive activity. They utilise Schön's (1983) account of design activity as a "reflective conversation with the situation" to argue for the hermeneutical nature of designing. They discuss how designing is accomplished by projecting possibilities according to an initial appreciation of the design situation. This projection then talks back and the designer responds by making further iterative projections. A back and forth process involves a circular relation between projections of the whole design situation and its parts enable a designer to make sense of the implications of particular design moves, that feedback into a projected understanding of the whole. In this way understanding of the design situation comes about through constant iterations and the designer's ability to anticipate the potentiality of particular design moves as well as being open to other potentialities that emerge as feedback.

The feature of ambiguity is also associated with Design Probes. Probes were initially proposed by Gaver, Dunne and Pascenti (1999) and utilised ambiguity to provoke and elicit responses from research participants in field work situations. Probes have evolved into a broad range including technology probes, cultural probes, empathy probes, mobile probes and domestic probes (Connor, Rouncefield, Gibbs, Vetere, & Cheverst, 2007). Probes are used primarily as elicitation devices often with data capture capability. Rather than fulfil a functional purpose they seek to engage research participants in creative activities that results in the generation of rich qualitative data. These activities revolve around recording tasks, that provides personal and often idiosyncratic information about the context and concerns of participants lived context. This data is returned to a research team for interpretation. The responses act as a catalyst for design work. The originators of design probes intended the information retrieved to serve as "inspirational data" rather than providing an objective view of participants (Gaver et al., 1999, p. 25).

Another feature of probes is their ability to allow things to come into view that might otherwise remain hidden. For probes with data capture capacity they make the things normally invisible or out of view visible to the designer (Connor et al., 2007). Dunne & Raby (2001) deploy a series of probes in order to influence people's experience and comportment. These probes register electromagnetic radiation and in doing so bring unintended or invisible effects of design into view.

Following Gaver et al. (1999), Wilde & Anderson (2009, 2010) utilise a participatory approach in the use of a series of body based wearable prototypes called bodyprops. Similarly they make use of ambiguity, in this case highly ambiguous objects to provoke research participants into interpretive work. Bodyprops are upholstered fabric objects used in research sessions where participants are interviewed while wearing the artefacts. The interview process is designed to "probe" responses to the bodyprops and the props intended to provoke strong reactions. Despite their plain looking appearance their size, shape and contouring of the artefacts imply bodily association. According the researchers they aim to produce an "emergent and imaginative space" through bodily interaction while they record on video participant responses to the following questions – "How does it feel? What is it? What does it do?" (Wilde & Andersen, 2009). The responses to these questions are of value to the researchers as prompts or catalysts for future technology design.

Given the broad commonalties between variants of probes, bodyprops in some respects stand apart. Bodyprops require bodily engagement and interaction. As embodied artefacts, participants experience them physically, they can feel the objects upon their bodies, they can manipulate and move them and move in them. It possible to argue, the process of interpretation is tied to an embodied projection of possibility. In other words any imaginative projection of what the ambiguous object might be is an embodied projection of the wearable artefact. The kind of projection in this situation is likely to possess a strong tactile, kinaesthetic and proprioperceptive component.

This approach is similar to that utilised in role playing or body storming activities, whereby designers explore contexts and situations relevant to a design project by acting and interacting in design situations themselves or conducting participant observations in context. The approach makes use of the situated experience within actual or simulated contexts and utilizes the capacity for sense making and understanding as an embodied process (Oulasvirta, Kurvinen & Kankainen, 2003).

In the following section I outline the approach to investigate ways of embodied knowing at play in designing. While utilising features of probes such as of ambiguity, provocation and behaviour elicitation they are directed towards understanding design activity, rather than design contexts or users.

A method to investigate embodied ways of design knowing

The research method utilizes ambiguous artefacts that research participants physically engage with and seeks to bring into view designerly ways of acting and moving. That is the physical exploratory activity that designers undertake in the course of their creative work. In research sessions designers physically interact with objects, they explore, appraise, and consider the designed things in a physical way.

The sessions aim to establish an authentic as possible situation from which visual and verbal data can be drawn. The sessions are recorded on video. While no research situation can be authentic, the way in which the sessions are conducted removes some of the barriers to naturalistic behaviour. This includes locating sessions within designer's studios. Studios are

material rich environments where designer are naturally comfortable. Participants are also drawn from a creative community and as such already immersed in creative work. In this sense the orchestration of the Touch and talk sessions reflects conventional ways designers interact with each other in communities of practice. The purpose of the session is to create a situation that engenders the kinds of talk and behaviour that practitioners normally engage in within studio settings. Studio talk often revolves around ongoing work and can take the form of feedback or interpretive responses to works in process or reflections on one's own practice.

Fig 1. Provocative artefact

Provocative Artefacts

Provocative artefacts are textile-like objects designed to encourage and enable physical engagement and exploration. They are ambiguous objects with no obvious functionality. This ambiguity is compounded by a rich affectivity. They possess a number of affordances consonant with forms of physical interaction and engagement. They can be held, manipulated, arranged and as articulated structures they can be rotated and explored. The range of materials also affords physical contact. For example components such as large wooden balls and beads, is used in the initial pilot phase. Other materials will be introduced in subsequent sessions.

In undertaking this research there is a necessity to articulate the embodied experiences of the practitioner-researcher and designer-participants within the research. As such the artefacts provide a focus for an exploration of the practitioner-researchers own embodied engagements and are used within sessions with other practitioners involving physical exploration of the artefacts. Throughout the data-collection phase new artefacts are produced that respond to insights that emerge from the touch and talk sessions. In this respect, the research design iterative. This iterative process of data collection opens up the potential to explore specific aspects that come to the fore through this process.

The form of the artefacts is open to ways in which research participants choose to manipulate them. Research participants use physical interaction to explore and understand the artefact.

Fig 2. Provocative artefact

Data is also generated from the making-process of the artefacts. This data will be recorded in form of reflective writing. Pedgley (2007) investigated the use of a “design diary” as a source of data on own design activity finding the diary an effective tool for data generation within the context of a practice based research project. The data takes the form of written reflections on the making of the artefacts and is used to examine the researcher-participants embodied understandings and assumptions brought to the research context.

Touch & Talk sessions

Touch and talk sessions are documented using video as a complement to traditional interview or observation methods. Videography is viewed by a number of authors as providing significant opportunities to access non-verbal or tacit aspects of practice (Harper, 2011; Marchant, 2011; Pink, 2007, 2009). These aspects include movement, gesture, performed skills, interactions with material, equipment and behavior. Furthermore the richness of these activities is captured as a part of an unfolding context, thus retaining richness and authenticity. Pink (2007) argues that the context of the video recording brings together a process where things, people and sensory experience are drawn together. For these reasons it is proposed that videography is well suited to the study of creative work due its potential to shed light on embodied knowledge.

Fig 3. Provocative artefact

Within the *touch and talk sessions* the practitioner-researcher facilitates a dialogue around the provocative artefact, through open-ended interview. This dialogue is recorded on video. The participant is encouraged to explore the artefact physically. The artefacts are presented as an outcome the researcher-practitioner's creative practice. This situation is not unlike the kinds of exchanges practitioners have with one another in the normal course of practice. In creating this situation the aim is to engender a dialogue around the artefact. This may take the form of interpretations of the artefact and reflective responses. For example as a largely under-determined artefact it may be likened to other things or artefacts, or the designer-participant may suggest other possibilities or creative directions the work may take.

The ensuing documentation encompasses a range of visual and verbal data and is examined as an unfolding context of exploratory activity. In this respect, the video record enables an extended examination of the inter-relationships between the practitioner-participant, the artefacts and practitioner-researcher. This can be explored in terms of meanings that emerge within the research context. The data types relevant to the study include aspects of bodily movement, such as position, object handling or movement, posture, modes of activity, as well as verbal statements, identifiable moods or emotion and silences.

These data types are relevant in terms of how they can illuminate and bring to the fore aspects of embodied knowing.[1] For example, handling an artefact may take on particular meanings within a context of activity. This formulation draws on insights from phenomenology of embodiment that the sensory-motor meaning and movement is one and the same thing. Handling for example within the context of activity may be at times appraisive or exploratory or may be active or passive. At other times it may possess a different meaning determined by its situation within a flow of interpretive activity. The readings of these interactions in the sessions comprise data for analysis and interpretation. This is combined with the data drawn from the making-diary for subsequent analysis.

Emplacement

Emplacement means a researcher becomes immersed within the activity or practice being investigated. This approach makes explicit the simple fact "ethnographic experiences are

[1] An interpretive scheme in the form of a set of research foci serve to illuminate how these data types within the context of activity contribute to a deeper understanding of the significance of physical activity constituting creative work.

embodied" and that "the researcher learns and knows through her or his whole experiencing body" (Pink, 2009, p. 25). The principle of emplacement sits within the wider interdisciplinary field of sensory ethnography and draws on philosophies of embodiment (Merleau-Ponty, 1962) and ecological psychology (Gibson, 1986). Emplacement recognises the embodied aspect of the researcher and research participants. For the researcher it is through emplaced learning as an embodied activity that enables them to become situated within practices thus gaining insights into to others, processes and practices.

There are a number implications of this orientation. The first is the way in which it recognises the body not as a source of experience through a subsequently rationalising mind, but is itself a source of knowledge and agency (Pink, 2009).This is consistent with insights from phenomenologists who show the body to be something that can be available to first-person experience in ways that transcend an explicit thematic awareness. The second implication is emplacement foregrounds the situatedness of an active knowing body engaged within contexts constituted through practical engagement. The third refers to the ways in which that practices are shared ways of doing things, acting, thinking, feeling and understanding (Rechwitz, 2002).

A number of ethnographers investigating the senses bring a focus to the intersubjective and practical dimension to knowing. Sensory ethnographers ground their approaches given knowledge is held in practices, is experiential, and while constantly changing, is also shared amongst practitioners. This conception of knowledge draws on theories of learning (Wenger, 1998) and suggests knowledge is held within communities of practice, while changing through continuous elaborations of practice. Participatory methods of investigation offer potential to investigate others experiences. For researchers to understand others, they need to become emplaced in order to experience practices with others. O'Connor (2005, 2006) adopts this strategy. Her ethnography of glass practice involved the researcher spending over a year learning to blow glass. The shared nature of practice knowledge indicates practitioner-researchers are well positioned to develop ethnographic informed approaches to researching and understanding the experiences of self and fellow practitioners.

Key concepts

The following section includes discussion of concepts relevant to the research approach. They outline the theoretical orientation underlying the research activity.[i] While the examination of this material is relatively brief in the context of this paper it serves to orient a reader to the significance of the material as a resource for the proposed project rather than providing an extended analysis. The concepts constitute key components of skilful activity and include the *1. Responsiveness, 2. Mobile attentional focus, 3. Practitioners are solicited into optimal situations, 4.Sensitivity to affordances, 5. Affordances reflect disciplinary dispositions and 6. Flow.* Key concepts are developed in relation to work first proposed by (Merleau-Ponty, 1962). His philosophy foregrounds embodiment as the basis of experience and agency in the world, while highlighting the interconnectedness of perception, action and meaning. This orientation is relevant for the study as it places emphasis on the embodied perception, bodily movement, physical interaction and meaning within contexts of action. These are taken to be fundamental aspects of designing under consideration within the study.

1. Responsiveness of skillful performance

Skills are outwardly-directed bodily dispositions ready for use in dealing with things, people and situations within unfolding contexts of activity (Todes, 2001). Skills are what make

possible coordinated action in any practical arena.[2] The key to understanding the significance of skills to the study is the way in which skills possess a receptive and active dimension. Skills are not merely mechanical action, albeit they can be performed without conscious thought; they demonstrate the body's capacity to act effectively and knowingly in response to changing situational demands. The significance of things we encounter through skilled work come about through our ability to move, orient and direct ourselves as we explore them.

The way skills are present in our activity should not be limited to activity associated with explicitly purposive action. Skills prepare one to be deal with things, artefacts, equipment but also people and events that transpire. Skills manifest on the basis of a background understanding of what kinds of things are likely to happen within situations as well as unlikely ones. Skills reflect the ways in which it is appropriate to deal with anything and that skillful discriminations are undertaken on a situational basis. That is the performance of skill is a responsive and adaptive movement to an unfolding situation.

2. Shifting attentional focus

Within perceptual life our attentional focus is neither passive nor static but a mobile and highly flexible mode of encountering the world. A part of this is the way things show up for us against a background. In perception, things are seen not in isolation but are perceived against a background and context. We understand things we encounter as already making sense to us; they already have particular purposes and possibilities.

The tendency to become absorbed in a task a feature of purposive activity. In action we become engaged on articular task. This engagement is a holistic engagement with a task at hand. Merleau-Ponty refers to this as a kind of "attitude" where our entire body is taken up in a task but in such a way that any underemployed body regions are simply "swallowed up" in the activity of our hands (1962, p. 186). Skillful action understood in this way challenges subject-object differentiation, associated with more intentional models of making or those associated with the notion of intuition. Ingold refers to skilled action of a craftsperson as a "form of attention... rhythmically responsive to ever changing environmental conditions" (2011, p. 61).

3. *Practitioners are solicited into optimal situations*

The intentionality of design is neither aimless groping nor a consciously directed activity but is guided by the way designers are always attempting to come to grips with the artefact they work upon. Merleau-Ponty's notion of maximal grip is useful to understand how actions within creative work are always servicing the project as a whole and how they exhibit a forward momentum. Merleau-Ponty argued perception is shaped by a tendency to be solicited into the best possible position. To do anything there are not only better and worse positions from which to do it but optimal ones. This solicitation is a bodily one, where without conscious consideration are drawn into a kind of equilibrium within the situation.

Designers undertake adjustments to their design situation in response to the inherent indeterminacy of the evolving project. The projective work of iterative making is the way in which designing maintains momentum, whereby the practitioner is always moving towards gaining a better grip on the making situation. Such a grip is not always a perceptual one but can refer to the project as a whole.

[2] The bodily and pervasive nature of skill is borne out by philosophies of embodiment and skill acquisition (H. Dreyfus & Dreyfus, 1982; Latour, 2004; Leder, 1990; Merleau-Ponty, 1962; Todes, 2001).

3. Affordances

Designers see the projective potential of works in process. This perspective can be understood in relation to affordances. Gibson (1986) refers to affordances as the action capabilities of an environment, object or situation. For a designer this means a design situation is experienced in terms of possibilities of creative action. In practice, we experience situations, environments and the things we encounter in accordance with our bodily capacities and skills. For example things may be close or far from us, or they may be graspable or manipulable, in terms of our bodily position and structure. While they may be usable or unusable for a particular purpose, they may be appropriate or inappropriate for others. So for designers a work in process artifact can be understood in terms of particular paths or possibilities of action. Dohn (2006) argues that the epistemological status of affordances is relational, cultural and skill-relative. The implication of this is that what shows up to someone is dependent on the skills, and their cultural and professional background and dispositions they possess. That means that the possibilities inherent in any situation will differ depending on the dispositions and embodied skills and understandings of those within that situation.

5. Affordances reflect disciplinary dispositions

A number of authors have identified the fact that we have culturally and professionally variegated skills and dispositions (Wenger, 1998). In simplest terms a practitioner will possess disciplinary shaped ways of doing things, acting, thinking, feeling and understanding. These are ways of experiencing the various dimensions of practice and mean they are able to make the necessary discriminations as to what to do and when to do it.

This aspect of our practical engagement is characterized by the way things show up for us[3]. This capacity to be affected is not pure passivity but actively works within the specific context of our practical dealings with things, objects, situations, persons, events to enable things to show up to us as mattering, being important or significant. Our commitments and concerns are what tune us in to the world in particular ways. The possibilities for action that stem from this commitment will reflect a set of dispositions, skills and sensitivities that are particular to an individuals professional, educational and personal background.[4]

6. Flow

The ability to perform skills successfully as a flow of action relies on the body's ability to coordinate movements in advance of the desired task. That is, the body does not work as a set of independent organs to affect some intervention in the world, but moves in a coordinated manner such that we orient our entire body toward a particular task. For example when catching a ball our entire body prepares for its arrival by orienting the body in the direction of its approach, while lifting our arms and hand in one, for the skilled catcher, coordinated and graceful action. As the ball approaches our hands prepares for its arrival by softening for the impending impact. As anyone who has caught a ball will know a failure to

[3] Heidegger denotes the receptive aspect of our being-in-the-world *Befindlichkeit*. This is interpreted as affectedness (H. Dreyfus, 1991) or attunement (King, 2001). This aspect of being-in-the-world is characterized by the way things show up for us.

[4] Bruno Latour discusses "body talk" and skill acquisition in reference to the French perfume industry. He explains how practitioners in a training scheme are able to distinguish increasingly subtle differences in fragrances, such that they are able to inhabit a, "richly differentiated odiferous world" (2004, p. 207). He attributes the acquisition of a body to the cumulative capacity to distinguish differences. The "nose", as a perfumier is called is acquired through focused exposure to a nuanced range of fragrances. Similarly, within different domains practitioners will develop sensitivities to the material properties of their media. For example a fashion designer may have acquired sensitivities to fabric and how the fabric feels on a body and how it may respond in different situations. That is, fabric is experienced as a set of tactile, proprio-perceptive and kinesthetic possibilities. A musician on the other hand will have a different configuration of sensitivities or attunements aligned to the production, performance and reception of musical composition. This research focus points to ways in which a practitioner is open to the creative possibilities that inhere within a making situation.

provide “soft hands” for the ball will result in a dropped catch. Merleau-Ponty (1962) attributed this ability to coordinate our body as a part of our practical activities to a “body schema” that establishes a unity between the world and out participation in it.

Successful practice requires an ability to anticipate regularities within an unfolding context of activity while managing irregularities that may emerge (O’Connor, 2006). Over a period of time novice practitioners begin to anticipate the regularities of practice such that the body exhibits a pre-reflective practical knowledge – within each action bodily preparations for subsequent actions emerge. In this way the body works to enable the integration of temporally motivated actions into a meaningful whole. Through this incorporation or actions and understandings practice is achieved.

Practice is also experienced as a flow of action. It follows a path that is opened up in the forward-going anticipatory actions of the practitioner. For example, practitioners undertake tasks that although embedded with the project-like structure of practice, are processual. That is a particular project might encompass a wide range of quite different actions, activities and tasks. This could involve the moving around of artifacts or preparing the space for work, examining existing artifacts and effecting changes to those artifacts. Walking around, handling and rotating the artifact effect an appraisal of a work-in-process artifact. Immersion within practice means undertaking any work at all on the artifact is always experienced as the culmination of a flow of activity, rather than discrete movements or actions. Importantly, the activities flow into one another as a mode of circumspection or opening onto the artifact.

Conclusion

In this paper I have presented an approach to examine embodied ways of knowing in relation to the physical interpretive work of design. The research approach draws on a conception of creative design, achieved by iteration and projection through physical activity. The research approach encompasses the design of provocative artefacts and a research situation that provokes the designer to respond, firstly by interacting with the provocative artefacts, secondly to engage in interpretive work involving physical interaction with the artefacts and thirdly, to undertake a consideration of the artifact in terms of its future significance as a designed artifact. This study makes possible an examination of the sense making activity of design and has the potential to extend current accounts of design beyond an intentional, conscious agent to a sense of design as a responsive practice. This has the potential to re-orient practitioners towards attributes of responsiveness, sensitivity and noticing as important aspects of a design to be cultivated. This reframed orientation draws attention to the permeable relationships between design and design contexts and would suggest more flexible and adaptive practitioners are tuned into and more responsive to the shifting complexities of contemporary life.

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Todd Robinson

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DnA: Design and Art Research Methodologies – Understanding the Way We Work

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Abstract

DnA, our work, Design and Art, while each hold to their distinctions and are often understood as separate fields of creative practice and enquiry they are also widely acknowledged as inherently intertwined. The DnA project was initiated by a keen desire to identify the intrinsic connections amongst peers. This is a generative research study set in parallel to the way we work, the way we understand our work and the way our work evolves. It has been built on the premise that the acts of listening, questioning and riposte might help to unravel the complex matrix that makes up research within the creative fields. Our aim is to make our form of research more easily understood between ourselves and in turn to our peers situated in other fields of study or context.

The DnA project responds to a rich and vibrant university commons: a collective of individuals working with a plethora of different mediums, distinct material practices and methodologies who form a critical creative mass. It is an emergent enquiry connected to Emily Carr University of Art + Design in Vancouver, Canada.

Through *Individual Practitioner Interviews*, construction of *Responsive Spaces* and *Dissemination Events* the DnA team aims to investigate the unique aspects of individual and collaborative practices; to document design and art methodologies at work amongst peers.

Treating topic and resource as native, the DnA project frames creative practice in research through the active use of creative research methodologies. It is a reflexive, generative effort that is still in process. This paper frames work done to date.

The project has several goals: To identify convergence amongst disciplines; to facilitate accessible collaborative expression; to promote further interest in emergent topical conversations centered on research; to generate and promote new, (open - positive – collaborative) works and methods that reflect the strengths within each of the creative disciplines represented in the University and finally to develop emergent strategies for conversation and collaboration.

Keywords

design; art; research methodologies; generative research; production of knowledge

DnA: Design and Art

The DnA Project is an emergent enquiry amongst faculty peers within Emily Carr University of Art + Design in Vancouver, Canada. It responds to a rich and vibrant university commons: a collective of individuals working with an abundance of visual mediums, distinct material

practices and methodologies – a critical creative mass. This work aims to investigate the unique aspects of our peer's practices; to document the broad range of design and art methodologies that they make active use of.

Creative practice based research has been recognized as a key and growing field of specialized knowledge production. Research methodologies used by individuals working in the creative fields are wide and varied. Currently Art and Design Research is not well articulated for conversations between: creative material practitioners, our design peers and those situated in the fields of science and the humanities. We are seeking a reflexive form of communication, a means of translation, a means of facilitating broader understanding about how we frame and justify our research. What follows is an outline of these concerns and our initial foray into identifying the connections embedded within the creative helix we work within.

The first section of this paper contains a discussion of contemporary perspectives on creative based research from within both art and design. This is followed by a description of the research conducted to date by the DnA research team and an articulation of the key themes and patterns at work within the University. Lastly, we discuss how creative research might be framed in order to facilitate understanding and foster collaboration across different practices and frameworks of inquiry and investigation..

Distinctions and Connections

In his 1993 paper 'Research in Art and Design' Christopher Frayling identifies three types of arts research: 'research into art'; 'research for art'; 'research through art'. This initial articulation has been actively taken up and translated. In design discourse the criteria has been rearticulated as: research into design; research for design; research through design (Sevaldson, 2010). While the terms 'into' and 'for' have been debated extensively the understanding and agreement of the term 'through' has broader agreement and has been less widely debated (Sevaldson, 2010; Biggs, 2002). The DnA project is work that investigates the nature of creative research through practice – whether that be via the arts, where it has been noted that "practice is central in generating knowledge" and capable of addressing "external tasks given by others" or from within design where Jonas Wolfgang notes that "researchers are directly involved in establishing connections and shaping their research object" (Sevaldson, 2010).

The 2007 AHRC Research Review defines Practice-Led Research as "research in which the professional and/or creative practices of art, design or architecture play an instrumental part in an inquiry" (Rust et al., 2007). Furthermore it has been noted that "(PAR) is typically legitimised via the claim that art makes available a distinctive kind of knowledge not available in other domains and inaccessible to other (more traditional) modes of enquiry." (Pakes, 2004).

Still, there are views that run counter to this. Scrivener's 2002 paper "The Art Object Does Not Embody a Form of Knowledge" is a case in point. Scrivener's argument aims to undermine the premise that new knowledge is to be found through the viewing of a finished work of art (pictorial work is used as an example). He notes that that there are two ways of knowing: knowing through active exploration or recurring experience and knowing through communication. His argument excludes art from the active exploration and concludes that it is subject to the premise of knowledge derived by communication (via the pictorial artifact). This act of communication, however, proves to be difficult when linked to research as it is often not stable and "can engender multiple and even inconsistent interpretations" (Scrivener, 2002). As such, Scrivener continues to argue that it is difficult to see how art is part of a

construct of a “body of shared knowledge” or new knowledge comprised of “ both knowledge and justification”. He concludes that as research requires both new knowledge to be claimed and the justification of this claim to be communicated an artwork cannot be claimed as evident research (Scrivener, 2002).

Scrivener’s perspective assumes that artists *work* is completed and retrieved in isolation when in fact large numbers of artists and creative *works* do not function this way. Practice-led research through collaboration and dependencies on others means that in fact an art*work* and its capacity to serve as evident research cannot be judged solely on the artifact alone.

If practice is instrumental: what is it that we do? how do we do? Identifying differences in praxis and intent while seeking out nodes of contact or points of transference may further the capacity for research by the arts to be understood both by researchers within the domain of design and art and those exterior to it. From within design Biggs and others have noted the lack of clarity in defining Practiced Based Research and the persistent need for the creative fields to articulate and establish a series of criteria (Biggs & Büchler, 2007; 2008; Rocco, Biggs & Buchler, 2009).

The DnA project is exploring the work of the practitioner through a lens that acknowledges distinctions in research methodologies and practice in the creative fields of design and art. Working from a perspective that encompasses both art and design research concerns we are seeking means of establishing connection amongst peers in research.

A preceding research project at Emily Carr University, titled *Safety Lab* (Fall 2010 – Spring 2011) has served as a useful meter. *Safety Lab* brought together a broad range of stakeholders working out of art, design, industry and academia contexts. The project had three distinct groups working from within the academic context: A four-member research team (Rteam); a Design class (Dteam); and an Art class (Ateam). The industry partner Lululemon Athletica ® provided an additional team of designers working from an external point of view. In the Fall of 2010 two dialogues were initiated: one revolved around a broad directive to investigate the notion of safety, the other explored “means of creating and supporting collaborative conversations between individuals working in art and in design in both academic and business contexts” (Day Fraser, 2011). The three Emily Carr based teams worked through the question of safety pulling on a wide range of distinct research and practice based methodologies. A series of thirty 6’4” blackboards resembling the spinal boards used by paramedics were made specifically for the venture. All of the Emily Carr participants were given one of these blackboards and instructed to use this as a medium for their ideation and communication through out the project. As modular units with an accompanying connection system of Velcro® and drawstring straps the blackboards served as simple idea objects (artifacts) with the capacity to provide both random and prescribed events of exchange (action) and to act in and of themselves as abductive tools (Day Fraser, 2011). This happened through individual practice, in critiques, in impromptu public interventions as well as at larger events that brought the Emily Carr teams together with the Lululemon Athletica ® group. The Safety lab project demonstrated how a range of creative based research methodologies used within a twinned design and art based practice could work (Day Fraser, 2011). Through a range of formal and informal settings the considered use of artifacts and actions acted effectively as tools for projection and connection.

While researchers in the creative fields do use distinct methodologies: contextual inquiry (art and design); critical design and cultural probes (design); generative design research and practice as research (art), insight garnered from Safety Lab indicates that there are plenty of mechanisms for convergence. Our work on the DnA project, which will be described below, further substantiates this. The facility to jump back and forth / to make connections between different research methods both within individual research practices or as members of

interdisciplinary research teams, is evident. An example of this can be seen in expert practitioners in both art and design as they cross over conventional domains - picking and choosing techniques developed within other areas of research and creative practice based on the particular problem space in front of them. Alternatively, creative researchers working under the auspices of the academies and conventions that affirm distinctions between art and design research often collaborate with experts in fields of research other than their own. These collaborations also facilitate means of cross over between different practices and research methodologies. In this case researchers actively respond to others work and in doing so they evaluate and move projects on to the next phase.

Generative vs. Stable

When looking across a wide range of practice that spans art and design it should be acknowledged that there are key distinctions in how creative practitioners frame their work. The understanding of research as either a stable or dynamic process and the subsequent means that people use to work around and through any given problem space is significant (Sevaldson, 2010). Certain outlooks privilege the understanding of research as needing a clearly defined route forward.

> Practice is an activity, which can be employed in research, the method or methodology must always include an explicit understanding of how the practice contributes to the inquiry and research is distinguished from other forms of practice by that explicit understanding (Rust et al., 2007).

This perspective is apparent within discourse on design research (Cross, 2007; Lawson, 1997). A counter point to this is offered up by Fiona Doloughan, who notes in a 2002 Design Issues article that “critical rationalism, which relies on making everything explicit, by revealing the methods of one’s logic and justifying one’s conclusions, and which has at the heart of its enterprise a belief in clarity, has been under considerable theoretical attack in the last 10–15 years” (Doloughan*,* 2002). The approach that aims to situate creative based research within what are widely assumed to be established, stable, formalized frameworks used by other domains of research outside of the arts invariably leads to false distinctions between art and design research practice and scientific endeavor.

In a recent paper Birger Sevaldson articulates design based research as understood as either a stable or dynamic proposition. He notes that “The dynamic perspective recreates design as a means of understanding problems within design but also far beyond its borders. This type of research is normative and generative” (Sevaldson, 2010). The basis of this perspective in creative research comes from the recognition of creativity as a complex phenomenon made up of a broad range of individual, cultural, and social conditions and practices (Sevaldson, 2010). Conversations with our colleagues working from both design and art affirm this outlook. Its ubiquity is apparent throughout creative research practice. While we assume, that the relative stability of scientific endeavor and enquiry are models in stable methodologies. We also consider that the tension between constraint and persistent ambiguity can exist in domains of research made up of arts and design based practice as well as those outside of the creative arts. It may be that rather than distinguishing between domains of research we should look to distinctions between stable vs dynamic practices in order to identify crossovers and possible points of juncture.

Method and Intent

The DnA project began in October 2011. Partial funding for the project has been received from the Emily Carr University President's Research Fund. This has served to cover the costs associated with pragmatic logistics as required by the University's Research Ethics mandate. Due to the sensitive nature of researching our fellow peers and their work our research staff have served as a key intermediary to establishing a means of enlisting our peers. Support from both fellow faculty and administration has been apparent. Amongst our peers the project has enabled a forum for discourse and exchange. From the discrete perspective of University administration the DnA project acted in the near term as a " warm up" to an international working symposium on research held at Emily Carr in November 2012: *Remaking Research*.

> the DnA project was conceived as a way of exploring methodologies for developing a dialogue about research among faculty at an art and design institution, and for finding ways to base that dialogue in different kinds of actual examples of work and material investigations… In the longer term it is one of the many practices being invoked to generate a means of continuing a productive dialogue about our work and research culture at Emily Carr. David Bogen*, VP Academic + Provost Emily Carr University*

The DnA Project proposes that an articulate set of terms for enquiry may emerge through dynamic conversations amongst peers invested in creative research practices. It is intended as a mechanism to study the links between current methodologies at work:

- To identify convergence amongst disciplines and peers (distinct methodologies, practices, contexts; in scale, materials and distribution).
- To facilitate a collaborative expression and communication amongst peers.
- To promote further interest in emergent topical conversations centered on research within institutions of learning as part of research projects.
- To generate and promote new works and methods thereby reflecting the strengths within each of the creative disciplines represented within the University.

The DnA project has been developed as a means of emergent enquiry through a generative interview process conducted as conversation. A construct concerned with exploring agency amongst peers and establishing a facility for construct for new collaborative response.

Throughout the project, iterative explorations concerned with personal, institutional and broader public forums are planned. These have been divided into three overlapping and repeating phases: *Individual Practitioner Interviews*, *Responsive Spaces* and *Dissemination Events*. The project has conducted and documented over twenty-four individual interview conversations and hosted two separate internal responsive events. The one-on-one interviews with our peers are ongoing, so to are the Internal Responsive Spaces. Further extension of the project to the broader public and stakeholders outside of the art and design community with vested interest in interdisciplinary research, are planned for Spring 2014. The work of the DnA project that is described below occurred between January 2012 and January 2013.

Individual Practitioner Interviews

The DnA project is reliant on the participation of our peers. Our fellow Faculty are contacted by our research assistants and invited to participate. Once they express interest and sign the requisite informed consent and media release documents one of the two lead researchers arrange to meet face to face. The time and location of each conversation is negotiated to the benefit of the "engaged participant". We meet with them: in their private studios, their offices at the University, and at local cafes. For consistency and to aid in the interview process an artifact, a specific set of questions and an activity have been used throughout the process. At the onset of the interview process a manual ink block stamp was created including the following text:

Four questions

What is it you do?

How do you do?

Is it media and / or material specific?

Do you consider it research?

One task

Make or place an artifact on this page

Before each interview the lead researcher conducting the conversation stamps this information onto the first page of a thick block of plain paper bound on all 4 sides. The researchers arrive at every meeting with the block of paper and use it as a starting point for discussion. Notation and documentation during the interviews is done via short-hand note taking and mark making (fig.1). Diagrams and words related to concepts and ideas discussed are collected on the single, top page of the paper block. The task activity noted above is given to the participant at the end of the conversation. Artifacts that are chosen or made by the participants and placed on the block of paper are recorded via a smart phone photo. Whenever possible, and dependent on the wishes of the engaged participant, the artifacts remain in the DnA team's possession.

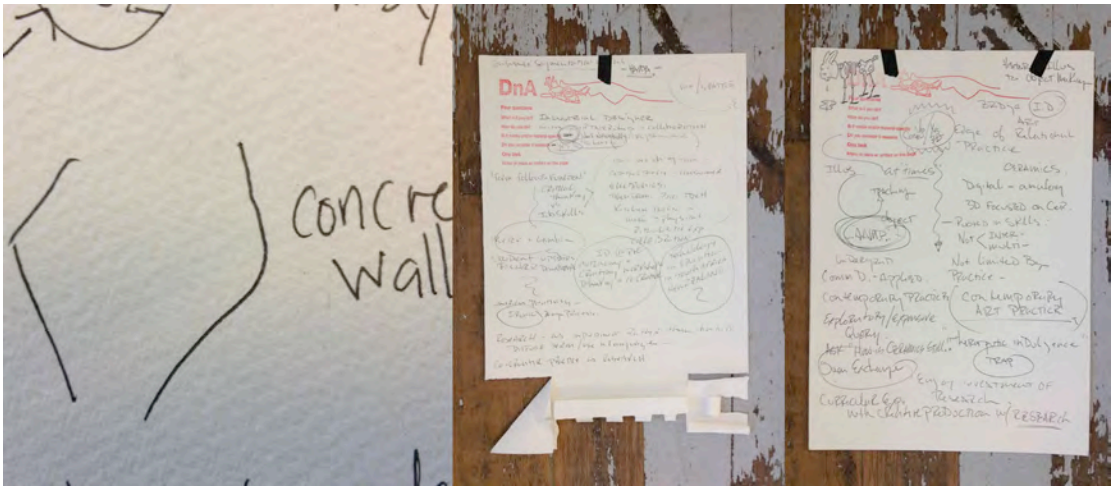

Fig. 1 Four questions, One task - conversation artifacts

To date artifacts placed on the block of paper have included: a salt shaker; a postcard with a hand written notation on the backside indicating a research study that the principle investigators (DnA researchers) “should look up”; a book on social responsibility and sustainability; a sculpture; a torn out section of a card; an eraser; a small limited addition book containing original work; a drawing; another drawing. The responses often involve actions: a salt shaker intentionally tipped over; remnants of a cup of coffee dripped in the center of the page and rubbed into the marks and notes made on the paper pad; the page ripped; the corners of the page folded and bent to form a shape.

Occasionally additional papers with information written down by the participant (often in diagrammatic form) become part of the conversation. These are kept by the DnA team and documented along with the main page of notes from the paper block. Finally, at the end of every interview the top page is ripped of the block revealing a blank sheet underneath ready to be stamped and used for the next conversation.

The mark making and artifact responses that our colleagues have provided have begun to take up a significant amount of space in our studio. Notes have been posted on a large wall that currently acts as forum for contemplation. This has become a key space for dialogue as we consider, draw out key themes of practice and research engaged in by our peers and in turn respond via our own creative practice(s).

What are they doing?

Our peers deal with constraint driven outcomes. These constraints often involve or make use of tangency. Different lines of thought or actions act as a key or formula and a means of contrast that helps to establish context and/or aids in moving their process ahead to the next stage. Many of the participants we have spoken to rely on improvisation in practice. This turns up in terms of shared language but also by playing with agreed or established standards of art. The act of acting on assumption is a recurring theme. Many participants are taking on creative research that intentionally works outside of convention. Our colleague’s work is aligned to discipline and precedent. It is often steeped in contemporary art and design practice. It is also methodical and calculated. It is comprised of a promised action were objects and form are the necessary mediating surfaces. Throughout the institution synthesis occurs in the form of evaluation and response to the quotidian. Co-creative practice/working with others serves to reconcile disparate thinking and acts as a point of juncture. It facilitates the fusion of method to action. Lastly, we have found numerous examples of material driven enquiry. This is not problem-solving as understood in traditional craft + art but rather “acts of making” that meander, that are reactive in nature, that pull on personal experience and community and the relationship between the two.

How is it done?

Much of our peers current work constitutes embodied approaches to research as enquiry. It is contextual by nature, consensus seeking and confirmatory in approach.

This is research done through:

- Kinesthesia: it involves reactive action, is movement based, and is reliant upon the physical body for insight.

- Moving ideas into action: strategic in manner, proactive in intent, content that conspicuously aims to shift perspectives

- Reflection: actions of dwell-time; where focus, repetition and modesty of process evolves to form clearer understandings of practice

This is research that:

- Is material driven: re-configurative, provocative, conventional, radical, remedial, ephemeral, rhetorical, material.

- Is user focused and task driven: it is defined by discipline, application of theory, humanism, reflection and convergence. It can be described as Human Factors Driven enquiry and resides within conventions of the "institution".

- Is inspired by activism and advocacy: made up of political agendas and acts that consciously seeking out the transformative and means of understanding via constraints of position and stature. It resides within conventions of the "institution".

- Is actively re-creative: establishing mechanisms for understanding through deconstruction and reconfiguration.

Response and Dissemination: Spaces and Events

Responsive space #1 March 2012 Remaking Research Dialogues; DnA: your are, we are, our work is: Practices for Engaging Peers.

DnA's first Responsive Space was held in March 2012. It was situated within a series of research related dialogues held at a Canadian University as part of the run up to the AICAD 2012 Remaking Research Symposium (November 2012) We articulated that our dialogue would *"explore making, marking, and charting semantics amongst peers while asking; How do We do? How do We practice? What do We pursue?"*

The Remaking Research dialogue was an opportune forum for the DnA Project to further explore the convergence of research existing within an academic institution. The format was inclusive; open to faculty, staff, administrators, technicians and students. Expanding from peer – to – peer conversations we shifted our focus to engage the broader University community. Dialogue #3, (attended by 45+ persons, faculty, staff and students) afforded us the occasion to bring forward a discussion of individual and group aspirations for a dialogue on research, to identify how we draw connections between creative practice in a larger social context.

To set the stage for the dialogue an event was devised that involved both dissemination and sharing through formal and informal methods. As per convention a slide presentation was used. In lieu of a Q and A session, however, an abstract making activity was planned.

Participants entered a large black room, a purposeful and egalitarian context. The space was set with a series of seven semi circular chair formations. Each group of five to six chairs formed an arch around a neatly stacked pile of materials: 8" x 8" squares with holes in the corners, a collection of dowels in a range of lengths, a large spool of thread. Three large tags and a pencil were placed on each chair in the room.

The event commenced with a twenty-minute talk. The presentation set out to inform and discuss the notion of a mash up of art and design practices and methodologies - to identify precedents of this in creative based work. Ideas and observations about collaborative design and art practices drawn from an earlier research endeavor, Safety Lab, were used as a starting point. The presentation discussed mechanisms for inquiry evident in both art and design research practice as identified in the Safety Lab project (Day Fraser,H. 2011). This was bookended and discussed in tandem with critique, statements, and manifesto, from a

series of practitioners, critics and arts based cooperatives such as; the designer Hellla Jongerius, the critic Hal Foster and n55.

We finished off by asserting:

- That ambiguity is a device for discovery. “The role of the uncertain in the propagation of ideas and future possibilities must be affirmed.”

- That much of both art and design practice shows evidence of responding and being committed to the everyday experience. “Collaborative Design /Art practices should be able to function cooperatively drawing on this commonality.”

- That “tension points act as means of idea transference” and “are instrumental in initiating movement and development forward in creative work”

Following this conclusion the audience was asked to participate in an act of “assembly”; to respond to three statements: you are, we are, our work is (fig. 2). This was to be done firstly on an individual basis by writing affirmative statements on the three paper tags that had been provided and secondly from within their seating group via mediated material response using the artifacts stacked neatly in front of them.

The response to this directive was silence - a long pregnant pause was interrupted, broken by a statement of reluctance and request for more clarification. What was the intention? Could the researchers be more specific? What was the goal? After five to ten minutes of negotiation the participants acquiesced. The groups set about the original course of action proposed by the investigators.

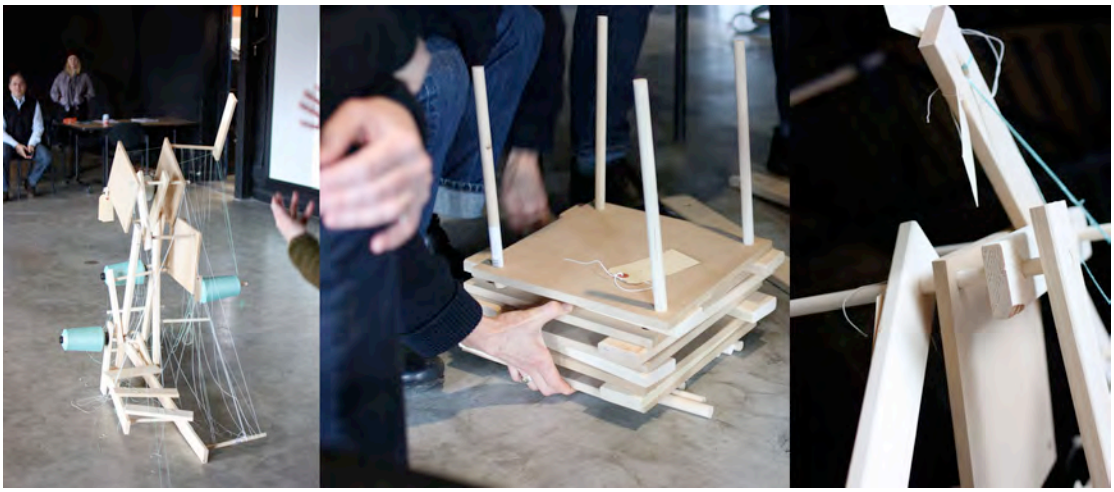

Fig. 2 Remaking Research – acts of “assembly”

Each group went about constructing with their materials. After a thirty-minute period the entire room regrouped to discuss the outcomes:

A gentle nudge set an artifact gliding across the room. A precise stack of short dowels (10” in length) instigated by a group that included a member with an art based research practice tightly connected to collaborative work with Physicists.

A form suspended from the high rafters of the presentation studio informed by external circumstance and a casual conversation; a discussion just prior to arriving at the Responsive Space.

A conscious decision to let the materials and imposed physical constraints direct the assemblage. The result of which was a series of trébuchets tenuously connected by a thin string, constructed by a team who tentatively worked through the task without a common directive.

A long deliberation on a plan, words guiding the making, a course of action taken just as time was running out. Part of which included a University administrator set to walking through the halls of the institution with one end of the spool of thread, only to be reprimanded and turned back by staff.

Per the aforementioned “pregnant pause” the most poignant aspect of the results was not the form but the range of means used to sort through the ambiguous territory and achieve a ‘solution’. Outcomes, intentions, and process are all contingent on one another as part and parcel of a social construct. Negotiating uncertain context and seeking different means of sorting information is informed by practice, by external events, by material, by words, by action, by the preceding social context of the individual participants.

Responsive space #2 October 2012

DnA Riposte; we are, our work is

The October event re-engaged DnA’s initial set of participants with an aim to further the conversation via riposte. New physical assemblies and text artifacts were generated in response to salient responses from the wide range of face-to-face and collective assembly conversations that had been conducted (fig. 3). The lead investigators invited engaged participants with whom they had previously conversed to spend one to two hours responding to artifacts in a private gallery context. A room was set up on campus containing: the tag responses from Responsive Space #1, two easels, a row of threads, a tall thin role of white paper, black tape, a log cabin stack of split cedar rails. Over a period of fives days small groups of engaged participants visited the space.

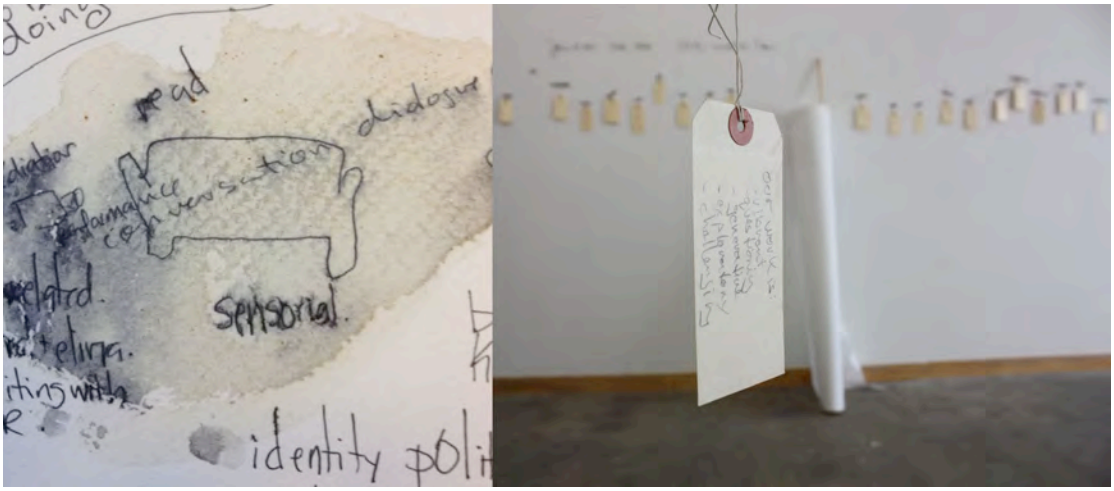

Fig 3. Riposte – previously generated artifacts and tag responses

Responses to this scenario for dialogue ranged widely and were heavily dependent on the other participants in the room, the time of day, the stage of the week. The re-riposte collected from the engaged participants in this Responsive Space came in a range of forms:

- Decisive marks - notes of indignation at not wanting to be pulled in to / forced to work on, creative output out of context with their own individual practice.

- Artifacts of quiet contemplation. An end of thread picked up wound around and around a piece of cardboard – an artists means of moving out of uncertainty to a fluid conversation made up of musings and considerations.

- A gradual shifting of artifacts in the space

- A turning of the tables – a participant choosing to contribute by sitting down and interviewing the lead researchers.

- Tape marks of abandon and exploration (predominantly from creatives working out of a design based context and seemingly more comfortable with being asked to play).

Throughout the process the lead researchers had to be flexible – open to movement, adjustment, resorting, negotiating and renegotiating the uncertain. These key attributes were necessary to assure that everyone was still on board and willing to participate in the next round.

Conclusive Results from Responsive Spaces

The Responsive Spaces of the DnA project were created with the intent of pulling discourse away from a privileged rumination on individual practice. They presented an opportunity to invite our participants and peers external to the project to engage in a broader action and conversation of what it means to practice research within the community of Emily Carr University of Art + Design. As a strategy for exploring what it means to do research in this context the spaces were purposive in their intent to privilege the social act of making.

Each DnA Responsive Space has drawn on collected artifacts and documentation of previous research dialogues, statements and participant interviews. Past dialogues have been reframed synthesized and re-presented in spaces made up of the residual artifacts of our conversations. Engaged participants have been presented and intentionally confronted with the artifacts and evident action (Day Fraser, 2011). These have been designed to act as triggers, as facilitators of further actions of riposte by our peers (fig. 4).

In Responsive Space #1 a new material form was added to and became a gateway for an emergent dialogue of common experience in assembly. Groups responded differently but had a common bond. In Responsive Space #2 didactic content and artifacts (which participants had a hand in creating) were presented for review and consideration. The range of responses garnered from our participants was notably varied; concerns for privacy and individual investment began to play a role. Unlike Responsive Space #1, uncertainty of an events' direction and ambiguity of context was less easily negotiated in space #2. The constraint imposed by the lead researchers for responsive actions in combination with pragmatic contextual confusion (whose work was it, whose practice was it) emerged as a concern for some.

Reflection on the second responsive space makes it clear that individual research practice, acts of response and the negotiation in dialogue on a one-on-one basis are inherent in spaces where ambiguity, tension and uncertainty prevail. The lead researchers were forced to develop fluid means of responding: forming agile terms, revisiting, reaching out or backing off - dependent on our peers' own riposte.

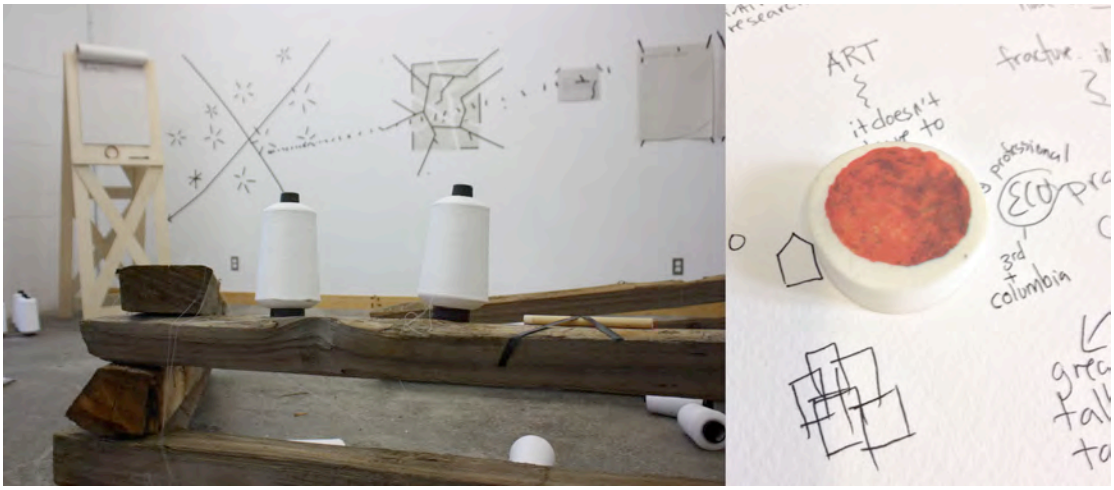

Fig 4. Riposte – acts of response

Our intention has been: to identify convergence amongst disciplines; to facilitate accessible collaborative expression; to promote further interest in emergent topical conversations centered on research; to generate and promote new works and methods that reflect the strengths within each of the creative disciplines represented in the University and finally; to develop emergent strategies for conversation and collaboration.

It is evident, however, that the documentation of the responses and our subsequent reflection on each event has allowed us as artists/designers/researchers to configure and identify the next course of action in the DnA project. Responsive spaces have acted as the means of dissemination in the near term. Our experiences within them will also contribute to further generative development of the project. As a platform for creative research they have served to help distribute, share, access and acquire new knowledge (Scrivener, 2002).

Autonomous Fields of Enquiry

Through a multilayered approach looking into the way our peers work it has become clear that assessment of existing output = new knowledge. Within the context of creative based research the timing and experience of achieving points of confluence, however, varies tremendously from one practitioner to the next. Modalities of exchange and assessment depend greatly on any given research practice both in terms of the act of making and the mix of individuals involved be they: individual, group based, interdisciplinary or other. In this context, the production of knowledge in design and art must inherently involve: growing effective personal partnerships; avoidance of miss-understanding miss-representation and gross assumptions about the “other”; mutual respect and deference for different utilities of research practices.

Growth in interdisciplinary partnerships, research collaborations between Science and Art require mutual respect for individual endeavors in research. We are left with many questions: What still needs to be articulated in terms of defining an articulate creative practice based research - with room for academic rigor and ambiguity in methodology? What are our relations to one another? Are we seeking an articulation of Contextual Rights?

The DnA project aims to enable design and art research to set criteria for collaboration on our grounds rather than the tendency to conform and mold to more historically based methods of evaluation and discovery. The project set out to articulate connections - to

identify means of creating convergence, collaborative links between creative practitioners approaching research from a broad range of perspectives, using a wide range of toolsets and methodologies. We continue to work toward a reflexive form of communication, a means of translation, and a means of facilitating broader understanding about how we frame and justify our research as creative practitioners in Art and Design**Acknowledgements**

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Drawn Threads: Drawing as a Visual Methodology to Enhance Qualitative Studies

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Abstract

This paper is an analysis of the value that drawing can bring to a formal research methodology. It is based on a series of drawings that were produced to extend and develop a form of qualitative enquiry, an Interpretative Phenomenological Analysis (IPA). This analysis was conducted as part of a study of personal textiles that individuals retain and value beyond their practice use, solely for their sentimental or family historical value, termed, the domestic textile archive. Interpretative Phenomenological Analysis was used for analysing the individual experience of these textiles, and was found to be a methodologically sound, yet flexible and creative method of uncovering the data.

Phenomenological research methods are established as valid means to investigate subjective human experience, across a range of different subject disciplines (Smith, Flowers & Larkin, 2009). Such an interpretative approach was found to be an effective method to discern and illustrate the themes that arise through the individual's engagement with their own archived personal textiles. However, a visual rather than a text-based method is investigated for the supplementary value and illumination such an approach could bring to a qualitative study.

In this respect, drawing is explored as a practice-based method of visual inquiry to supplement and support the initial research analysis. Within this model of thinking, drawing is a means of embodied, visual enquiry, which can be used to produce an analytical and evaluative practice that offers further insights to the text-based analysis. Drawing from the final and completed artefacts is a method for making implicit aspects of the experience of their making explicit. The drawn exploration of the material qualities of a textile design enabled an increased understanding of the tacit expertise of the designer or crafts-person, through applied drawing expertise.

Keywords

phenomenology, textiles, methodology, qualitative studies

Introduction

This paper focuses on the use of drawing to enable the further interpretation and understanding of qualitative data. To illustrate the method, a case study is used to demonstrate how a research study can be augmented by drawing as a qualitative visual research tool, and to discuss the insights that arise through this approach.

The case study is taken from a research project which examines how socially significant textiles are retained and stored within the home, forming the domestic textile archive. The domestic textile archive consists of clothing and textiles whose primary use is no longer utilitarian; in the case of clothing these items are kept, but no longer worn. These textile

artefacts are “curated” by people within their homes, to form personally significant, yet informally stored and arranged “archives”. The clothing and textiles within the domestic textile archive are kept for their purpose as reminders of family or personal histories. The purpose of the research project is to uncover how these textiles within the domestic textile archive are kept, and to understand the nature of their value for their “archivists”, and to formally express this value as research. This is to unlock the tacit, implicit knowledge that remain unarticulated between the textile artefact and its “curator”. To test the question over whether drawing could be used to sympathetically explore the possibilities of textiles, a combination of an interview analysis, a drawing analysis and a photographic analysis were used to gain insights into the experiential domains of the craftsperson.

Phenomenological Research

Textiles and clothing are the most omnipresent of designed artefacts, (Schoeser & Boydell, 2002) and as such form both a common human experience and a uniquely intimate experience, through being worn directly on the skin. In this way textiles comprise an embodied experience, and their investigation requires research methods that provide an in-road to this inner experience. Embodiment describes the intersection between the emotional and the physical arenas (Ashworth, 2003) and is key to understanding the emotional response to the qualities of textiles including smell, touch, fabric handle and emotional ties. Such a context requires qualitative methods that are adaptable and sensitive to this affective engagement with textiles.

The research project’s data set was created and analysed through a phenomenological methodology. Phenomenological methodologies have been designed to enable a “fresh, complex, rich description of a phenomenon as it is concretely lived” (Finlay, 2009). Within the literature, phenomenological research methods are established as effective tools for researchers to reveal and analyse the individual's subjective, inner-world. Phenomenological methods are also noted for their sensitivity to the context in which phenomena are encountered, and their flexibility as a research paradigm.

A phenomenological enquiry is one which is idiographic in nature, in order to allow an in-depth and purposeful understanding of a phenomenon on a case-by-case basis. This understanding arises through the analysis of the data, and its purpose is to grasp the nature of an experience prior to laying out the data for explaining it, without, “explaining, predicting or controlling” it (Valle and Halling, 1989).

A key facet of a phenomenological enquiry is the understanding of what Husserl, the “father” of phenomenology, termed the natural attitude (Husserl, 1970). This is the taken-for-granted world, which we experience unconsciously and without reflection. Through a phenomenological analysis in which we are both consciously aware of and responsive to an experience or phenomenon, we suspend the natural attitude and engage in a conscious, and reflexive way.

This in-depth analytical process allows the researcher to uncover and elicit rich data sets. The study followed Interpretative Phenomenological Analysis protocols and recommendations, and complex data sets emerged which in relation to the ways in which the individual experienced their own personal sets of narratives, from family and personal historical events, through to cultural and emotional ties.

Within a phenomenological enquiry, the attention of the researcher is drawn from within their own subject boundaries and expertise, but left sufficiently open to allow the participant’s experience to infuse the research area. The interviews followed a Standard Operating

Procedure which set out a semi-structured interview schedule. The interviews were transcribed in full, and the interview transcripts were analysed for their themes, as is the recommended protocol for an Interpretative Phenomenological Analysis (Smith et al. 2009). A series of semi-structured interviews were used, which were designed to enable the research data to expand and extend the expectations of the researcher, thereby allowing unexpected findings to emerge.

Through the process of conducting the analysis questions arose with regards to the ways in which a further method for visually analysing the artefacts, aside from the taped transcript of the text, could be used to augment the understanding of the object. Therefore, drawing was selected as a method for understanding and making explicit the tacit knowledge bound up in the production of an artefact, where it was a hand-made, crafts-based object, or in the post-consumption life of the object, that is, the life an object has beyond its practical use (Lury, 1996).

The Drawn Textile – How Textile Designers Use Drawing

Drawing has been identified as instrumental within the design process, at all stages from research to completion and as enabling practitioners to highlight and identify key aspects of the design process (Lawson, 2004). Drawing is an established process of research and visual communication of ideas, within the art and design disciplines. As Steve Garner (2008) states, “drawing research is 'making knowledge'.”

In this case study, drawing is used as a means to render the expertise of the textile designer explicit, and for showing an interpretive response to a textile artefact. For the textile designer, the systematic delivery of design knowledge expertise occurs through the inherited practices of textile design: briefing, concept development, testing, design development, testing again, final resolution and production (Wilson, 2001). For the finished artefact, which has passed into use, ongoing, implicit questions about the density of a textile's structure and material, it surface qualities, and the elements which make up the design can be explored and defined through the process of drawing. In turn this exploration can be a form of reflexivity which promotes a deep awareness of the qualities of the textile artefact. Drawing has a long history as an established method of visual research for a range of disciplines, including design and engineering, fine art, anthropology, and scientific subjects. As Steve Garner notes, drawing is used in these fields as both a means to visually record and explore possible ideas and concepts, prior to further investigations, but is also used as a tool for “problem solving and problem finding” (Garner 2008).

Textile designers work in specific subjects such as printed textiles, knitted textiles, embroidered textiles and woven textiles. Drawing expertise is used throughout the research, development and production schedule, in innumerable ways, including collecting visual research, the process of developing design ideas and for completing design collections. Both traditional hand-rendered methods, such as pencil, pen and ink, and painting, and CAD based methods such as Photoshop and Illustrator, are currently employed by designers throughout the design and production processes. Drawing for visual design research in textiles is a process of analysing objects or motifs for use, and the selection of suitable drawing processes and techniques for articulating a coherent design sense within a textile collection. In this way, drawing is used for image gathering and development, and as both an analytical and procedural tool.

However, research into the ways in which drawing may be used to explore the textiles themselves is less readily available. As a textile designer with drawing skills honed over many years, it seemed that the expertise and experiential knowledge of drawing as a means

for exploring a visual topic or motif prior to the design development process could be brought to bear on the interpretation and further understanding of textiles in their post-consumption phase. The design abilities of the practitioner, honed through many years of practice and research, can become instinctive.

As Laverty (2003) notes, methodology is not a prescriptive series of rules to follow, but must allow for a creative approach, which is both sensitive to the research context and a responsive approach which engages sensitively with the data. Phenomenological research has been proven to provide methodologically valid approaches for practice-based research in fields such as education (Van Manen, 1990).

Key to phenomenological analyses are the concepts of “bracketing” and the “natural attitude” (Husserl, 1970; 1982; 1989). The natural attitude is the everyday experience of being-in-the-world, in which consciousness is directed towards what Husserl (1970) terms our “pre-suppositions” and “pre-reflective expectations”. Through the process of bracketing the researcher suspends and sets aside their assumptions about the nature of an experience to allow themselves to explore a research question from afresh, rather than taking a teleological approach which frames the research question or data analysis in order to confirm a firm hypothesis (Van Manen, 1990). Methods of bracketing include writing down prior expectations of the research, before conducting an interview, keeping a memo pad throughout the both the research gathering, transcription and analysis (Smith et al. 2009).This is to ensure that the researcher approaches each piece of evidence from a fresh perspective (Aanstoos, 1986). Langdridge (2004) also recommends this process to as a method to provide ideas for further exploration between an interview's themes and theoretical links. The decision to explore drawing as a further method of visually analysing the textiles arose in response to such a memo.

Having taken an approach based on Interpretative Phenomenological Analysis (Smith et al. 2009) for the analysis of the research project, it was deemed necessary to investigate the possibilities that another type of experiential expertise – drawing expertise – could be used to understand and creatively interpret the textiles within the domestic textile archive themselves. In this way, the expertise of the draughtsperson / designer was applied to explore the tacit expertise of the craftsperson / embroiderer.

Through a process of reflection, the researcher can link their area of practice to the area of research. As one of the primary visual methods of research for the textile designer is through drawing and photography, it seemed likely that this skill-set could have potential for transfer to a more established text-based analysis. Not as a means for replacing such an established analysis, but as a mean for sensitively extending or exploring the lines of enquiry that have become apparent through text-based interview analyses.

Process

The process of drawing enables one to become immersed in a visual subject, and to experience a sense of “flow” (Csikszentmihalyi, 1992) whereby one is meaningfully engaged with a subject matter. As a phenomenological enquiry is one in which the subjective personal experience of the individual is recorded and analysed, in order to uncover their individual sense of an event or facet of their life, it seemed that there were parallels between the act of transcript analysis, through breaking down an interview into its themes, and visual analysis through selecting and focusing on areas within a textile through the medium of drawing.

Drawing is a way of connecting with these textiles, through using its potential to visually interrogate artefacts and its processes of simultaneously focusing and expanding an enquiry.

A series of exploratory drawings were worked up in a sketchbook, to explore different drawing processes and techniques, and the ways in which these could be selected and used to visually engage with the textiles within the research participant's domestic textile archive. Most of the techniques that were initially selected were rejected, as these were stylistically selected, from an aesthetically focused viewpoint in which variations in weight and flow of line, and tone and gradient of line were used creatively rather than hyper-factually or diagrammatically.

Ideas for areas to further explore arose from the text transcript. For example, in this case study the Richelieu embroidery which was left unfinished, with a hanging thread, was deemed of interest for visual exploration, directing the researcher to visually analyse and focus on this area.

For the purpose of exploring the textile artefact, the reason for creating the drawing was not to produce an aesthetically pleasing drawing, but to enter the world of the craftsperson through the singular focus on one aspect of the textile. Within this case study, 2 embroideries, a piece of Richelieu work (Figure 1) and a Crinoline Lady embroidery (Figure 2) were selected for visual analysis through drawing, for their emotional significance to their "curator" or owner for their emotional significance and representation of a period of time.

As Crowther (2009) notes, elements of style and interpretation are invoked through the embodied physical process of creating a visual artwork, including drawing. The intention of the drawing was to simplify the detail, creating areas of visual focus, and exploring the physical, embodied nature of creating a drawing. For example, in the drawings created to examine the Richelieu tablecloth (Figure 3) and Crinoline Lady embroidery (Figure 4) the focus was on the process of filling in the design, in the style of the original textile, rather than on creating a reproduction of the tablecloth. In this respect, tacit knowledge, that is knowledge that is "bound up in the activity and effort that produced it" (Sternberg & Horrath 1999) was deemed to be key to understanding the significance of the textiles, as their construction represented a key point in the research participant's personal history.

Fig 1. Richelieu Work Embroidery

Fig 2. Crinoline Lady Embroidery

Craft and Tacit Expertise

The knowledge that crafts-makers acquire and express in the practice of their craft is often tacit in nature. This knowledge is multi-modal, and encompasses the embodied interaction between themselves and the physical and conceptual manipulations of media, materials, process and technique. Through the process of drawing, a clearer understanding of the skill and process of the embroidery process was accessed and articulated. Within fashion and textile history, techniques used within object-based analysis have become established as a means to investigate clothing and textiles (Taylor, 2004). However, tension arises through having a partial provenance to work with when attempting to visually unpick and interpret these textiles; using drawing with another research protocol provides a contextual or interpretive addition to this knowledge.

For the research project a particular point of interest was the sense that something hand-made by a craftsperson had a special and intrinsic quality which precluded their disposal, even past their post-consumption life, whether these were made by the individual being interviewed, a friend, or a family member, even if these other people weren't particularly fondly remembered. As the focus in the study was on textile artefacts, these hand-crafted textiles were in the main embroideries, knitted toys and garments, crocheted items, and handmade lace.

Benefits of this Method: Drawing Expertise and Experiential Knowledge

Through the drawing process, specific elements became apparent in their importance, achieving prominence. The nature of the handmade articles brought a clearer understanding of the process that occurred in their making. In particular, the stroke of the pen, to represent a stitch, paralleled the slow, meditative process of embroidering.

Themes that arose included a sense of time passing yet suspended, through being immersed in the activity of drawing. Observations were made on the page as they occurred, and left for further analysis at a later date. For instance, one of the observations that arose during the process of drawing was an emerging sense of impatience as the drawing neared completion. This was paralleled in the interview data, in which the interviewee described how she would “get excited” towards the end of an embroidery. Though this theme from the interview had been picked up within the interview analysis, experiencing it through the drawing enabled a clearer sense of how this impatience manifested itself.

Of note was the limited interest in attempting to use drawings as a visual transcription of the mechanically manufactured pieces of textiles. The lack of the “human touch” imposed through the mechanical process of manufacture meant that possibilities for engagement were limited, and there was little insight to be gained from drawing these.

Findings

The process of drawing as a visual analytical method brings a different perspective to the process of a qualitative interview analysis. A comparison of 3 analytical processes: photographic analysis, drawing analysis and interview analysis are illustrated below in Table 1 in order to list the differences and emphasised areas of focus each approach had.

In particular, as Table 1 shows, there are different qualities which arise through each method of analysis. For example, the process of drawing enabled an in-road to the embodied experience of the interviewee's embroidery practice. This experience was described through the interview analysis, but replicating the embroidery through an “embroidery mark” in the drawing brought a greater understanding of the nature of this experience.

Themes within the interview analysis relate to the period of time and era that these embroideries represent, a period of incapacitation due to rheumatic fever when the interviewee was 20 years old. During this time, she was unable to climb her household stairs and was ensconced in her front room, by the fire, doing what she describes as endless knitting and embroidery. Though none of her knitting remains, 2 embroideries dating from this period were produced for the interview. Within the interview analysis, themes relating to temporality became apparent. This sense of time was expressed a long period in which normal life was suspended, when spent most of her time resting, and her wakeful periods were occupied with embroidery. This sense of time that was both occupied and suspended intertwined was described as being recalled as a merged time between the embodied experiences of being ill and producing embroideries.

Though linear drawing is a much quicker activity than producing an embroidered textile, the sense of time was one of the most noticeable aspects of completing the drawings. In particular, when drawing, there was a split between being acutely aware of time passing, and an accompanying sense of impatience for the completion of the task, with contrasting periods of time whereby the sense was of being absorbed within the task of drawing, and consciously unaware of time passing.

The sense of “filling in” was also apparent, in which the motif, proportions and design were already determined, and the purpose of the activity was to fill these in. In addition, a clearer understanding of one of the themes of the interview analysis, of impatience, was enabled. The interviewee describes feeling impatient to complete a design, excited as she neared the end of one, and wishing to move on to another. This was noted in the interview analysis data, but only through the process of completing the drawing was this fully realised and reflected upon, as a similar feeling of impatience to complete a drawing was experienced.

The embodied feeling of drawing the hanging thread, which represents the final stitch of her illness, felt emotionally poignant and particularly notable, as a means of finishing the drawing, as it was the last element to be drawn in. For the interview participant, this poignancy represented her return to wellness, and as such she described how this was the most emotionally resonant and important artefact in her domestic textile archive.

Fig 3. Richelieu work drawing

Fig 4. Crinoline Lady drawing

Table 1: Comparison of photographic, drawing and text analyses

Textile artefact: Crinoline lady	Photographic analysis	Drawing analysis	Interview analysis
Fabric	Heavyweight bleached cotton or linen	Folded and creased from storage	Fabrics arriving with the imagery on, ready to fill
Colour	Saturated hues contrasted with browns	N/A	Choosing the colours for the silk threads as part of the “design process”
Stitching	Colour dominates Stitch styles vary Shine of thread	Varied directions and scales of stroke to represent different types of stitch Weight of line varies Fine quality versus heavy weight quality	N/A
Process	Stitch onto base cloth	Skilled quality of mark Need for concentration to achieve uniformity	“Endless”

		Filling in the space of a design Need to control line of marks to retain direction of design	
Time	Mid 20th Century	Sense of time passing Impatience to complete Leaving areas unfinished Contrast between sense of time passing versus sense of time suspended	Folded and creased from storage
Significance	N/A	Skill noticeable Variety of type of stitch	Representing a period of ill-health and recuperation
Textile artefact: Richelieu	Photographic analysis	Drawing analysis	Interview analysis
Fabric	Heavy interior weight cloth	Folds and creases from storage Edges frayed	n/a
Colour	Beige cloth, brown thread Mid-century	Black on white	n/a
Stitching	Solid stitching Last stitch with hanging threads noticeable Cut-through areas more noticeable	Directional stroke to represent running stitch Fine quality Repetition Last stitch with hanging threads noticeable	Running stitch and buttonhole stitch
Process	Stitch and cut work	Filling in the space of a design	"Endless"
Time	Mid-20th century	Sense of time passing Impatience to	Representing a specific time – 1950 Representing an era

		complete Leaving areas unfinished Contrast between sense of time passing versus sense of time suspended Slowing down Visual interrogation processing	– 9 months of recuperation from illness and enforced rest Representing a location – downstairs near the fire Feeling impatient to complete Leaving areas unfinished
Significance	N/A	Feeling of completion set against incompletion	Representing a return to health, due to incompletion Most precious artefact in collection

Conclusions

Designed artefacts within material culture can be visually interrogated and analysed using drawing as an interpretive method. This is useful as a way of articulating the original practitioner's expertise and knowledge, as a means for reflecting on the process of the designer, and as a way of exploring the designed artefact as it has aged and been used through visually exploring its wear and tear. In this respect, the drawing process naturally lends itself to investigating artefacts in their post-consumption phase, beyond their utilitarian usage. Within this study, wear and tear on the textiles was minimal, even after 60 years, as the textiles had been carefully stored. However, the creased nature of the textiles, which had been kept within a chest of drawers, was noticeable in both the photographs, and where the creases had distorted the fabric.

Through removing extraneous detail, drawing allows a focus on one element at a time. This parallels the qualitative research process in which one theme is reflected on at a time, and giving it individual consideration to develop insights about each theme's quality. For example, on the Richelieu work the thread which was hanging down from the final stitch was equally visible in both the photographic and drawn images. However, removing the colour and other information made the thread more noticeable, and the process of drawing it made the finality of the stitch more evocative, in parallel with the described experience within the interview.

This paring down of the drawing process, enabling the drawing to achieve primacy as the point of private entry to the life-world of the individual shows how this approach can have value for a designer to support a qualitative approach.

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Aesthetic Experience and Design Expertise

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Abstract

An important part of design expertise is the ability to design objects that produce aesthetic affection. To shed light on the relationship between design expertise and aesthetic experience, this paper proposes a model of how aesthetic preferences are developed and understood. The model is derived by using a distinction between conscious and subconscious mental processes, which produces the four processes of "affection," "attention," "reflection" and "internalization." These processes can be seen as occurring in cycles, during which aesthetic preferences and understandings of such develop. Since the cycle of four processes only represents an idealized perspective of reality, possible deviations and their sources are clarified.

The usefulness of the model is investigated through interviews with four experienced architects. Although four cases are not enough for statistical generalization, the studies indicate that the model is a useful means for understating how aesthetic preferences are developed and understood. In fact, the interviewed architects seemed to believe that the kind of cycle described in the model may be the main source for gaining design expertise with regard to being able to create designs with aesthetic qualities. Other main findings include that the interviewed architects: (1) seem to have completed more full cycles of the proposed model than non-experts; (2) acquire a "catalog of means" for creating aesthetic designs by carrying out the cycles of the model; and (3) are highly aware of contextual factors to such an extent that they may be almost immune to being misled by them.

As well as serving as a means for understanding how aesthetic affection for design objects develops and how understandings of such affection are achieved, the model may provide a frame of reference for future investigations of the nature of design expertise, as well as the effects of contextual factors on aesthetic affection.

Keywords

aesthetic experience; aesthetic affection; design aesthetics; design expertise; design theory

Introduction

When design artifacts are noticed and appreciated, it is often for their aesthetic qualities rather than for their functional abilities. In relation to architecture, furniture and fashion, the importance of aesthetics is obvious, but aesthetics are often also extremely important for more technical products. For example, the successes of products such as the Apple iPod, the Fender Stratocaster guitar and the Dyson vacuum cleaner may, to a large extent, be related to their aesthetic qualities. However, it is often difficult to explain why a design object has aesthetic qualities, as opposed to describing its more concrete attributes (Snelders and Schoormans, 2004). This may be part of the reason that design expertise differs from many other kinds of expertise in the sense that experiential knowledge (episodic) seems to be

particularly important relative to theoretical knowledge (semantic) (Lawson, 2004). According to Lawson (2004), important reasons that designers are particularly dependent upon experiential knowledge are the ambiguousness of design problems and the integrative nature of design solutions.

Design expertise enables designers to create design objects that produce aesthetic affection for observers of the object. Although universal rules may be laid down with regard to how design aesthetic quality is achieved (e.g. Hekkert, 2006), such insights are far from actually giving one the ability to create original and beautiful design objects. In other words, design expertise comprises much more than what can be explicitly described. To shed some light on the nature of design expertise, this paper proposes a model of how aesthetic preferences and understandings can be seen as developing through cycles of four distinct processes. In this vein, the paper argues that a relationship seems to exist between the number of times such cycles are completed and the level of design expertise. This and related assumptions are supported by interviews of four experienced architects.

Literature

The literature review in this section resumes the areas of design aesthetics, aesthetic appreciation and design expertise.

Design aesthetics

The perceptions of aesthetics today are, to a great extent, based upon the ideas of German philosophers Alexander Gottlieb Baumgarten and Emanuel Kant, who represent two different perspectives. Baumgarten derived the term 'aesthetics' from the Greek word ‘aisthetikos,’ which means ‘pertaining to sense perception.’ In Baumgarten’s “Aesthetica” (done two parts: 1750 and 1758), the term is used to describe a philosophical discipline that investigates the “lower” sensual aspects of human experience, as opposed to the “higher” realm of logic (Folkman, 2009). From Baumgarten’s perspective, aesthetics refers to a science of sensitivity wherein beauty allows us to better understand the nature of things; and, thus, to some extent, echoes the old idea of intrinsic beauty (Fedrizzi, 2012). However, although Baumgarten is credited for coining the term 'aesthetics,' Kant is regarded by many as the establisher of the discipline of aesthetics within philosophy through his “Critique of Judgment” (“Kritik der Urteilskraft”) in 1790. In Kant's perception, aesthetic experience does not refer the determinate contextualized sensory experience of individual objects that Baumgarten refers to, but to an indeterminate orientation related to subjectivity and reason (Makkreel, 1996).

In philosophy literature, aesthetics has often been tightly linked with art. However, in recent years, there has been a tendency to loosen the connection between art and aesthetic theory and to revisit Baumgarten’s original idea of applying aesthetics to sensual matter. This movement from 'art philosophy' to ‘general sensuous experiences’ represents a new era of aesthetic theory that has been unfolding since the 1990s (Folkman, 2009). This paper leans towards such understandings of aesthetics, which can be exemplified by Walker’s definition:

> *The aesthetic experience of an object is an interlinked and inseparable union of sensory response and contemplative experience. As a sensory response, the object is enjoyed for its combination of qualities such as shape, color, texture, i.e. for its beauty. As a contemplative experience, the appearance of the object is studied for its significance and value; this can lead to a discriminating judgment, which is the basis of taste (Walker, 1995).*

Aesthetic appreciation

Literature has produced various explanations of the concept of 'design aesthetics.' Weggeman (2003 in Weggeman et al., 2007) found that in literature, aesthetic appreciation tends to be expressed as related to any of four types of explanations: (1) in balance, in harmony, at peace; (2) simple, complete, pure authentic; (3) exciting, adventurous, provoking, challenging; and (4) innovative, discontinuous, surprising, strange. The literature study of Blijlevens et al. (2009) compiled a similar set of words to explain aesthetics: harmony, unity, symmetry, proportion, typicality, massiveness, naturalness and delicateness.

A more in-depth understanding of aesthetic appreciation can be achieved through the concepts of 'emotional response' and 'cognitive response.' Desmet (2003) defines five overall types of emotional responses: instrumental, aesthetic, social, surprise and interest. Instrumental emotions (such as disappointment and satisfaction) relate to whether a product is perceived to allow the user to achieve his/her objectives. Aesthetic emotions (such as disgust and attraction) relate to the potential of a product to delight or offend the senses. Social emotions (such as indignation and admiration) relate to whether a product is perceived to comply with socially determined standards. Surprise emotions (such as amazement and unpleasant surprise) relate to the perceived novelty of a design. Interest emotions (such as boredom and fascination) relate to a perceived challenge, combined with promise. A 'cognitive response' refers to judgments the user makes about a design object based upon the information perceived by the senses. Based on a literature review, Crilly et al. (2004) define three categories of cognitive response: aesthetic impression, semantic interpretation and symbolic association. Aesthetic impression is defined as “the sensation that results from the perception of attractiveness (or unattractiveness) in products.” Semantic interpretation is defined as “what a product is seen to say about its function, mode-of-use and qualities.” Symbolic association is defined as “the perception of what a product says about its owner or user: the personal and social significance attached to the design.” Emotional and cognitive responses produce certain consumer behavior in relation to a design object (i.e. affection or avoidance). In addition to the design object itself, the response is also related to personal characteristics, cultural influences and situational factors. While "aesthetic emotions" are directly linked to "aesthetic impressions," the full range of cognitive responses may contribute to the full range of emotional responses; for example, instrumental emotions can be produced by aesthetic impressions, semantic interpretations and symbolic associations if the product is perceived to produce satisfaction of decorative, practical and social objectives (Crilly et al., 2004).

With regard to understanding aesthetic experience, the model defined by Leder et al. (2004) has been appraised by several researchers (e.g. Hekkert, 2006; Cropley and Cropley, 2008). Although the model focuses on art experience, it can also be useful in the context of design (Hekkert, 2006). In brief, the model by Leder et al. (2004) includes five information-processing stages that take place after an object has been classified as art: (1) perceptual analyses (structural features such as complexity, contrast, symmetry and grouping are extracted and analyzed); (2) implicit memory integration (mechanisms related to experiences that are not necessarily conscious to the recipient); (3) explicit classification (deliberate and conscious involvement of processing information of the artwork); (4) cognitive mastering (meaning is extracted from the artwork, including higher-order interpretations); and (5) evaluation (aesthetic judgment based on the interpretations). The five stages are connected in sequence and through feedback loops. The two distinctive outputs of the model are "aesthetic judgment" and "aesthetic emotion," which are seen to constitute the endpoints of aesthetic experience. According to the model, therefore, the interaction between cognitive and emotional processing accounts for the aesthetic experience of and preferences for art, while the way that these components interact is still unclear (Leder et al., 2012). If returning to Baumgarten's understanding of aesthetics, only the first two or three stages would be included, since it is in these mostly automatic stages that sensuous delight occurs.

A major theme in the discussion of aesthetics is the tension between subjective and universal aspects. Some literature has argued that aesthetic evaluations rely on universal standards, while other literature has argued that such evaluations are strongly subjective (Vessel et al., 2012). However, these perspectives are not mutually exclusive, and, in fact, it makes good sense to perceive aesthetics as including both universal (biological) and subjective (cultural) aspects (see e.g. Coates, 2003; Norman, 2004, pp. 29-33; Hekkert, 2006).

Design expertise

Across various research fields, there seems to be a general agreement that experts approach problems differently than non-experts. In the cognitive science, 'expertise' is defined as the skilled execution of highly-practiced sequences of procedures (Anderson, 1982; Ericsson et al., 2006). According to Ericsson (1999), deliberate practice guided towards improvement of performance is one of the key factors in the acquisition of expertise. In the same vein, Cross (2004) argues that part of what distinguishes experts from novices is that experts have been exposed to a large number of examples of the problems and solutions within in their domain, and that they are better able to recognize underlying principles, rather than merely focusing on the surface of problems.

Lawson (1994) studied outstanding architects though a series of interviews and observations. Lawson found many similarities in their ways of working, but also some differences. An important trait that appeared to be shared among these architects was their ability to keep openness to aspects at different levels of detail simultaneously. On the other hand, a significant difference was that some of the architects preferred to generate a range of alternative solution concepts, while others focused on a narrow range -- or even just one concept.

In relation to design expertise, Lawson (2004) identifies five stages that designers seem to pass through during the accumulation of expertise (each stage does not necessarily have to be completed before the next one can begin):

1) Acquisition of the design domain schemata

2) Development of a pool of precedent (at some point in this stage the designer may be seen as a professional rather than a novice)

3) Identification and development of guiding principles that further structure and filter the continued acquisition of precedent (at this stage the designer may become known for his/her ideas and be seen as an expert)

4) Development of the ability to recognize situations with little or no analysis

5) Building a repertoire of 'tricks' (or design gambits), which are integrated into the schemata that is used to recognize problem situations (at this stage designers may be seen as 'masters')

With regard to the last two levels, Lawson and Dorst (2009) argue that the development of high levels of design expertise appears to involve a change from a conscious struggle to effortless, even automatic, performance.

In the arts, judgments by trained viewers are generally believed to be more valuable than judgments by non-expert observers (Bourdieu, 1989). In this vein, Hochberg (1978, p.251) argues that "if he [the viewer] does not know anything about art, he cannot know what he likes." This is supported by several studies; the study by Hekkert and Van Wieringen (1996)

illustrated that art experts attach much more value to originality in determining the aesthetic quality of art works; the study by Augustin and Leder (2006) indicated that experts process artwork more in relation to style, whereas non-experts refer to criteria such as personal feelings; and the study by Leder et al. (2012) indicated that 'art experts' display greater flexibility and differentiation in art appreciation. Because of the sometimes blurry border between art and design and in the light of the findings by Lawson (2004) and Lawson and Dorst (2009), it can reasonably be claimed that the expertise of designers at least provide a more nuanced way of seeing design objects, as well as an improved ability to spot original features.

A model of the development of design aesthetic preferences

This section develops a model of how aesthetic preferences for design objects and the understanding of such preferences develop through experiencing design objects. Obviously, aesthetic preferences and understandings can also be developed by other means, not the least through design education. Since the focus of the paper is on the process of experiencing design objects, educational aspects not related to this process are outside the scope. In the following subsections, the basic concept of the model is presented, after which the effects of contextual factors and the relationship to design expertise are discussed.

Aesthetic preference development

As demonstrated in the literature review, design objects are experienced on both conscious and subconscious levels. Using the distinction between conscious and subconscious, four processes related to aesthetic experience can be defined as illustrated in Figure 1. It should be noted that all four processes do not necessarily occur when meeting a design object and that the model merely shows the logical sequence of processes. Next, the four processes are explained, after which possible deviations from the idealized model are discussed.

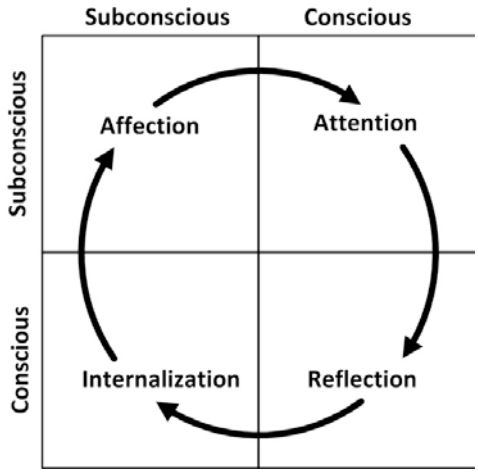

Fig 1. Development and understanding of design aesthetic preferences

The first process of "affection" describes a feeling (either positive or negative) produced by the meeting with an object. The movement from subconscious to subconscious in the "affection" process refers to the subconscious processing of sensory impressions into affection. Affective emotions can be seen as a product of a person's preferences, i.e. a predisposition for affection for certain design objects or object aspects.

The second process, "attention," describes the situation wherein a person becomes aware of affective emotions for an object. The movement from a subconscious state to a conscious state refers to the process of moving from subconscious feelings of affection to becoming aware of these feelings. In this context, it should be noticed that "attention" refers to "the awareness of some affective emotions," and not just the "the awareness of there being an object." In practice, it may be difficult to separate affective emotions from the awareness of them. However, from a logical perspective, feelings of affection must precede awareness of these feelings, even if there is only a split-second between such events.

The third process is "reflection," which describes the process where a person reflects upon the experienced affection for an object. The movement from one conscious state to another conscious state refers to the process of moving from conscious awareness of affection to conscious reflections emerging from this awareness. Such reflections may include attempts to try to understand why the affection occurred, comparing the object with other objects, associating the object with a particular style, etc. In addition to existing memory (e.g. object information, design theories, memories of other objects, etc.), inputs from texts and other persons may also affect the observer in this process and give rise to altered perceptions of the object. If, during the reflection phase, attempts are made at understanding aesthetic affection, knowledge about what is found aesthetic may deepen and knowledge about possible means for creating aesthetic objects may broaden.

The fourth process, "internalization," describes the situation wherein the thoughts of the "reflection" process are internalized in a manner that changes the predispositions for affection towards similar objects or aspects of that object. The movement from conscious to subconscious refers to the transformation of conscious reflections into internalized preferences, which works on a subconscious basis. If thoughts from the reflection process are internalized, this may imply a new way of seeing objects, in which case the predisposition for affection has changed.

The proposed model has some resemblance to the SECI (Socialization, Externalization, Combination, Internalization) model, introduced by Nonaka (1991) and later further developed through several other publications (e.g. Nonaka, 1994; Nonaka et al. 2000). The SECI model includes four processes that are created by using a distinction between tacit end explicit knowledge. Although these two types of knowledge have some similarity to subconscious and conscious experience, they are not exactly the same. Furthermore, in contrast to the proposed model, the SECI model focusses on 'knowledge conversion processes' and interaction between persons, for which reasons it describes a different kind of phenomena.

Deviations from the idealized model

As mentioned previously, the occurrence of one process does not necessarily imply that the next process is initiated. For example, a person may feel aesthetic affection without consciously realizing this, i.e. not moving on to the attention process. Also, the cycle may begin at different points. More specifically, an aesthetic experience can start with: a belief in affection for an object, although it did not produce such; reflection about affection towards an object, although it did not produce such; and internalization of affection for an object, although it did not produce such. Finally, in practice, there may also be iteration between processes. Figure 2 illustrates the types of deviations discussed: the four entry-points; the four exit points; and possible iterations.

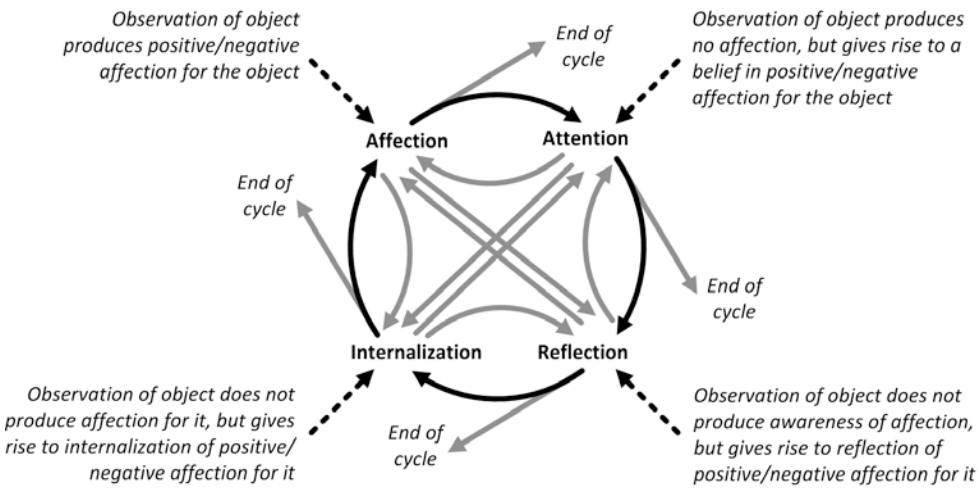

Fig 2. Entry and exit points in the model

Many of the mentioned deviations (Figure 2) from the idealized situation (Figure 1) can be explained by the effects of contextual factors. Such contextual factors can be divided into external and internal factors. The external contextual factors relate to the impressions which are received through the five senses, while the internal contextual factors include physical and emotional states, which may positively or negatively affect how receptive an individual is to aesthetic affection. The possible deviations from cycle in the idealized model (Figure 1) are highlighted in Figure 3. The full arrows show the "logical" sequence of processes, while the dotted arrows show the "illogical" sequence of processes that can occur. The latter types of sequences are consequently discussed.

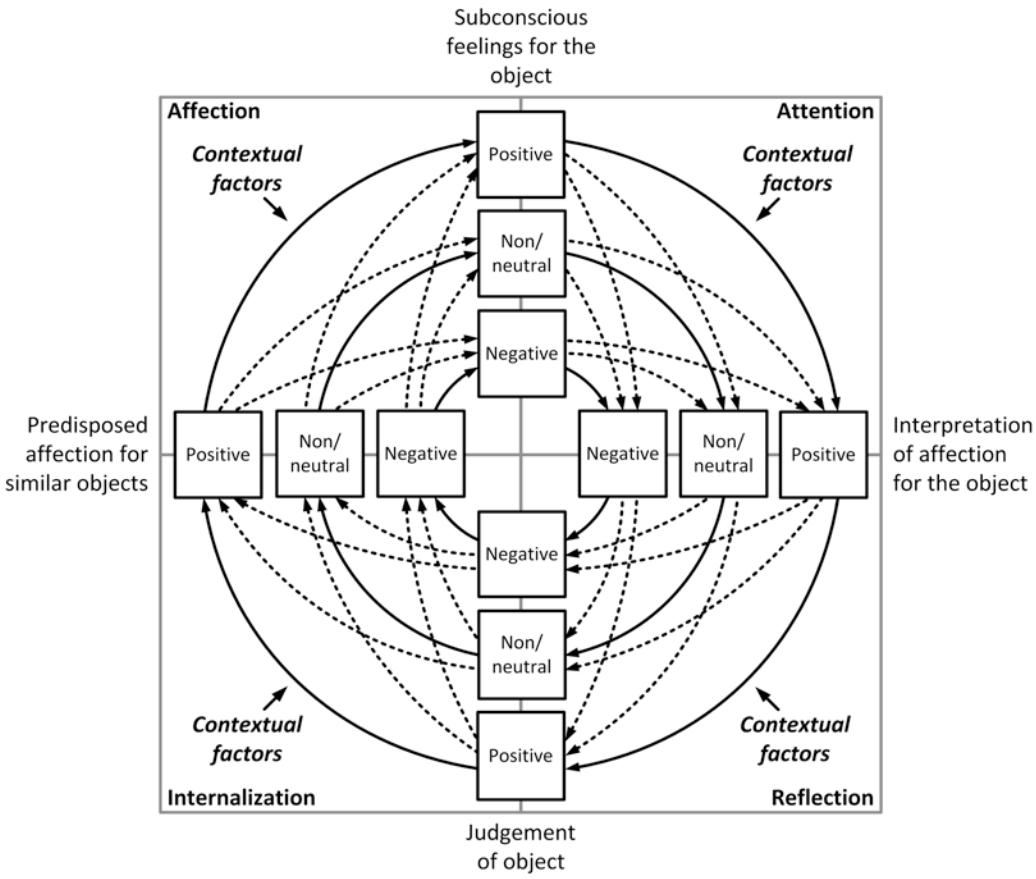

Fig 3. Possible effects of contextual factors

In Figure 3, during the "affection" process, the illogical sequences may be explained by sense impressions from the object's surroundings, which can make the person feel something else than what would be the case under more neutral settings. For example, a predisposition for positive affection for an object could lead to experience negative affection if there is a bad smell, ugly surroundings or the room is cold. Conversely, positive impressions from the surroundings may make an object appear more attractive. In addition, internal contextual factors, such as varying moods and stress levels, can affect the affection experienced for an object.

In the "attention" process, the sequences from positive and negative affection to "no belief in affection for the object" may be explained by contextual factors, which disturb the situation in such a manner that affection for the object does not come to the attention of the observer. For example, when observing an object in a context with many sounds or many other objects, the surroundings may claim the attention so to speak. Sequences from neutral and negative to positive, and from neutral and positive to negative, may be explained by the fact that the emotions produced by contextual factors are confused with affection for the object. For example, if observing an object while listening to music the person likes, the pleasant feeling from the music may induce a belief in affection for the object that under more neutral settings would not have occurred. Again, internal contextual factors, such as mood and stress level, can also affect what is brought to the attention of a person.

In the "reflection" process, the "illogical" sequences may be explained by inputs from others that affect the attitude towards the object. For example, if upon having experienced affection for an object, other people are criticizing the object, this may negatively affect the perception of the object. On a more internal basis, reflections about the design object in focus may result in a different conclusion than what was experienced in the "attention" process. For example, if upon thinking "this object is beautiful" it is realized that the object is designed by a designer that is not in favor, the person may dismiss the affection as being caused by "cheap design tricks" rather than quality design.

In the "internalization" process, the "illogical" sequences may occur in situations wherein the surroundings affect the experience that is internalized. For example, after initially having judged an object as attractive and thereafter experiencing feeling cold, stressed or other types of discomfort, these negative impressions from the surroundings may subconsciously become connected to the object in the mind of the person. Another type of illogical sequence can occur in situations where the judgment made in the "reflection process" differs from the type of affection the object produced, for which reason the judgment does not become internalized. For example, if positive affection was produced and discovered in the affection and attention phases, but a negative judgment was made in the reflection process (e.g. because of not liking the designer), the predisposition may differ from the judgment but still correspond to the initial affection experienced. In other words, we cannot decide what triggers our emotional responses to design objects.

Design expertise

The proposed model has two obvious applications, namely in relation to understanding reactions of consumers in a marketing context and in relation to investigating design expertise. As mentioned earlier, this paper focuses on design expertise. In this context, the model may provide a framework for investigating several issues, including:

1) The relationship between experiencing design objects and design expertise

2) The relationship between design expertise and awareness contextual factors

With regard to the first type of relationship, it may be assumed that there is a general relationship between the number of times that cycles are completed and the aesthetic understanding of the person carrying them out. In other words, design expertise may be developed through such cycles. Designers may also carry out cycles as observers, in the sense that they gain understanding of the preferences of others through observing and interacting with these as they go through the cycles. For the relationship between design expertise and the effects of contextual factors, it may be asserted that through repetitions of cycles, designers become increasingly aware of contextual factors, for which reason the effects become diminished. Such assumptions are investigated in the following section.

Empirical studies

Research method

The main contribution of this paper is the proposed model of how aesthetic preferences are developed and understood. However, to be able to say more about usefulness of the model, initial empirical studies were carried out. The focus of the empirical studies was to investigate the relevance of the proposed model in relation to understanding the development of design expertise. This was accomplished by conducting four semi-structured interviews with experienced architects (8-16 years of experience). The first two was face-to-face interviews each lasting 1.5 hours, while the last two interviews were conducted by phone and lasted 45-60 minutes. All interviews were digitally recorded for later analysis. Before the interviews, reference projects of the architects were studied in order to acquire a preliminary understanding of their work.

The interviews began by asking the interviewees to reflect upon on their experience with the four processes in the proposed model in the timeframe ranging from before starting their MA in Architecture until the present. Next, the interviewees were asked to reflect upon the development of their awareness of contextual factors in relation to evaluations of design objects during the same period. For both questions, the interviewees were asked to consider their answers in a professional as well as a personal context.

Main findings

With regard to the four processes of the proposed model, all the interviewed architects believed that during their career they had experienced an increase in the frequency of the four processes. In relation to the first two processes, the architects all expressed that, because of their interest in design, they seek meetings with beautiful design objects, including goods, interiors, buildings and spaces on a much more frequent basis than most other people. With regard to the reflection phase, they all found that this was the phase in which they were most certain of increased activity as compared to the time before becoming architects and as compared to others. In relation to the reflection phase, two types of thoughts were mentioned, which can be described as categorization and analysis thoughts. Types of "categorization thoughts" mentioned included placing object designs in historical contexts, categorizing objects according to design styles and relating objects to relevant consumer groups. Types of "analysis thoughts" mentioned included studies of means, rhythm, repetition, material quality, proportions, color combinations, texture and light reflection.

The importance of the reflection phase, according to the architects, is that it allows them to gain new means of creating quality designs. By understanding the means by which design objects achieve quality, the architects increase their own "catalog of design means." For example, studying original designs may increase insights into material types, ways of using

materials, original combinations, special finishes, assembly details, etc. In fact, all the interviewed architects saw this process of observing and reflecting as the main source of gaining design expertise, at least in relation to the aesthetic aspect of their job (more technical aspects were also found to be very important). According to the architects, some of these insights were applied on a conscious basis in design processes to begin with and, over time, became more internalized, i.e. applied without conscious thought. In this vein, all the architects felt that during their career they increasingly applied their expertise in a more automatic or intuitive manner.

In relation to the overall model, the architects believed that, as compared to non-experts, they had completed many more full cycles; i.e. completing all four processes of the model, mainly because they did not stop after the "attention" process. Two of the architects also mentioned that observing others going through the four processes (mainly the most apparent ones, "attention" and "reflection") was an important source of inspiration for them and a means for understanding potential consumers/users. Therefore, all four interviews can be said to confirm the relevance of the proposed model in relation to understanding design expertise.

In relation to the effects of contextual factors, all the architects believed that they because of their job had gained a solid awareness of how these can affect perceptions of design objects and materials. This was partly explained by the fact that they themselves use such design means in their own work. Also mentioned was the ability to mentally take objects out of their context and place them in others. Thus, they all felt that they had become capable of "seeing though contextual disturbances" during their career. The lack of an effect of contextual factors when evaluating design objects and materials should not be confused with not being open to the input of others. In fact, all the architects mentioned that inputs from others were often important (i.e. attitudes and reflections of others about objects). It was also mentioned that contextual aspects were related to the lifespan of the design object, in the sense that consideration was paid to how it would appear in different use situations and how it would age.

If the interviewed architects are as 'immune' to contextual factors as they believe, this would imply that they do not make poor design choices because of such factors. This at least corresponded with their memory, since neither of the architects could recall having made poor design choices that could be traced back to contextual influence. However, two of the architects mentioned that sometimes the emotions and physical conditions could imply less openness to new and more untraditional ideas, but not in manner in which contextual factors interfered with appearance evaluations. Additionally, it was mentioned that for buildings it is somewhat harder to ignore the context compared to consumer goods and materials because of the integration with the surroundings.

The high awareness of contextual factors was also perceived to have an impact on the architects in their private lives. This may, for example, be illustrated by the fact that few, if any, purchases of aesthetic products (e.g. furniture and clothes) were made that they later regretted. In this vein, all the architects stated that in relation to aesthetic products they made relatively few purchases, but these purchases were often expensive and based on considerations, rather than on impulse. If buying something of less design quality, they were very aware of this in the purchase situation, and did so based on other arguments than the appearance of the object. In fact, all the architects expressed that they had become less inclined to jump to conclusions about designs and materials.

Conclusion

This paper proposed a model of how aesthetic preferences and understandings develop through experiencing design objects. More specifically, the model describes aesthetic experience as a cycle of the four processes: affection, attention, reflection and internalization. The model may provide a frame of reference for further investigations into the nature of design expertise, as well as studies of the effects of contextual factors on aesthetic affection.

The usefulness of the proposed model was investigated through an initial empirical study in the form of interviews with four experienced architects. Although four cases are not enough for statistical generalization, the similarity of the answers produced by the four interviewees indicates the usefulness of the model in relation to understanding preference creation processes and the relation to design expertise. Additionally, the main findings from the empirical studies include that the interviewed architects seem to:

1) Complete more full cycles of the proposed model than most other persons; most significantly because they reflect more often on why aesthetic affection occurs

2) Acquire a "catalog of means" for creating aesthetic designs by completing cycles of the model, which may be the main source of gaining design expertise

3) Be highly aware of contextual factors to an extent where they may be almost immune to subconscious affection by these factors

Future research needs to conduct more empirical studies, which further investigate the model with regard to the development of design expertise and the effects of contextual factors.

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Developing Expertise and Connoisseurship through Handling Objects of “Good Design”: the Example of the I.L.E.A./Camberwell Collection

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Abstract

The paper develops from the study case of the I.L.E.A./Camberwell Collection. The I.L.E.A./Camberwell Collection comprises about 20,000 design and craft objects chosen by the London County Council and the Inner London Education Authority as examples of “good design”. It circulated in London schools between 1951 and 1976. The paper uses the Collection in order to discuss “handling” as a research methodology with particular relevance to expertise and connoisseurship in design history. It provides an overview of how expertise and connoisseurship diverge in their meaning and scope in the discipline of design history as compared to art history and adjacent disciplines, particularly material culture studies. The discussion also addresses two of my research objectives: one, to construct a history of the I.L.E.A./Camberwell Collection that situates the project of “good design” in its specific chronology and recognises its aesthetic limitations; secondly, to argue that the educational legacy of the I.L.E.A./Camberwell Collection lies in the implementation of “handling”. “Handling” is examined as a multi-faceted research tool: as an aspect of object analysis, as part of the Collection’s unique history, and as a desideratum for the Collection’s future use. Finally, the discussion enlists ontological approaches that aim to argue for the relevance of “handling” as a methodology that unlocks and significantly enhances expertise embedded in the artefact.

Keywords

design history; good design; handling; collection

Disciplinary Approach to the Research

This paper will draw on my PhD research on the I.L.E.A./Camberwell Collection (where I.L.E.A. is an acronym for the Inner London Education Authority), currently held at Camberwell College of Arts, University of the Arts, London (figure 1).

Fig 1. Display of I.L.E.A./Camberwell Collection artefacts at the Prospectus exhibition, May 2012

The artefacts in this Collection circulated in London schools as examples of “Good Design” between 1951 and 1976. It was acquired by Camberwell College of Arts when the Inner London Education Authority was disbanded in 1990.

One significant objective of my research is to explore the argument that the act of “handling” objects is a distinct methodology that enhances knowledge, and thus expertise about the artefact, in a unique and irreplaceable manner. In this pursuit I view myself as a reflective and reflexive agent. Both words, “reflective” and “reflexive” denote awareness of one’s own practice in the tradition of educational philosophers as John Dewey and Jean Piaget (Dewey, 1933; Piaget, 1952; Addison, 2003). In educational theory, the reflexive researcher is one who does not only reflect about his or her actions but who adjusts them accordingly as a result of reflection. In sociology, Pierre Bourdieu examines his own reflexivity in Homo Academicus, the sociological study he conducted on French academia. Bourdieu explains that:

> In the study I pursue a double goal and construct a double object. First the apparent object constituted by the French university as an institution, which requires an analysis of its structure and functioning, of the various species of power that are efficient in this universe […] and, second, the deeper object: the reflexive turn entailed in objectivizing one’s own universe’ (Bourdieu and Wacquant, 1992, p.67)

In the same text, he sums up with the comment that sociologists often fail to recognize that their discourse “is not the object but their relation to the object” (Bourdieu and Wacquant, 1992, p.69). These comments locate the discourse in a methodological frame that encompasses the activity of the researcher – in my case setting out to offer insights into a Collection that has evolved as a result of my own work but also as a result of the practice of others: designers, craftspeople, makers, manufacturers, teachers, collectors, local authority employees, students, administrators, conservators, critics, researchers. All those who have contributed, managed or used the I.L.E.A./Camberwell Collection, have been engaged with notions of expertise and have gained a degree of connoisseurship as a result. Furthermore, foregrounding matters of expertise and connoisseurship through reflection/reflexivity does not only refer to the Collection’s past. It draws attention to the I.L.E.A./Camberwell Collection as a dynamic resource for the present and the future and underlines that the practices of researching, of writing, of documenting, of exhibiting, of conserving, of teaching. It is these actions themselves that allow for expertise and connoisseurship to become apparent and to develop.

In the spirit of reflexivity, I situate my research in the disciplinary field of design history. In terms of applying professional expertise I consider the I.L.E.A./Camberwell Collection an ideal topic for the design historian since "design history is a discipline interested in all aspects of designed objects and images [and it] seeks to understand design in historical context, as conditioned by and bearing evidence of, the time and place in which it was undertaken and produced." (Lees-Maffei, 2010, p.1). Also apt is Tim Putman's view of design history's essential role "to explain the artefact" (Putman in Bird, 1996, p.134). This makes design historical approaches particularly relevant to this year's Experiential Knowledge conference, since "expertise" and "connoisseurship" can be conceived as two sides of the same prism through which to explain the artefact. It is important to keep in mind that "expertise" differs from "connoisseurship" in as much as "expertise" concerns the maker and connoisseurship the observer of the "made" – where "the made" ascribes to a wide definition, including the non-material.

In understanding how design history approaches the artefact and creates expertise from it, it is worth looking at adjacent disciplines, especially that of material culture studies, as the framing of the artefact in design history bears an affinity to how artefacts are considered in material culture studies. The work of Jules Prown in establishing a method of analysing material objects has been influential (Prown, 1982). Prown's artefact analysis uses investigative methods like description of the object's substance and form and the examination of the relationship between the object and the analyst. Based on the information derived from object analysis Prown suggests creative hypothesising as to how the sensory, intellectual and emotional engagement with the artefact yield useful results. Prown's subjective model extends traditional scholarly engagement that often rejects subjectivity as a valid research method. Prown recognises the input of additional allied disciplines, citing "archaeology, cultural geography, folklore and folk life, history of art, social and cultural anthropology, and social and cultural history". (Prown, 1982, p.10), though does not mention design history. Later work as that of Ezra Shales introduced design history into the U.S. mix of methodologies that informs approaches to visual and material culture (Shales, 2010).

The comparison between the fields of design history and material culture studies foregrounds the way notions of "expertise" and "connoisseurship" are problematised within design history: for design history the focus has mainly been on the output of industrial and post-industrial societies, on artefacts that necessitated a high degree of human intervention and intentionality since "design in the modern sense is a feature of advanced industrial/consumer societies" (Walker, 1990, p.126). Therefore design history developed in the U.K., the first industrialised nation, while material culture studies developed in the U.S., a relatively new nation where "most artefacts 'Made in America' were not elite, high-style objects but rather vernacular, folk creations" (Schlereth, 1982, p.21). In contradistinction, design history has often had an explicit aesthetic agenda: early texts, such as Stephen Bayley's In Good Shape (Bayley, 1979) bear evidence to that. The prevalence of the aesthetic is the legacy of modernism and can be detected in many more key design historical texts (Pevsner, 1991 [1936]; Naylor 1973; Sparke 1986).

Design history acknowledges the contribution of connoisseurial knowledge, which may be built over years of experience and can provide the bridge between the known and the assumed. There are areas of cultural life where connoisseurship is highly regarded, as for example within the fine arts market where there is vested interest in the placement of a work in the high-end of the production spectrum since that placement translates into increased monetary value. Scholars have identified the corrosive relationship between connoisseurship, the art market and the function of public and private institutions. Design is not immune from this affliction: in many respects the design market mirrors the fine art market and reproduces its distortions.

However I wish to argue that in design history, connoisseurship is a contested skill, because, while design history recognises the need to implement connoisseurial knowledge in order to authenticate collections, connoisseurship’s associations with the elite art object problematises design historical discourses of mass production. In order to overcome this, design history sometimes implements “object-analysis” as a preferred methodology. In Pearce’s Interpreting Objects and Collections (Pearce, 1994) the models of object analysis offered imply that “rather than succumbing to the temptation to consult printed or written works when confronted with an unknown object, [...] the material historian should develop a grammar in order to read the artefact.” (Elliott et al in Pearce, 1994, p. 115)

Developing the model proposed by Prown, object analysis contributes to this ‘grammar’, by grounding the artefact in its observable qualities and presenting a set of rationalised criteria as a first level of interpretation. Sensory engagement with the artefact yields observable data and while “handling” is not a strict necessity of object analysis, it facilitates and enhances it (figure 2).

Fig 2. “Teacher John Morley, at Bow Secondary School discusses the qualities of wood” photograph from the Design Council Archive, University of Brighton

I align “handling” with haptic knowledge and I define haptic knowledge as knowledge derived from touching and handling material objects. I use the word “handling” in preference to “touch” because I want to extend the notion of “touch” by including the action of holding, which the terms touch, tactile, tacit do not necessarily imply. As a design history researcher I use handling as an aspect of object analysis. This allows me to resist contextually imposed hierarchies of connoisseurship where certain non-inherent qualities, for example rarity, position the object within a value system that either excludes or awards low status to objects of mass-production. The complication introduced by this one aspect of “connoisseurship” is a constant problematic in my research, in both the historical and the contemporary context, considering that the “good design” agenda is itself directly dependent on value judgements. The following section explores how the context of “good design” in connection to the I.L.E.A./Camberwell Collection may be analysed as a historically situated project. This example will highlight the temporal and cultural limitations of discourse in “connoisseurship”.

Establishment of the I.L.E.A./Camberwell Collection and the Project of “Good Design”

One objective of my research is to provide a linear history of the I.L.E.A./Camberwell Collection and situate it in the history of government schemes that aimed at educating the

taste of the public. The I.L.E.A./Camberwell Collection was instigated by the Council of Industrial Design and the London County Council in the aftermath of the 1951 Festival of Britain. The London County Council was superseded by the Greater London Council and its Education Authority, “I.L.E.A.” was set up in 1965. The Collection was initially referred to as the Experiment in Design Appreciation, and its implementation belongs to a long history of the British state acting as an arbiter of taste with the objective of improving the output of manufacture.

Education of the public in matters of taste was discussed in the 18th century, but the debate gained momentum since the early 19th century, and particularly with the establishment of the Schools of Design in 1837. During the 19th and into the 20th centuries, the government’s attempt to reform public taste was articulated in tandem with the attempt to reform the education of designers and to influence the output of manufacture, though as Malcolm Quinn has recently shown in his Utilitarianism and the Art School the management of taste in the hands of government has not followed a uniform rhetoric and there was, during the 19th century, a cacophony of public opinion based on different factions’ vested interests and producing little consensus. Utilitarians for example put public welfare above the distinction between “good” and “bad” taste, while Henry Cole and Richard Redgrave established public taste as a “priority discourse”. (Quinn, 2011).

By the early 20th century there had been a number of government-backed committees and reports, which advanced the argument of reforming manufacture and consumer choices in Britain. Of notable influence to the idea of support for British manufacture through education and state guidance, was the Meynell-Hoskin Report of 1944 (Boards of Trade and Education, 1944), which specifically stated that its main objective was the “establishment of a Central Design Council”. Furthermore, the Meynell-Hoskin Report returned to the subject of “simple sets of exhibits illustrating the principles of good design”, a plan that the Art and Industry Council had been considering before World War II (Boards of Trade and Education, 1944, p.9). The report’s recommendation for a grant-in-aid led to the establishment of the Council of Industrial Design, the authority that would dominate design discourse in Britain during the decades following World War II.

Fig 3. Council of Industrial Design, Design Council Archive, University of Brighton

In its capacity as custodian of the message of “good design” the Council of Industrial Design needs to be identified as a paternalistic institution that was mostly made up of male industrial designers (figure 3). The Council’s first chairman was Gordon Russell, the celebrated designer who had produced much of the furniture for the Utility scheme. Russell’s profile is fairly typical of the designer/hero model that modernism favoured during its “pioneering” and “disseminated” phases. I borrow the distinction from Paul Greenhalgh who identifies the first

half of the twentieth century as modernism's pioneering phase and the post-war decades as its disseminated phase (Greenhalgh, 1990). Keeping this in mind helps to consolidate the boundaries of modernism for the purpose of this paper.

The relationship between the recognised designer and the product, as this relationship is acted out in the professional field, reveals design history's fundamental paradox: in its effort to emancipate itself from the "parent" discipline of art history, design history rejected the elite object and its engendering hierarchies. However, there is an inherent conflict since in its early stages design history's adherence to the designer-hero and the superior object, favoured a set of values that inevitably mimicked connoisseurish aspects of fine art.

In order to liberate and distance design from this flawed model, we need to keep in mind that design has unalienable ties to usage, and that it generally cannot exist outside the market-place, while aspects of its value are dependent on consumption (it succumbs for example to the law of supply and demand). Adrian Forty replying to Victor Margolin's attack on design history's pre-occupation with "good design" points out that "far from being trivial and connoisseurish, the whole question of judging quality in design, of discriminating between good and bad design, is essential to the entire activity of design." (Forty, 1995, p.16).

Forty's call for value judgements contributes a crucial distinguishing parameter, that has implications on our understanding of the I.L.E.A./Camberwell Collection: to think of the objects as simply "designed" is not particularly helpful because the notion of design is broad. "Design" defies a singular taxonomy and includes the "combined embodiment of configuration, composition, structure, purpose, value and meaning in man-made things and systems" according to Bruce Archer, former director of the Design Research Department at the Royal College of Art (Archer, 1981, p. 30). Yet to think of the objects as not merely "designed" but as "well designed", opens up the possibility of locating them in the taste context that the Council of Industrial Design rigorously pursued in connexion to the I.L.E.A./Camberwell Collection and it also opens up the possibility of tracing how this taste context was constructed by the London County Council (1959 to 1965) and later, by I.L.E.A (1965-1976).

"Handling" and "Good Design" within the I.L.E.A./Camberwell Collection

The I.L.E.A./Camberwell Collection's predecessor, the Experiment in Design Appreciation, functioned as a teaching resource, circulating in London secondary schools between 1951 and 1976 with the explicit aim of teaching schoolchildren, "the consumers of tomorrow" the principles of "good design" (Pavitt, 1996). Circulation started with only three displays in 1952: "Textiles", "Pottery" and "Wood". Initially these travelled only in London secondary schools "that enjoyed art teaching of outstanding quality" as judged by the London County Council's art inspectorate (Stevens, 1967). By the late 1960s, the project had expanded and individual displays numbered 58, with the aim of producing multiples of 6 for each display, though primary sources indicate that this ambition was not realised when the I.L.E.A./Camberwell Collection was withdrawn from circulation in 1976 (Carolis, 1976).

Right from the stage of its inception the scheme was meant to be subjected to non-specialist "handling" and this can be identified as one of the three immutable principles that remained standard for the duration of the scheme, the other two being the commitment to "good design" and the commitment to circulating the exhibits. Sporadic remarks, like that found scribbled on the back of an original photograph, bear evidence of how design appreciation was supposedly achieved through the action of handling: "particularly with the wooden object,

the first instincts of the child was to feel” (figure 2, John Morley and Class at Bow Secondary School, undated). The unknown author of the note evidently felt compelled to add this observation. One example of how displays anticipated “handling” is the “Woven Textiles” case which included fabric pieces loosely attached to the display, known as “feelies” (figure 4).

Fig 4. London County Council display Woven Textiles, 1950s, uncatalogued photograph from the I.L.E.A./Camberwell Collection Archive

Handling remained of paramount importance throughout the life of the project. Apparently the L.C.C. and later the I.L.E.A. were not discouraged by the breakages, the need to clean fabrics and the “missing” items they had to constantly replace – these actions are well-documented in the I.L.E.A. record cards of the 1960s and early 1970s, held at the Metropolitan Archives, London. Handling necessitated large quantities of multiples and these are still present in the Collection: for example, items by glass and porcelain firms such as Arabia, Iittala, Kosta Boda, Old Hall, Wedgwood, Whitefriars, are found in significant numbers.

The appreciation of “good design” was supplemented by written panels that aimed to communicate “good design” principles, often using the technique of extracting answers through a series of questions. In the set entitled Materials and Design made of three displays, the text invites pupils to think about the context of usefulness that informs design:

When you are deciding whether a thing is well designed it is helpful to ask yourself questions like these: does it do its job well? Is it easy to clean? Does it take up too much room when not in use? Is it likely to last? (Anonymous photograph “Materials and Design”, undated)

This remarkable consistency with the terminology of functionalism and faith in the inescapability of “good design” is perhaps the overriding characteristic of the early stages of the scheme and the main criterion for object selection. However, the history of the I.L.E.A./Camberwell Collection, discloses the historical boundaries that confine the message of “good design” in the immediate post-war period. By the mid-1960s, good design’s associations with functionalism were rendered largely irrelevant, as evidenced in the flourishing of pop culture.

My research suggests that during the I.L.E.A. phase there occurred a weakening of the message of “good design”. This development concerned not only the Inner London Education Authority, not even just the visual and applied arts in general; it was connected to a rapidly changing cultural field that reflected changing social structures in areas like gender equality, distribution of wealth, education, immigration – changes which occurred on a large enough scale to affect all social strata and both genders. So while the research suggests that “good design” had been endorsed as a straight-forward and unproblematic frame for the

scheme in the minds of its instigators, historical scrutiny across time highlights considerable deviation from good design's original objectives, to the point where "good design" becomes an entirely different proposition by the late 1960s (figure 5).

Fig 5. I.L.E.A. display Pop, Folk, Modern 2, 1968, uncatalogued photograph from the I.L.E.A./Camberwell Collection Archive

The I.L.E.A. display "Pop, Folk, Modern" of 1968 clearly signifies that the pre-eminence of functionalism was by that time under threat and even the arbiters could no longer recognise one single standard of taste. Design historian John Walker describes how "a disturbing relativity of values became evident and disagreements between different factions about what constituted good taste and good design became fiercer" (Walker, 1990, p.191). "Kitsch" or "camp" became desirable and absorbed into "pop" – a word, which loosely defined the taste of a new post-war generation. The I.L.E.A./Camberwell display "Pop, Folk, Modern" can be viewed as a response to this new perception of design. It was evidence such as this that led me to an awareness of the Collection's limitations as an educational channel that would, or even could, inculcate the preference for a specific "modernity" on the "consumers of tomorrow". The trajectory of "good design" as this is observed in the history of the I.L.E.A./Camberwell Collection suggests that connoisseurship's success is dependent on a fixed frame of reference. Teaching students to recognise "good design" became irrelevant when the whole context of "good taste" was in flux.

"Handling" and its Philosophical and Educational Contexts

Understanding good design's limitations allows for a broader perspective of the I.L.E.A./Camberwell Collection's educational legacy. As the previous discussion has shown, expertise gained through the use of the Collection as an archival body of objects, transcends the confinements of "good design". My research proposes that this Collection's value and strength lies in its function as a "handling" resource.

"Handling" is a universally accessible modality and it can inform expertise through engagement with material culture. The deceptive obviousness of this statement conceals a long and contested discourse on the relationship between consciousness and the material world. In my research I chose to ground "handling" in the theory of phenomenological philosophy in order to argue handling's necessity in our understanding of the material world. An inside/outside ontological dichotomy lurks behind the apparent matter-of-factness of claims that sensory engagement yields knowledge; this dichotomy foregrounds a diachronic ontological problem dating back to René Descartes and beyond concerning perception's reliance on representation rather than sensory input.

Merleau Ponty in the work that is perhaps of most relevance to my research, *The Phenomenology of Perception* explains that Descartes and particularly Kant, detached the subject, or consciousness, by showing that "I can not possibly apprehend anything as existing unless I first of all experienced myself as existing in the act of apprehending it." (Merleau-Ponty, 2002, p.v). Merleau-Ponty's project focused on revealing the role of our bodily existence in giving meaning to the world we perceive, and is thus an important advocate for "handling".

I also enlist Martin Heidegger and his teacher, Edmund Husserl, who called for the faithful description of phenomena, as opposed to metaphysical speculation. Husserl's crucial contribution has been the attempt of bridging transcendental subjectivity and the external world through the study of "embodied agents immersed in worldly situations." (Carman, 2005, p.9). Heidegger and Merleau-Ponty built on Husserl's foundation. In both we find the idea that our conceptual thinking is "embedded" in the everyday, in the condition of "coping". To the philosophers, this "coping" is before and beyond learning. Heidegger calls it "zunächst und zumeist" (translated as "prior and pervasive" by Carman, 2005, p.35). We are born as "coping" infants and we are inducted to speech after already existing in this coping for years.

This explains why Merleau-Ponty places emphasis on the child and particularly the pre-linguistic child. He sees the revelation that language brings to the child as the instrument that makes the existence of objects manifest. Though Merleau-Ponty says that language is the particular cultural object which is destined to play a crucial role in the child's perception, there is an enchanted pre-linguistic infancy where

> The child lives in a world which he unhesitatingly believes is accessible to all around him. He has no awareness of himself or of others as private subjectivities, nor does he suspect that all of us, himself included, are limited to one certain point of view of the world [...] Men are, for him, empty heads turned toward a single self-evident world. (Merleau -Ponty, 2002, p.13)

Merleau-Ponty then goes on to explain how language shatters this accessibility by imposing boundaries that gradually reveal the child's environment as a highly structured and regimented place. My research interest lies in the prior condition, the condition of innocent accessibility, that Merleau-Ponty calls the "primordial silence" (Merleau-Ponty, 2002, p.214): "Our view of man will remain superficial so long as we fail to go back to that origin, so long as we fail to find, beneath the chatter of words, the primordial silence." (Merleau-Ponty, 2002, p.214).

It is in the space afforded by the primordial silence that the true connectedness between the material world and our private one occurs. These observations are of particular relevance in the context of learning in educational institutions and museums. Learning activities involving handling foster connoisseurship and expertise in students; they provide a material anchor for abstract ideas about history, culture and society. They empower the individual by promoting a type of advancing expertise and connoisseurship through ownership of the learning process and the development of a sense of entitlement towards artefacts. Especially in museums, handling activities counter-balance the subliminal message of connoisseurship as the prerogative of museum curators and other professionals by creating a space where anyone may gain significant insight in aspects of material culture. The discussion on the I.L.E.A./Camberwell Collection suggests that while the expectation of educators in instigating a connoisseurial understanding of "good design" was arguably misjudged, the handling aspect of the scheme may have resulted in the cultivation other types of connoisseurship, the connoisseurship that allows for the notion that artefacts are a repository of knowledge to be shared by all mankind, may flourish.

Conclusion

In this presentation I have firstly analysed the connection of my research to the role of expertise and connoisseurship in design history: I have discussed how these terms diverge in their meaning and scope in my chosen discipline and how they problematise it. I have also discussed two of my research objectives: one, to provide a history of the I.L.E.A./Camberwell Collection that situates the project of "good design" in its specific chronology and recognises its aesthetic limitations; secondly, to argue that the educational legacy of the I.L.E.A./Camberwell Collection lies in the implementation of "handling". "Handling" was examined as an aspect of object analysis, as part of the Collection's unique history, and as a desideratum for the Collection's future use.

Finally, my research enlists ontological approaches not with the intention to privilege subjectivity in our interaction with material culture, nor to suggest that expertise only takes place in the "enchanted", non-articulable space, the space of "primordial silence" between the user and the object. The aim is to argue for the relevance of "handling" as a methodology that unlocks and significantly enhances expertise embedded in the artefact. In design history this might translate as gaining insight into industrial processes or the appreciation of a maker's skill as this is captured in the materiality of the end artefact.

Furthermore, my research aims to support "handling" as a unique learning opportunity in a cultural field where it is constantly under threat due to its inherent conflict with conservation. Therefore "handling" emerges as a methodology that adds to the armoury of connoisseurship in design history by investigating the personal as prerequisite for the universal and proposing that through accumulated personal experience, consensus on matters of expertise and connoisseurship may be reached.

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Design History, Connoisseurship and Sustainability: Object Lessons and Collecting as Learning Tools for Designers

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Abstract

The academic discipline of Design History is sometimes accused of having a connoisseurial approach, something which arguably fosters the creation of false hierarchies and subsequently leads design students and the design community to create products which are environmentally, socially and economically unsustainable.

The first part of this paper takes the work of sustainable design theorist Tony Fry (2009) as a starting point by which to evaluate this proposition. Fry has been critical of design history, claiming that a focus on style and the icons of design to has resulted in a lack of student interest in the real issues of the day. Simultaneously he has attested that that the key to any new formulation of design practice is "redirection" of existing design practice. Redirection, simply put, seeks to collapse the boundaries between the disciplines and to foster new knowledge by which to address the pressing issues around sustainability. With new knowledge and new practice, designers become better placed to mitigate the "defuturing" tendencies which characterise contemporary design disciplines.

As a counterpoint to Fry, a particular focus of this paper focuses on the work of an author whose work is at the heart of connoisseurial practice. Charles F. Montgomery's "Science and Practice of Connoisseurship", published in 1961, (cited in Schlereth, T.J., 1982) describes a series of methods by which to consider the study of artefacts and collections. The incorporation here of Montgomery's work is an attempt to re-evaluate (redirect) connoisseurship, object lessons and collecting towards more acceptable academic aims and principles. In particular, the proposal within this paper is that connoisseurship may serve to engage students of design in more realistic understandings of objects, materials and impacts.

Thus, part two of this study thus proposes a meeting of Fry's redirection strategy and elements of Montgomery's Fourteen Steps of connoisseurship. In this part, a series of experimental interventional exercises are carried out with a group of 15 product design students in a UK university. The exercises are set against the ideas of Stuart Walker (2006) and others theorists, who assert that designers need to reconnect with objects to counter the dematerialised practices of modern industrial design practice. The aim of the exercises is therefore to relocate objects as the central motifs of design historical practice.

The interventions with students incorporate questionnaires about collecting, the curation of collections, design historical writing and creative writing about objects. Findings establish the potential for a reconsideration of a modified connoisseurial approach and the further evaluation of the role of Design History at the service of sustainability.

Keywords

design history; sustainability; connoisseurship; product design; redirective practice

Part One: The Background to the Project

The Status of Design History and Connoisseurship

In 2009 Tony Fry published his book *Design Futuring: Sustainability Ethics and New Practice*. In the same year, (as main contributing editor, with Anne-Marie Willis as Editor), he brought out a special two part edition of their journal, *Design Philosophy Papers* (DPP) about "Design history futures" (2009) with a view to interrogating the role of academic Design History in the context of sustainability studies. DPP is a journal with sustainability philosophy at its heart. The terminology "sustainability" as Fry and Willis present it, recognises the inter-relatedness of environmental and social equity agendas. Fry calls to the design community to consider its culpability in generating unsustainable practices and its potential to provide sustainable change. Both *Design Futuring* and *Design history futures* offer up opportunities to question the role of Design History within the context of economic, social and environmental crises. Fry's essential view is that Design History is a significant agency in the transmission of values about the way in which design is practiced and how designers ascribe value. The main problem of Design History however is that rather than seeing this bigger picture, that it

> ..just does not recognise how design has been a significant agent of historical change beyond micro-impacts. It also lacks the sense of how design inflects futures, which by implication means it is history without a theory of history. (Fry, *Design Futuring*, 2009, p.122)

For Willis (2009), DPP's editor, Design History's pluralistic approach is seen to be at one and the same time its strength and its "inadequacy" (Willis, 2009, *Design Philosophy Papers, Editorial).* Her editorial in *Design history futures* states that *"In the academic journals and at conferences, the more "critical" topics and methods sit alongside papers on style, taste, artistic movements and canonised designers"*. (Willis, 2009, *Design Philosophy Papers, Editorial)* This distinction between critical and (therefore) less critical Design Historical methods is essentially a critique of the problems posed by the type of Design History which emphasizes style over content.

> ..rather than broadening the view of its object of study so that design is politically, socially and historically contextualized, such history mostly presents design as historically decontextualized. Thus, design is viewed as a particularist concern, grounded in aesthetic or historicist predilections based on connoisseurship, or it is implicated in a popular cultural celebration of kitsch, style or fetishized objects. (Fry, 2009, *Design Futuring,* p.122)

Many of the papers in Design History Futures rallied to Design History's defence, as one would expect. Such was the case with Anne Massey and Paul Micklethwaite, who argued the need for "a New Design History which does not eschew everything from the original Design History, in the spirit of sustainability." (Massey & Mickethwaite, 2009). As part of this argument they proposed that a "focus on the artifacts of everyday material culture is central to the sustainability debate". (Massey & Mickethwaite, 2009). By implication, Massey and Micklethwaite are also of the mind that connoisseurship of objects may have a place in the repertoire of Design Historical approaches. The second part of this paper attempts in part to respond to this and other imperatives which call for object lessons to be a central motif in the sustainability agenda.

Fry, the University and Redirective Practice

Fry's (and Willis's) propositions have prompted this paper and the direction it takes. Analysis of the Fry critique reveals that he takes fundamentally the same trajectory as Ivan Illich

(1973) in his *Deschooling of Society,* where the institutionalization of learning tends towards the institutionalization of society. In this model the modern university (read schools of art and design, design teachers, design historians and designers), becomes culpable in the defuturing of society and our planet. According to Fry it is the idea of a university in ruins which "inducts learners into unsustainable ways of thinking and acting". (Fry, *Design Futuring*, 2009, p.12)

It is possible to see similarities between Illisch's *Deschooling* tendencies and Fry's own theory which he calls *Defuturing*. Through the design and production of things, we act to "take futures away from ourselves and other living species" (Fry, *Design Futuring,* 2009, p.1). The environmental, social and economic crisis, in which contemporary globalised society now resides, is therefore the consequence of the badly structured educational systems, and their inability to give equal focus to both cause and effect. Both Illich and Fry decry the politicised and progressivist tendency of education to value-creation rather than problem-mitigation. The upshot for this paper is that the whole premise of design scholarship and activity is challenged. And likewise the nature of the design disciplines.

"Disciplinary thinking, by its very nature, is exclusory and thus has a limited ability to comprehend and engage the relational complexity of unsustainability and the creation of sustainment….What redirective practice enables is practical transformation of knowledge in action." (Fry, 2009, *Design Futuring*, p. 55) The challenge for Fry and those who subscribe to his views therefore is to "redirect" our learning and our attitudes away from institutionalizing modes of designing towards those where we can apply new structures and new knowledge.

The main thrust of the idea of redirection is that it highlights the error of our ways and, most importantly, identifies new knowledge that fosters sustainability. In the context of Design History, and this project, we might therefore contemplate that this re-appraisal of connoisseurship and the manner by which it can lead to new knowledge, constitutes part of this redirection. This may in turn foster practices which serve to reconstitute professional activity. Fry suggests that,

> a great deal of knowledge that historically has been acquired as the corpus of the discipline underpinning a profession, and the manner of its deployment, could well need to be discarded and replaced in order for any real ability of the 'remade professional' to drive affirmative change. By implication this means that the being of professional identity and conduct is radically and structurally changed. (Fry, 2009, *Design Futuring*, p. 11)

How does this work in practice? If the concept of redirection suggests that connoisseurship needs to be re-evaluated, we need also to consider both what connoisseurship was and how it came to be considered a pejorative terminology. In addition, if we take redirection to mean rejection of the narrow parameters of the disciplines (in favour of a meta-discipline), then by extension, it may also be necessary to consider a reformatted connoisseurship with a different master, in effect, sustainability.

On the Connoisseurship of Things: The Object as Motif

Most Design Historians, in their training, have come across the author and theorist of connoisseurship, Charles F. Montgomery (1961). The premise for the introduction of Design Historians to Montgomery's text entitled *Some Remarks on the Practice and Science of Connoisseurship,* (originally published in American Walpole Society Notebook in 1961 and cited in Schlereth,1982) is to establish the journey which the discipline of Design History travelled in the 1970s and 1980s. In part, it is studied also to create an understanding of the short-comings of such an approach.

For the purposes of this paper connoisseurs are, by their very nature, considered also to be collectors, since they acquire both objects and knowledge as part of an on-going cumulative process. Montgomery's text cites a number of definitions of connoisseurship. Firstly it is "a way of looking at and appraising objects…one of the cultural hallmarks of the Renaissance gentleman" (Schlereth, 1982, p.143). Secondly, it is part of the one of the qualifications of "Becoming a Gentleman" (Schlereth, 1982, p.143) himself professes that "connoisseurship still retains this association with a self-proclaimed, discriminating gentility, with a special almost secretive artistic sensitivity possessed only by a privileged elite of curators and collectors of objets d'art".(Schlereth,1982, p.143). Clearly, much of the connoisseur's skill lies in an aesthetic sensitivity to abstract concepts such as "grace" and "line" and "harmony". For the likes of Fry, this approach will offer little to the broader discussion of design and extended debates about sustainability.

In spite of a rather elitist feel, Montgomery's approach to connoisseurship may yet reveal something of use for the designer. More than anything he stressed the centrality of objects and object lessons to learning. As such it may be possible to align the "immersive" approach that he describes to engender a more connected attitude to objects and what can be learned from them. Such activity, based on constant handling, observation and reappraisal, may offer new insights into the value of objects and the hierarchies which they occupy.

"The Fourteen Steps", "Does it Sing to Me?" and Other Object Lessons

It is the manner of looking at objects which the Montgomery article is so potentially useful. In a Fourteen Step plan (Schlereth,1982, pp.145-152) Montgomery offers a number of ways of appraising objects. Each step is elaborated with a series of case lessons, some of which are referred to below.

1. Over-All appearance
2. Form
3. Ornament
4. Color
5. Analysis of Materials
6. Techniques Employed by the Craftsman
7. Trade practices
8. Function
9. Style
10. Date
11. Attribution
12. History of the Object and Its Ownership
13. Condition
14. Appraisal or evaluation

In many respects the Fourteen Steps testify to what many scholars would feel to be inappropriate about any critical and contextualised model of Design History. At one and the same time the list bears witness to a formalistic approach, appropriate for the collectors and curators who were the audience in 1961, whilst delivering the impression that historical artefacts are the preserve of a moneyed and rather elite intelligentsia. Further scrutiny reveals the type of statement which would repel the likes of Fry and others. Under the heading "Techniques Employed by the Craftsman" Montgomery asks,

> Why, for instance, did the cabinetmakers of Philadelphia favour the stump rear leg and the mortising through the stile, so that the end of the end of the side-rail tenon shows on the back? Or why did the New York silversmith favour the cocoon-shaped thumbpiece and the foliated applied band about the base of tankards? (Montgomery, 1982, p.148).

In spite of their elitist tone, there may be some value in the Fourteen Steps to a student designer audience. Before any object study begins Montgomery suggests that we ask ourselves, "Do I enjoy it? Does it automatically ring true? Does it sing to me?". (Schlereth, 1982, p.145). What he is saying, regardless of financial or intrinsic value is, "is there anything here that makes me want to pick this object up and have a look at it?" The significance of such a statement for this project is the perceived importance of the moment of initial engagement with the object as a critical point in the student encounter. The suggestion is that without some form of sensorial interaction the potential for learning is diminished. Furthermore it reinforces the notion that the real rather than the digitised object is somehow pivotal in this initial encounter. As such it has the potential to rescue connoisseurship from its rather elitist forbears.

Under the heading 'History of the Object and Its Ownership" (Schlereth, 1982, p.151-152). Montgomery invites the scholar to consider provenance (and fiscal value) as part of scrutiny of the object. On the face of it this is not useful to a design student. However, an extension of this approach to include attitudes to both consumption and disposal, may allow more critical positions to develop. This would serve to redirect the emphasis of "ownership" away from biographical details to a more qualitative appraisal of social identity and behaviours. This in turn would demand some understanding not only of the acquisition process but of what happens to an object at the end of its life. This is rarely questioned in a design historical context. Such lessons, drawn from dealing directly with objects, reveal the potential of connoisseurship to sustainability audience.

In short, Montgomery's Fourteen Steps, when taken at face value, seem to have little in common with the ambitions of Design Historians working to serve the design community in developing methodologies which might mitigate our *defuturing* tendencies. However, the proposal here is that, brought up to date, redirected at an audience of designers, reduced of all their dandiness and aspiration, that they might serve as useful prompts to initiate more systematic interrogation of things. So, scrutinising an object, asking the simple question about why it looks the way it does, what it is made of , who designed or made it, and the manner of its consumption and disposal may help the design student to understand the nature and benefits of questioning and contextualisation. In this regard, the collecting and the object lesson necessarily begin to open up and to reveal the new knowledge called for by Fry to redirect designers away from existing practices. This is taken up in the part two of this study.

Some Reasons for Repurposing Connoisseurship

The problematic nature of connoisseurship's past is described above. If we take Fry at his word then there is potential to redirect it and to find alternate modes of method and application. If so we would need to describe the rationale and function of such an exercise.

Rationale:

The motivation for this project came initially from personal observations of product and industrial design students over a number of years. As a design historian working with student designers I had witnessed a perceptible dip in understanding of materials, technologies, styles and contexts. There was also a diminishing of linguistic ability to describe objects

(those being designed and observed) and to be able to cross-refer these to historical precedents. Students would default to design classics (the Juicy Salif or the i-Phone) but appeared unable to describe other historical exemplars. In trying to inspire designers by showing them iconic forms, I had unwittingly created impressions of good and bad design and these had served to establish an unreasonable hierarchy of objects. Starting from such a perception was one thing, but it was rather inadequate as a methodology.

When I cross-referred my own experience with more theoretical and contextual positions, I sensed there was some basis for an investigation. It was possible that what I was observing was, in part, a response to the oft-predicted *dematerialised product landscape*, where virtual, rather than real encounters with objects and things, would characterise everyday life. The fact that students experience of historical objects was increasing digital and the form of PowerPoint presentations bore this out. By extension, this virtuality had become part of design pedagogy and practice. Maldonado (1993) had already commented that the "materiality of objects (and therefore the objects themselves) is said to be gradually dissolving". (Maldonado, p.2, 1993). He argued that the emerging virtual realities, which are now so evident in our studios and classrooms, were likely to pose a challenge to designers at any stage of their career. Earlier than this, Morgantini (1983) had proposed that "immersed as we are in an artificial landscape, sickened by excessive abstraction, we find ourselves surrounded by an historical hoard of objects with which we entertain various and often ambiguous relationships". (Morgantini, p.43, 1983)

If Fry's redirection theory legitimises this repurposing of connoisseurship within Design History, it has been the work of Stuart Walker (2006) which has crystalised the idea within the design studio. Walker's work can be seen as both experimental and redirective and clearly of significance to pedagogy. His work on "ephemeral objects" proposes the idea that both "direct encounter" and awareness of "product transience" are vital to overturning the endurance of unsustainable modes of design practice. Walker proposes that,

> ..industrial design is typically pursued though sketches, CAD illustrations and models, technical drawings and physical models. These methods tend to distance the designer from a deeper physical encounter with the material world and a more thorough appreciation of the three-dimensional space, the form of objects and their existence within the larger environment. (Walker, 2006, p.171)

These comments draw attention to the virtualisation referred to by both Morgantini and Maldonado, and identify the enormity of restoring to object to its place in the studio. Walker's resulting set of exercises, where he creates rather experimental designs from objects found around the home, (such as candlesticks from halved apples and forks, and lamps from detergent bottles) assert his belief in the value of designers refamiliarising themselves with the physicality of things. At the same time this stimulates an appreciation of the *transience* of things, and ultimately their need be "re-integrated back into the world with little adverse effect when their use her is over". (Walker, 2006 p.171)

Walkers project is inspirational for this project in manner by which it strives to force recognition of the potential for designers to adjust their practice to be less virtual in their relationship with objects. Walker's work also highlights the requirement for designers to get hands on with existing objects and to develop more contemplative relationships with them. The proposition which is presented here thus takes both Fry, Walker and earlier theorists as starting points to expose product design students to less familiar scenarios than those to which they are used, and to see what might emerge from such new encounters.

Part Two: Connoisseurship Repurposed

Methods: An intervention

In trying to establish the viability of a repurposed model of connoisseurship, I undertook a series of experimental exercises with fifteen product designers in their second year of study, on a module entitled Product Design Contexts. The intention was to gather data relating to their perceptions of connoisseurship, and sustainability, without using the words themselves, and to establish any potential directions for this line of research and application. As has been noted, these exercises were in part an attempt to suggest Montgomery's Fourteen Steps as potential methods for re-engaging students with the materiality of objects and things. Whilst the Fourteen Steps are only explicitly referred to later on in the project they are mostly referred to indirectly. Students were thus encouraged to address an edited version of the Steps mostly through questions about the activity of collecting. Similarly sustainability is dealt with indirectly so as not to skew the findings. To this end students were asked about values attached to objects (fiscal and emotional), about the disposal of objects and their own ethical standards and behaviours.

Participants were aware of the exploratory and experimental nature of the exercises, but unaware of its specific aims. The exercises they carried out were part of a formal assessment. This guaranteed that each student would give the exercises the full attention that a voluntary project may not induce. The project was carried out over twelve weeks and comprised five components. A number of methods were used to gather information, including open and closed questionnaires, a focus group and creative writing. Students were encouraged always to use real objects rather than digitised or virtual expressions of objects. Indeed central to all of the exercises were objects, their collection or curation, opportunities for student reflection and analysis of findings. Because the majority of findings were expressed in a written format their inclusion here in full is not possible. What follows are excerpts and impressions of the intervention which are qualitatively interpreted and which are not intended to be scientific or empirical.

Exercise 1: Questionnaire about collecting

The main thrust of the opening questionnaire was to establish whether students were collectors of objects and understood the concept and merits of collecting. The first five of Montgomery's Fourteen Steps, relating to the visual appearance of objects, were subsumed into these questions. Students were also asked to comment on favourite things in their possession (so as not to exclude those without collections). They were also asked about the determinants for the hierarchies for their objects, notions of value, display and disposal of collections. The aim was to establish whether collecting brought academic value to the learning experience in terms of applied language, value creation and personal ethics.

Unsurprisingly not many students were collectors. Of the fifteen, six students had significant bodies of similar artefacts that constituted a collection. All of the rest had favourite things.

Most collections were extensions of childhood activity and related to BMX bikes, collectable cards and collectable figurines. Significant non-childhood items being collected were Singer sewing machines, airsoft (gas-pressured) rifles, and Hollywood DVDs.

The generic line of questioning asked about the merits of having a collection. Asked if "your collection or FT (Favourite Thing) gives you any other type of knowledge that you otherwise would not have known?", most students ranked "knowledge of materials, technologies and processes" in the top 2 of the options. Close runners up were "knowledge of financial value or worth" and "knowledge of new words, expert terminology and vocabulary". When

students were asked if their literacy or word power had increased because of collecting, only one student said “yes”.

Students were asked about their relationships with recycling, museums and charity shops. Since few of the objects being collected were second hand, it followed that none of the students considered that what they were doing was a form of recycling. Likewise museum visits were not integral to the way they accessed objects and learning. Many of the students gave to charity shops, whilst few of them made purchases from them. It is the association with financial worth which is noteworthy here. Students asserted more interest in collecting because of the potential to ‘make a profit’ than for any other reason.

Exercise 2: Starting a collection of everyday items

Students were asked to collect six everyday items which should cost them nothing and to arrange them as if in a public display, in a hierarchy of 1-6 (1 being highest value). They were then asked to write up to fifty words about each item about its form, materials and associated emotions and feelings. The main aim for the student was for the display to develop an ability to rationalise the creation of a hierarchy of objects. A sub-theme was to extend the theme of collecting (connoisseurship) from Exercise 1, particularly in relation to the “Does it Sing to me?” scenario. If students were able to experience the emotions associated with the curation and collecting aesthetic qualities of objects of their own choosing, the more likely that they would surrender to a natural inquisitiveness about their subjects. This was the plan!

Not all students understood this brief. My imagined essays about the rapture of collecting beautiful and significant everyday things, were in fact essays that presumed that I wanted to see a product design analysis of the type of plastic used in deodorant bottles, the position of split lines and the ergonomic feel of the product. There was enthusiasm and thoughtfulness in some quarters. One student says of his Skyfall Coke can,

> When opening the coca cola can, it clicks which is also interesting, why would they use a ring pull rather than any other method. I think this is something that is for a person on the go. They may be working or going to work. The only problem with the design of the can is that there’s too much to take in. I think simplicity in graphics would help to make it clearer. But other than that I think the design of this can is good.

Another student talks about his/her collection of bottle tops

> The “STELLA ARTOIS” was one I found in kitchen. This is my 3rd favorite out of all of my collection. It has a really classic look to it and almost looks like a coat of arms. The gold against the white also catches my eye. The lettering is bold and stands out.

Whilst not all participants were open to a fully-fledged baring of souls about their collections, this exercise nevertheless reveals that students are capable of both creating and reflecting upon their own hierarchical structures. As such, and with value creation to the fore, collecting prompts a progressive and cumulative sense of enquiry and appraisal. Values are seen as relative and shifting, which corresponds to the imperative of Fry’s contextualised histories.

Exercise 3: Collecting an object-type

With the previous exercise in mind, I decided upon a focus group situation for the next exercise. I felt this to be an appropriate method to circumvent the association that students clearly had with writing as a “formal” rather than creative exercise. Rather than focussing on hierarchy creation and analysis, the emphasis would be upon students’ linguistic capacity to describe objects and their cognitive aptitudes in the absorption of contextual date in a short

period of time. Here students were asked to acquire a mechanical object (from one the following contexts; food, health, travel, office, safety or household) and to "become an expert" (read connoisseur). As part of this they would need to know about the history of the object type, the type of mechanism this was (using specific nomenclature), the name of the "best" version of this type of object, the rationale for "the best" attribution and other supporting contextual information which would help their peers understand the nature of the thing they had acquired.

Students were asked to present an account of the mechanism and to field questions where there were gaps. Students appeared more passionate in this guise. They became capable of describing what to them had been new mechanisms and had taken interest in their origins and associations. Here again there was much here to chime with Montgomery's notion of "Does it sing to me?". One student revelled in his findings about the history of yo-yos, and the complexity and difference in types of gearing in amateur and professional versions of the toy. Others variously described the historical or unknown facts about their carburettors, cigar-cutters and lip-stick mechanisms. Less successfully students described their mechanisms as "gadgets" or "thingamajigs". For some the ability to acquire specific language, especially in the description of materials, (i.e. white metal=chrome) suggested that these were unimportant details. More important to them was the story of the birth of an idea. Who had invented this or that, what year and so on. This narrative approach suggests that very focussed single object studies (connoisseurship) can open subjects up in ways that provoke and stimulate the designers mind. What we should not assume is that this exercise is "particularist" to such a degree that it restricts learning.

Exercise 4: Introducing the Connoisseurship Model

In 2011, I adapted and incorporated a BBC/ British Museum project, a *History of the World in a Hundred Objects* in to my teaching (http://www.bbc.co.uk/ahistoryoftheworld/). In that project the BBC and the British Museum created a digital visual bank of artefacts where the public might view objects of significance, selected according to the stories they told about the development of culture and society. The inclusive nature of the "100 Objects" site, where members of the public could upload narratives of their personal possessions, was attractive and popular.

In my version of this project students taking my first year Design History module were asked to upload their own historical accounts of a chosen object onto the regional pages of the "100 Objects" website. Showing the students an example of the history of the modern credit card and the mobile phone illustrated the capacity of objects to tell stories of culture and cultures. The ease with which they adapted to the task at hand (because of a low word count and an informal writing style) suggested that this may be an appropriate vehicle for this current connoisseurship project.

In the "connoisseurship" version, students were offered an edited version Montgomery's Fourteen Steps as a structuring method by which to develop their narratives of chosen objects. It was suggested they were not compulsory but may help to open up the discussion of the chosen object. To some degree this was successful. One students asserts that "The carburettor has changed the way transport works; from steam powered carriages and horse drawn carts the carburettor allowed the internal combustion engine to revolutionise the way we travel". Another tells about the modern door hinge "While the invention of hinges was revolutionary, their creation was somewhat old in its ways. Blacksmiths would forge hinges out of brass and other similar materials, fast forward to the 20th century and you will find that hinges are more likely to be extruded".

Similar contributions about safety razors, Zippo lighters and the electric light bulb all bore witness an awakening interest in the story-telling potential of objects. Whilst none of the

students used all of the Fourteen Steps, it was having them there as prompts which provided the most benefit. Students were able to cross-refer to the Steps, both as structuring devices and as tools to validate the inclusion of certain data.

Exercise 5: The Scenario of Disposal-Creative essay

This last exercise responds to Montgomery's issues with ownership as a valuable tool for establishing the value of an object. Here I propose that ownership and disposal are of equal concern to a repurposed connoisseurship. In this exercise I asked students to consider an imaginary scenario for their objects, in effect, the transition from a first phase of consumption, via disposal (of some kind such as donation to a charity shop, scrapping or bequest), to a second phase of consumption. The objective was to "finish" the lifecycle story which Montgomery begins to open up through his interconnected lines of interrogation.

The resulting essays, written from the point of view of the object passing from first to second phases of consumption was beyond what was anticipated. Where previous exercises still felt to some degree like students were going through the motions, here the students felt fully unencumbered.

> I'm electronic razor, my owner threw me away. Just because one of my razor blades broke. The rest of me worked, I wasn't even chipped on the paint work. I was replaced with this Braun razor, the owner could have bought replacement blades but he didn't. My replacement blades aren't even that expensive, but because he couldn't find them in the shops he didn't bother. I'm sure he could have found them on the internet. Maybe it's just easier just to replace me rather than looking after me.

Another essay about the end of life scenario of a lipstick is equally compelling

> It's gone dark I feel like the world has ended I went from being in a range of places and last time I was in somewhere this dark it was a Luis Vuitton handbag. I look at myself don't see why I'm here I'm working fine there's lipstick still left in me why am I here ? I see a glimpse of light I look through the gap in my design I see a huge crack in the outer plastic casing I start to panic I'm a separate component why am I in this situation I should be out being used. I eventually see the light I'm in an open place surrounded by other forms with similar materials I have a sense of feeling that I'm going to be destroyed. All of a sudden I'm grabbed my plastic cover is torn of I feel bare I'm in a wide open room I don't know what is happening. I'm picked up thrown into a box I hear the rumbling sound. I've heard this sound before it sounds like a car but louder.

This *Point of View* approach to writing about ownership was one which the students decided upon themselves. It clearly generates very interesting findings. It is here that some of the students discover their own position on the (un)sustainability of things. Their capacity to engage is clearly magnified through having direct contact with objects rather than a virtual image. It is here most likely that the project has achieved some common ground with Fry's sustainability agenda and a redirected or repurposed connoisseurship.

Conclusions

The above impressions of the interventions can only offer a general sense of the value of this project. However, there are a number of instances where we can see alignment between Montgomery's work and Fry's proposition that redirective practice can serve to modify the disciplines in favour of more sustainable ends.

First, it is likely that direct encounters with objects, such as those proposed by Walker are significant in engaging student interest. Some more work is required here such as engaging the services of museums and collectors to help students to formulate their own ideas about what they find interesting and how a collection might be put together. Likewise it will be vital to create spaces in the curriculum where a collection can grow and where reflection can take place. Object lessons, based around individual objects and collections of objects, stimulate students to produce their own narratives and interpretations of value and significance. What needs to be established is how and why this might be different from a digitised representation of an object. Here it would seem appropriate that further enquiry would need to evaluate the role of tactile and sensorial interactions in whether or not an object "sings".

In the questionnaire element of this project, there was evidence that design students as collectors were, in part, financially motivated. I take this to be significant. It suggests that before one enters more academic stage of interrogation of objects, one must necessarily encounter the spark which lights the intellectual flame. In a student-collector-context, the financial imperative seems reasonable given their stage of life. What becomes clear is that collecting or connoisseurship is inflected by context, location and specific focus. Here, the promulgation of a connoisseur's mentality was not successful. However, where it already existed there was strong evidence to indicate considerable ability to articulate ideas about value, re-use and hierarchy. So, where students possess the ability to describe how to take objects apart, to consider their aesthetic merits and to consider that object in an after-life, there must exist a potential to extend these fields of logic and enquiry to include studies and theories of sustainability.

Whilst many of the cumulative results of the interventions do little beyond establishing which exercises need refinement and which were successful, the ambition is to continue with this project. Ostensibly the discipline of Design History came out slightly redirected and, arguably, with greater appeal because of its hands-on approach. What is inconclusive is the benefit to sustainability imperatives. Clearly connoisseurship and collecting have become institutionalized through the historic practices of museums, galleries and auction houses. Implicit in *this* project is the potential which arises from a more democratic version of connoisseurship which serves to reconnect design students and professionals alike with objects which open up discussions about acquisition and disposal. Such a move, in the eyes of Fry and other sustainability champions can but redirect the practices of design in directions which broach the crises which we all face.

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Generating Space to Articulate the Value of an Artists' Practice

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Abstract

The expertise of the artist, as a relational and social practice, is unstated in the sense that it is present but not articulated. Donald A. Schön's structure for the making of generative metaphor offers a theoretical and analytical framework for movement from the tacit into the explicit. "FOLD" is an art-work at the centre of this enquiry. It is the subject through which Schön's framework is tested to reveal new ways of valuing an artist's expertise. This project is part of a doctoral programme between Gray's School of Art and Woodend Barn arts centre, Banchory, Aberdeenshire. The author is the artist/ researcher tasked to ask how the presence of an artist in an organizational context can influence, through provocation, their long-term sustainability in the light of social, economic and cultural change.

Keywords

generative metaphor; visual/artist/social/relational; value; organizational

Introduction

This research began as a conversation in the autumn of 2011 between myself and a group of people whose story spans two decades in the development of a successful rural arts centre in Banchory, Aberdeenshire. It grew out of a shared concern with the research community at Grays School of Art to understand how relationships, between artists and organizations, shape experience in profound ways that are not fully grasped. In particular, the research seeks to understand how the presence of an artist might influence the inevitability of change in sustaining the case study for a further twenty years.

As the selected artist-researcher and as part of a practice-led methodological approach, I took up in residence, in a studio within the arts centre. There was an expectation that I would produce an exhibition at the end of the first year, a year in which I was free to move within the organizational structures. As a result FOLD grew out of an intense period of mapping the organization and its network of associations marking an important milestone in my doctoral research. FOLD is an exploration into the value of creativity as a social process in the sense proposed by Berys Gaut in his "Agency Theory of Creativity". Creativity is both "the capacity to produce original and valuable items." (Gaut, 2010, p.1039). And "a particular exercise of agency, or will." (Gaut, 2010 p.1041) He argues for the development of a philosophical theory of creativity that sits not just in aesthetics, but "exists in the domains of science, craft, business, organizational life and everyday activities." In these terms FOLD is an open conversation between aesthetic experience, the everyday and organizational life. It is a collaborative and organizational process, a sculpture and installation, a performance, a series of workshops and a book. When traced through Schön's generative metaphor FOLD offers the potential for rich insights into the relationships between an artist and a community.

Generative metaphor is, "central to the task of …how we think about things, make sense of reality, and set the problems we later try to solve," (Schön, 1996, p.137). Schön saw this happening occasionally and intuitively, but without any reflection or shared learning. Consequently he developed an anatomy of the making of generative metaphor because "starting with reflection on these rare intuitive processes we need to build a full and explicit understanding of them." (Schön, 1996, p.149). He carefully follows a thread by which metaphors emerge and unfold in experience. He traces the implications of "seeing as" within concrete experiences in which metaphor acts as a generative force in the construction of particular ways of knowing.

Fig. 1 FOLD 2012

FOLD: An Artwork

Inspiration for FOLD came from the over-abundance of rotary washing-lines, visible behind the hedges of Banchory's gardens; and the details of lives in the washing revealed to passers-by and neighbors. In preparation for the exhibition large quantities, of bright, white, starch-folded and steam-ironed cotton sheets were borrowed from the mending cupboard of the Deeside Laundry. The sheets told their own stories; tiny squares of darning, top-edges ready for replacing with bottom seams, and the names of the Royal Deeside Hotels they belong to, stitched into their pink or blue edging.

Many people have contributed to the story of FOLD. This dialogue allowed the author as researcher to be known as an artist and equally to get to know the individuals within the organization. FOLD became a motif for a discussion within the organization around the future of the visual arts programme. It built trust in the author's presence; creating a significant milestone in the broader enquiry into how an artist might influence organizational change.

FOLD

Let's dance! If not, dance, then let's fold cotton sheets together.

Lifting a folded sheet from the top of one of two piles of sheets and asking another person to unfold the sheet with you.

Offering them 2 corners and fully unfolding the sheet.

Then, folding the sheet up again. Doing this together, and on finishing, putting it on top of the opposite pile of sheets.

Doing this as many times, and with as many people, as you have time and energy for.

(Smith, 2012, p.1)

Fig. 2. FOLD 2012

In a public environment this everyday interaction became playful, conversational, confrontational, reflective and political. The invitation was often made by offering a folded sheet to another person; if accepted the two people would find and hold the four corners, as if in conversation with each other. They would then negotiate the moves of stretching their arms wide, holding the corners tight with the full billowing sheet between them. The often unspoken negotiation on who would lead by determining the "left hand", "right hand" mirroring action, sometimes resulted in emotional tension or the sharing of intimate experiences describing why it had to be this way. Pulling and wafting the sheet, up and down, to air it, happened vigorously and tentatively, calmly and with much energy. At some point, the aim of folding the sheet would be remembered, and the partners would bring their corners together. One of them would accept the other's corners and still holding their own would manage to hold all four together. The other person, released of their corners would bend forwards and take hold of the corners, of the now, half size sheet. This sequence continued, often more business-like now. The fun was had when the sheet was fully unfolded. The final movement would be a letting go by one of the pair and the other would make a final fold of the cotton sheet and return it to the others. This was the experience of FOLD.

Generative Metaphor: A Method for Social Change

Schön's field of expertise is social policy. His most coherent examples involve large - scale and complex negotiations between disenfranchised communities and planning authorities. In this sense it is a substantive method for bringing about new social positions though revaluing previously estranged values. FOLD as an experiment tests his method as a theoretical tool to see if the same process can draw out new language to articulate the value of an artist as an agent for change. Schön draws on pragmatism in the formulation of a series of steps:

setting the conditions; identifies the metaphors; story telling; identifies new references; renames and resets the original boundaries. Graham Low describes Generative Metaphor as "an influential narrative approach…to locate problems (conceptually)…and then bring about some sort of change." (Low: 2008: 212).

Fig. 3. FOLD 2012

The underlying principle of Schön's process is to draw boundaries between or "frame" situations as a way to give shape to the problem to be explored. "If we can once see it, however, in terms of a normative dualism such as health/disease or nature/artifice, then we shall know in what direction to move." (Schön,1996, p.128). Following the harsh "blight and renewal" policies of the 1950's Schön was seeking a new method for conflicted public situations in American urban planning to "reinforce and rehabilitate" rather than "redesign and rebuild" communities such as the North and West Ends of Boston or the East Village in New York City. His proposal acts as a catalyst in the sense that if both communities experience each other's stories, in such a way that generates new and deep understanding between them, Schön felt that their original identity and integrity is retained through the process of re-orienting to a new, single, position.

Schön recommends the following five stage sequence; The first stage is the process for **setting the conditions** to generate the stories from which the metaphors will emerge. The second stage **identifies the metaphors** from the language in which the stories are told, letting us "interpret the story", incorporate "the centrally important features", and become "generative of it" (Schön,1996, p.149). The third stage engages in a process of **story telling** that allows new language to emerge. These new references describe and orientate this confusing mid-way stage. As Schön advocates through contrasting, or "naming and framing" oppositional positions the terms of the stories begin to shift from facts about the particular situation to sets of values. He refers to this as a "normative leap from data to recommendations, from fact to values". (Rien and Schön,1997, p.147). Now, Schön, says "we are dealing not with 'reality' but with various ways of making sense of a reality. Then we may turn our attention to the stories themselves." (Schön,1996, p.149). The forth Stage **identifies new references and "sees" them as oppositional values** which "underlie our problem setting stories," by noticing "the presence of several different and conflicting stories about the situation." (Schön,1996, p.148). This "leads to critical reflection awareness through becoming involved in critical enquiry (Schön,1996 p. 150). The fifth and final Stage **renames and resets** the original boundaries by using the new sets of values to map the similarities and differences between them.

Fig. 4 FOLD 2012

Definitions

Metaphor is from the Greek metapherein meaning to transfer. This translates to the application or transfer of a word or phrase to an action or an object to which it is not literally applicable. It "is a fundamental scheme by which people conceptualize the world and their own activities" (Raymond W. Gibbs Jnr: 2012 p3).

Generative metaphor is by definition a new conceptualisation of the world or our own activities through transferring the meaning of a word or phrase to something else. It is in this sense a live process of making new, or moving, to a new position. Schön's method relies on stories that grow from real experience to generate the metaphors for his process involving transference from two positions to a new unimagined place.

Applying Schön's "Anatomy" to FOLD

The analysis of fold moves through Schön's five stages of generative metaphor, one-step at a time, as a way of opening-up aspects of the experience to draw out language relating to the role of the artist in this situation.

Fig. 5. FOLD 2012

Stage 1. Setting the Conditions

These are the props and attributes of FOLD.

FOLD is two identical stacks of crisp cotton sheets piled high, and folded to fit the shape of the plinths they are balanced on. It is the daylight in the gallery, and the continuously changing tonality of shadows and uplifting brightness it brings to the sheets. It is an atmosphere of calm, the ordered linen-cupboard, waiting to be disrupted. It is an invitation to fold sheets with someone else, and following this to reflect upon the experience, which, like any invitation, may be declined. It is also a series of workshops before the exhibition opens with volunteer stewards to experience folding sheets together before discussing ideas on the best ways to invite visitors to fold a sheet. It is the uncertainty of wondering: How might they respond? How might they gather visitors' reflections on the experience and display them in the gallery? FOLD is 100 hand-made books designed collaboratively through conversations about the printing traditions of creasing and folding with a print-maker. It is the photographs taken by an Aberdeenshire photographer of the author and the chairperson of the gallery committee folding sheets.

Through the precise placing of the sheets on plinths in a symmetrical, and ordered, fashion I created a calm environment; animated only by the gently changing daylight. The space FOLD occupies is carefully prepared in readiness for the arrival of the public. This atmosphere was crafted as a minimalist aesthetic and politely punctured by an invitation to disrupt its formality. Within the invitation I laid a path that led to a set of experiences; a sociable engagement; a reflective and collaborative event to which "they" are invited to contribute their own expertise and become a part of the event.

The stories generated from these conditions in Schon's 1st stage of the Anatomy reveal the role of the artist in the careful construction, through making choices informed by experience, of a very specific environment. This involves, to some extent, an intuitive sense of "what will work," based on previous experiences. But, it calls into play, in terms of expertise, an ability to read a complex set of systems and cultural behaviors and a high level of communication and organizational skills to build trust, credibility and interest in the work. A commitment to the idea and a genuine interest in working with and learning from other people is essential, as well as traditional craft and new-media skills used to make objects and disseminate the work.

Stage 2. Identifying the Metaphors

FOLD is a metaphor working at different levels. The act of folding sheets in a gallery situation becomes symbolic, physically "folded" into the architecture of the gallery as an event in time; conceptually folded into the cultural and organizational life of Woodend Barn as an experience. It is also a conversation from which we emerge changed in some way. Julian Barnes in his 1998 novel, *England, England* expresses this as a tacit and transformational experience. "One day they were folding sheets, air dried, from the line. Suddenly, as if to herself, but loud enough to hear, her mother said, 'This is the only thing you need two people for.' They carried on in silence……When they pulled, there was something which ran through the sheet which wasn't just pulling the creases out…, it was more, something between them…Was that always there?" (Barnes, 1998, p.21). In referencing this quote in the book of FOLD, my intention is to trigger participants' own experiences, beyond the space of the gallery. In this way the sphere of influence of FOLD is extended in space and time.

FOLD creates the conditions for valued experience between two people. It is like having a conversation, or "dialogue" in which, when you have finished, you feel that you know the person you have been talking to, and yourself better; you have heard yourself say things you hadn't said before; you have been challenged and you have challenged; you have experienced emotions; you remember this conversation because it has affected you. FOLD is not like being talked at, or experiencing a "monologue" by someone who is more interested in telling you their ideas than knowing yours; appears to be satisfied and unaware of the purposelessness of this one sided "dialogue"; leaves you feeling disappointed because you didn't have the opportunity to contribute your knowledge and respond to the ideas of the speaker; and ultimately doesn't inspire you to want to repeat it.

Fig. 6. FOLD 2012

The metaphor from the language in the stories pivots around folding the artwork into the life of the organization, and a network of other people I have collaborated with. This process took place over time and involved reflecting critically on the experience with each other. FOLD is a distinct event leading to other events. The emerging theme is a dialogue on many levels that generates experiences through forming relationships. This is a generative dialogue folded into the social and organizational spaces of Woodend Barn. It is not, by contrast, an oppressive or "non" dialogue that doesn't engage us. The role of the artist in this sense can be said to be that of a conduit, in the sense that the dialogue happens through and in their practice.

Stage 3. Story Telling

The evocative stories told by visitors who experienced FOLD are the source of new language to be translated through the frame of the metaphor of FOLD as a conversation in Stage 4. The stories are rich and contain metaphors of their own. Capturing the stories was one of the conditions of "letting it go" (Unpublished interview, F. Hope, November 2012) to see if visitors accepted the invitation to fold sheets, would they then post accounts of their experiences to the gallery wall, or engage in conversations with stewards, who transcribed these conversations and pinned them up. The over-riding responses are of personal recollections; "The smell of the warm linen cupboard" or "giggles with, my sister, or mother…trying to keep a tight hold of my end of the sheet." Some reflected on their observations of others; "Two ladies in the room folding now, it's infectious." (Unpublished visitors reflections, September 2012). "Letting it go" is a metaphor for a liberating openness,

while "infectious" denotes a viral way of being affected by something, either healing, or harmful. To recall the "smell of the linen cupboard" triggered by the sight of the beautifully folded sheets, leads to transference of meaning across the visitors' senses and indicates a depth to their experience in FOLD.

One visitor left a response after spending time in the gallery without folding sheets and another, strikingly different response after a following visit when she did. The first reflection is; "Unsettling. I worked as a nurse and associate sheets with the purple-edged mortuary sheet in which, we reverently wrapped the dead, before the porter came to take the body away." And her following reflection; "Beautiful day, so we went outside…to the grass… to fold sheets; run up and down with sheets; singing while folding sheets. Great fun." (Unpublished visitors reflections, September 2012). The contrast in these emotional responses, "Unsettling" to "Great Fun!" is also striking in relation to their correlation with, firstly, witnessing FOLD, and on a following occasion, actively participating in the experience.

FOLD evoked negative responses. "Weird, not really an exhibition" (Unpublished visitors reflections, September 2012) is just one of these. Most were not written down, but heard, or observed through visitors choosing not to accept an invitation, or staying in the gallery briefly. The sharing of negative responses or more poignant experiences contrasted with the positive and celebratory. They inspired more critical conversations, and a deeper level of trust and insight grew between the author, the stewards and the work through this process.

Drawings, photographs and short videos were made by visitors and brought back to the gallery or put up on UTube. A steward described one afternoon's experience of FOLD: "They took photographs, and….were throwing sheets up in the air and running backwards and forwards. They were really having a ball" (F. Hope Unpublished transcription; 27.11.12) "Having a ball" reveals the possibility for active, social and celebratory experiences to occur as a response to FOLD.

FOLD found its way out of the gallery. It became a symbol for the organization's 20th anniversary event. "What else does it take two people to do" was discussed, wryly, and at length by a group of women friends. A book swap on the history of serviette folding and folding "as the art of manipulating fabric" took place. These are immediate and reported events, and there are, presumably, many more, that are only known to the people affected.

The facts of the stories held within FOLD evidence and describe what took place. In this stage of Schon's Anatomy the facts begin to shift to sets of values. This involves making a judgment in relation to the value of an artist and their practice in the process of becoming a more sustainable organization.

Sociability - one person is motivated to invite another person to fold a sheet, and they respond with a choice to either accept or decline the opportunity.

Empathy - within the act of folding a sheet together there is an intimacy between the participants that involves watching and mirroring the other persons' actions.

Openness - to enter the arts centre and become a part of its life is a choice that indicates we are looking for new experiences.

Commitment - once the choice to accept the invitation is accepted a level of commitment to the task is necessary to complete the action.

Collaboration and Partnership - in the willingness to engage in an experience with others we are building relationships, which become networks.

Stage 4. Identifying New References and Seeing them as Values

The stories that occurred through individual and shared experiences helped to raise interest in the method, process and experience of FOLD across the organization. An interest in knowing how it might lead to a deeper collaboration and influence change in the organizational life of this community grew informally as a conversation during the exhibition, and subsequently, as unstructured recorded conversations discussing what was successful, what didn't work and what was revealed through FOLD and its delivery. In this sense FOLD began a conversation about underpinning the values of the organization as an intervention into the everyday pattern of the visual arts programming, marketing, audience development and business planning. Through the telling and re-telling of the facts of these stories they increasingly became values associated with the metaphor of dialogue.

In my role as artist in this process I act as both a leader and a co-learner in a collaborative process. The experience of FOLD and our critical reflection has generated a new event that is a more deeply embedded collaborative practice operating across a broader reach of systems outside of the organization and over a longer period of time. I am acting as a conduit within an organizational and social situation that contains the political, creative, meeting and physical spaces in which we act. I move through the whole arena, in relation to others, with the aim of creating what I see as a key element of their future sustainability; a critical space for generative dialogue that is arrived at, and inhabited, through collaborative and creative experiences provoked by an artist.

Fig. 7. FOLD 2012

Stage 5. Renaming and Resetting the Original Boundaries

Schön describes this as a sense-making exercise, which if the metaphors have generated rich stories will allow for "the integration of conflicting frames by including features and relations drawn from earlier stories without sacrificing internal coherence". (Schön, 1998, p. 148). This he suggests is how positions that have shifting reference points or values can now be mapped across different domains.

I have found the artist to act as a conduit in the sense that a dialogue happens through, and in, their practice. One aspect of her role lies in generating a set of highly tuned conditions to engage the public and shape their experience. My analyses of setting the conditions for FOLD has shown that an artist engages in an immersive process of experiencing the situation and critically reflects on her findings to inform decision making and communication for further analysis with fellow collaborators. Artists have different traditional "craft" skills underpinned through a practical knowledge of new-media. What is essential to this practice, I have found, is an interest in learning from new situations and a respect for the expertise of others.

In response to the experience of considering FOLD to understand the role and value of an artist in relation to Schön's generative metaphor a new description of the project might now read: FOLD is relational to the entire cultural, social, economic and political surround of the community. Expertise is not limited to the artist. Her expertise lies in developing a range of experiences through her arts practice in which the sustainability of our organization is embedded as a question and in the process. To achieve this, the artist sets an aspirational ambition for the project, and collaborates with others to agree a collective and realistic commitment to an evolving and flexible plan.

Fig. 8. FOLD 2012

Conclusion

Devising and making FOLD has created rich experiences and stories for exploring Schön's anatomy. The aim has been to test the "anatomy" as a method to reveal new ways of articulating the process and value of an artist's expertise. The process of framing was used to articulate the experiential qualities of FOLD; its purpose and relationship to the author's research; its context; and theoretical position. Through this experience of calibrating FOLD and the "anatomy" it has become clear that in setting the conditions, or developing the attributes of an artwork the experiences cannot be predicted. And, without the willingness and trust of the conflicted communities or skeptical visitors to engage in an unfamiliar experience labeled art the conditions will not offer up any insight or learning. Schön does not

touch on the expertise it takes to build this trust and create this willingness to engage in a process in such a way as to be changed by it.

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Helen Smith

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Accessing Experiential Knowledge through Dance-Writing

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Abstract

When performing the theoretically informed, critical activity of *dance-writing*, my personal and corporeal memories, associations, and experiences open up a path into a *twilight space*. This zone, as well as the experiential knowledge it can bring forth, is created when writing *with* dance, which is an *ethically* informed activity, in contrast to writing *on* art. Knowledge thus emerges step by step as an *essayistic text*, that is to say, as a hybridity encompassing, but never fully uniting "passion and science". Dance-writing keeps moving with knowledge creation, acknowledging dance as a vital form of articulation, and a full participant in critical dialogue. It can be described as a creative, conscious, and vital journey, with the purpose of engaging the researcher in a process where analyses of live experience, practitioners' knowledge, as well as archival material can be given the distinct and different values they deserve. It takes an ignorant, sweating researcher – willing to *get lost* in the quest for knowledge – to enter the zone and partake in the thrilling *exchange* that will not only make dance events "move differently", but transform the researcher as well. The very thought of treating dancers – in action, as well as in archival traces – as *equals* and intelligent, rather than too quickly judging them from a safe distance, will indeed affect the explorative process. Ultimately, it is claimed that dance-writing allows us to partake in a practical verification of radical equality. In the paper, dance-writing is worked through in a number of interwoven, theoretically informed clusters, in relation to examples from the dance theatre performance *Oedipus the King* (2011). The main contribution the paper wishes to make is to provide a set of theoretical concepts to serve as directional indicators for dance-writing in the promising trans-disciplinary field where practice-based research and the humanities can intersect. Well aware that a thorough understanding of dance-writing might only be possible to achieve by involving bodily practices, I will attempt to give a "live" demonstration as part of the oral-corporeal presentation at the conference.

Keywords

experiential knowledge; essay; exchange; ethics; equality

While it is well known that standardized research methodologies foregrounding distance and stable results fall short when applied to art events, it can be argued that what I call dance-writing can serve as a challenging alternative. So, what is dance-writing, and what promises does it make? Briefly put, it can be defined as a theoretically informed critical activity involving personal and corporeal memories, associations, and experiences that open up a path into a *twilight space* wherein new knowledge can be accessed and produced. An important aspect is that it challenges often used, but profoundly "narcissist" methods, such as "self-reflexivity" (Deleuze, 1968; Sand, 2012). Instead it urges the subject to partake in a critical process involving corporeality, creativity, and potentially unsettling feelings of being lost and feeling ignorant. In the living space of dance-writing, feelings, free associations, and

corporeal sensations are considered very precise forms of knowledge, well suited to exist within, against and in relation to the realm of traditional scholarship (for a look at the cognitive tradition's insights in these matters see Clark, 1997). The aim of this article is thus to provide a set of theoretical concepts to serve as directional indicators for dance-writing in the promising trans-disciplinary field where practice based-research and the humanities can intersect.

On a general level my approach can be associated with the multifold trend that has been labelled the *affective turn* in the humanities. Not only does this turn acknowledge corporeality, materiality, and sensuousness, it also brings social aspects, transformation, and critical development to the fore (Diprose, 2002; Meskimmon, 2011). My way of applying creative writing has no doubt benefited from critical feminist thinking (e.g. Cixous, 1976; Bränström Öhman, 2008; Lykke, 2010), which strives to acknowledge and integrate corporeality into academic texts, as well as to perform a critique of the often unconsciously dismissive or even hostile structures that prevail. Furthermore, the bodily basis of scholarly work has been acknowledged in a wide range of dance and performance studies as well as in recent publications on artistic research (e.g. Biggs & Karlsson, 2011; Elkjær, 2006; Foster, 1996; Gehm & Husemann & von Wilke, 2007; Jackson, 2000; Kershaw & Nicholson, 2012; Phelan, 1997; Roos, 2006). While providing innumerable valuable insights, some of them touching on the topics I present here, there is still a need to go further and try to explain and clarify the work conducted in the messy borderlands, without disparaging the productive aspects of unclearness.

Dance events, past or ongoing, can be considered vital forms of *articulation*, as doing more than simply representing and reflecting theatrical, political, and societal structures. When engaging in them we partake in a conceptual modulation between corporeal knowledge, material aspects of our lives, and fundamental questions concerning what it means to be human.

So, what I will try to do in this article is to explore and theorize dance-writing as a way of *accessing* experiential knowledge. In working toward this objective I will use examples taken from the dance theatre performance *Oedipus the King* (Swe. "Kung Oidipus") staged by director and choreographer Kajsa Giertz, at Malmö City Theatre, in the fall of 2011. Attending the 24 September performance, I took notes, made small sketches of movements, and tried to be as receptive as possible. However, the fact of having "been present" at an event guarantees nothing (Jones 1997, pp.11–12). It is equally important to grant other efforts in the research process the weight they deserve. In the exploration I therefore stress the importance of taking a more conscious approach to the co-creative presence of experiential knowledge in various traces. In particular it is not my intention to give an exhaustive interpretation of the performance of *Oedipus the King*. What I offer here is a set of theoretical concepts serving as directional indicators – not tool-boxes or frameworks – that can merge with the activity of writing *with* past or ongoing events. I will take it step by step, bringing in various theoretical concepts over the course of the journey. This is neither an exercise in purity, nor in frozen clarity. Towards the end, an attempt will be made to sum up the main points of the article, but at the same time I would like to declare that a thorough understanding of dance-writing might only be possible to achieve by actually testing oneself in relation to bodily practices. In short: let us dance, and let us write. But first I shall say a few words about arriving to attend the performance of Oedipus, an experience that from the very beginning consists of multifarious factors contributing to and shaping how the attendee will perceive and interact with the event. While I will not give a full account of these factors (which would be impossible), it is necessary to acknowledge their existence as well as their more or less substantial impact.

Enter the essay

When visiting Malmö City Theatre's website, when looking at posters and flyers, and when reading the programme, the name Oedipus stand out. Most people have probably heard it, and some might associate it with ancient classics or with Freud's theory of the Oedipus complex. It is clear that the theatre took pains to make the myth of Oedipus accessible for anyone interested – whether or not this was successful is another question. Short articles and a video explaining the plot were a part of this effort. Giertz used the first part of Norwegian author and dramatist Jon Fosse's (2001) adaptation of Sophocles' Oedipus trilogy. This adaption follows Sophocles closely but gives the dialogue a contemporary tone. In an interview Giertz states: "We are all Oedipus" (Erlandsson, 2011). This point of departure was carefully worked into the performance. Several actors of different sexes and body shapes took turns with Oedipus' lines and movements. This theoretically self-conscious solution, not all that unusual today, opened up a possibility to engage more smoothly with the performance. To hear women speaking Oedipus' lines in voices resembling my own made me listen and feel differently. The typical tragic-hero trope of traditional stagings was thus destabilized. In the sections when Oedipus was performed as "a man in a suit", he was still many voices and bodies.

Upon entering the auditorium, one saw there was no curtain, and a large podium covered with a parquet floor was visible on stage. In the presence of the audience the podium turned into scenography, "an expressive and affective agent of performance" (McKinney & Butterworth, 2009, pp. 4–5). Moreover, it can be argued that the situation also carries the experiential knowledge of the scenographer, the people constructing the podium, and so forth. This knowledge, foregrounding materiality, spatiality, movement, and time, actively takes part in the event.

A few theatre workers walked past the podium. Office chairs and microphone stands were placed on it. It was low key; we were all in there together, getting ready. The atmosphere could be perceived as open and straightforward; the generous promise of dance theatre, namely that it will be an accessible event, was immersing us from the start. It can also be mentioned that the performance only lasted about an hour. The short duration signals an awareness of the length most people seem to prefer when it comes to modern dance experiences.

The presentations and texts on the website and in the programme, the exposed podium, the low key approach, and the plurality of the Oedipus character in the performance are all examples of factors contributing to the construction of *atmospheres*. According to Erika Fischer-Lichte, atmospheres

> take hold of the spectators, colouring their perspective and thus allowing for a very specific experience of the space. Such an experience cannot be explained in reference to any single element in the space – its extent, particular objects, smells, sounds or other elements. (2012, p. 92)

When attending a performance we are present in a space that can be theorized as not primarily semiotic, even if sign systems always are present and call for interpretation (Féral, 2002, Féral & Bermingham 2002). Rather, it might be characterized as a potential arena for multiple performative *exchanges*, instable complexities that finds themselves at the very heart of dance-writing.

Not solely based on a meeting or a conflict, an exchange "is itself a provocation and a potential source of new thought" (Todd, 2009, p. 154). When engaged in an exchange proper, the people involved can create or construct something new together. Such an enterprise inevitably involves an *ethics* of working *with* art and events, which is now and then

advocated in artistic research (e.g. Hannula, 2008). My version of this "working with" is tightly connected with essayistic writing, corporeality, and my own experiences of a life in the theatre. Before I became an art history scholar, I was a professional classical and contemporary dancer working within a broad repertoire including theatrical and experimental work. A dance background brings with it memories, experiences, and knowledge, that differ from those of the art historian. This "schizophrenic" stance is undoubtedly productive, but at the same time it can be very difficult to implement cross-border thinking and practices into academic environments. One problem arises when people in traditional structures speak as if they are prepared to engage with new approaches, but when the opportunity comes, fiercely avoid it.

The idea of *working through* problems rather than unconsciously repeating and reproducing them (Freud, 1914; Braidotti, 1994; Hannula, 2012) has been and still is central to the way I understand the activity of dance-writing. When articulating and investigating the process I draw on the *essay*, theorized as hybridity, an on-going, but impossible attempt to unite "passion and science" [Swedish: "passion och vetenskap", the latter most readily understood as "scholarship"] (e.g. Montaigne 1986; Møller 1994; von Rosen 2012). The way I see it, essayistic thinking and writing creates a twilight space, a liminal zone, wherein rather fragile and tentative thoughts can live and be worked through without immediately being threatened and censored.

Thinking through the notions of exchange and ethics and applying them in essayistic dance-writing has had profound repercussions on how I attempt to access knowledge in dance, and other forms of human expression. My reason for foregrounding the "personal" or even "passionate" is that I consider it indispensable when approaching experiential knowledge. This does not mean that "just anything" may enter the text, but I do insist on the importance of freedom of thought during the investigative process. Being deliberately and insistently essayistic, dance-writing "is" not; dance-writing "tries", again and again. That is, it keeps moving with knowledge creation, acknowledging dance as a vital form of articulation, and a full participant in critical dialogue.

It can also be pointed out that I am not exhuming something believed to be stable and fixed: there will be no digging, and no petrified corpses. To think and write with elusive traces and polymorphous practices such as "putting bare feet on the floor," is rather to engage in a process with no fixed points. As formulated by Rosi Braidotti, "the challenge is in how to represent in-between zones and areas of experience or perception" (2002, pp. 173–74). Dance-writing clearly answers to this urging desire, and it does so while paying special attention to experiential knowledge.

Moving with equality

Fig. 1 Photo: Peter Westrup

Darkness, and then, a sickening light. Like unconscious worms from the past, the dancers/actors perforate the podium from beneath (Fig. 1). When they come up from rifts in the parquet, and smoke invades the space, it is naturally tempting to turn to iconography or semiotics and say that we are seeing the dead awakening on the Last Day, just like in medieval paintings. It is also possible to interpret the scene as the dead awakening in a horror movie. And yes, long gone Greek performers are coming back to haunt the newcomers.

It is admittedly fascinating to have a rich frame of references. However, in this context such a hasty, or judgmental "knowing-best" approach is somewhat out of place if we are interested in accessing and articulating experiential knowledge. It is crucial to become aware of our habits of sorting and judging, as well as of our desire to appear as "elevated experts", confident in our highly reliable interpretations. The other, equally problematic side of this is the risk of being induced to view oneself as ignorant and to stop thinking when confronted with a complex piece of art and all the "expert" knowledge encompassing it. Of course, we should try to use good judgment, and respect and acknowledge the efforts of hopefully qualified experts. And of course we are ignorant; nobody can know everything from every discipline necessary for the "perfect" analysis of a dance theatre performance.

Nevertheless, in this context, I would like to recommend a stance that I have found immensely productive when engaging in dance-writing: stepping away from the often required role of the "cool-headed" expert and start working up a sweat (more or less metaphorically) in the quest for experiential knowledge. It is worth noting that Jacques Rancière, in *The Ignorant Schoolmaster: Five Lessons in Intellectual Emancipation,* claims that the role of the expert or explicator has a deadening downside. He equates the principle of explanation with a principle of *enforced stultification*.

> The stultifier is not an aged obtuse master who crams his students' skulls full of poorly digested knowledge, or a malignant character mouthing half-truths in order to shore up his power and the social order. On the contrary, he is all the more efficacious because he is knowledgeable, enlightened, and of good faith. (Rancière, 1991, 7)

The unspoken effect of the expert's explications is that the students (or similar) become indoctrinated. They no longer know how to learn, and they become convinced that they need

the superior knowledge of the expert to understand what they are learning, indeed to be learning at all. Hence, the explanatory model determines our incapacity to learn by ourselves and establishes our inequality.

It might be necessary to point out that Rancière has nothing against knowledge, or those who possess it. What he criticizes is how so-called expert knowledge tends to become a tool for silencing the voices and thoughts of those positioned as ignorant. “What stultifies the common people is not the lack of instruction, but the belief in the inferiority of their intelligence” (Rancière, 1991, p. 39). Scholarly contexts obviously vary in terms of what persons are positioned as inferior, and are induced to think of themselves as unintelligent. A dancer’s knowledge and means of expressing it can obviously be very far from the techniques and practices that are exercised within the traditional university.

According to Rancière “learning and understanding are two ways of expressing the same act of translation” (2011, p. 9). From this it follows that understanding a work of art “does not consist in explaining it from a position of superior knowledge and authority, but in translating it, in appropriating it within an activity of (self- as well as social) transformation” (Citton, 2010, p. 37). Thus, dance-writing can be understood as a way of engaging in a constant process of translation, in accordance with our needs in the current research project, and in relation to our desire for equality and emancipation. This equality is neither a utopian paradise nor a manifest, measurable quality to uncover. It is a principle for a democratic politics, presupposing intelligence, and thus guides an ongoing “practical verification of the equality of intelligence, that is, a process of subjectification through which all participating agents are empowered to find out for themselves how their conditions of living can be improved” (Citton, 2010, p. 33). Interestingly, this comes very close to how Cecilia Roos describes the result of the interpretive process undergone by a dancer involved with a new choreography: a conscious and empowered subject, has managed to transform an external, foreign body of material into an act of dynamic, performed understanding (2006, pp. 135–136).

I would argue that the idea of a *practical verification* of the equality of intelligence can be fruitfully applied to studies of performances and theatrical material. The very thought of treating dancers in action, as well as dancers in video recordings and on photographs, as equals, and intelligent, rather than too quickly judging them from a safe distance, changes the research process. Moreover, it also provides an entry into the heart of the practitioner’s interpretive process.

Getting close and getting lost

On the podium in *Oedipus the King* there was a constant transformation involving bare feet and differing placements of empty shoes. Those seemingly simple choreographic acts easily catch the eye, but their profound impact goes far beyond the visual register. Since feet perform, and shoes walk us and dance us every day, it is time to make an effort to join the dancers, in an ethics of being with them. Roll, walk, run, be there, feel the floor and sweat with them – not only during the performance, but day after day, at work. We can take off our clothes, not as a provocation, but as a way of entering the world of dance, by way of the almost redundant routine of changing into dancewear, training and sweating a lot, taking care of sore feet, rehearsing, changing again, maybe eating something, and putting on the costume. Breathe – and enter the corporeal knowledge of Oedipus, in many versions. When recognizing and moving with such repetitive structures, the dancer’s knowledge becomes more accessible. Thus, a corporeally anchored articulation of a dancer’s everyday life can be useful when working through notes and sources in various media.

Within in the repetitive structures the dancer's personal, creative contributions can be accessed. According to Roos (2006), a dancer engages in the interpretive process in two, often intertwined ways: 1) *focusing outwards* – engaging in cool, technical, and detached procedures; and 2) *focusing inwards* – experiencing form in a sensuous, sensitive, and conscious way. These creative experiences then merge in a *twilight space* (to use my concept), in which "a dynamic equivalence represents the dancer's absolute attention to the body in the encounter with new material" (p. 133, my translation). The word "absolute" should be understood in a non-static way, as signifying the ability continuously to remain in a dynamic relation to the situation. Following this way of theorizing the practitioner's knowledge, two approaches can be useful here: a detached, technical registration of what can be seen in a performance, a video, or a photograph; and an inward focus that does not censor affective, corporeal sensibility, since (no matter how fragmentary or vague) it can be a most productive way to enter the space of knowing more, about the dancer's professional interpretation. The researcher will have to sweat and get lost, as well as think and analyse, in order to learn from the dancer. Thus, the essayistic endeavour will allow a dynamic equivalence between the various parts of the research process to take shape and be performed, as dance-text in a twilight space.

While it has often been pointed out that photographs show scattered moments from something inevitably vanished, it might be equally important to acknowledge their precarious relation to the dancers once present in the situation. Working with images can be understood as being involved in performative events (Rossholm 2007), as opposed to confronting and writing on them as fixed objects. The photographs from *Oedipus the King* that are accessible on the internet have apparently been selected for the press and for the purpose of marketing. Even so, in this case they are reasonably similar to the performance, and thus can be considered particularly useful as "dance partners". What draws me to these traces is their ability to function as entrances to a striking, urgent, insidiously corporeal – or in other respects irksome – presence. Such palpable experiences can be connected to Roland Barthes' *punctum* as well as to *the real* in the Lacanian sense of the word. Barthes points out that now and then something personal and ungraspable, a painful disturbance, hits him when he encounters photographs (1986, pp. 13, 44). Lacan describes this physical and material – yet impossible – sensation like this: "The function of the tuché, of the real as encounter – the encounter in so far as it may be missed, in so far as it is essentially the missed encounter." (1977, p. 55). The connection between Barthes' punctum, and Lacan's real has been amply clarified by Sean Homer:

> Unlike painting or language, photography can never deny its past, that the thing existed and was there in front of the camera, but that real is lost the moment the photograph itself comes into being. And it is this that is the very essence of photography – its *noeme*, that is to say, its "that-has-been" or its intractability. Another name for this is "the real" in the full Lacanian sense. (2005, p. 93)

I look at the pictures from *Oedipus the King*; I put my bare feet on the floor and move with the dancers, in my memory, with the help of a documentation video, and the notes. It is as if the pictures open themselves to me and I dwell and work within them for a while. This experience, constituting an important dimension of the twilight space of dance-writing, is not a futile dream of reconstruction. Rather, it can be thought of as an ethically informed exchange with dance photographs, to bring forth living and shared experiential knowledge.

The scene with the blind prophet Tiresias is a key moment in the performance. It is revealed that it is the seeing Oedipus who really is blind, who lacks insight or knowledge of his own life and history. A very small dancer clings to a very big dancer and like a monster they move across the stage, giving birth to the ungraspable horrible truth. Like a small girl, I hang on to the leg of the big dancer, and the immense blindness is corporeally present on stage. It is like we are wallowing within and outside a painful knowledge process. The dancers project

such moments very strongly and directly; it is done beyond words, but in a conscious way. Dance has the capacity to make us feel, see, live through, and access this painful, crucial, carnal area, so bursting with content. The dancers do not merely reflect, illustrate, or represent the written text; they do something different. It is, I think, quite possible to gain a theoretical and general understanding of the dancer's interpretation process, but to access the experiential knowledge in an actual past or ongoing performance is a far more precarious undertaking. While there is no standard route, I will suggest a few paths worth exploring.

Monica Sand (2008, 2012) claims that everyday actions, if brought to awareness and re-learnt, can be transformed into methods of investigation. The act of making the redundant habit of walking unfamiliar brings us further into the area of dance knowledge. I remember how, when working in the dance studio, walking and running became advanced activities, difficult to perform as well as to teach. The corporeal practices were brought to an epistemological level, where they could be problematized and reformulated. According to Sand, moving like this in space is a way of creating a space for *thinking* (Sand, 2008, p. 184; see also Deleuze & Guattari, 1980). For example, when stepping on the wrong foot, or getting lost, a given and stable map is redrawn by the disturbing as well as affirmative presence within the same map (p. 192). Such a mutual, ongoing interaction between body, thought, environment, and writing can indeed have critical implications.

Another researcher who argues for the importance of *getting lost* for the sake of knowledge is Patti Lather. In a landscape where the stable foundations of science are questioned, she strives to find a fertile ontological space for feminist ethnography.

> With women living with HIV/AIDS, I first began to learn about getting lost in terms of what it means to not be in control and to try to figure out a life, given that. Perhaps more precisely, I learned about getting lost from trying to simultaneously produce and theorize a book about these women. There I put myself in an awkward position that was not so much about losing oneself in knowledge as about knowledge that loses itself in the necessary blind spots of understanding. (Lather 2007, pp. vii–viii)

These deconstructive, interventionist perspectives are fundamental to dance-writing. Instead of stultifying opposites, we can have affective, corporeal, intuitive dimensions collaborating with intellectual practices, in the production of knowledge. While some of the impact of *Oedipus the King* was immediately perceived, the process of working with it had to involve periods of *getting lost* and feeling *ignorant*. And it has to take time, and it is not over yet.

The love of knowledge

In the Messenger's brutal dance with an office chair the pain inherent in the play breaks through on stage. When the dancer's two feet simultaneously land on the floor with a distinct thump, the atmosphere is cleaved by shear threat and despair. The chair and the dancer then wrestle and rustle in space. They become a hybrid creature banging a gigantic metal extension – the swollen foot that cannot be hidden – into the area of unbearable truth. An insensate piece of furniture, the corporeal presence of the dancer, and the many skills involved in the event communicate very strongly in a dimension where there really are no words (Fig. 2).

Fig. 2 Dancer/actor: Jan Vesala. Photo: Peter Westrup

Starting from the easily accessible moment described above, we can go further. Dance-writing aims at providing a zone for experiencing and thinking. When engaging in it, we enter a *twilight space*, an essayistic laboratory allowing polymorphous feelings, and rather "free" associations, for example: what you really feel and think about when sitting in the office chair with Oedipus – not what you think you have to say to satisfy the expert. I thought about everything that is hidden, but somehow impossibly pressing and present, beneath a rather nice surface at work, the things not talked about, the fear, the panic, the hate, and even the pleasant moments when people get along really well. These thoughts provided a way of accessing the dancer's movements, intensifying the extraordinary in the ordinary.

What happens in the zone has nothing to do with demands of proving things or the obsession of assessment – there are other times and places for such passions. To borrow a strong passage from the performance: the horrific history is now permeating space; Jocasta (mother and wife) and Oedipus (son and husband) act front stage, close to the audience (Fig. 3).

Fig. 3. Dancers/actors: Fredrik Gunnarsson and Cecilia Lindqvist. Photo: Peter Westrup.

It is a tender and tragic moment which both contrasts and enhances the brutish content of the scene. It could be any ambitious couple, in the middle of their careers, trying to handle a shitty situation, and it is precisely here that multileveled experiential knowledge operates.

The grown man and the small child in one body, head resting in the lap of his mother, and the wife caring for her beloved, hands almost touching, and eyes seeing nothing but pain. Almost without noticing we become immersed in the family drama. So, in the act of physical tenderness in the midst of a catastrophe, an overwhelming impossibility and anxiety reveals itself, through experiential knowledge.

To provide a theoretical stance, I will once more turn to Lacan's notoriously complex notion of the *real*. This notion is known for being difficult to pin down, but at the same time its "radical indeterminacy" is what makes it useful for what I am trying to grasp here. The real is something that finds itself outside language; it resists symbolization and is thus connected to impossibility. It also has connotations to matter, "and to the body in its brute physicality". When mediation is not possible, and where there are no words, anxiety shows itself. Furthermore, "it is never completely clear whether the real is external or internal, or whether it is unknowable or amenable to reason" (Evans 2005, p. 160). In addressing artistic actions, the real can be helpful when trying to access their capacity to say something in the realm of the impossible, unspeakable, and material. I will retell an anecdotal incident to give an example in which these dimensions come into view.

One day, in the famous seminar of his, Lacan turned to the real (Johansson, pp. 105–107). He just sat there, in silence, making the knots he was so interested in. One might say that he was getting very old and confused. However, it is also possible to perceive the situation as a highly theoretical artistic statement with performative dimensions. Lacan wished, in a more or less conscious way, to really say something beyond given laws and images. Through the silent and corporeal expression he forced the others into an insecure area, into thinking, interpreting, and seeing without knowing beforehand. Anxiety revealed itself; people were obviously *getting lost*, and feeling *ignorant*, when made part of this impossible situation. But they were also being put in the position where it is possible to ask real questions (questions that you do not know the answer to) and begin to feel the birth of new ideas. This situation, involving corporeal expression and the experience of something uncomfortable and insecure, is pregnant with the possibility of moving towards knowledge.

In Lacanian terminology the dancers in *Oedipus the King* turn to the real, trying to articulate something very difficult concerning the multifaceted complexities of the Oedipus tragedy as well as our everyday lives. The performative actions destabilize the order of the ordinary office, living room, or other area, and thus challenge our redundant habits and expert positions.

Fig. 4. Dancer/actor: Fredrik Gunnarsson. Photo: Peter Westrup.

The different bodies of the ten dancers/actors, their movements, the empty shoes, the chairs, and the clothes remind us of common features. Oedipus (in one version) is there in a sort of floating office, spreading his legs and displaying power (Fig. 4). He and his colleagues are very efficient, but his feet are bare, as he sits in his chair. The contrast between the powerful posture and the vulnerable feet is acted out in the event, but it has also been carefully worked on beforehand. When writing with the dancers, knowledge from the collective production process reveals itself in the traces and memories of the event. As previously mentioned, reconstruction is not the aim; what I am after is the intelligence of experiential knowledge, which reveals itself in the process of exchange. In this complex mission, the sweating researcher can start to learn about the powers of dance and scenography and thus realize a tiny piece of Rancière's radical equality. This engagement cannot be solely mechanical or instrumental; as a start, one also has to care.

In the space of dance-writing we are allowed to be angry, enchanted, loving, desiring, lost, ignorant, tired, frustrated human beings. It is not necessarily a good thing to censor our affective, corporeal sensibility, since it (no matter how fragmentary or vague) can be a most productive way to get a foot in the door, and enter the space of knowing more. Or, in the words of Shannon Jackson: "Callused fingers, numb limbs, and swollen feet are all quite literal reminders of the bodily basis of research. To place them within the same memorial space is […] to suggest something of what it means to join performance and the past" (2000, p. 3). By way of feeling her feet as well as consciously analysing the sensation, Jackson fruitfully entered straight into the spatial and corporeal world of the subjects she was studying.

This tryout of a passionate as well as scholarly exchange between dance and text is almost over, for this time, and I would like to propose the following: dance-writing can be understood as a theoretically informed critical activity or practice acted out in a space where *the love of knowledge* can live, move, and work. This "love affair" can be connected to the way Lacan theorizes the notion of *transference.* In psychoanalysis the concept of transference refers to the relationship between the analyst and the patient. Even if this relationship clearly has imaginary effects, and often manifests itself through strong affects, such as love and hate, Lacan locates it in the symbolic order (Evans, 2005, pp. 213–214), or the order of research. The Lacanian way of understanding affect, and placing it within the concept of transference and directed towards increased knowledge, accounts for the co-creative, mobile, knowledge producing exchange of dance-writing.

I would suggest that an applied awareness of the implications of our more or less conscious roles involving expertise, experience, ignorance, disorientation, passion and the search for knowledge can be very constructive. This stance not only challenges stultifying approaches denouncing corporeality and affectivity, it can also make research more critical in relation to the vivid articulations of dance events, as well as other performative activities.

Conclusions

In this article, dance-writing has been worked through in a number of interwoven, theoretically informed clusters, in relation to examples from the dance theatre performance *Oedipus the King* (2011). The aim has been to provide a set of theoretical concepts to serve as directional indicators for dance-writing in the promising trans-disciplinary field where practice-based research and the humanities can intersect.

When performing the theoretically informed, critical activity of *dance-writing*, my personal and corporeal memories, associations, and experiences open up a path into a *twilight space*. This zone, as well as the experiential knowledge it can bring forth, is created when writing

with dance, which is an *ethically* informed activity, in contrast to writing *on* art. Knowledge thus emerges step by step as an *essayistic text*, that is to say, as a hybridity encompassing, but never fully uniting "passion and science". Dance-writing keeps moving with knowledge creation, acknowledging dance as a vital form of articulation, and a full participant in critical dialogue. It can be described as a creative, conscious, and vital journey, with the purpose of engaging the researcher in a process where analyses of live experience, practitioners' knowledge, as well as archival material can be given the distinct and different values they deserve. It takes an ignorant, sweating researcher – willing to *get lost* in the quest for knowledge – to enter the zone and partake in the thrilling *exchange* that will not only make dance events "move differently", but transform the researcher as well. The very thought of treating dancers – in action as well as in archival traces – as *equals*, and as intelligent, rather than too quickly judging them from a safe distance, will indeed affect the explorative process. Ultimately, it is claimed that dance-writing allows us to partake in a practical verification of radical equality.

I would suggest that a thorough understanding of dance-writing can only be achieved by actually testing oneself in relation to practices. Hence, I encourage you, the reading dancer, or the dancing reader, to start dance-writing. The outcome is (and should be) unknown and risky. It requires a somewhat passionate as well as intellectual curiosity about art and dance, and moreover a determination not just to write whatever words come up, but to go through the hard process of sound scholarly work – to support, refine, and perfect that which is worth presenting. And this is not always what you expect it to be at the outset. An essay never truly ends with a full stop; it prefers a comma, to be lived, loved, and moved with, in the future, as long as anybody cares to come and dance,

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Participatory Art Based Research as a Tool to Restructure Notions of Participating Second Generation Immigrant Youth

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Abstract

In my paper/presentation I will discuss my multidisciplinary research project A Finn, a Foreigner or a Transnational Hip-hopper? Participatory Art-Based Research on the Identification Negotiations and Belonging of the Second Generation Finnish Immigrant Youth. My main research objective is to offer new knowledge about the localisation processes of second generation immigrants by making the participants' voices heard and their perspectives visible. Also, my intention is to develop cross-disciplinary approaches and methods. I have been working with several teams and groups of youth. However, in this article I concentrate on the work done with a group of young second generation Somali men and two young Somali women.

I started to work with the young men during autumn 2009 in the "Youths Multicultural Living Room" run by the Youth Department of the City of Helsinki. Based on the material created mainly by young men we produced a video and photo exhibition, a radio program and a book. During March till September 2013 visual and audiovisual material produced by the group of young men and one young woman will be presented in the exhibition at the Institute of Migration, Turku, Finland.

In my presentation I will show some of the work exhibited in 2013 and discuss the themes emerging from the material. Those themes are, for example, nationality, racism and prejudices, transnational relations, diaspora, questions of identifications and nature. It seems that a central issue that emerges from the material is ambivalence. I claim that participatory practices and art-based approaches help youth to make this ambivalence visible, talk about their experiences and share their knowledge that can be otherwise difficult to reach. By creating productions the results can be distributed to the larger society, not only to the academic community. Youth likes to take part in and give their perspectives to the inquiries that concern themselves. Researchers, educators and artists can give them tools to do that.

Keywords

art based research; performativity; visual approaches; participatory multidisciplinary projects; youth work with second generation immigrants

My research project continues to deal with the themes of cultural in-between spaces and issues of multiculturalism that I have approached in my previous research. Methodologically I am interested in applying experimental postures and perspectives in the research context. I think that art based, narrative and performative methods can be used to advance understanding of the interplay between diverse contemporary social *and a*esthetic realities, and can also be seen as a way of building bridges between artistic and scientific approaches

in academic contexts.

During 2009-2012 I conducted photographic, video and narration workshops with various teams in youth centres, schools and other youth spaces. The work process and the productions created in the workshop form the main part of the research data. In the workshops the youth participate in producing the material that will be - besides other documentation and observations collected during the field work - an important part of my research data and research reporting. In this way the research participants are part of a multi-level theory and methodology development of intervention approaches that community researchers across multiple fields embed in their studies (cf. Pain, Kindon & Kesby 2007; Schensul & Trickett, 2009; Wang, Morrel-Samuels, Hutchison, Bell & Pestronk, 2004).

Participatory action research includes the subjects of research as co-creators of the study. It can create spaces for dialogue, promote polyvocality and increase involvement in producing knowledge as well as action. Visual, audio, audiovisual and literature productions created together with the participants provide sites for them to tell their stories and facilitate sensuous knowledge and understanding of the complexity of social identifications. (O'Neill 2011.) Divya Tolia-Kelly (2007, p.132) claims that making voices and perspectives tangible in visual forms entails a possibility for coming up with unexpected grammars and vocabularies that can be inexpressible in other contexts. I think that in the workshops and in the productions created in them these above mentioned qualities and possibilities have been present.

In this paper I mainly concentrate on material produced in the video and photography workshops conducted with photographer Sami Sallinen during 2009-2010, in the Youth Centre called Young People's Multicultural Living Room, run by Youth Department of Helsinki. Most of the participants and co-researchers happened to have Somali background. I also organized other workshops in the Young People's Multicultural Living Room; for example, in May 2010 I conducted a workshop with Professor Lily Diaz and her students from the Media Department of Aalto University, School of Arts & Design, in which ten participants produced narratives about their relationship to the cultural heritage of Helsinki by using Life Breather mobile applications.

During 21.12.2010–24.1.2011 I organized, together with a team of participating youngsters, the video and photo exhibition, *My Helsinki,* in Library 10 which is located in downtown Helsinki. Since then the exhibition has been presented on several occasions. For example, in April 2012, it formed a part of the Young-Helsinki photo and video exhibition that I created together with the Finnish Museum of Photography and several artists and art educators for that museum as part of the programme of the Helsinki Urban Photography 2012 Festival.

In spring 2011, together with five young Somali men and one young woman, I made a radio programme Mis on mun tila? (Where is my Space?) as a joint production with a team from YLE, Finland's national public broadcasting company. A book based on the visual and audio visual material created by the youngsters, was published in 2012.

During March–September 2013 the materials produced by the young Somali men were presented together with the photographic and audiovisual material produced by a young Somali woman in the exhibition, Through my Eyes – View Points to the World by Somali Youth in the *Institute of Migration*, Turku, Finland. The material includes photos, a short film and a book produced by the group of young men, and photos and audio narration from the female participant.

The visual and narrative productions of young Somali men participating in the exhibition are on show mainly in Helsinki. The contributions of the female participant – photos on the walls of the exhibition space and a video narrative with photos and story – circulate between

Finland, England – where she studied for three years – and Somalia, which she visited in summer 2010 (Fig.1 and 2).

According to Maggie O'Neill (2011, p. 21) "biographical and narrative-based research entails an understanding of the relationship between the particular and the general and the need for analysis that takes account of the embeddedness of the small scale phenomena in the broader social totality." I have also noticed that when working with the materials produced in collaboration with the youth I constantly find new layers within the productions, and new angles to view the relationship between diverse micro- and meta-phenomena.

Fig 1. From the opening of the exhibition.

Fig 2. A visitor admiring photos.

Methods used

Unfinished knowledge

In our project all the participants have been taking part in generating the results. The research process could be described as producing unfinished knowledge (Yuval-Davis 1997). When the insights of the various members of the research are included, surprising perspectives and critical and empowering discussions are part of the whole research process and all participants will be part of the producers of knowledge (cf. O'Neill & Hubbard, 2010).

I think that visual (and audio) methods allow participants to empower the research space and give them tools to be co-researchers. Participants become main actors of the research when they take part in the productions that emerge from the project. In our project these productions - for example, books, videos and exhibitions - are created in a way that will interest the wider public, not only academics and authorities. In this way the published material helps in creating the reflexive discourses within the members of the researched groups and between "majority" and minorities. The productions conducted during the research process will also contribute to the preservation of the cultural heritage of the second generation Somalis in Finland.

The perspective of unfinished knowledge breaks the myth of a solid narrative, thereby also opening up fresh viewpoints on the structure and interpretation of the stories. This enables the dynamic expression of opinions, acting and interaction of research objects, researcher and audience in the different phases of the research (cf. Denzin, 2003; Finley, 2005; Oikarinen-Jabai, 2011a).

Hybrid spaces

As a researcher I have mainly leaned on postcolonial, postmodern and poststructural interpretations of in-between spaces. For example I find Avtar Brah's (1996) analysis of diaspora spaces and Bill Ashcroft's (2001) concepts of interpolation and horizon interesting and useful for my research. As Brah (1996, p.193) reminds, even though diaspora involves an aspect of separation and dislocation, diasporas are also potentially the sites of new beginnings. The multi-locationality across cultural geographical and psychic boundaries and possibilities are differently experienced and mediated within each generation. Gender – along with various other variables – also shapes the lived experience of individuals (Brah, 1996, p.194). Ashcroft argues that Gayatri Spivak's question "Can the subaltern speak?" is problematic (see Spivak,1988), as there are in fact many strategies with which "colonized" people can empower themselves within the dominant culture (Ashcroft, 2011, pp. 45-49.) According to the phenomenological idea of horizon, things may spatially appear in the "outer horizon", which effects an extension of contextual meaning and also brings emerging views in sight (Ashcroft, 2001, pp. 183-185). Notions such as this find approval in the texts of many scholars dealing with hybrid embodied spaces, and they have inspired me and supported my work and study processes (for example Anzaldúa, 1987; Behar, 1995; Bhabha, 1996; Canclini, 1995; Hall, 1990; hooks, 1995; Minh-ha, 1991; O'Neill, 2008; Soja, 1996).

These readings enable the use of diverse methods when analysing and processing the data. The narratives based on different genres and styles of writing are fundamental when we want to perceive the in-between spaces and landscapes of merging (Dunlop,1999). When various scientific, personal and expressional viewpoints intersect, fresh angles will also open to research, art and diversity (Denzin, 2003; Finley, 2005; O'Neill, 2010; Richardson, 1992; St Pierre, 2005).

Thus far, when I have analysed the material produced with the second generation Somali youth in Finland I have found that "post theories" and related methodologies enable the

understanding of the processes of belongings that the youth describe. For instance, often the identifications and identities of the youth cannot be simply fixed to cultures or traditions, but are conditional (cf. Viswesvaran, 1994, p.12). Moreover, it is possible to feel at home in a certain place even in cases where the experience of social exclusions may inhibit public proclamations of such feelings (Brah, 1996, p.193). One of the participating youth described; "if I'm abroad and someone asks me, 'where do you come from?', so first I say I'm from Finland. Then if he/she's looking at me like, how Finland, then I specify I'm from East–Africa." Those youth who have moved to towns from the countryside have strong connections to their home villages, feeling that "city boys are different". Local identifications are also strong, also between suburbs in Helsinki, even though the town is seen as a little place "like my home backyard that I know as the inside of my pocket."

The landscape created in the context of my research reveals many kinds of practices of differentiation, as well as a variety of negotiations of identification, and also how these are reconstructed. When embodied and expressed by visual and textual narratives, these discourses open the "potential space" in-between objective and subjective reality experienced by the informant, in consequence making it possible for him/her to deal with his/her identity configurations (O'Neil, 2008; Turner, 1984). This also lends support to considerations of citizenship from new perspectives.

Crossing the boundaries

Ashcroft remarks that *horizontality* is a practical concept through which to understand postcolonial subjectivity. While boundary marking is central to the western understanding of spatial relationships, the horizon offers perspectives where different enclosed spaces and places merge (Ashcroft, 2001, p. 183). Also, the intersections of political, social, economic and psychological spheres of influence that can be encountered in diasporic space may be understood to be situated on the horizon (cf. Brah, 2001). Many second-generation immigrants are experts of these domains (Oikarinen-Jabai, 2011b). When creating productions the participating youth were able to name those 'no man's horizons' and they achieved the means to occupy merging spaces (Fig. 3). This made it possible for them to deal with rhizomic realities involved in the postcolonial metaphoric and embodied realms (cf. Ashcroft, 2001, p.183).

According to Ashcroft, the horizon is created in language (2001, p.185). "Language is the key to the personal and cultural voyage" (Ashcroft, 2001, p. 48). I think that the constant shift between Finnish, Somali and English language that most of the participating youth used to exhibit, can also support youth in finding alternative visual perspectives. Participatory ethnography and artistic research methods can acknowledge the special cultural knowledge shared by youth living in-between different ethnic and social realities (Finley, 2005). Also, the involved spaces can act as holding spaces and can be therapeutic for everyone, as well as supportive of social justice through a politics of recognition (O'Neill, 2009). When we discussed and dealt with the language issues, in our project the youth became more conscious of them and started to actively "theorize" about the multilingualism that they share.

Fig 3. Photo taken by a female participant. The hands of youth coming from different continents.

It seems that these youngsters are at least as familiar with the locations on borders as with (their) potential homes in different countries and cultural spheres. The transnational spaces, to which they concretely belong through the kinship relations and the diasporic community, also make it possible for them to share a kind of ”horizontal citizenship” and an experience of home reaching over different continents (Ashcroft, 2001, p. 86; Oikarinen-Jabai, 2010). They are used to negotiating in-between different cultures, languages and value systems. “One is like James Bond, playing a role in a cover story,” one participant remarked about his placement in-between cultures. An outsider position gives a standpoint to examine the structures of Finnish society and its connections to global value mappings. Living in-between different cultural systems and negotiating about them can be alienating, however, it should be seen as a resource rather than a burden (cf. Alitolppa-Niitamo, 2004, p. 55; Oikarinen-Jabai, 2008, p. 112).

Action research or research in action

Jon Prosser and Andrew Loxley argue that more collaborative and participative modes of research across social science disciplines have led to more equitable distribution of power and knowledge between researchers and participants. Greater understanding of individual lives and group culture is possible through close reading of photographs and videos. Children and youth are able to access physical and mental territory not available to adults and, consequently, to act as fellow researchers. The images represented in the research can be put to a number of different uses, functioning as a phenomenological centring of the participants lived experience. (Prosser & Loxley, 2008.)

According to Ruth Frankenberg & Lata Mani the approach that addresses various phenomena, moving from one culture to another, should describe moments, social formations, subject positions and actual practices which arise out of an unfolding axis of colonization/decolonization. Uneven, unequal relations interwoven with one another should be carefully considered (Frankenberg & Mani, 2001; cf. Viswesvaran, 1994, p.12). This kind of approach gives the research a transgressive, multidimensional validity (Lather, 1994, p. 39).

Maggie O'Neill claims that participatory approaches are useful when dealing with transnational and diasporic experiences, because they involve praxis as purposeful knowledge, which tells us, in a relational and phenomenological sense, something about what it is to feel 'at home' and have 'a sense of belonging'. These approaches allow us to include creative methods in the study such as subjects producing artistic work or visual/poetic material in addition to other, more traditional, methods of data collection (O'Neill, 2009).

In my study I have wanted to consider both the questions of social and personal empowerment of all participants, including the researcher. I think that personal and social aspects of the research are interwoven but sometimes certain approaches are useful, for example, to produce personal narrations. Often personal narrations touch directly on the social questions. For example, when one of the youth described his belongings in the book *My Town*, his words could be seen to present, in general, the perspectives of a new generation of Finns with immigrant background among whom each individual has diverse identifications and implantations:

> Even though I don't see myself as a Finn, this is my home country or something in-between. I have a lot of friends here. I was born here, I went to school and I grew up here. I get along in Finland. After the school I would like to see the world a bit, but I think I'll stay here. I am used to living here. My friends are also from all parts of the world, but I often talk with them in Finnish. I guess we are some kind of new generation of Finnish, and each one also slightly something else. (Oikarinen-Jabai, 2012, p.5.)

The participating youth's frequent experiences of racism and prejudice - all of them had experienced verbal or physical assaults – could be generalized as not being only personal incidents. The Finnish youth with immigrant or non-European backgrounds negotiate, identifications as "foreigner", "backward", "refugee" and "hip-hopper" (Oikarinen-Jabai, 2008, p. 97). Often these kinds of labels are hierarchically related to each other (cf. Sawyer, 2000, p.184). Within the group of Somali youth the categories like immigrant (non-western), African, Somali and Muslim are the most visible (Oikarinen-Jabai, 2010). All these labels also have a "racial" and cultural diasporic substance – black people all over the world. Many youth in our group related strongly to the images of Blackness/Africanness created by Afro-American resistance media (Fig.4).

Fig 4. Photo taken by a male participant in a park in Helsinki

The categories relating to different transnational and diasporic contexts become especially important because of the experienced racism in everyday encounters. All of the informants agreed that racism in Finnish society has become more noticeable in recent years. This could be partly due to their age. One participant told:

> In primary school when people used that n-word, first I didn't know that they meant me… I asked the teacher and she said don't worry. I told mother and she said don't worry, you have to tell to teacher if they continue. (Oikarinen-Jabai, 2012, p. 68)

They all agreed that othering and prejudices became worse when growing up. Most participants admitted that they and their Finnish peers became more conscious about racist attitudes in the secondary school. One of the youth had experienced former friends becoming openly racist:

> In our school there are those who are skinheads or Nazis […] we have been friends in the primary school and in the secondary school they suddenly turn to be different […] you feel that the person is a good human being inside, but anyhow how he behaves and what kind of picture he gives about himself […] so you have to think that he has mental problems or something. (Oikarinen-Jabai, 2012, p. 69.)

All the youth thought that prejudices and racism should be approached and dealt with in the school context. The female participant who was interviewed for the radio programme put it in the following way:

> Teachers don't do enough, even though they should. Since the primary school it happens that this one dissed me, so I beat him up. Nobody ask why did he diss. […] They are avoiding sensitive subjects. Actually they are not so sensitive. These things are part of one's life […] if someone calls you with the n-word, he is not necessarily a racist. He just wants to agitate you […] and knows how.
>
> We should discuss about the roots of racism, what it is […] what kinds of racisms exists […] There are many kind of racism […] If we categorize that only white people are racist against blacks it is outrageous […] And teachers are very scared to talk about racism. If you avoid the subject it does not mean that is goes away […] because these children are living with it all the time. There should be a racism course at school that people would understand really what it means. We all have prejudices […] we should learn to deal with people as individuals […] and children would learn to respects other people, black, semi-black and all […] We all have at some point during our lives […].
>
> Personally I have thought for some time that it should not be this way. That these children and youth should not be all the time looking for their own place, but they should make their own place […] so that they would feel that they belong to somewhere […] Because in the end we don't have a place - almost anywhere. (Where is my space? Radio program, 2011)

Brah (1996, p.193) talks about homing desire, which is not the same thing as desire for a 'homeland'. As I see it, the young people in this project created their own places and followed their desire 'to feel at home' as they produced their visual and audio-visual narratives about Helsinki and other places. Their own research process opened up spaces where it was possible to deal with difference in alternative ways as well as to build bridges across difference (cf. Tolia-Kelly, 2007, p.132).

The youth thought that the media partly reproduces negative images. For example, they argued that quite often the way in which the media represents and writes about immigration and immigrants strengths the prejudices and the polarization between the Finns and Others.

On the other hand, the youth also wondered if too much patronage of immigrants by the media might result in the public reacting in the opposite way to the intended purpose.

> Media somehow presents the things wrongly… either they don't show the positive things or when they try to do it, they do it somehow in a black and white manner. People don't like that they are pushed by the media that they have to like the immigrants. (Radio program Where is my Space, 2011)

The youth were aware about the fact that visibility does not necessarily mean re-representation (cf. Phelan, 1993, p. 6). Anyhow they thought that if there would be more positive role models in the Finnish media – for example "a politician or something like that who would be like a foreigner, but also a Finn and would take part in this society, the attitudes of Finnish people would slowly start to change." Also, they stated, instead of concentrating on negative news, the media should write more about constructive incidents concerning ordinary people with immigrant backgrounds.

In their own photographic and video work the youth re-represented familiar images connected to 'race' and ethnicity, but also performed personal experiences of self that opened new routes to in-between landscapes. For example, one of the youngsters took a lot of self-portraits. In his 'identity collection' he played with both the black male images – so unavoidable on the streets of Helsinki - and with his (own) narrative (Fig 5).

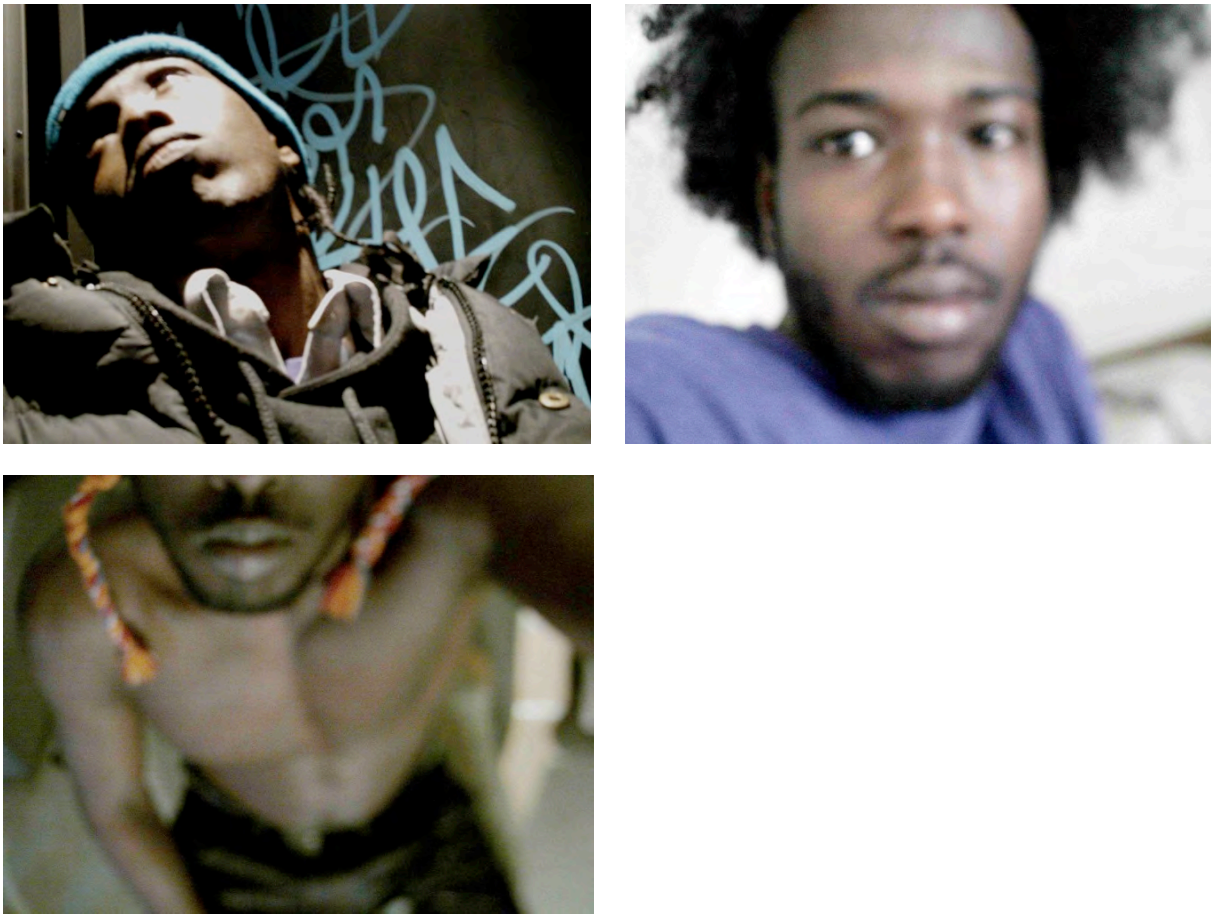

Fig 5. From a series of self-portraits by a male participant

Many photographs of the female participant focused on people, nature and landscapes (Fig. 6, 7 and 8). In her audio narration she is telling that she likes to wander in forests and nature like many Finnish people. She thinks that a deep relation to nature is a common feature in the Finnish and the Somali culture and connects people. In her story she relates her own experiences to the experiences of her parents. The family is present also in her visual narrative. Young men for their part don't talk much about their families and live them out in visual material.

Fig 6. With friends in Hadrian's Wall in England

Fig 7. Girls in Hargeisa

Fig 8. Winter in Finland

The young men don't talk much about religion, but her faith has a central role in the story of the female participant. She has also photographed religious items, like the Koran and her praying matt. She tells:

> Islam, my own religion, it has perhaps molded me the most as a human being…Just these five daily prayers, if I miss one it feels that something important has been missed. It is somehow like a medicine.

The visual genres that the young men and the female participant use in the exhibition are different in kind. It may be due to the fact that the young men worked mainly together, while the woman worked mainly alone or with different partners, but it may also be that their gender affected the way they chose to present their environments and the different angles of their experiences. The data produced in the project indicates that second generation Somali girls in diaspora find it easy to adopt the role of a protector both in their family and in the diasporic community. Also, the participating females emphasized their own strength, for example in encounters with prejudices and racism.

According to Brah (1996, p. 83), in England women from different immigrant backgrounds have formed groups to fight together against the shared anti-black racism. It seems that females in our project had similar dreams and expectations. In the installation the participant talks a lot of love and understanding between people from different cultural, religious and ethnical backgrounds. She is actively looking for strategies, also by way of the photos she has taken, to make her different embodied worlds and realities to merge. Audiovisual approaches serve this purpose well. In her installation the young woman found a way to express her longing for peaceful and equal landscapes where difference and hybridity are seen as a resource and possibility.

Conclusion

Boundary marking is central to colonial relationships, ranging from the most concrete material forms of spatial enclosure to the more abstract forms of Western thinking. The force of dominion lies in the invisibility of boundaries, because they are part of social ruling and become ways of understanding "how things are". (Ashcroft, 2001, p.182.) The Somali youth participating in the project are conscious of the boundaries that restrict, label and place them in certain enclosures. Still, they don't agree to be victims of the situation. Instead, it seems that the negotiations in-between various values and spaces provide them the means to deal with the experienced othering and categorizing (cf. Hautaniemi, 2004, p. 16). The youngsters are talented in creating dialogues that partly mock the boundary categories such as "nation", "race" and "class", thereby generating new kinds of resistance discourse (cf. Aschcroft, 2001, p. 186; see also Yuval-Davies, 2004). For example, in video material that the youth produced in the project they deconstructed the normalising and categorising identities and performed their contradictory subjectivities. Instead of taking an act towards normalization the youth took a step towards empowering the marginalized identities (cf. Butler, 2000).

Trinh T. Minh-ha (2011, p. 27) reminds that a "travelling self" can be seen as one who moves physically from one place to another following 'public routes and beaten tracks' but who at the same time embarks on undetermined journeys, constantly negotiating between home and abroad, between here and there and elsewhere. The Somali youth in diaspora were not travelling physically, still they were constantly on the journey, bargaining between Somali culture, Finnish culture and other cultures they meet on the way. The elsewhere is always present. This leads to ambivalence, which is a fundamental idea that one can come across when analysing the narratives of the participants. On the other hand, they seem to share the same reality as most Finnish youngsters. Then simultaneously, they are forced to be

concerned about their cultural and "racial" backgrounds and "difference" (Oikarinen-Jabai 2010). Often they also act as intermediates between their family and Finnish society. A female participant remarked in the radio programme:

As Somalis we are also at home like bridges to everywhere. You, for example, take care of the issues between the outside world and your family. Then when you are in outside world, you are expected to be a typical Somali. We should find here in between, in the centroid of the identity crisis, some nice box where everyone could go, where they would fit. (Where is my space? Radio program, 2011)

The second generation Somali youth in Finland have that kind of mental and emotional resources that Finnish bureaucrats and education officials savour for in the name of innovation (Oikarinen-Jabai, 2010). As ground breakers they take part in deconstructing and restructuring the surrounding culture and existing ethnic relations. Because they feel at home in in-between spaces and 'traverse on the tightrope' on the horizon where locality and possibility merge, they have qualifications for being cultural mediators (cf. Ashcroft 2001, pp. 182–189; Oikarinen-jabai, 2011a). As specialists in matters with specific phenomena and images which are not openly discussed and dealt with in Finnish society, these youngsters are able to recognize and transgress rigid conceptual borders and national images, and eventually transform such notions and attitudes into brand new ways of thinking.

I am over and over again surprised of the strong sensual expression and multilayered analysis that the youth present in their audio-visual materials. Although they don't know the postcolonial academic vernacular they give amazingly astute descriptions of the phenomena also discussed in the theory. I agree with Minh-ha (2011, p. 83) that audio work can let the voice find its own way, powerful in its vulnerability and magical in its simplicity. Moreover, the electronic communications media have made it possible for sub-cultural groups to intervene in the contradictions generated by modernity, and to democratize everyday and political culture (cf. Canclini, 1995, p. 265). In our project, to be able to present their productions in gallery spaces, seminars and the media has been important for the participants. In this way their work and perspectives have been socially and culturally recognized. (cf. Tolia-Kelly 2007, p.134.) In the Finnish monocultural context, projects that make it possible for people with immigrant backgrounds to work with their own audiovisual-visual narratives are especially important, as they open "dialogic spaces" that may help in creating a cultural imaginary and furthering an understanding of processes of belongings (cf. O'Neill, 2011).

A challenge that a researcher is likely to encounter is deconstructing, "translating" and interpreting "unfinished" understanding and styles based on diasporic or horizontal zones (Oikarinen-Jabai, 2011a). Although the interdependence and dialogue between researcher and researched is meant to further subject-subject relationships, there will still be power relations between subject and object (O'Neill 2011). Visual vocabularies recorded through the participatory process can act as a communicative and educative tool for both researchers and participants, but tensions of translation and mediation remain. (Tolia-Kelly, 2007, p.134.)

The complex characteristics of participatory work bring out practical challenges and ethical inquires that are not encountered when working with more traditional paradigms (Manzo & Brightbill, 2007, p. 33). The youth involved in this project could censor the material by choosing their own files from the data which they wanted to share with the researcher and audience. However, we team leaders made the final work, for example, choosing and producing the pictures and texts for the exhibitions and video, as well as editing the book. In the mediator role that I have adopted during the research project, it has not been always been easy to engage in the practice of inter-reflexivity and power shifting that is characteristic of participatory research. (cf. Pain et al., 2007, p. 30). Likewise the conclusions that I present in the context of the academy, for example in this paper, are concluded by myself and based

as much on the existing research and theory as on the data and reporting produced with the youth.

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Helena Oikarinen-Jabai is a researcher, educator and freelance journalist. She has long experience in using artistic methods when working with minority children, youth and women in different communities (e.g. in Finland, Sweden, Guyana, the Gambia and Tanzania). In her Art Education Ph.D. thesis Boundary spaces and dissonant voices: Performative writing in-between Finland and Gambia she portrays experiences of moving in transnational and in-between spaces by using performative research and writing methods. Within her postdoctoral research project “A Finn, a Foreigner or a Transnational Hip-hopper?” she concentrates on belongings and identifications of Finnish second-generation immigrant youth. Her special interest is in creating rhizomes in-between different ways of knowing and expressing knowledge through narrative and art-based methods.

The Interplay between Experiential and Theoretical Knowledge in Service Design

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Abstract

This study explores how a designer's experiential and theoretical types of knowledge are involved in her research, analysis, and synthesis processes, based on observations made from a cafeteria service design workshop. A designer's experiential and theoretical types knowledge arise from her interaction with the natural world. While experiential knowledge is acquired from her direct experience with intuitive thinking, theoretical knowledge is a product of her direct-indirect experiences reflected with both intuitive thinking and analytical thinking. Experiential knowledge and theoretical knowledge are two sides of her knowledge as a whole. They are dependent to each other in that experiential knowledge is explained with theoretical knowledge, and theoretical knowledge is demonstrated with experiential knowledge.

In this study, a designer's experiential knowledge is argued as part of her seemingly rational problem framing, hypothesis building, and decision-making. It can assist her to be sensitive to particular aspects of design problems, contextualize observed problems and find potential causes, and intuitively see feasible solutions without much analytical thinking. Simultaneously, experiential knowledge may make her thinking biased towards certain aspects of design problems and exaggerate their priority, limit her thinking only to situations she experienced before, or misguide her to consider irrelevant facts/assumptions and render the deduced conclusions faulty. For the reasons, a designer's intuitive decisions based mostly on experiential knowledge need to be triangulated with multiple sources of information that often come in the form of theoretical knowledge, proven with supporting data and evidences. In the conclusion, a model of design expertise is described, that becomes richer and broader through deepening experiential and theoretical types of knowledge, in these four areas: understanding the problem space, representation of current problem, exploring the solution space, and materialization of the solution ideas.

Keywords

experiential knowledge; theoretical knowledge; design expertise, service design

Introduction

Designers' projects reflect their knowledge and technical expertise, and their stories often reveal how their personal experiences/observations became the inspiration behind their projects. The kinds of problems designers are facing now, however, may not be properly identified with such an intuitive approach. In many occasions, problems are global in scope, they are caused by interlinked factors, and they remain invisible until it is too late to revert their long-term consequences. For example, minimizing human causes of climate changes is a subject many designers are interested in, but the problem, its causes, and resulting

consequences are too abstract and complex to be recognized with individual designers' observations alone. For another example, to design a sustainable dining experience at a cafeteria, a designer needs to see beyond what is directly observable, such as how each ingredient is produced and delivered through the national food supply chain, or how much environmental impact are caused for it. Useful scientific information can be given to designers in an interdisciplinary team, but how such information is relevant to, or how it is handled in their creative processes remain unknown.

This study presents a case of sustainable cafeteria service design where authors were involved as an instructor and an observer. From our observation, we aim to clarify how a designer's experiential and theoretical knowledge guides her thinking and decision-making throughout the process. Knowledge is a person's direct-indirect experience of the natural world, stored either as personal episodes or codified concepts. The two types of knowledge are interdependent in that the codified, theoretical knowledge—following Bloom's taxonomy (1956), factual, conceptual, procedural, and metacognitive knowledge—is grounded to experiential knowledge stored in the form of personal episodes, and theoretical knowledge becomes more meaningful, when it is located in the right context. While there are many case studies emphasizing how a designer's theoretical knowledge and scientific research activities led to an accurate analysis of a problem situation and successful solutions, this study argues that a designer's observations of problems and her subsequent design decisions are affected by both types of knowledge. This study will highlight (i) how the designer's experiential knowledge is involved in her seemingly rational problem framing, abductive reasoning, and decision-making, and (ii) how the experiential knowledge makes the processes either efficient or biased. In the conclusion, a model of design expertise shaped by experiential and theoretical types of knowledge is proposed.

In the next section, the definitions of experiential and theoretical knowledge in this study, current understanding of designer's expertise, and the types of analytical thinking relevant to a design project will be discussed.

Theoretical background

Experiential and theoretical types of knowledge

Evans (2008) discusses previous studies on two types of thinking processes—type 1 is rather intuitive, rapid, and automatic, while type 2 is analytical, slow, and deliberative—and how researchers tried to map them to two hypothesized systems that Stanovich (1999, as cited in Evans, 2008) termed System 1 and System 2. Researchers have been trying to characterize and contrast the two systems, such as contextualized vs. abstract. Storkerson (2010) also contrasts naturalistic thinking and formal thinking. Naturalistic cognition is a holistic process where a conscious body perceives and interacts with its environment, and that is how people develop knowledge of the natural world. On the contrary, formal thinking is propositional and logical. Through formal thinking, our observations of the natural world are codified into articulate knowledge, but formal thinking is also dependent on our knowledge of the natural world.

Regarding the two types of thinking, researchers concluded that they are not neatly mapped to System 1 and System 2 characteristics (Evans, 2008); multiple implicit processes of different natures are found, and similarly, some evidences suggest that System 2 thinking processes are not completely decontextualized, and should be considered broader than pure mental logic or abstract logical reasoning. For instance, when people reason, the process would seem rational, type 2 thinking; but often they draw conclusions by *heuristic*

thinking (type 1 thinking) based on rather irrational grounds such as their personal experiences; their conclusions can be flawed by excluding relevant information or including irrelevant information; such a conclusion may or may not be inhibited by their analytic, type 2 thinking later. Evans concludes that there may be one system that operates with type 1 processes, and the other includes a mixture of type 1 and type 2 processes. The latter requires access to working memory among other resources (p. 271).

In this study, the authors argue that a designer's experiential and theoretical types of knowledge are acquired, when she handles and reacts to what she perceives from the natural world with the type 1 and type 2 thinking. Experiential types of knowledge are acquired with a person's direct experience of the world and intuitive–holistic thinking. Storkerson (2010) cites tacit knowing (Polanyi, 1967), experience-based expertise, naturalistic decision-making (Lipschitz & Strauss, 1997), and perceptual cognition (Johnson, 2007) as examples of naturalistic knowing. This study would add the designer's personal observations of the natural world—the world as she knows, feels, and remembers—as part of it. Theoretical types of knowledge, on the other hand, are products of her direct and indirect experiences reflected with both contextual and analytical thinking processes, such as factual, conceptual, procedural and metacognitive knowledge involved in the learning process (Bloom, 1956). Theoretical knowledge is developed with both types of thinking in that most concepts we handle are grounded into our physical experiences of the world; the concepts may be analytically derived from the experiences, but they are meaningfully connected with each other in the web of episodic experiences.

A designer's experiential and theoretical types of knowledge matter as her design expertise is shaped with both of them. How expertise has been defined in general, and how design expertise is currently understood will continue in the next section.

Theories of design expertise

Regarding the nature of expertise in general, three major perspectives exist (Phillips et al., 2004): Firstly, changes that happen to a person as she gains more experiences: consistent performance, integrated strategies, pattern perception, and the ability to form new strategies on her own (Glaser, 1996). Secondly, better understandings or superior mental representations of current problems that experts seem to build, because they view the problems at a deeper level (Chi et al., 1981). Lastly, more categories of knowledge: the ability to make fine discriminations with perceptual skills, to build mental models with broader and deeper (declarative) knowledge, to recognize typical situations as patterns, to find unapparent opportunities, and to monitor one's strength and limitations, just to name a few (Klein and Militello, 2004). The findings from these studies may or may not be applicable to design expertise, because none of them were written about expertise in creative processes such as design. Nonetheless, certainly similar insights have been proposed.

Regarding design expertise in particular, the differences between novice and expert designers have been understood on two different levels: On a more concrete level, expertise is viewed as *repertoire of solutions* applicable to a problem based on guiding principles and intuitive situation recognition. On a more abstract level, expertise is understood as a designer's ability to *understand* the problem situation, consider a broad range of relevant information, and develop specific goals and plans.

One example of the *repertoire of solutions* view is Lawson (2004)'s work. He explains that design novices become experts through five stages of development: (1) acquiring more sophisticated domain schemata, (2) gaining knowledge by studying precedents, while continuously developing their domain schemata, (3) developing guiding principles to structure and filter their collections of precedents and current problems with them, (4) intuitively recognizing the features of precedents in their domain schemata, from their

current cases, and (5) creating original solutions for current cases from repertoire of tricks. Dreyfus (1992) also emphasizes the expert designer's ability to recognize similarities between different design situations, and this ability matters, because they can apply potential solutions that they have previously tried, to new problem situations that are seemingly undefined, shifting, and unique. On the other hand, from the *understanding* view of design expertise, Björklund (2012) pays more attention to the differences in mental representations of the problem space between novices and experts. Experts' mental representations are superior in extent, depth, and level of detail. They seem to perceive a wider range of requirements, and consider information drawn from many external sources. Their representations show how their knowledge and current problem are connected, and how they find latent relationships between pieces of information. Experts also create more and specific sub-goals and customized plans.

The expertise in the field of service design—where designers create commonly shared systems, processes and tools—is the ability to understand complex information, i.e., knowledge of all related fields and entities. Services are complex, interactive, and evolving products. Designers need to study existing systems with secondary research, while collecting primary data from users and stakeholders to understand where current systems succeed or fail, and what features and constraints the system should function with. They need to rely on both theoretical and experiential types of knowledge. In the next section, how a designer' expertise in service design, her ability to discover causal and other relations between entities to understand design requirements, is relevant to abductive and deductive reasoning processes will continue.

Deductive and abductive reasoning processes

Peirce (1878) classifies three types of logical reasoning, deduction, induction, and abduction. While deductive reasoning draws a conclusion by examining a given case against given rules, inductive reasoning induces a rule by making an observation from cases. Johnson-Laird (2001) argues that a deductive reasoning process entails construction of mental models, that is the reasoner's understanding of what is possible, what is probable, and what is necessary with the given premises (p. 435).

He also pointed out that, despite people's effort to be logical, human deduction process is incomplete in many aspects yet. Firstly, people tend to stop reasoning when they found some, not all, models that are compatible with the premises, and finding some compatible models can lead to a conclusion that may be possible, but not necessary (p. 441). Each mental model found by the reasoner (each possibility) shows what is true with given premises, but it does not show what is false (p. 434). Reasoners cannot see the validity of their temporary conclusions because they only have a partial picture of the situation. Secondly, a deduction process with concepts of the natural world can be modulated by how the reasoner sees the content of the premises and her background knowledge; meaningful concepts in the premises can evoke additional information from her background knowledge that is irrelevant to the given task, but the reasoner can unwittingly accept it as part of her assumption.

Deduction is part of a creative process when you try to come up with a solution considering design requirements. Ideally, a designer logically examines given requirements and systematically explores all possible design solutions that meet them. In reality, however, not all possibilities are considered. Only some spontaneously found solutions that meet requirements are considered and refined further, either due to designers' limited time and resources, and *heuristics*. In this study, heuristics are defined as a designer's intuitive judgment of what solution will work and what will not, based on their previous experiences and knowledge. For example, an experienced art director knows A visual style will work better than B style for a food related message. As designers gain more work experiences,

they tend to develop heuristics along with domain knowledge, and a novice designer's heuristics are suspected to be simpler than experts.

Abductive reasoning, or hypothesis, is somewhat different; rules are given and observations can be made, but the relationship between the rules and observations are not obvious. The relationship is explained by building hypotheses. Such a hypothesis, according to Thagard and Shelley (1997), is an external, creative element that are layered on top of given observations, such as guessing who the murderer is considering physical evidences. There can be more than one hypothesis, and each one needs to be corroborated with more data.

Abduction is a key to many constructive processes such as designing, as a creative solution is synthesized while people are trying to make sense of given data, finding relationships between seemingly unrelated elements (Kolko, 2010). The hidden relationships become explicit when the entire meaning-creating process is externalized and made tangible in the physical realm, with visual structure (p. 19). Designers can methodify the process by prioritizing data according to their importance, judging their relevance, and creating connections between seemingly unrelated pieces of data. Abduction is also a key part of problem-reframing, since a different problem can be identified by changing current hypothesis. Asking different questions let you look for different answers. The reframing process entails reconsidering current requirements, which Johnson-Laird (2005, as cited in Kolko, 2010) describes as a four-step process of changing given constraints, to expand the problem space and explore new solutions.

So far, the Theoretical Background section elaborated how previous studies define experiential and theoretical types of knowledge, their relevance to design expertise, and abductive/deductive reasoning observed in the design process. On this background, this study will present an empirical case of design major students' service renovation project, to exemplify how experiential knowledge, not only theoretical knowledge, plays a key role in their seemingly objective abduction and deduction processes. On the same background, in the conclusion, the authors will propose a model of experiential-theoretical knowledge that shapes four categories of design expertise, heavily indebted to Peirce (1878), Bloom (1956), Johnson-Laird (2001), Klein & Militello (2004), and Evans (2008). In the next section, the service design project and follow-up tasks will be described in detail.

Research design

Culture of sustainability workshop

In 2012, a design school in Helsinki hosted a 5-day, graduate level service design workshop, *Culture of Sustainability*, taught by two instructors. The workshop aimed to broaden students' understanding and knowledge about sustainability by working on concrete design solutions. Students worked in teams, and one team worked on school cafeteria (T-Cafe, hereafter) service design. T-Cafe was a university cafeteria that serves meal for two groups, students and regular customers. Meals for the two groups were different due to price difference; students eat at significantly lower price thanks to government meal subsidies.

The T-Cafe team was multicultural (members were from China, Finland and India), and multidisciplinary. During the workshop, teams had daily meetings with instructors regarding project management, problem framing, design references, methods and tools, designing solutions, and documentation. Students worked on design problems they experienced daily, and solvable in 3–4 days. Thanks to the limited time, T-Cafe team framed their problems mostly around the social aspects (how customers are served at T-Cafe) of sustainability, even though ecological and economical aspects were also brainstormed in the beginning. T-

Cafe team approached from the student customer point of view, improved features they thought problematic as student customers. They started out from observation, documented customer journey, and discussed their findings to mind-map problems and solutions. On the last day of the workshop, T-Cafe team's research findings, design process, and solution prototypes were documented in a written report.

Follow-up interviews

After the workshop, two members from the T-Cafe Team (S1 and S2, hereafter), and one more student interested in food sustainability (S3) were chosen for follow-up interviews. Each student participated in a semi-structured interview, a hypothesis-building task, and two space redesign tasks for three hours.

Firstly, during the interview, the authors investigated how the student team framed design problems during the workshop, what were supporting data, and how the students would change their perspectives and reframe problems with more information. After discussing their project deliverables, the authors briefly shared more examples of theoretical knowledge—Fogg (2009)'s human behavior model, physical limitations of human vision, and Elkington (1997)'s sustainable business model of triple bottom line—that are relevant to the team's project to contextualize the next question, how such theoretical types of knowledge would change the foci of their project. Students were able to discuss how their project can be expanded with more primary and secondary research activities.

Secondly, during the hypothesis-building task, the students were asked to explain certain situations/phenomena. The situations provided for this task were all relevant to sustainable eating and problems the student found from T-Cafe. This task was designed to see their abduction thinking process behind the hypothesized causes of current problems, and how the hypotheses were related to their direct and indirect experiences.

Lastly, during the space redesign task, students were invited to create new cafeteria space layouts under two different conditions: First, with a set of alphabet symbols and arrangement rules. Second, with natural world concepts of food items (salad, bread, e.g.) they see in the T-Cafe context and buffet cafeteria design guidelines provided by the authors. The alphabetical symbols actually represented food items, but students did not know it. Rules-guidelines given for the two conditions were similar (Figure 1). This task was designed to observe how a designer's deductive thinking is affected with the *content of the problems* (Johnson-Laird, 1983, p. 52), by contrasting abstract symbol and natural world concept manipulation results. The authors hypothesized that, with natural world concepts, students would try to apply their own arbitrary rules—the rules are formulated from their experiential knowledge with the concepts (e.g., food pairing considered common sense to them, because they have seen them many times). Differences found from the results were described in the next section.

Space Redesign Task

Symbol Arrangement Task

"Collect A, B, one of D/E/F, H, I, J, and K.
You can also collect C and X, but they are optional."

A	Tray and plate	**H**	Bread
B	Salad	**I**	Drink
C	Rice or potate (optional, no extra charge)	**X**	Soup (optional, extra charge)
D/E/F	Three hot dishes (take only one of them)	**J**	Cutlerly
		K	Cashier

(The letter symbol meanings were hidden to participants during the task.)

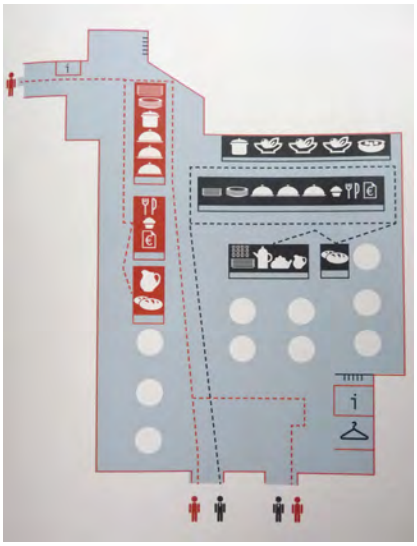
Food Concept Task

"Re-design cafeteria space for a hot meal that includes tray+plate, salad, one of three hot dishes, bread, drink, cutlery. You can also have rice or potato with no extra charge. Soup is sold at extra charge."

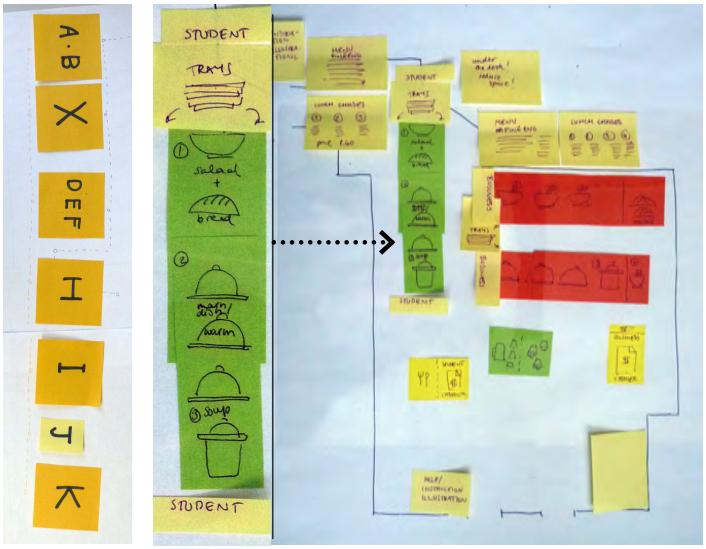
(Rules written in parentheses were not explicitly told to students because the rules were obvious to them.)

Rules

Pick up A and B first.	**1**	(Customers usually pickup tray and plate first.) Among food items, pick up salad first.
You can collect C at any time, after A and B.	**2**	(Rice or potato are free options, so they can be picked up at any time after tray, plate and salad.)
Pick up X before K, but after A and B.	**3**	Soup should be placed before the cashier stand, because it is sold at extra charge.
Pick up H, before I, but after B and one of D/E/F.	**4**	Pick up bread before drink, but after salad and one hot dish.
J should be picked up after one of D/E/F.	**5**	Place cutlery and napkin, after the main menu.
J can be placed with K together.	**6**	(Cutlery is currently placed at the cashier stand.)
You can collect I either before or after K.	**7**	Drinks are picked up at the end (either before or after payment).
Collect either I or K at the end.	**8**	(Customers go to either the cashier stand or the drink table last.)



A workshop deliverable:
cafeteria space improvement suggestions



Space redesign task results during the follow-up interviews:
abstract symbols (left) and food concepts (right)

Fig 1. T-Cafe team's initial layout solution produced during the workshop, and space redesign task results produced during the interview.

Discussion of findings: how experiential and theoretical types of knowledge interact

Problem framing and the designer's experiential knowledge

Follow-up interviews with T-Cafe team show that a designer's experiential knowledge and individual needs can strengthen her perceptual skills towards particular aspects of a situation; she can identify more problems in the aspects, and she may take the problems more seriously.

About T-Cafe service, students' opinions were somewhat different in the following areas (Table 1).

Table 1. Students' different opinions about T-Cafe service

	Opinions on T-Cafe service reported during the follow-up interview		
	S1 (vegetarian)	**S2**	**S3 (vegetarian)**
Food quality and placement	• Salad included to the student meal is too simple. • Student bread is not freshly baked. • Soup placement is problematic: the electric soup container is currently kept at one corner, away from the serving table, to be plugged into an electrical outlet.	• Food quality is improving, it feels tasty even to international students. • She does not eat salad, vegetarian menu or bread, so no opinions about it.	• Food is tasteless (not as good as the vegetarian food she tried at other cafeteria). • Vegetarian food is not part of traditional Finnish cuisine, and usually cafeterias do not know how to make them tasty.
Signage and space layout	• Students accidentally pick up regular meals and pay extra, because T-Cafe did not separate student and regular meal areas with clear signage and enough space in-between.	• New students accidentally pick up regular meal food.	• Service is not good - students are charged extra for innocent mistakes. • She could not understand why desserts are placed on cashier stands.
Menus and pricing	• Students are confused about menu choices ("What is included to a student meal?"), and how price will differ if they add or remove some options.	• Cashiers are ok - cashiers do not charge for students' first time mistakes.	• Menu choices and pricing are confusing. • Food is expensive at T-Cafe for its quality.
Cashier stand placement and payment system	• There are two cashier stands at T-Cafe. There are long lines at one stand because customers do not know the other one is available. • A credit card reader is available at only one side, even though customers line up on two sides. • Students have to show their IDs every time because the payment system does not recognize their student status automatically.	• Cashier area is not too clowded, so no need to put them at separate locations, and separate lines.	• The cashier area is crowded - between the two cashier stands, one can be assigned to students and the other to regular customers. Separating lines and cashier stands for these two groups is a good idea. • A credit card reader is available at only one side. Sometimes she forgets it and has to line up again on the other side.

S1 and S3 were vegetarians, and it made them to rate the T-Cafe food quality mostly based on the salad and vegetarian menu, even though T-Cafe serves more non-vegetarian meals. They thought T-Cafe food is not as good as other vegetarian food they tried. The problems highlighted by S1 and S3, however, were not serious issues for another student (S2) who was not a vegetarian, and she actually preferred T-Cafe over other places. S2 did not complain about food much, mentioned T-Cafe cashiers did not charge extra for students' innocent, first-time mistakes, and did not feel waiting line at the cashier stand was long. While S1 frequently commented that student meal quality is poor compared to regular meals, S2 acknowledged that she is not interested in knowing what they serve for regular meals. Such a difference (also known as *researcher bias* frequently reported in ethnographic

observation data) can either facilitate or bias the problem-framing process. S1's knowledge gained from her direct experience was useful in identifying many improvement opportunities for vegetarian student customers. There might be, however, other urgent problems S1 may have missed due to her focused perspective.

Theoretical knowledge, in addition to experiential knowledge, should be part of design problem framing for two reasons. First, in deciding the project's priorities, each designer-researcher's findings should be triangulated, with multiple researchers' insights, and with multiple sources of information including the expert interview, secondary research, or quantitative data. If her observation is correct, it will be supported with more congruent findings; otherwise, she will shift her perspectives and reframe design problems considering majority opinions that often come in the form of theoretical knowledge, proven with supporting data and evidences.

Second, theoretical knowledge is essential for a designer in discovering system-level issues or predicting long-term effects of current problems, because such issues and problems are not observable with experiential knowledge alone. During the follow-up interviews, T-Cafe team members were challenged to broaden their perspectives with relevant scientific knowledge, and think beyond their previous idea of a sustainable business ("keep student customers happy"). Following Elkington's sustainable business model (1997) that suggests meeting Triple Bottom Line (people, planet, and profit), they discussed more problem areas to investigate, and the conflict of interest among the three factors. With more information, they were able to understand T-Cafe service as a system where all elements are working in connection. They acknowledged their lack of theoretical knowledge of what makes a cafeteria business profitable or eco-friendly, and wanted to investigate more about cost/profit, ingredient procurement, resource use, and cooking methods. The instructor of this workshop (T1, hereafter) also expressed her interests in exploring the same subject in a broader context, eating as a socio-economic behavior. She suggested that social trends, life style changes, food supply chain, ecological and economic aspects of food consumption, psychology and health as relevant theoretical knowledge areas.

In summary, a designer's experiential knowledge gleaned out of her direct interaction with the natural world can make her sensitive and knowledgeable in some problem areas in a system, but to see the priorities of problems from an objective perspective, and to see beyond what is perceptible on the surface, looking at the whole project on a conceptual level with theoretical knowledge is recommended. As T1 mentioned from her teaching experience, however, providing theoretical knowledge to designers needs much preparation: instructors need to consider what theoretical knowledge is relevant, how much of it should be taught, and in what language it should be spoken not to confuse designers with too many jargons.

Abduction (hypothesis building) and experiential knowledge

A designer's experiential knowledge stored as personal episodes guides her abductive reasoning process, when she tries to find hidden causes of observed problems by building hypotheses; the experiential knowledge is used to fill in unidentified information about the problem situation, because "people reason by making a representation of the events" (Johnson-Laird, 1983, p. 53). They see possible causes of observed problems from their direct and indirect experiences. Storkerson (2010, p. 8) also suggests that "Decision making in the natural world often requires that uncertainties be resolved into a 'best guess' judgment, requiring experiential knowledge and thinking."

During the workshop, T-Cafe team suggested to place movable pictogram magnets of ingredients (beef, pork, and carrot for vegetarian menu) next to dishes, to help customers see what they eat. In follow-up interviews, S1 explained her problem observations and

hypothesis: (i) There are three warm main dishes, one of them is vegetarian. Customers are supposed to choose only one of them, but they sometimes unwittingly pick up two (mostly one meat dish and one vegetarian dish), then later they have to pay extra. (ii) Many customers ask cashiers where the vegetarian menu is. S1 thought the problems were caused by lack of a clear signage ("vegetarian menu"), and shared her own experience of having confused a vegetarian dish as a free side dish. Another student, S2, mentioned she knew a person who had to find out what meat was in the meal frequently. S2 guessed it was because the person could not eat certain type of meat for a religious reason. S1 and S2 made similar observations, and their hypotheses were grounded into their personal observations.

As a solution to this problem, S1 and S2 arrived at the same solution of pictogram, for different reasons. S1 mentioned art school students (including herself) as the target user group, and backed up her idea with an assumption: young users are familiar with pictograms because they grew up using GUI. On the other hand, S2 mentioned people with food allergy, religious diet restrictions, and dyslexia. Later, S3 (who was not on the T-Cafe team) pointed out that T-Cafe is located in a building shared between an art school with many international students and a shopping center crowded with foreigners, so the pictogram will work for people with language barriers.

Their responses suggest that designers' experiential knowledge, what they remember from their direct experiences of the world, helps in guessing potential causes of observed problems or building design rationale. This pictogram question was just one of the five questions the authors asked during this session, and for all questions, students projected their experiences on to observed problems, trying to resolve what they see in terms of what they can understand. The same experiences, however, can also limit their thinking within the boundary of their personal experiences, and it can be biases. To corroborate their hypotheses or explore broader range of solution space, designers can utilize more data, evidences, and theoretical knowledge.

Deduction (resolving design requirements) and experiential knowledge

A designer generates solutions that meet a number of requirements, and this process calls for rule-based deduction with premises. This deduction process is incomplete, as Johnson-Laird (2001) pointed out: First, designers will stop thinking when they find first few solutions. Second, how they see the content of the premises will bias their deduction. From the content, designers will unwittingly add more information that is not stated in the premises. Such information comes from their background knowledge of the content, and if it is rather irrelevant to the matter, it can simply bias the deduced conclusions.

An example of considering such unstated information was observed during the space redesign task. Students (S1, S2, and S3) created new T-Cafe space layouts twice, following similar rules, once with abstract alphabet symbols and later with concrete food items. Comparisons of results show that, in the natural world context, designers considered different possibilities, and added arbitrary rules based on their personal observations/preferences. Students were observed to explore more number of possibilities with abstract symbols, but the possibilities were not considered when symbols were replaced with real world concepts (Table 2).

Table 2. Space redesign task results with symbols and food concepts

Space Redesign Task Results Comparison

Rules:

- SALAD is the first food item to pick up.
- SOUP should come before CASHIER, because you need to pay extra.
- BREAD and DRINK can come either before or after CASHIER, because they are included to a meal, without extra charge.
- DRINK should be picked up after collecting all other food items to prevent spillage.

* Rule violation - BREAD should come before DRINK.
** Rule violation - SALAD should come before all other items.

S1	ABSTRACT SYMBOLS	SALAD – MAIN – BREAD – SOUP – DRINK – CASHIER SALAD – MAIN – SOUP – DRINK – BREAD – CASHIER* SALAD – MAIN – DRINK – SOUP – BREAD – CASHIER*
	FOOD CONCEPTS	SOUP – SALAD – MAIN – CASHIER – BREAD – DRINK**
S2	ABSTRACT SYMBOLS	SALAD – SOUP – DRINK – MAIN – BREAD – CASHIER*
	FOOD CONCEPTS	BREAD – SALAD – MAIN – SOUP – CASHIER – DRINK**
S3	ABSTRACT SYMBOLS	SALAD – SOUP – MAIN – BREAD – DRINK – CASHIER SALAD – SOUP – MAIN– CASHIER – BREAD – DRINK
	FOOD CONCEPTS	SALAD – BREAD – MAIN – SOUP – CASHIER – DRINK

All students tried symbol combinations that they would not have thought of with food concepts. Later, they justified their food concept solutions with arbitrary rules based on their personal observations/preferences. For example, theoretically, soup can be placed at anywhere between salad and drink/cashier, because it is an optional item sold at extra charge. While S1 placed soup before salad, based on her meal preference ("soup and salad always go together"), T-Cafe did not serve soup and salad combo menu for students. S2 and S3 put it right before cashier to group it with other hot dishes and away from cold salad for a more logical reason, to keep hot food hot and cold food cold. For them, soup was perceived as an extra item that customers may or may not add at the end. S3 also introduced arbitrary assumptions about bread ("bread and salad are always served together"), putting bread next to salad.

Introduction of arbitrary rules based on a designer's experiential knowledge of the content may or may not be problematic. It will be problematic if a designers' insufficient experiential knowledge let her accept her limited experience of what she knows about the natural world as obvious requirements or constraints. S1's idea of "soup and salad always go together" or S3's suggestion of "bread and salad are served together" are only some ways to pair food, but students made a quick decision to see them as design requirements, and settled to solutions that meet the requirements. Both novices and expert designers can come up with solutions based on such arbitrary rules, in fact, but the expert designer's breadth of background knowledge from which arbitrary rules come explain the performance difference between novices and experts. Even though both experts and novices make heuristic decisions—knowing what solution will work and what won't without deep deliberation—experts can re-evaluate given design requirements on an abstract level and reframe the problem, so their solution space can be expanded; they can find hidden opportunities and

unusual matches from their large pools of solutions they have tried in the past. For novices, however, their simpler heuristics may lead to a fixed definition of the problem and obvious solutions.

Designers' experiential knowledge of the content, on the other hand, enables them to consider the messy real-world experience that is often ignored during the design process; many products and services are designed for rational consumers who would attentively follow the designer's intention, but in reality, consumers improvise, customize, and appropriate what is available for them to achieve their goals. S2 and S3 were somewhat skeptical about the space redesign task to begin with, because they witnessed many customers starting from anywhere, moving in irregular patterns. Even though it was not observed in this study, the designer's experiential knowledge can let them see beyond what is logical or acceptable to them, and pay attention to customers' seemingly unconventional use of products/services; from the novel usage patterns, they can guess how customers understand current products/services and find new opportunities.

Conclusions: Two Looping Processes of Knowledge and Design Expertise

From the lessons learned, the authors describe the relationship between a designer's experiential–theoretical knowledge and her design expertise as two interlocking and looping processes. Her experiential knowledge and theoretical knowledge are two sides of her knowledge as a whole. They are dependent to each other in that what she knows from her experiential knowledge can be explained with theoretical knowledge, and what she learned as theoretical knowledge will be tested or demonstrated with experiential knowledge. Through a designer's experiential and theoretical types of knowledge, her expertise is shaped; they can be compared to two interlocking rings (Figure 2). The design expertise ring goes through the knowledge ring that has experiential and theoretical sides, meaning the designer can gain expertise from both types of knowledge.

The experiential side will provide knowledge of the natural world from which she can find both problems and opportunities. It will assist her to build intuitive understanding of the problem. It will also let her test her conceptual ideas by externalizing and materializing them.

Her theoretical side, on the other hand, will help her recognize patterns from what she perceives, find underlying causes of problem situations, build conceptual understandings of the situations, and mentally simulate various solutions. Later, she can develop the understandings further into models or theories applicable to similar situations. Logical thinking and reasoning processes are involved in these actions, but the authors would like to emphasize again that they are not purely logical processes; they are guided, at least partially, by inputs from the designer's experiential side; her definitions of problem situations, her hypothesize causes, and her proposed solutions may arise from her direct-indirect experiences, through rather intuitive processes; later, she will find a way to justify her design decisions with supporting evidences. In that, the designer's seemingly rational decisions are made by both analytical and intuitive types of thinking.

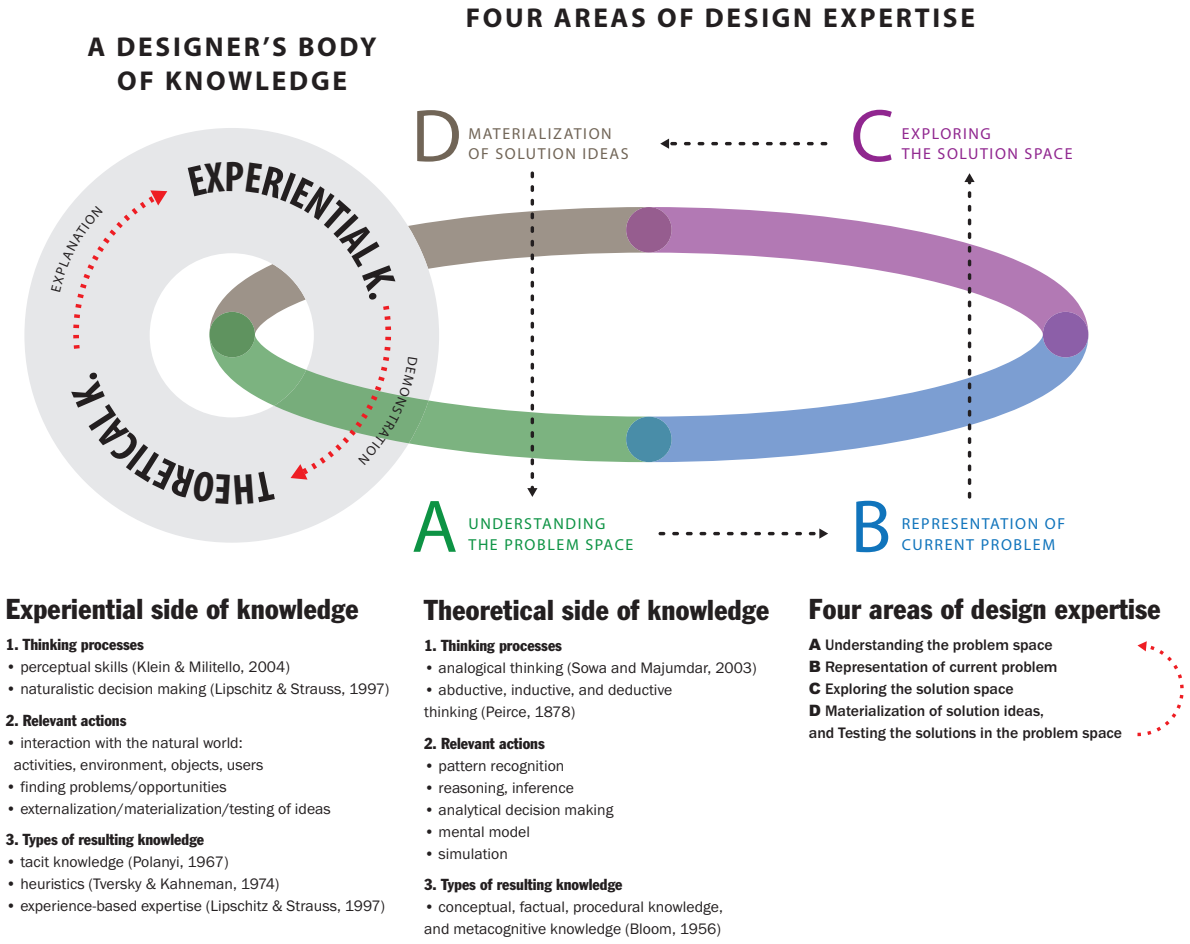


Fig 2. A model of experiential-theoretical knowledge and design expertise

For future studies, the authors will look in to how the experiential and theoretical sides contribute to what the authors define the four areas design expertise: understanding the problem space, representation of current problem, exploring the solution space, and materialization of the solution ideas. The four areas can be also viewed as steps a designer or a design team goes through in a project, but you can see them as four areas in a circular structure, than steps with clear starting and ending points with designated orders, because one's design expertise can become richer and broader starting from any of these areas. Development in one area can trigger further changes in adjacent areas, because what a designer produces with expertise in one area need to be tested in the next area. Development can happen either on the individual or team level; Developing expertise in service design—where knowledge in various areas and collaboration with professionals from other fields are required—can happen on the team level, between experts and novices, when expert designers guide novices though sometimes demanding tasks by sharing their knowledge exist as either episodes or theories, through discussions. What facilitates such knowledge sharing activities for an individual or a team will be an interesting comparison to make.

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Making the Tacit Explicit: Developing Tools to Support Collaboration During Industrial Design and Engineering Design Practice

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Abstract

Industrial designers employ an extensive range of media and techniques at various times during professional practice. Whilst general patterns of use are acknowledged, such as loose sketches at the beginning of product development and full prototypes at the end, the nuances of use for specific design representations remain elusive. Having identified problems in communication during product development, the researchers identified a lack of understanding in the use of design representations as a key issue. This paper reports on research to enhance communication during product development by making tacit knowledge on the use of design representations explicit. This was achieved through the development of two design tools called CoLab and iD Cards. Phase 1 of the project identified barriers to communication through semi-structured interviews with 61 industrial designers and engineering designers at 17 industrial design consultancies. Phase 2 explored the nature of design representations and categorized 35 types as sketches, drawings, models or prototypes using isemi-structured interviews with both industrial designers and engineering designers, with differences in use between the two groups becoming apparent. Phase 3 used a process of information design to translated the findings and data from Phase 2 into the card-based CoLab design tool that included the taxonomy and indication of when the design representations were used by industrial designers and engineering designers and for what types of information. Changes were made after appraisal and the final tool was validated through semi-structured interviews with 43 industrial design and engineering design practitioners and observation. Phase 4 disseminated the research output with the support of the Royal Academy of Engineering (RAE) in the UK (CoLab web-based design tool) and Industrial Designers Society of America (IDSA) in the USA (iD Cards physical design tool). The paper concludes that the use of appropriate research methods that integrate literature based sources with practitioner engagement has the potential to elicit valuable and unexpected tacit knowledge. It also acknowledges that whilst the outcomes from such research can be enthusiastically received, translation into a format for effective dissemination can be a challenging and time-consuming process. However, with confidence in outcomes and a desire to disseminate, opportunities can be identified if researchers are prepared to be flexible and adapt to stakeholder needs.

Keywords

industrial design; product design; engineering design; design tools; collaboration

Introduction

The complex and competitive nature of product development requires collaboration between design professionals to effectively conceptualise, develop and commercialise innovative products (Edmondson and Nemhard, 2009). Despite the importance of inter-disciplinary collaboration, few studies have examined the relationship between industrial design and engineering design. In the context of this study, industrial design is defined as the specification of product form and includes aesthetic judgement, semantics, user interface and social requirements (IDSA, 2006; Tovey, 1994; Flurscheim, 1983). In contrast, the term engineering design broadly encompasses mechanical, electrical and electronic engineering (Fielden, 1963), all of which employ science-based problem solving methods (Hurst, 1999).

The aim of the research was to investigate problems associated with collaborative interaction between industrial designers and engineering designers. Disharmony during NPD may occur when team members approach a project differently. For example, industrial designers adopt open-ended solutions, using instinct and trial-and-error to embody personal creativity for the design; whilst engineering designers view problems as precise and focus on functionality, specification and performance (Kim and Philpott, 2006). In terms of deliverables, engineering designers produce technical details for manufacture, based on quality, performance and cost (Flurscheim, 1983); while industrial designers deliver visual representations such as sketches and physical models. As a result, their dissimilar views and contrasting outcomes may create conflict (Persson, 2002).

Previous research has focused on inter-disciplinary collaboration between engineering design and manufacturing (Beskow, 1997; Ulrich and Eppinger, 2000) and engineering with marketing (Griffin and Hauser, 1996; Shaw and Shaw, 1998). With the exception of Persson and Warell (2003), who identified methods and tools adopted by industrial designers and engineering designers, research to investigate the collaborative interaction between industrial designers and engineering designers is under-represented. Persson and Warell (ibid) reported that communication, social factors, personality differences and physical settings were key factors in influencing professional interaction. Persson (2005) went on to propose a collaborative workspace with a joint mindset by means of socialisation and mediating instruments to enhance collaboration. Other integrating mechanisms included social organisation (Kahn, 1996; Jassawalla and Sashittal, 1998), the use of inter-communal negotiation for better cross-functional teamwork (Brown and Duguid, 2001), having boundary-spanning and good teaming skills (Edmondson and Nemhard, 2009), and employing information and communication technology (Sproull and Kiesler, 1991; Toye, et al. 1993). Although other established methods, such as Quality Function Deployment (QFD) and stage-gate solutions are available (Ulrich and Eppinger, 2000), they are primarily designed for engineers. As such, very few integrating mechanisms are available to enable, facilitate or improve collaboration been industrial designers and engineering designers.

Rothwell (1992) proposed that effective communication and cross-functional linkages are the primary factors for successful NPD. Communication can be made effective by transmitting symbols precisely, ensuring that the meaning is relayed correctly, receiving the intended meaning accurately, and reaching the right audience through proper distribution (Chiu, 2002). Although communication mechanisms exist, researchers have observed that industrial designers and engineering designers still do not fully understand each (Fiske, 1998). Communication only becomes accurate and effective when the team develops a common vocabulary and by understanding the communicative codes and language within the message content (Persson and Warell, 2003). In addition, collaboration represents a higher level relationship when compared to communication that is limited to information exchange. Jassawalla and Sashittal (1998) stated that collaboration occurs when participants command equal interest, adopt transparency with high awareness, are mindful through integrated understanding, and perform with synergy. Collaboration allows members from different

teams to divide work effectively, assist each other in maximising their joint contribution, and communicating accurate information such as through the use of precise design representations.

In the context of an opportunity to enhance collaboration between industrial designers and engineering designers by standardising language, developing awareness of methods and identifying differences in the use of design representations, the authors defined a methodology that would generate a taxonomy of design representations and then be used to collect empirical data that would confirm accuracy and identify on when they were used and for what types of information by the two groups. By standardizing language and providing a level of understanding of how industrial designers and engineering designers use design representations, a knowledge framework would be generated with the potential to translate into some form of design tool.

Phase 1: Identification of Barriers to Communication

Interviews

Semi-structured Interviews were undertaken with experienced industrial designers, engineering designers and design managers from 17 industrial design consultancies specialising in consumer electronic products. There was a balance of large (more than 10 design staff), medium (between 6-10 design staff) and small industrial design consultancies (less than 5 designers) to allow a wider sampling and to obtain findings from a larger pool of respondents. 61 semi-structured interviews were conducted. A semi-structured interview was selected as this method had the capacity to explore issues with the potential for respondents to fully describe personal experiences relating to group interaction and inter-disciplinary collaboration. After gathering general demographic data (educational background, work experience and the company structure) the participants were asked project-specific questions to identify factors relating to collaborative work. This required an example of a project, experiences of group interaction, reasons for project successes and failures, and an indication of the tools and methods used for the project. The questions can be seen in Table 1.

Table 1: Questions used during semi-structured interviews

Research-specific questions
1. Describe a recent project undertaken
2. Describe the design approach and strategy adopted
3. What was the project deliverable?
4. What activities were involved?
5. Describe the tools and methods used
6. What design representation methods were used?
7. Did collaboration between industrial designers and engineering designers occur during the project?
8. Describe the quality of group interaction and teamwork
9. What factors might have influenced group work?
10. Were there any leadership or management issues?
11. Name the success or failure factors
12. What is your view of the final product?
13. Did you have any personal concerns working with the other discipline?
14. Suggest some improvements for future collaborative work

The interviews identified issues relating to inter-disciplinary collaboration which were encoded into a spreadsheet. A coding and clustering technique was then used to analyse the qualitative data and to help build theory (Miles and Huberman, 1994), as well as reducing data into themes and relationships (Strauss and Corbin, 1990). This pattern coding has been used by other researchers (Purcell *et al*., 1996) in order to summarise findings into condensed categories. The issues were re-organised with the most frequently occurring problems in a descending order as shown on the right column of the chart in Table 2.

Table 2: Matrix of 61 problem categories tabulated from interviews

	Issues	Company																	Occurances	Category
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17		
1	Having knowledge of the other field					■	■	■	■	■		■			■		■		8	A
2	Conflict in Principles	■		■				■	■		■		■						6	A
3	Choosing the right tools and methods	■	■			■	■	■						■					6	B
4	Communication Skills	■					■			■				■	■			■	6	B
5	Use of Representation				■	■	■			■		■			■				6	B
6	Understanding each other			■	■										■		■		5	A
7	Fixed Engineering Mindset	■					■			■	■	■							5	C
8	Individual Differences & Attitude			■			■					■			■	■			5	C
9	Direction of Project Manager							■					■		■	■	■		5	A
10	Use of Rapid Prototype for Representation		■		■		■					■							4	B
11	Designers and Engineers having Different Values		■				■				■		■						4	C
12	Having a Common Goal			■			■								■				3	A
13	Get-together updates / Milestones						■		■						■				3	B
14	Informal Meetings	■					■								■				3	A
15	Understanding through Experience				■			■							■				3	C
16	Translation from 2D to 3D						■					■						■	3	B
17	Company Emphasis on Design or Engineering					■							■					■	3	A
18	Educational Background of Individual		■					■			■								3	C
19	Western vs Asian approach of working		■								■					■			3	C
20	Conflict in Interest	■						■											2	-
21	Fixed Working Protocols						■	■											2	-
22	Location of support members						■								■				2	-
23	Trust as a high-level understanding														■	■			2	-
24	Knowing the technical requirements						■					■							2	-
25	Working towards Joint-Solutions									■					■				2	-
26	Production & Manufacturing Limitations							■				■							2	-
27	Company Culture	■														■			2	-
28	Engineers do not Understand Role of Designers	■												■					2	-
29	Teamworking & Team Dynamics	■						■											2	-
30	Having standard Computer files			■			■												2	-
31	Limitations in Time leading to Poor Engineering						■											■	2	-
32	Limitations to size of Electronic Components												■				■		2	-
33	Creativity and Flexibility of Engineer					■				■									2	-
34	Marketing controls Budget affecting Design Quality		■											■					2	-
35	Language as a Probable Barrier				■					■									2	-
36	Knowing who is in charge / Roles & Responsibilities									■	■			■					2	-
37	Team Dynamics							■											1	-
38	Being specific				■														1	-
39	Designers getting carried away & fall behind time										■								1	-
40	Using standard codes				■														1	-
41	Having Multi-cultural Teams														■				1	-
42	Having Multi-disciplinary Teams														■				1	-
43	Fostering Team-spirit														■				1	-
44	Complexity of Project											■							1	-
45	Marketing Understand Designers Working				■														1	-
46	Designers Understand Manufacturing Constrains									■									1	-
47	Testing, Reviewing, Changing, Refining														■				1	-
48	Marketing should be faster to React														■				1	-
49	Engineering Issues affecting Design Aesthetics														■				1	-
50	Client Changes affecting Design Process				■														1	-
51	Designers not understanding Marketing Viewpoint	■																	1	-
52	Trimming Cost affecting Design Aesthetics						■												1	-
53	Difficulty in Explaining visual effects to Engineers											■							1	-
54	How Company & Organization Values each field																	■	1	-
55	Software Incompetence																	■	1	-
56	Proper justification for each decision to Understand																■		1	-
57	Using Technology for Enhanced Communication												■						1	-
58	Changes in Design due to Safety Requirements					■													1	-
59	Client Involvement in Design Stage							■											1	-
60	Education as a means to close gap btw Eng & Des										■								1	-
61	Difference between a Designer and Artist			■															1	-

Observation

Following the interviews, observations were conducted to obtain detailed information by being close to the field of study. The use of observations is advantageous as it allows the researcher to examine interaction taking place between engineering designers and industrial designers in their natural working environment and to record potential barriers that might have occurred. The observations took place through a commercial design project over 2 consecutive weeks and involved the design of a consumer product with an industrial designer and an engineering designer working together. The observation was conducted at a design consultancy within its normal work environment and took place from the beginning of the project (design briefing) to the embodiment stage (3D CAD modelling). As video and voice recordings were not allowed due to project confidentiality, note taking was used as it allowed conversations to be recorded and enabled first-hand accounts of the interaction to be documented. Reliability was achieved by cross-checking records during breaks to minimise work disruption. Other documents, including reports, specification lists and physical or virtual artefacts provided a more complete understanding of the design activities. To obtain a holistic view of issues within the project, observations were undertaken with the project leader, industrial designer and engineering designer.

The observations identified that formal and informal meetings were extremely valuable in enhancing collaboration. Co-location was an important factor since both industrial designers and engineering designers were located close to each other and had significant interaction when compared to other departments who were on a different floor in the building. The observations recorded different working approaches in which engineering designers focused on technical properties and cost whereas industrial designers explored on form and expression. In addition, the lack of a common language in design representations caused miscommunication where certain words were interpreted incorrectly. For example, the engineers had intended simple sketches yet the designers interpreted their task as requiring renderings which the engineers regarded as time-consuming and unnecessary at that stage. The generic term ‘sketch’ did not fully describe the requirements and deliverables for both parties. The observations also found that the loosely rendered sketches from the industrial designers were imprecise and the elliptical shapes drawn in perspective became hard to translate into a 3 dimensional solid in CAD

Outcomes from Interviews and Observations

The interview study identified 3 problem areas in collaborative design which related to conflicts in values and principles. The first, conflicts in values and principles, related to the fact that engineering designers worked systematically based on quantified solutions. In contrast, industrial designers favoured an open-ended approach and used open solutions. The second, differences in design representations, noted that engineering designers often used technical terms and facts that included calculations, technical information and specifications; whereas industrial designers used freehand sketches and drawings to communicate ideas. The third, differences in education, was due to the fact that engineering designers were taught to employ systematic problem solving and to justify solutions with facts. In contrast, industrial designers were taught to solve problems intuitively, rarely relying on quantified data. Due to differences in their educational background, both professions had different specialisations, approaches and expectations.

In addition, the observations revealed the significance of formal and informal meetings; the importance of co-located members; and the issue of having different interpretations of design representation terminology. Of these, the problem area of design representations was found to be highly significant in both interviews and observations and a decision was made to conduct a further investigation.

Phase 2: Investigating the Use of Design Representations

Phase explored the nature of design representations, generated a taxonomy, and collected data on when they were used and for what types of information.

The Nature of Design Representations

The problematic nature of the use of design representations during product development necessitated an in-depth examination of their nature and function during product development.

Design representations can be expressed through language, graphic or artefacts (Goel 1995; Goldschmidt, 1997) and they refer to models of the object being symbolised (Palmer, 1987). During the early stages of product development, representations such as sketches tend to be quick produced and are relatively unstructured. As the design develops, more controlled methods such as drawings and models tend to be employed. Leonard-Barton (1991) noted that the progression of having more information embedded within a representation enhances the understanding of the design. For the practicing designer, sketches support visualisation, communication and information storage (Tang, 1991); externalising ideas (Larkin and Simon, 1987); thinking (Suwa et al, 1998); verification of decisions (Herbert, 1993); and allow a range of interpretations for a design solution (Scrivener, 2000).

While many forms of design representations are available, sketching is seen as being central during the early stages of product development. Goel (1995) sees sketches as the first step of the design process to externalise and visualise ideas at an individual level. At the next stage, representations are used to communicate with others and include presentation drawings and physical models. In the later stages, detailed technical drawings and prototypes are used to communicate detail (Goldschmidt, 1992). In comparing the differences between the representations favoured by industrial designers and engineering designers, Veveris (1994) observed that engineering designers used models associated with engineering principles, functional mechanisms, production issues; whereas industrial designers applied representations related to appearance and usability. Despite various attempts to classify representations (Tjalve *et al*. 1979; Ullman, 1988; Tovey, 1989; Evans, 1992; Goldschmidt, 1992; Veveris, 1994; Kavakli *et al*., 1998; Cross, 1999; Do *et al*., 2000; Otto and Wood, 2001; Cain, 2005; Olofsson and Sjölén 2005; Pavel 2005; Pipes 2007; Eissen and Steur 2008), they are largely incomplete or do not incorporate both industrial design and engineering design representations. In addition, researchers have noted problems with their use when symbolic elements become unclear. The more incomplete or vague a representation is, the greater and wider the perceptual interpretation space becomes. Despite such drawbacks, ambiguous representations allow for creativity and the generation of open-ended solutions (Rodriguez 1992, Ehrlenspiel and Dylla 1993, Fish 1996). They enable things to be seen in different ways that in turn produces new designs and allows flexibility in terms of design attributes.

Although ambiguous representations possess benefits, their ill-defined nature makes it difficult for engineering designers to comprehend and recognise how they work in relation to a product's technical parameters (Saddler, 2001). It may be difficult for a viewer other than the originator to understand the embodied meaning, context or scale (McGown, et al., 1998). The need for accurate and effective representations has been shown by Stacey and Eckert (2003) who provided an example of confusing sketches used in the knitwear industry. They cited that although the lines of a garment sketch were intended to describe the structure pattern, they could be misinterpreted as being stripes on the fabric.

Taxonomy of Design Representations

Following a comprehensive literature review to identify the key design representations used during product development and the information they were used to communicate, a taxonomy was generated that categorised 35 design representations as sketches, drawings, models and prototypes. Eighteen types of information that the design representations were used to communicate were also identified, being categorised under the headings of 'Design Information' and 'Technical Information'. The categories can be seen in Table 3.

Table 3: Categories of sketch, drawing, model, prototype and categories of design information and technical information

Sketches	Idea Sketch Study Sketch Referential Sketch Memory Sketch Coded Sketch	Information Sketch Renderings Inspiration Sketch Prescriptive Sketch
Drawings	Concept Drawings Presentation Drawings Scenario & Storyboard Diagram Single-View Drawing	Multi-View Drawing General Arrangement Drawing Technical Drawing Technical Illustration
Models	3D Sketch Model Design Development Model Appearance Model Functional Concept Model	Concept of Operation Model Production Concept Model Assembly Concept Model Service Concept Model
Prototypes	Appearance Prototype Alpha Prototype Beta Prototype Pre-Production Prototype Experimental Prototype	System Prototype Final Hardware Prototype Tooling Prototype Off-Tool Prototype

Design Information	Design Intent Form & Detail Visual Character Usability and Operation Scenario of Use	Single Views Multi Views Areas of Concern Texture & Surface Finish Colour
Technical Information	Dimensions Construction Assembly Components	Mechanism Part & Section Profile Lines Exploded Views Material

Data Collection on the Use of Design Representations

The taxonomy and categories of information were translated into matrices to use as research instruments. The first matrix was used to appraise the categories of the taxonomy and collect data on when the representations were used. The interview structure and process was identical to that of the first stage of interviews and involved 27 participants of which there were 13 industrial designers, 10 engineering designers and 4 project managers.

The results indicated that industrial designers to employ sketches and engineering designers prototypes. Whilst engineering designers did sketch, this tended to be during concept generations but industrial designers employed this during the entire process. The second matrix (see Figure 1) investigated the types of information that the design representations were used to communicate.

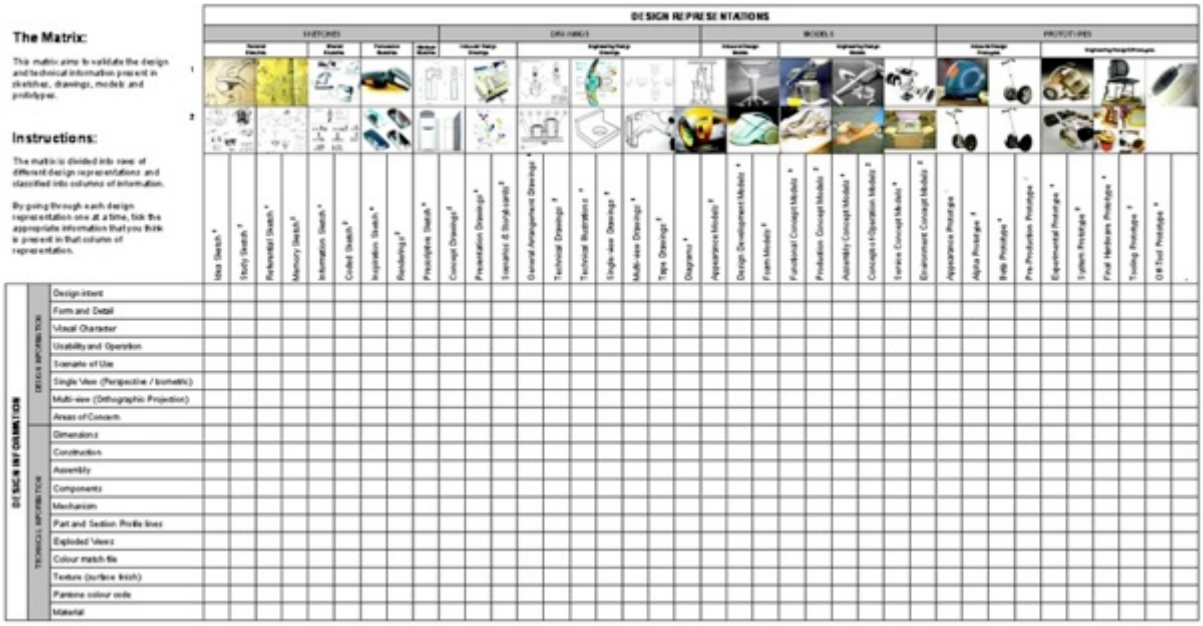

Fig 1: Research instrument to collect data on the types of design information communicated by design representations

The findings from the second matrix-based survey indicated that sketches, drawings and models provided a balanced range of design and technical information, with prototypes focusing on technical information. It was also apparent that design information was more commonly used by industrial designers than engineering designers. Conversely, technical information was more commonly used by engineering designers.

Phase 3: Development of Design Tool

Having defined a taxonomy of design representations and collected data to identify the different way in which industrial designers and engineering designers, Phase 3 translated this knowledge framework in to a useable design tool. For the development of the design tool, several factors were used to determine the tool specification. According to Saddler (2001), the industrial design profession has representations that are ill-defined, imprecise and lack in communicative power. In addition, communication could be improved by having a common understanding of shared definitions (Matthew, 1997). Therefore, the primary feature of the design tool was to clarify the terminology of design representations and to act as an effective means of communicating these shared definitions. To meet this requirement, several physical formats were developed, including matrices, flowcharts, wheel diagrams and Rolodex systems. Digital formats were also considered but this meant that users would need to have constant access to a computer and it would be impractical to carry a laptop at all times. While personal digital assistants, tablets or smart phones presented more portable options, the dissimilar operating systems, short battery life and small screens would create additional problems for information retrieval. In addition, Wi-Fi or internet-based tools would be limited to subscribers or connectivity.

Following an appraisal by the authors, a physical card format was selected for portability and immediate interaction between users. The aim was for the cards to be used by industrial designers and engineering designers as a portable tool that could be carried around as a reference guide or kept as an office resource or learning tool.

The design was undertaken by the researchers and, after numerous iterations, the knowledge framework was translated into two sets of 57 cards each. Both sets of cards included an identical taxonomy but differed in that there was a red set for industrial designers (with information on when this group used the design representations in the taxonomy and for what types of information) and a blue set with similar information dedicated for engineering designers. The principle behind the cards was to standardise language and demonstrate differences in the use of design representations by each group. Each pack comprised 4 cards describing the 4 design stages of product development (Set 1); 10 design information cards plus 8 technical information cards (Set 2); and 35 design representations (Set 3) of the taxonomy. Cards for an Idea Sketch in the taxonomy section can be seen in Figure 2, with the bar graphs indicating what this was typically used for and when, with the industrial designer card being red and engineering designer blue.

Fig 2: Idea Sketch cards for design tool

Appraisal

The design tool, this was appraised through a pilot study that involved interviews with 10 design practitioners. Feedback indicated that a numerical referencing system would support faster access to information and a larger card format (ISO B8 size of 62×88 mm) would improve readability. Other improvements include a simplified layout with less text and larger images. These changes were implemented and the background redesigned to reduce the

visual clutter. The revised design for is shown for the entire Sketches section of the taxonomy in Figure 3.

Fig 3: Revised version of the cards for the Sketches section of the taxonomy

Validation

Having integrated several revisions, validation was undertaken through semi-structured interviews with final year industrial design (x4) and engineering design (x14) undergraduates who had worked together on an industrial project; experienced practitioners (x43); and an observation study (x1) to identify the contribution when the card were used during the design of a consumer product in an industrial design consultancy.

In the student interviews, all industrial design students and 92.9% of the engineering design students provided ‘good’ and ‘excellent’ feedback on the physical format of the cards. All industrial design students and 85.5% of engineering design students felt that the tool would provide an enhanced understanding of design representations. 66.7% of industrial design students and 64.3% of the engineering design students felt that the cards would be effective in creating common understanding of design representations. While some students found it relatively difficult to search for the correct card, if a systematic approach was followed this should not have been a problem. A significant finding from the interviews was that all industrial design students and 85.8% of engineering design students felt that the tool would have helped to foster enhanced collaboration.

All 43 of the practitioner participants were presented with identical questions to those of the students. When asked about the physical format, 86.4% of industrial designers and 89.5% of engineering designers gave a good/excellent rating. They also believed that that the tool would provide an enhanced understanding and clearer definition of design representations, with 86.4% of the industrial designers and 89.5% of the engineering designers offering agreement. In terms of the capacity of the cards to create a common understanding of design representations, 86.4% of industrial designers and 84.2 of engineering designers believed that they would achieve this. When asked if the system would foster enhanced collaboration, 68.2% of industrial designers gave a good/excellent rating and 27.3% were neutral. 63.2% of the engineering designers gave a good/excellent rating and 36.8% were

neutral. A small number of participants claimed that experienced practitioners did not need these cards.

The observation study involved the design of a consumer product within a consultancy over a 3 week period. Observing how the tool was be used within a commercial context proved to be an extremely useful exercise as the authors could not predict how the tool would be received during practice. The industrial designers, engineering designers and team leader were observed and interviewed at the end of each day. During the observations, it was noted that the cards were useful as a clarification tool during the design process. On commencement of the third week, it became apparent that both industrial designers and engineering designers used identical keywords that had been learnt from the cards, thereby minimising the potential for misunderstanding. For example, the engineering designer started to request a more specific type of representation as opposed to a 'sketch' as a generic term which enabled more precise and relevant representations to be delivered. Similarly, when there was a need for a specific type of technical information, the industrial designer would refer to the cards to find the exact design representation that was required. The findings from the observations reinforced results from the interviews and provided further evidence of the potential for the tool to foster collaboration in a multi-disciplinary environment.

The validation indicated that most participants gave an excellent and good rating for the design tool although it must be acknowledged that the sample size was limited to 65 participants.

Phase 4: Dissemination and Impact

The overwhelmingly positive response to the CoLab tool indicated the contribution and value of the cards. As academic research, it would have been possible for the researchers to have concluded their work at the validation stage but a decision was made to maximize impact through a process of dissemination.

CoLab

Despite making contact with numerous commercial and non-profit organisations who saw value in the CoLab tool, the relatively expensive production costs for 114 double sided playing card-size cards was prohibitively high. Whilst the researchers had made a conscious and informed decision to create a physical design tool, there was a fundamental change in direction when an opportunity arose to translate CoLab into a web based tool with the support of the UK's Royal Academy of Engineering.

With funding from the National HE STEM Programme, the data on when design representations were used and for what types of information was translated into a database driven website with functionality that was almost identical to that of the physical CoLab cards. The screen for the Embodiment Design section of the web-based version of CoLab can be seen in Figure 4.

The orange tab at the bottom of the card indicates that it is one of the four Design Stages cards and the white background shows that Embodiment Design has been selected. The red card shows that the most popular design representation used by industrial designers during this stage was the Mulit-view Drawing (70%) and the blue card that the most popular for engineering designers was the Technical Drawing (70%). An additional level of functionality enables the user to click on the wording for the Design Representation and this then reveals

full details on that particular card. For example, Figure 5 shows the Idea Sketch card from the Design Representations section (i.e. the taxonomy).

Fig 4: Design Stages cards showing information for Embodiment Design

Fig 5: Idea Sketch card from the Design Representations section

The purple tab at the bottom of the card indicates that this is from the Sketches section of the Design Representations. The red card indicates that Idea Sketches were mainly used by industrial designers (90%) to provide information on Design Intent and the blue card by engineering designers (50%) to provide information on Components. Design Intent is

categorized as a type of Design Information and, again, by clicking on the wording reveals this card which has a green tab (Figure 6).

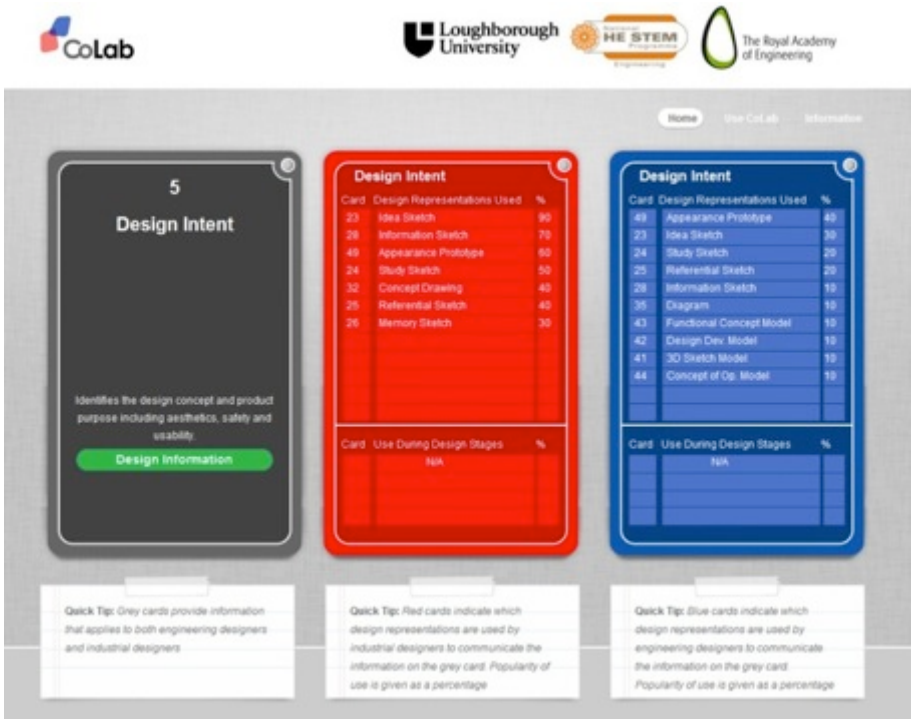

Fig 6: Design Intent card from the Design Information section

Components is categorized as a type of Technical Information and clicking on the wording reveals this card which has a yellow tab (Figure 7).

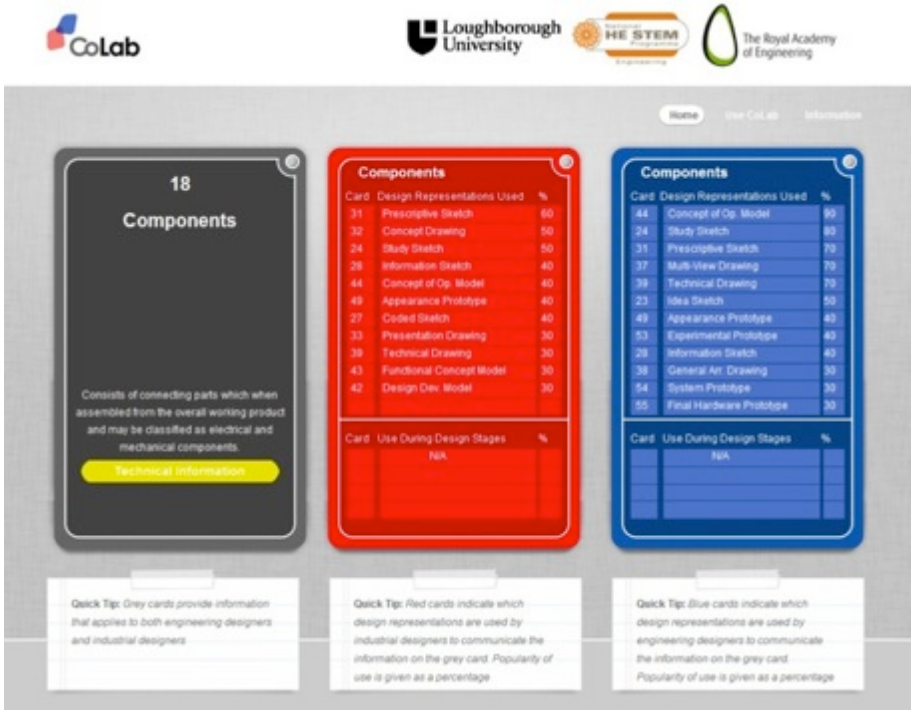

Fig 7: Components card from the Technical Information section

The CoLab website is available at www.colab.lboro.ac.uk

iD Cards

As a member of the Industrial Designers Society of America (IDSA), one of the researchers had presented the development of the tool at several of their International Conferences. Following significant interest, particularly for the taxonomy, information on the use of design representations by industrial designers only was translated by two of the researchers into a fold-out tool using the Z Card printing process. This enabled the folds created by the 48 credit card-sized panels to replicate the card-based approach (see Figure 8).

Fig 8: iD Cards

The revised tool, called iD Cards, was approved by the Board of Directors of the IDSA in January 2011 and 5000 sets ordered for distribution to their practitioner, educator and student members. Further validation of the contribution of the iD Cards was received when they became a finalist in the 2011 International Design Excellence Awards. The information provided in the iD Cards groups representations as Sketches, Drawings, Models and Prototypes, indicating when an individual card is used (yellow tab active) and for what type of information (red tab active for a type of Design Information, blue tab active for a type of Technical Information). Details in the type of information is provided on a separate panel as are instructions on use. The two sides of the folded-out iD Cards can be seen in Figure 9 and 10.

Fig 9: Folded-out front face of iD Cards

Fig 10: Folded-out rear face of iD Cards

Despite the researchers wish to create a physical design tool, on-going demand necessitated the conversion of the iD Cards into a pdf that was made available on the Design Practice Research Group web site at http://www.lboro.ac.uk/departments/lds/research/groups/design-practice/

Conclusions

Design representations are an integral component of product development as they support innovation through the externalization, manipulation and communication of design. The fact that design representation, collaboration and communication are closely linked means that the use of CoLab and iD Cards can contribute to professional practice by presenting a language platform to standardise vocabulary, thereby facilitating social networks and enhancing understanding between stakeholders. The context where the tools can be used is not limited to industrial designers and engineering designers but has the potential for use by other stakeholders, including marketing and production engineering. Additionally, the tool has an application as a teaching and learning tool in design education.

Whilst the formalisation embodied in the tool might be seen as introducing rules and procedures which, at times may have a negative impact (Burns and Stalker, 1961), the authors believe that a focused system can minimise misinterpretation and lead to more accurate communication. By including key design and technical information, the tool serves as a decision-making guide and helps identify representations used during design stages. It also allows industrial designers and engineering designers to be aware of each others' working practice and aids the coordination of actions, task management and the anticipation of actions by others (Gutwin and Greenberg, 1996). Through the use of the CoLab and iD Cards, inter-disciplinary teams are able to develop a shared language to communicate effectively. By simplifying processes and communication, barriers to interaction are reduced, operations are quickened and parallel processing achieved. Users are able to eliminate unnecessary design representations, saving time, accelerating product development.

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An Investigation of Spatially Fluid Knowledge within the Retail System

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Abstract

Design, as an activity, produces its own stock of knowledge that is embedded or encoded within design objects. It is through increased interactions with users that this knowledge evolves, generating new levels of meanings to establish significant, personal connections. The design object can be viewed as containing the designer's expertise, which is communicated and made transferrable to the user. This form of knowledge is mediated by the connoisseur, represented here by the physical layout of the retail space. Using the example of a vertical retail complex in Hong Kong, this paper examines the fluid nature of knowledge against the restrictions imposed by the mall's spatial configuration. The retail space is simulated as a system of knowledge transference, exchange and diffusion. Knowledge, specifically design knowledge, is further discussed within the domain of design activities and as an extension of design expertise. User experience is framed against the context of the case-study, suggested as an antecedent to user-object interaction and resulting in experiential knowledge. This conceptual paper identifies the retail structure as assuming the role of the connoisseur and becoming the access point to knowledge, presenting the tension between the fluidity of knowledge and the disruption of its natural flow.

Keywords

design knowledge; knowledge flow; user experience

Introduction

Knowledge is the natural ability of individuals to organize information and understandings of the world into integrated systems, processes or materialized finished forms (Narvaez, 2000). Designers, as one source for knowledge, create and use knowledge in their respective practices through the designing of products. Users, as individuals engaging in interactions with design objects, acquire design knowledge in their ability to perceive and recognize product attributes and functions. This transactional relationship between the design object and user stimulates the fluidity of knowledge, as it moves across different levels of meanings to facilitate new forms of knowledge production (Csikszentmihalyi & Rochberg-Halton, 1981). Retail outlets serve as the channel through which designers connect to users, therefore, acting as intermediaries of knowledge transfer. They significantly contribute to existing knowledge through direct involvement in user interaction and the retail environment can be defined as a system for receiving, containing and disseminating knowledge. Designers develop tacit knowledge and embed it into the creation of products (Kazmierczak, 2003), whereas retailers articulate the intentional levels of design knowledge through their direct communication with users. Retailers become connoisseurs of design knowledge by mediating the knowledge exchange between users and products. The retail complex, through its physical and spatial layout, is identified as disrupting the direct flow of design knowledge with its own representational use of space.

The design of vertical malls has significantly changed the physical patterns and behaviors of its patrons, from the freedom of moving horizontally to constricted, upward flows of movement. This paper explores the juxtaposition of physical and simulated space with the example of "The One", a new shopping mall in Hong Kong, through a knowledge framework discussing the experiential knowledge of users. The transition from freestanding retail shops into a 29-story complex has transformed the notion of space for local users. This movement has not only affected the retail landscape of Hong Kong, but has altered the overall retail experience.

The knowledge framework addresses the following:

- *Expertise* – the knowledge developed, created and used by designers.
- *Connoisseurship* – represented by the physical layout of the vertical retail structure and its role in facilitating the user's access to design knowledge.
- *Experiential knowledge* – the knowledge acquired by users through increased interactions with design products and their experiences within the retail space.

Against the backdrop of the retail space as a system containing the flow of knowledge, the above areas of expert, connoisseur and experiential knowledge are further defined. This conceptual paper examines the restrictions imposed by physical space and its effects on user experience.

Design Knowledge

The activities or processes of design involve the problem-solving, pattern-constructing or code-creating skills of designers, concerning largely tacit knowledge that is often difficult to explicate (Cross, 2006). This knowledge is transferred into design objects which function as a semiotic interface to trigger responses in its users (Kazmierczak, 2003). The user becomes the final interpreter or receiver of knowledge, through increased interactions with the product, to construct the final meaning or significance. Although the design object serves the semiotic function of transmitting meanings, or design knowledge, it is dependent on the retail channels through which it gains direct access to users. The retail outlets allow a common platform for knowledge exchange between designers, the design object and users. This emphasizes the role of space within the retail structure as facilitating user experience and mediating the flow of knowledge. It is proposed that knowledge shifts from tacit understandings to explicit forms as it transfers between the expertise of designers and the experience of users. The area of expertise is reviewed to understand how designers develop individual perception and use human experience toward the creation of their own knowledge. Connoisseurship is explored in relation to the physical space of the retail structure, as setting the boundaries for user experience and facilitating the diffusion of design knowledge. Expertise and connoisseurship are discussed in relation to the use of tacit knowledge within cognitive activities.

Expertise

The body's natural inclination to receive, expect, and perceive utilizes the function of sensory stimuli to transform perceptions into expected regularities of knowledge (Popper, 1994). This illustrates the predisposition of individuals to gain and access knowledge existing in the world. Knowledge creation and usage is a human endeavor that is realized through the interactions and experiences of individuals (Fernie, Green, Weller, & Newcombe,

2003). Design involves a process of articulating tacit knowledge through the experience or professional practice of designing (Friedman, 2000). This implicates design knowledge as relying on human experience and development in order to make tacit knowledge explicit. The value of tacit knowledge is recognized in its scarcity and association with individual "ways of doing" (Weller, 2007) and, as a currency of professional economy and value, tacit knowledge must be codified to be made explicit and shared (Fernie, et al.; 2003). Mareis (2012) identifies a commonality in tacit knowledge that is characterized by its non-verbal activities and attributes. Within the domain of design, knowledge can be found in three main sources: people, processes and products (Cross, 1999). The human ability to take part in the activity of design can be developed into the designer's level of professional expertise, generating knowledge in the tactics and strategies employed within design processes. Products contain the designer's own knowledge, knowledge of the process, and evolve into other knowledge through its interactions with users.

Domains of Design Knowledge		
Resides in People	***Resides in Processes***	***Resides in Products***
	Types of Knowledge Produced	
Designerly ways of knowing	Design practices and processes	Form & configuration of artefacts
Human ability	Design methodology	Implicit knowledge
Engaing & reflecting in design	Using & reflecting upon artefacts	Product –context semantics

Table 1. Domains of Design Knowledge (Source: Adapted from Cross, 2000)

Friedman (2000), identifies designers as being analysts, synthesists, leaders, critics and thinkers. These roles support and endorse the designer's own knowledge, and knowledge generated through designing, as being a form of expertise that is cultivated and created from the transformation of experience. The expertise of designers is, therefore, the ability to conceptualize the design problem and solutions in a larger cognitive scope (Cross, 2004). Expertise and knowledge enable designers to frame and reframe situations to perceive problems and determine relevant solutions. This capacity for structuring problems is how designers explicate their tacit understandings of design problems and utilize foresight to initiate ideas into design concepts or design solutions. The expertise of designers is defined here as the ability to transform experience into framing activities which extend beyond the scope of design and into design activities and solutions within specific cultures and societies.

Expertise results from dedicated application of experience to a chosen field, providing the designer with the cognitive capacity for identifying the significance of design solutions within problem spaces (Cross, 2004). This form of knowledge is embedded into the design, particularly within the domain of fashion, where design knowledge is culturally accumulated in order to establish its social significance (Weller, 2007). Cross (2006) identifies a designerly way of knowing, an inner coherence, that is specific to the design area and embodied in codes translating thoughts or ideas into physical artifacts. The knowledge contained within objects is an example of the designer's impact on culture, in the skilled ability to assess the cultural world and translate it into concrete objects. This process is the language by which design activities are communicated and its knowledge is transmitted to be made recognizable in the finished form.

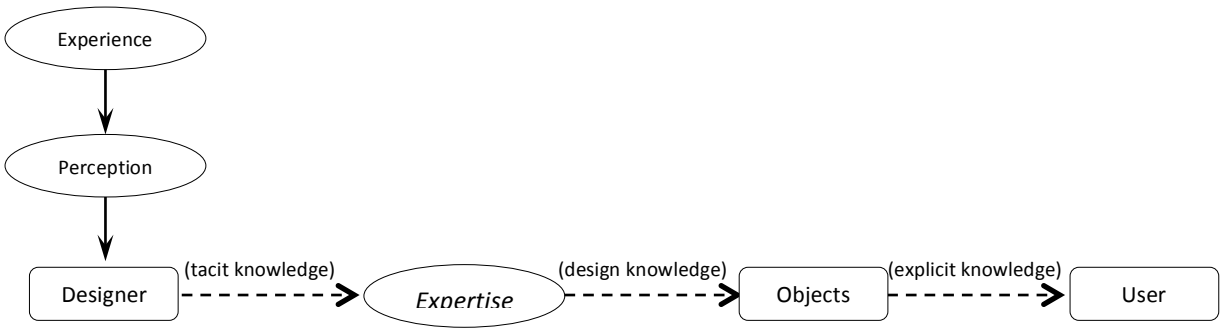

Fig 1. Flow of Knowledge – *tacit, design & explicit*

Cross (2006) recognizes the disparity within the profession of design, where some are "better" than others in their natural ability to design and optimize design solutions. The creativity of designers, in their specific ways of thinking and designing, sets them apart from non-designers as design processes involve innate and tacit understandings of the given situation. This sense of uncertainty and risk emphasizes the need for designers to attain a level of expertise in order to identify and explore the design territory, utilizing perception and intuition to assess design problems (Cross, 2006). The design process becomes less about matching solutions to problems but, rather, a practice leading to the acquisition of tacit knowledge as suggested by Donald Schon's "reflection-in-action" (Waks, 2001). As a form of dialogue or conversation, tacit knowledge or intuitive knowing accumulates from reflecting on and critically reviewing the repetitive experiences of a specialized practice (Schon, 1983). The practitioner develops tacit norms and appreciations to make judgments in assessing and making sense of uncertainties. This cultivation of experience into expertise allows designers the ability to confront situations or problem spaces by constructing holistic understandings of the sociocultural context.

Connoisseurship

Connoisseurship is the expert judgment for discriminating taste, requiring tacit knowledge to recognize details and characteristics of quality (Mareis, 2012). Similar to expertise, which is accumulated and developed through experience, connoisseurship is the expert eye and authority for identifying significance in a particular field of practice. Connoisseurs utilize self-perception and perceptiveness to appreciate and disclose judgment on specific design characteristics (Dunin-Woyseth & Nilsson, 2012). Experience allows them the ability and skill to distinguish, judge and evaluate objects by forming explicit interpretations to re-educate and influence the perceptions of others. They act as intermediaries between the designer's expertise and the final audience, using criticism to articulate and communicate their understandings. Connoisseurs are, therefore, both professional experts and competent critics possessing the ability to transfer and disclose tacit knowledge and judgments in taste.

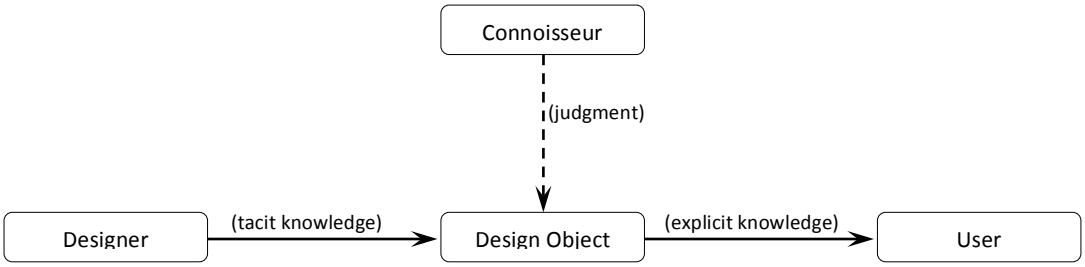

Fig 2. Mediating Role of the Connoisseur

Eisner (1976) defines connoisseurship as the appreciation based on an awareness and understanding of one's experiences leading to the basis for judgment. Connoisseurship involves the awareness of knowing what to look for, of being able to recognize the fine subtleties hidden within complexities (Dunin-Woyseth & Nilsson, 2012). It is an art of perception that relies on appreciation and criticism to explicate tacit knowledge into a communicable form for others. It fosters a sense of community, functioning as the catalyst for evaluating the experiences of the connoisseur and disclosing it in the form of influential descriptions or interpretations. Connoisseurship is based on the perceptual experience of making personal judgments leading toward the development of discriminating taste (Neidderer, 2007). It is a skill requiring cultivation in order to be informed of the qualities of the object or field of study, which are compared and contrasted against other particulars of the present (Eisner, 1976). This form of appreciation is personal and private until it is disclosed and made public, implicating the connoisseur as vital to the transmission of knowledge by linking the user and object of study. It is through the connoisseur that design knowledge, in its tacit form, is intervened and communicated to the user.

Experiential Knowledge

Experiential knowledge is the predicate for expertise and connoisseurship, as designers and connoisseurs rely and depend on personal experiences to develop tacit understandings. The design object communicates knowledge within the consumption process, where users are able to access the ideas and functions intended by the designer (Kazmierczak, 2003). It is through experience that individuals develop perception and the ability to respond or reframe in uncertain situations (Schon, 1983). This fundamental capacity for knowing is reflected in the practice of users, in how they engage with design objects and enter into framing activities contributing to their development and comprehension of design knowledge.

User Experience

Knowledge is the individual's ability to make judgments in assigning meanings for the appreciation and interpretation of information (Fernie, et al.; 2003). It becomes personal in how it guides and directs individual actions, signifying the mobility of knowledge and its need to be transferred or shared between individuals. Knowledge, to an extent, can be codified and personalized in order to engage individuals into knowledge sharing, a transactional process that makes known the knowledge of designers to users. The designer's knowledge is communicated to the user through the design object, which materializes design knowledge into a perceivable interpretation of social reality (Narvaez, 2000). It is through the design object that the user gains access to the designer's knowledge, suggestive of the need to increase interactions between the user and object. Following Cross' (2006) position

that design knowledge is embodied in people, design processes and design products, the design object represents the language or code for communicating knowledge. The designer, immersed in material culture, embeds knowledge into the object as a type of language (Dunin-Woyseth & Nilsson, 2012). The user receives and reads these informal levels of knowledge by drawing from their own experiences to establish an understanding of the communicated meaning.

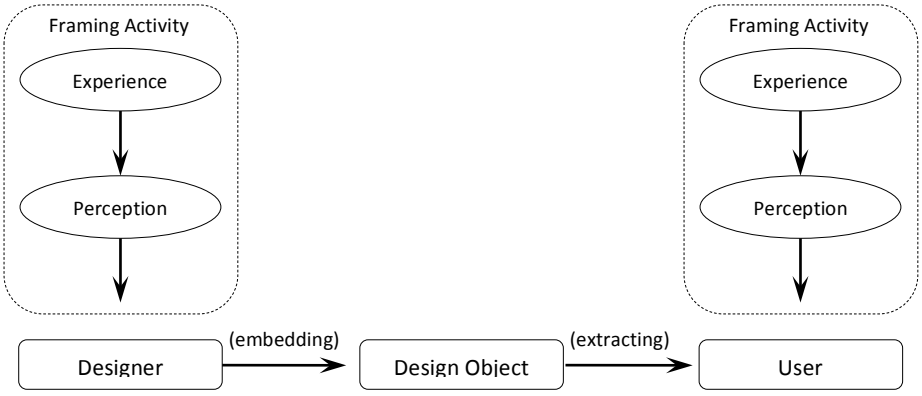

Fig 3. Framing Activities in Embedding and Extracting Knowledge

The designer, when initiating the design process, produces a design representation that fulfills two roles: a means for communication and a vehicle for exploration (Galle, 1999). As a means of communication, the design representation becomes an extension of the designer's own knowledge. Galle (1999) discusses the designer's process of self-communication through the design representation, initiating exploratory thinking and hypothetical questions to obtain further knowledge of the intended design artifact. Following this logic and pattern for seeking out knowledge, the user can be seen as engaging in similar forms of communication and exploration when interacting with the design object. The experience of the designer in embedding knowledge into an object is reciprocated by the user's own experience of extracting knowledge. It is through this experience that the user gains knowledge of the design, entering into the conversation-like activity of relating previous experiences to understand and make sense of the object. The nature of design depends on an ability to holistically recognize and process the discovered world, therefore requiring its users to experience and interact with the design to better understand its relevance and significance (Waks, 2001). Schon (1983) states that all professions are design-like in the use of framing activities and practice of reflecting upon actions. This suggests that users of design objects undergo a similar process when confronted by the introduction of new design solutions within a complex situation. The practice of reflection-in-action is not contained within design activities but applicable to user experience as a guide for interpreting knowledge.

Generative Knowledge

The user's consumption of the product signifies the simultaneous consumption of its meaning and knowledge (Baudrillard, 1988). The interaction between the user and design object becomes the actualization of self by establishing and fulfilling personal meanings. According to Nowotny (2000), the nature of knowledge is transgressive and fluid in its role of linking its producers to users through socially integrated and distributed processes. This type of socially robust knowledge emphasizes participatory aspects in how it shapes and generates cultural meanings. The recontextualization of knowledge, extracting knowledge from one context and adapting it to another, propels a change mechanism that initiates new representational forms (Fernie, et al.; 2003). Users, as receivers in the exchange of knowledge, create and generate new meanings when interacting with design objects. The

knowledge embedded or contained within the object is mobilized and disrupted by the user's existing stock of knowledge, indicating that knowledge is not unidirectional or strictly accumulative but is interpretive in how it regenerates through each stage of knowledge transfer.

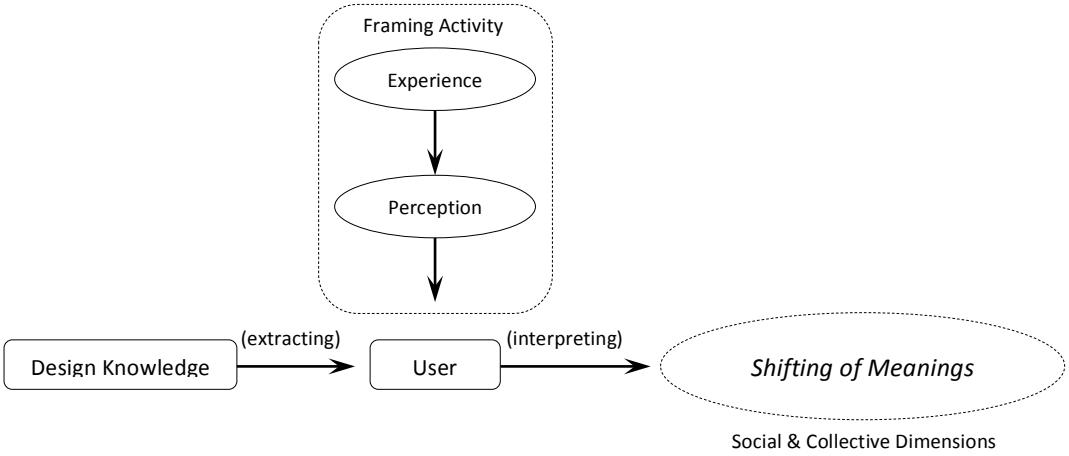

Fig 4. User Experience as Knowledge Regeneration

The design object operates symbolically through its semiotic function to generate meaning, which can only be fully realized when actively received by a participant or receiver (Kazmierczak, 2003). User experience becomes a meaning-making process that allows the user to reconstruct the object's significance towards new types of knowledge to modify its representational forms. The knowledge afforded and communicated by the designer is redirected into a neutral space when transferred into the design object. Through increased interaction with the product, its meaning or utility is transformed and reinterpreted by the user. Design objects, as cultural artifacts, initiate a socialization process in order to foster the sharing of knowledge between individuals. The transaction between the user and design object negotiates the significant symbols of meaning through affordances embedded by designers (Almquist & Lupton, 2010). User interaction allows meanings to shift into social and collective dimensions aiding and supporting the fluidity and regeneration of knowledge.

Expertise and connoisseurship depend on tacit knowledge as the basis for forming judgment and discerning taste. Experiential knowledge relies on the recognition of explicit forms that communicate a designer's specific ideas or conceptual intent through the design object (Kazmierczak, 2003). The object connects the designer to the user when meanings are sent, transmitted and received. Knowledge that cannot be explicitly known or shared enters into a negotiation with users, who assign new meanings as a means to establish personal or social significance. Therefore, the experiential process of accessing, interpreting and reinterpreting design knowledge indicates the competence of users and their natural intuition to perceive and reframe meanings.

Case-Study – "The One"

This case-study has been included to serve as an example of how physical space impacts user experience by disrupting the natural fluidity of knowledge. Completed in 2011, "The One" is Hong Kong's tallest retail complex located along the shopping district of Tsim Sha Tsui. It is a 29-story vertical retail structure with retail space covering over 400,000 square feet and more than 200 tenants that were previously located in free-standing retail outlets along the local shopping district (The One, 2012). The case-study is presented within a

cognitive context to explore how users interact with and within the structure to access its knowledge. Three main clusters of Schon's (1983) design domains have been adapted to provide descriptions of the case-study.

"The One" – *Design Domains*		
Domains	**Definitions**	**Descriptions**
Elements	Components of the Building	Glass doors Escalators Lifts Walls Ceilings Shops
Organization of Space	Types of Spaces Relations of Spaces	Double entrances separated by barrier General pass-through (levels UG1 & above) Upward vertical flow
Form	Shape of Building	Hard edged exterior
	Geometry	Curved interior lines
	Markings of Space	Level differences indicated by upward flow
	Experienced Felt-Path of Movement through Spaces	Utilization of space is apprehended by experience of space and movement across different levels

Table 2. Domains of Design (Source: Adapted from Schon, 1983: p 96)

The mall occupies a block of space between two parallel streets, which creates and emphasizes its key design characteristic. Although customers can enter the mall from either side of the building, the ground level entrances are physically separated by a central barrier. Therefore, it is only by moving upward to the next level that users can move freely across the space from one side to another. The design of the ground level affects and alters the overall experience of all users, who are physically forced upward in order to fully access the intended layout of space. Furthermore, the initial impression of users is influenced and determined by the specific street entrance they enter from. The shops located on the main entrance carry luxury watches and jewelry, while the back entrance opens up to standard high street apparel and footwear brands. It is only after moving upward, past the ground level entrance that the spaces merge and users begin to share in a common experience. This illustrates the mall's mediation of user experience, constricting the flow of users with its physical elements. The retail structure represents a centralized location and source for knowledge, through its various design products and brands, yet access to this knowledge requires active participation and experience with and within the physical layout of space.

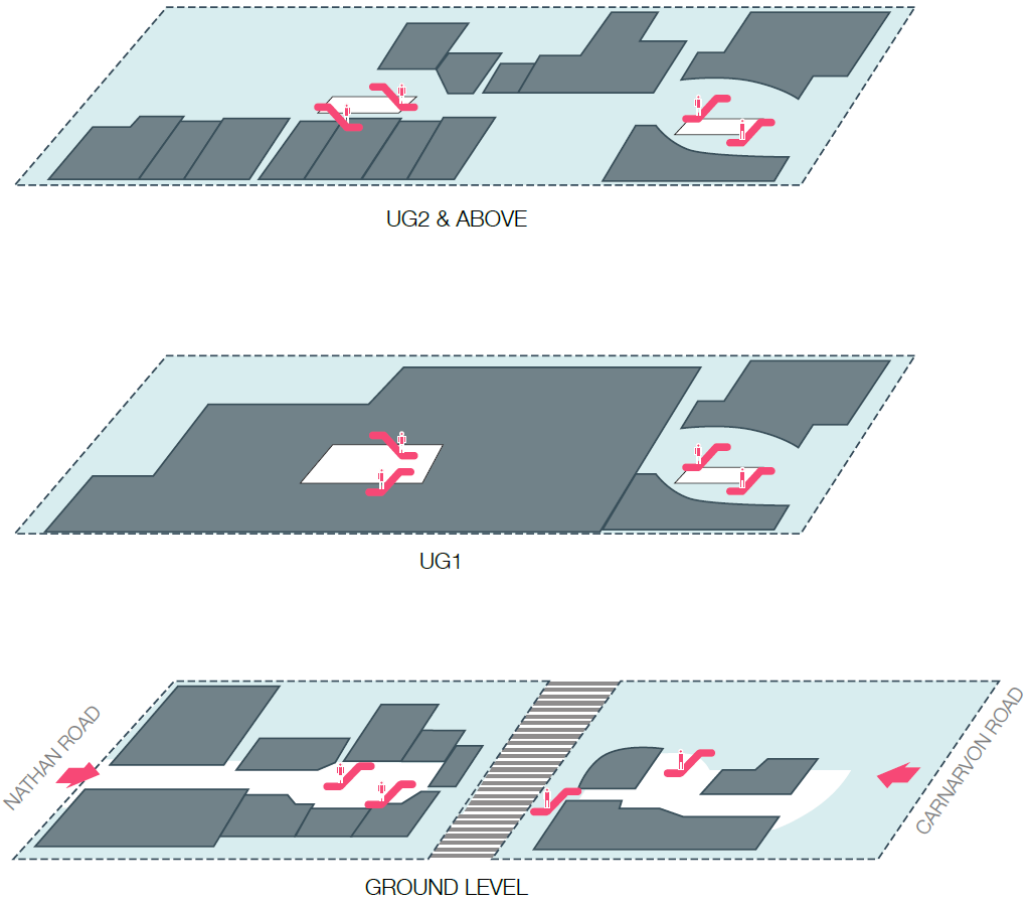

Fig 5. “The One” Interior Layout – *Ground Level, UG1, UG2*

The transition of the retailers and brands from the high street into this vertical structure has significantly changed the business scope in terms of clientele, patronage and overall perception. This new spatial landscape, shifting from its previous existence on a horizontal level, forces users to physically experience the upward flow of movement in order to gain access to products. Although serving as connoisseur, by assuming authority in determining the products and brands made available to users, the mall represents the mediation between design and experiential knowledge. The product selection is contained within the mall, signifying the stock of accessible knowledge, yet it requires users to engage with and experience the spatial flow before any possibility of user-object interactions can occur. Therefore, the mall’s physical properties create a barrier to user experience by limiting the potential and quality of interactions with products.

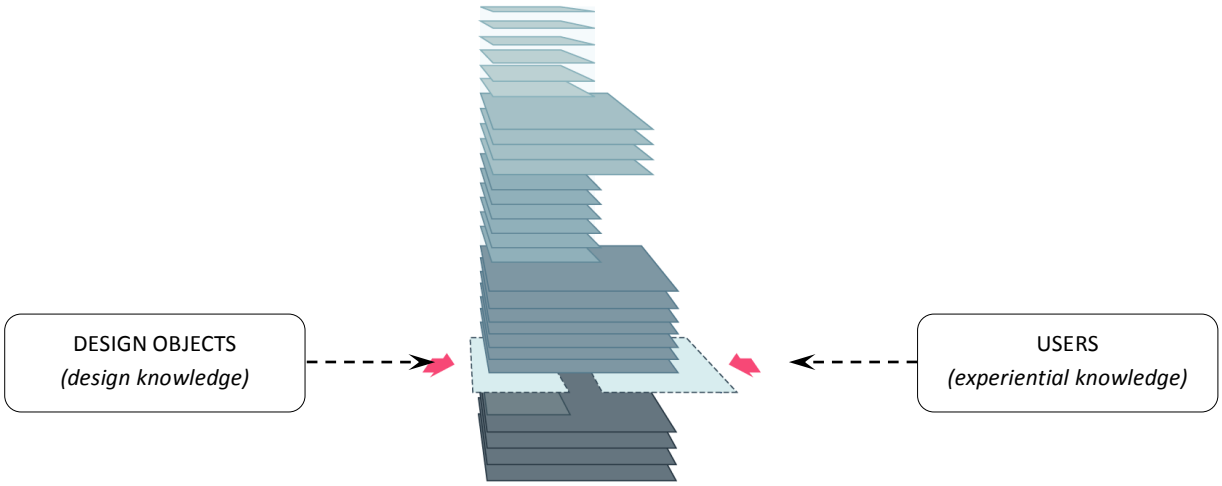

Fig 6. Retail Structure as Connoisseur – *Interface for Design Objects & Users*

Spatially Fluid Knowledge

The retail complex controls the experience of users with its intentional design and use of space. It is proposed that the upward movement of shoppers' traffic opposes the natural downward diffusion of knowledge, warranting a discussion on the juxtaposition of knowledge flow against the physical and spatial constraints presented by the mall. The mall is introduced here as representing the role of connoisseur, by strategically procuring design products and brands, and providing an interface for shifting design knowledge into experiential knowledge. However, the prospects for acquiring this form of experiential knowledge are deterred by the spatial layout.

Design knowledge has been identified as being created by designers and transforming experience into skills that aid the processes or activities of design. Relying on largely tacit knowledge, designers explicate their knowledge through the creation of design artifacts or objects. The user, as a receiver of its embedded meanings, enters into a transactional relationship with design objects to extract the perceivable and cognizable knowledge of the designer (Kazmierczak, 2003). Access to this knowledge is afforded through user experience, leading to the regeneration of knowledge in the user's final interpretation of the design's meaning and utility. However, the mall's physical space complicates the potential of user experience and future interactions with the design object, disrupting the flow of knowledge.

Knowledge is characterized by fluidity, in its ability to regenerate within social networks where it is transferred, received, changed and reinterpreted (Weller, 2007). Weller defines fashion knowledge as particularly mobile as it constitutes social interactions and aesthetic considerations leading towards the rapid adoption of stylistic trends. This knowledge is spatially fluid as it moves across different levels of knowing, from expertise to connoisseurs and finally to its users. "The One" represents a symbolic vessel for receiving, containing and disseminating knowledge. Knowledge enters the retail system, embedded within the products and brands, and moves across different channels and networks to be made accessible to users. It is within this simulated space that the designer's knowledge, the design product and user are directly connected. The flow of knowledge, passing from designers through the process into the object, is received by users who finalize its meaning and significance. This knowledge moves from tacit "know-how" to design knowledge and transforms into explicit knowledge when materialized into its finished form. It is immobilized within the context of the retail structure, where it will regenerate when confronted by the user's existing stock of knowledge and interaction with the product. However, access to this

form of knowledge is only by physically experiencing the upward flow of the retail space which reiterates the mall's mediation of user experience.

Discussion

Knowledge has been defined in terms of expertise (designers), connoisseurship (retailers) and experiential (users). The activity of designing allows designers to use their expertise to translate tacit knowledge into a final materialized form. Acting as connoisseur, the retail complex selects the brands and products made available to users. This mediation determines the specific knowledge that can be accessed and made known to users, signifying the authority of the retail structure as a critic of taste. Experience within the retail environment impacts the extent to which users increase their knowledge. The interaction between users and products is challenged by the physical layout of the vertical shopping mall, as the physical limitations constrain the spatial fluidity of knowledge.

The diffusion of knowledge follows a downward flow from the creators or owners to the users and consumers. According to Weller (2007) knowledge dilutes in value when it moves down the hierarchy and is increasingly imitated and translated. This emphasizes the need for knowledge to regenerate through interactions and be reinterpreted into new levels of meanings. Within the spatial context of "The One", knowledge is accessible but requires the active participation of users to physically seek it out. In contrast to the dissemination of knowledge which reaches users in a top-down flow, the physical layout of the mall forces users into the experience of a bottom-up movement to attain this knowledge. The ambiguity of this flow opposes the user's access to products, further limiting the opportunity to exchange and interact with its knowledge.

This conceptual paper reviews product interaction as a means for increasing knowledge of the design. Users, representing the final audience and recipients of design solutions, have the task of reinterpreting embedded knowledge by actively engaging in the meaning-making process. However, the physical restrictions limiting user access to this knowledge affects the experiential quality of the interaction. Knowledge, which relies on contact with other knowledge in order to reinvent and regenerate, is immobilized by the vertical layout of the retail structure. This is suggested in the case-study, which was introduced to illustrate the tension between the fluid nature of knowledge and the physical space disrupting its flow. The retail space has been suggested as significantly influencing user experience by affecting the quality and potential of experiential knowledge. Knowledge has been examined in relation to the retail system, producing a conceptual scenario and discussion of user experience.

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Knowing: Inside/Insider Knowledge, Outside/Outsider Knowledge

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Abstract

In Italian, there are two words for “to know” – Sapere – to know, to inform about, let know, be familiar with. Conoscere – “to know”, well known. (Conoscitore) – Connoisseur – one who has expert knowledge and keen discrimination in some field. The notion that the familiar everyday acknowledgment differs from the deeper understanding that is gained from experiential defines expertise from generic experience. When does critical knowledge from the experiential become that of connoisseurship?

In all PhD and post doctorial research, expertise is a pre-requisite. Often it is in the experiential research method that how knowledge is gained can truly make a contribution and change Design. As Sevaldson points out “Knowledge production in practice has far greater potential than being a curious sidetrack in academic research” (2010 p30). While practice-based/experiential methods are “accepted” in academia as valid approaches to advance research, these varied principles and practices are hugely open to interpretation, often diluting the contributions to new knowledge or indeed from gaining connoisseurship acknowledgment.

If practice-based is not to be classed as merely illustration to a critical text or demonstrative of the process, then what results is a body of physically made outcomes that locate and validate research. This paper will focus on this researcher as a case study whereby knowledge gained, utilitized practice–based methodology through textile processes in order to answer a critical philosophical question. Research exacted artefacts that had to be made because they did not exist. The outcomes were not prescriptive, but were a result of philosophical preponderances that had to be made to answer the question. The philosophical stance, as opposed to a scientific model of inquiry, meant that the engaging and understanding of the process would elicit the critical answers. Equally the methods embraced the interdisciplinary nature of varied subject domains and research methods that were needed to resolve the enquiry.

What becomes less clear for the often interdisciplinary/transdisciplinary nature of practice-based research is how validation of the varied expertises and the “connoisseurial” can be recognised. Connoisseurship has clearer associations with Fine Art, but for Design what does the term mean? Therefore can this title, a term that was born out of formal research methods, have resonances for design with its wide remit and ever changing morphing aims and objectives?

“Design begins and ends in the domain of experience… Thus the experiential knowledge, thinking and knowing are the heart of Design” (Stockerson, 2009, p.1).

This case study will unpack the insider expertise and argue that the experiential “making” process can be the heart of critical Design research.

Inside-out

The experiential mode of research can start from the very intuitive, intimate knowledge of making; this often takes on the introspective nature of the researcher as author, practitioner and maker.

Inside-within

The complex experiential process, while legitimate, needs rigorous defending and understanding of what is known. Yet on it own, this knowing / expertise does not necessarily equate to academic design research but needs to state why it is pertinent for Research. Knowing the reflective / reflexive process is complimentary and are in need of each other to demonstrate the making / experiential process can gain critical outcomes.2

Inside to outside

The imperative lies with the inquiry to articulate, (by various means and methods) that argue/debate/defend the personal (and therefore subjective) into a critical rationale. The knowing gained by the activity of “making” with that of theory form a synergy of experience.

Inside for outside

The knowing has to be evident and relevant within the subject domain, but it is vital to convey this knowledge to the outside for substantiation.

Outside–in

Validation of the experiential is manifested in a coherent inquiry for a public, critical peers, dissemination and be a continuum of research. If we understand “expertise” with that of a high level of skill and knowledge gained by the experiential, is the expertise “label” still true where research moves into other disciplines/subject domains? While legitimate in research practice, what of this multi inquiry acquires the outside connoisseurship acknowledgment?

What results is an osmotic migration of knowledge from the inside to outside through knowing things inside-out.

Keywords

knowledge; insider knowing; connoisseurship; interdisciplinary; experiential practices; making methodology

Introduction

In Italian, there are two words for “to know” – Sapere – to know, to inform about, let know, be familiar with. Conoscere – “to know”, well known.

The notion that the familiar everyday acknowledgment/knowledge differs from a deeper understanding gained from the experiential defines expertise from generic experience. This raises the pertinent question; when does critical knowledge from the experiential become that of connoisseurship? In other words when does “insider” knowing of something, gain outside recognition/acknowledged expertise?

In all PhD and post doctorial research, expertise is a pre-requisite. Often it is in the

experiential research method that ***how*** knowledge is gained can truly make a contribution and change Design. As Sevaldson points out “Knowledge production in practice has far greater potential than being a curious sidetrack in academic research” (2010, p. 30) While practice-based/experiential methods are “accepted” in academia as valid approaches to advance research, these varied principles and practices are hugely open to interpretation, often diluting the contributions to new knowledge or preventing gaining connoisseurship acknowledgment. The “process of interpretation and reinterpretation through framing (scenario) is a crucial part of design creativity, it allows design to take flight and move into truly new territory” (Dorst, 2010, p. 135).

If practice–based outcomes are not to be classed as mere illustrations for a critical text or demonstrative of a process, then what results is a body of physically made outcomes that locate and validate research. This paper will focus on this researcher as a case study, whereby practice–based methodologies gained knowledge by engaging in textile processes in order to answer a critical philosophical question. Research exacted artefacts that had to be made because they did not exist. The outcomes were not prescriptive, but were a result of philosophical preponderances of the making and the made to answer the question. The philosophical stance, as opposed to a scientific model of inquiry, meant that the engaging and understanding of the process would elicit critical answers. Equally the methods embraced the interdisciplinary nature of varied subject domains and research methods that were needed to resolve the enquiry.

“Creative practice itself is developing towards trans-disciplinary and emerging as a confident research area. It also demonstrates development towards an increasing multiplicity” (Sevaldson, 2010, p. 15). Yet what is less clear for the interdisciplinary/trans-disciplinary nature of practice-based research, is how validation of the varied expertises and connoisseurship can be recognised. Connoisseurship has clearer associations with Fine Art, yet within Design, what does the term mean? Therefore can this title, a term that was born out of formal research methods, have resonances for design with its wide remit and ever changing morphing aims and objectives?

“Design begins and ends in the domain of experience….. Thus the experiential knowledge, thinking and knowing are the heart of Design” (Stockerson, 2009, p. 1). This case study will unpack the insider expertise and argue that the “making” process can be the heart of critical Design research.

Knowing Inside-out

The experiential mode of research can start from the very intuitive, intimate knowledge of making; this often takes on the introspective nature of the researcher as author, practitioner and maker. Or put another way, “A new actor that has appeared on the stage – a practitionerwho reflects upon her / his own practice” (Mäkelä & Nimkulrat, 2011, p. 2).

In this case study, research utilized Design principles – amassing information; selection of visual sources by observation recorded by drawing/photography/croquettes; sampling using a wide range of manipulation/embroidery techniques. Recording, sampling, testing outputs in context, critical selection, rigorous experimentation with key techniques/key samples and final outcomes. There developed an emphasis on the importance for archiving the process in its totality.

For the micro scale maker, the material in hand becomes the critical platform for concept and artefact. Ferragamo states, “The designer has only one ambition, to dominate his material in such a way that his work appears independent of the material of which it was

made" (Ricci, 1997, p. 30). For the maker, affinity with the materials, control of making, knowing the process, often is of more interest than the completed product. This also suggests that the maker is equally a thinker, reflective and reflexive equally in the expert maker's practice. According to Cross cited by Mäkelä & Nimkulrat:

> Knowledge also resides in the artefacts themselves, in their form and materials. Some of this knowledge is also inherent in the process of manufacturing the artefacts, gained through making and reflecting upon the making of these artefacts. Thus, the triangle of maker-making-artefact seems to provide a useful means through which it is possible to approach practitioners (2011, p. 2).

This research focused on the shoe object to communicate design's interdisciplinary practices and methodological approaches for research outcomes. The shoe, whether as a mass produced product or a metaphorical artefact, is the ultimate communicator of material culture and as social and cultural signifier. Sudjic states "there is much to be gained from exploring what objects mean as from considering what they do and what they are like" (2009, p. 49) This approach has much relevance for Design at large but is an approach embedded in the research for this applied practitioner and researcher. There is "dialogue between maker and object; an interdependency between process and intention which is linked by skill" (Edwards edit. Harrod, 1997, p 351). Hence the practice-based route of inquiry was the most appropriate methodology for philosophical reflection and contextualizing research findings. The practice as an applied artist with a command of certain skills was the starting point of the critical inquiry to locate such experiences/knowledge(s) within and for academic research. Scrivener cautions that, the making methodology "does not necessarily demonstrate knowledge, ideas and intentions" (2002). This is not to say, knowledge in making is not valid, instead this "insider knowing" has to determine why and what of its nature makes it valid critical knowledge.

This researcher's philosophical creative practice experience was deemed to be of merit and "value" having "currency" for the research inquiry that needed to document the reflexive/reflective rational to determine outcomes. It seemed to be a given that the knowledge of the practice had been proven and was a worthy agent from which research could surface. For this researcher is was not the "practice of researching" that was the expert knowledge (it may be considered as such now), it was the skills of making and locating made visual outcomes as an interface with public peers, that moved the expert practice to that of expert researcher. Mäkelä & Nimkulrat notes "the researcher who is simultaneously an artist/designer, whose artistic process and production of artefacts is the target of the reflection' (2011, p. 1) succinctly sums up the rational of the practice based inquiry as a starting point, but needs outcomes to have resonances outside of the core field of study. This researcher sees the reflective and reflexive both as activities, complimentary and in need of each activity. This constant partnership often is not harmonious in academic research yet the conflict and tension is part of the creative process. Thinking should not to be seen solely as passive reflective; after an activity. For the micro makers, thinking is a constant, of "real-time" thinking that is a prerequisite in the making processes or put another way, "art as thoughtful workmanship" (Edwards, 1997, p. 349).

The practice-based outcomes are often problematic when not seen as a holistic experience especially when critical research needs, like all skills, to be practiced. Hanrahan says "art practice and research practice are not the same" (Colford, 2005). Makers hone skills of making, equally refining research methods to best articulate knowledge have to be crafted. Booth, Colomb and Williams argue "that research is also an artefact, look at research as a craft. This perspective might be useful to keep in mind when attempting to bridge the gap between theorizing and practising and when looking at research as a skill and practice" (Sevaldson, 2010, p. 24). Certainly the notion that doing and thinking are separate activities

frustrates many a maker and the notion that practice-based research is made up of very distinct activities that often exist in parallel tracks should be fought, instead aligning to a reciprocal / complimentary inter-engaged process methodology fulfilling the aim for a holistic research outcome.

Insider expert / within the field

Applied outcomes and approaches of interdisciplinary, trans-disciplinary and multidisciplinary are underpinned by a subjective interpretative nature, whereby the critical framework is tested without prescription or prediction of outcomes. Knowing the rules before the practitioner pushes into the unknown is an important element in the making (and in research) experiences and moves the expert's specifics to that of expertise that negotiate further parameters of advancement in knowledge. Contemporary education often uses the buzz phrase "Design Thinking", but Dorst points out that "design thinking" is too vague (2010, p. 131) lacking defined meaning instead he considers the nature of design reasoning. More often than not Design thinking is more or less the same in many fields that use experiential methods, yet it is in the "reasoning" that there is great differences. This "reasoning" allows the applied practitioner to assert and contribute to research outcomes that would not otherwise result. This researcher's rational used Design practices and principles similar to other disciplines in Design but it was in the physical outcomes and their location (physical and critical location) that there could arguably be divergences.

The terms "expert"/"expertise" are used in the craft(ed) disciplines. The art and design institutes talk of "Master Classes" and "Master Designers"/"Crafters", that singularly pride and protect what it is to be an "expert" in the creative practices, which nurture the notion of expertise borne out of the experiential and experience of repeated making practices and practices in making. Dorst distinguishes between the expert designer/maker and the Master designer/maker. "Expert designer ("expert" as in better, not as in 'specialized). The Master Designer has achieved a high level of innovation that questions the established way of working of the experts, their work representing new knowledge in the field" (Dorst, 2011, p. 136). Academia has often cited crafted/applied fields as too vocational with too much emphasis on skill acquisition and not engaging or embracing how that experience and knowledge-base can innovate and fed research strategy. This is changing from inside the applied "space" with the maker's knowledge having much to say, but needs to continually find convincing articulation and communication for *outside* the field and the domain. The expertise of the master to push outside of his field into societal/cultural debates critically promotes what of the experiential materiality experience can be exploited to build a strategy for research.

Many decisions are made within any aspect of the creative process. It is in the articulation of the creative process, choices made, selection that becomes the knowledge often cited from the practice based researcher. To many outside the experience, this is the value that experiential practices can give to the wider research community. The notion of systematic recording and documentation is important, the laying bare of the process. Scrivener notes that clear documentation can capture the experiential creative knowledge, "so that what the practitioner learns from within his / her practice becomes explicit, accessible and communicable" (as a researcher) (Scrivener, 2002, p. 25). The documentation or evidential proof of process can be resisted by many mature professional makers. Yet it is a critical research criterion for the route of practice based outcomes. The means and methods are varied, especially within interdisciplinary domain that may use different taxonomies. For the applied practitioner this evidential proof does not follow one rational or system, which ever adapted, it needs to be rigorous and be consistent. Archiving all work is instilled at

undergraduate level, but this archiving only goes some way to make evident the critical choices and processes undertaken. This is often difficult for the practitioner where the intuitive decision making happens at the finger tips with quick intuitive confidence. The notion to stop and record, at every stage breaks production and thinking and indeed implies that there is clear delineation of "stages". Within research the objective tries to articulate the practice methods as a way to gain insight. Not everything made is of merit; often the maker abandons an idea quickly, not seeing the value of documenting even the discarded idea as part of a process and critical selection. Insights into the intentions of a designer help use understand creative design from the aspect of understanding the actual thought process of designers. The designer develops solutions integrating knowledge and skills, i.e. "using the cognitive skills of the designer to generate knowledge … as well as emotional skills within design action to generate knowledge" (www.tue.nl). For the maker, it is not a constant paced process, there are high and lows, bumps and troughs that makers experience but don't necessarily see the knowledge that can be gained from the mapping of these integral experiences.

The experiential art/design practitioner factors in the notion of "playing". This is not some superficial abandonment of the task at hand. It is an imperative for all makers to experiment, to try, to break the rules or challenge constraints to see potentials fully realized. This can often go against the notion of the scientific model that sees systematic prediction. Yet the "happy accident", can open up new terrains, outcomes and interdisciplinary applications are vital for all design processes that by definition, need to change and morph and reinvent. "Being prepared to notice the unexpected often is the key" (Grinnell, 2009, p. 28). What is crucial is when the unexpected or unprescribed happening is applicable to the task at hand, resulting in a better outcome or more precisely, innovative for research. The expert knows what to pursue, what should be "parked" for later development, but ultimately what is pertinent to the research inquiry. "You cannot always rely on your knowledge or past experiences alone. Thinking will often need to be undone as a way to discover different approaches" (Cohn, 2012, p. 37).

Acknowledgement in the field/subject of the expert knowledge is often evident, but when we consider this in terms of research this expert knowledge has to negotiate more than the perimeters of their field. It is this expertise that migrates and makes relevance outside of the field, driving and influencing the expert to new invention. The cross-fields /cross disciplines in art and design can a have a "stage managed" if not superficial result, as opposed to a genuine location of new knowledge. Dormer points to craft/applied practitioners need of "assembling a kind of cultural currency that would inform internally directed displays of authentic belonging" (Cohn, 2012, p. 231). This "belonging" of the maker is becoming more and more of an importance as we negotiate the field and locate ourselves in societal, post modern terms that questions the generation of, and acquisition of things grappling with the hand made thing in a mass production world. "Clusters" (or "belongings") are made and driven by different agendas no longer merely finding others that make the same thing or use the same techniques (i.e. this researcher is an embroiderist but I am not interested in others who embroidery, instead the interest lies in concept and location of outcome). Research activities can often re-shape the practice aligning it to certain research cluster's rational. Interdisciplinary practices create networks and clusters of over-lap enriching each others practices and experiences and contributing to thinking, reasoning and widening knowledge (i.e. this researcher is not aligned to one critical cluster but overlaps, migrates and is osmotic as the research finds relevance in differing interests). "Most importantly, makers establish their positions through making" and position themselves "across a set of creative systems" (Cohn, 2012, p. 38). The merit of the specialist expert being acknowledged with expertise allowed for this researcher to move outside of the field and inform other critical domains.

The expertise of this researcher, was not a linear knowing but one that continually found new context, new appropriation and new philosophical "reasoning". According to Mäkelä &

Nimkulrat (2011, p.1)**,** in Schön's (1991) *The Reflective Practitioner* (1) sees "The exploration of knowledge partly through making artefacts has brought a new dimension to design research as the practitioner/researcher not only creates an artefact but also documents, contextualises and interprets the artefacts as well as the process of making them".

Even for the expert there is often the desire to push the parameters of their knowledge. Carlo Scarpa – an expert glass practitioner became Master of his craft as he refined his command of skills allowing for "play" that pushed the material to produce never-before attempted outcomes. He brought innovation to this discipline. Subsequentially he transcended the discipline, applying his knowledge outside and into the domain of architectural product design that evolved and become an immersed practice for which he is most commonly known, that of architect. His architectural practice was ignited by his experience with glass, having processed that uniquely Venetian relationship with that particular material, applied his expertise thinking and "reasoning" into the wider interdisciplinary design practice. Yet at the core was an experiential knowledge of materials borne out of the intimate experience of making.

That knowledge and expertise of the individual, from small scale, of one material, found application in contexts of team designing, multi materials and knowledge(s) to determine large scale outcomes.

Insider Expertise ergo Outsider Connoisseurship?

Conoscere – "to know", well known. (Conoscitore) – Connoisseur – one who has expert knowledge and keen discrimination in some field. The word "connoisseur" comes from conoscere, to know well. What arises out of interdisciplinary or multi disciplinary or even diverse in methodological approaches to critical research, is often the sense of the researcher been seen as magpie, taking what they want without the perceived "apprenticeship" to make claims of knowledge they claim to know.

When we hear the word connoisseur we think of collectors of fine art painting or as Dunin-Woysth & Nilsson (2012, p. 5) point out, wine appreciation! In-fact it is the appreciation that is an underpinning criterion for the connoisseur, in this context appreciation means "awareness of its characteristics and qualities". In art history the connoisseur "judged by the practical result of the connoisseur's activity….." emerged from the collector and collections (Ebitz, 1988, p. 207). One could arguably see Venice as the predecessor of the collector/display of collections, developing the notion of "dedicated spaces" in domestic architecture for these grouped objects in the form of "studio", casino and the ultimate public interface for collections and precursor of the modern museum. What is most interesting in Venice was "early collectors were not motivated solely by the pursuit of knowledge" (Brown 2004 p218) nor as mere sources to decorate interiors, the Venetian's uniquely saw collections as a way to "possess". This in-term, marked collections with notions of "taste" in what was a highly ordered society, the collector could have social status by virtue of his collections that circumnavigated the patrician order of social status. These dedicated spaces were often described as "theatres of the world" (Brown, 2004, p. 221). Unpinning the evolving groupings of artefacts was the selling / commissioning and acquisition of objects that has become practices of the art dealer, the connoisseur. While it may seem the text is digressing somewhat, there are two points of relevance to this paper. Firstly that this research inquiry needed to understand historical and social Venice, to ascertain how Venetians viewed the made object, their design ethos and their unique use and understanding of light and colour. While this is broad base of topics, they were vital drivers, determining the physically made outcomes of the research. Secondly, in defining what

connoisseurship is, what emerges is an emotional response and connect, to the thing(s) focused on whether studied, collected or made. This seems very apt for this researcher, the fusing of the making and the made entity. Yet it is in the very fact of this shared emotional connect that connoisseurship and that of the applied methodology use for research; "has been criticized as subjective an unscientific" (Ebitz, 1988, p. 1).

> The connoisseur could be said to be embedded in practice and here the experience and perception of the qualities and competences of that particular practice is crucial. (Dunn-Woyseth & Nilsson, 2012, p. 6)

The seminal text by Eisner has framed much of our understanding of the connoisseur and critic role, these two roles are often intertwined but not the same. Eisner sees criticism as the "art of disclosure" (Dunn-Woyseth & Nilsson, 2012, p. 6) a role that researchers become as they take the insider knowledge and brings forth making external. Criticism – "a rendering in linguistic terms of what it is that he or she has encountered so that others not processing his level of connoisseur can also enter into the work" (Eisner, 1975, p. 4). Therefore one can conclude that criticism requires connoisseurship but the connoisseur does not require the skill of criticism. For the practice-based practitioner, this is very often the case and would suggest there are many who not only are experts but have connoisseurship knowledge. In research/doctoral study it is the critic skills that are called upon for judgment that have to be explicit and communicable. "Communication, after all is one other necessary conditions of research" (Aprile/Mirti 2009, p. 4579). If we argue that practice based needs to be a holistic experience, then the researcher has to move outside of his expertise / connoisseurship role of subject to be the critical outsider evaluating the knowledge's appropriateness to "making" new knowledge.

Insider Connoisseurship for Outside Validation

To illustrate; this researcher's question had been "Binary Oppositions, what constitutes a pair?" The research paired visual sources of surfaces found and exploited in Venice, with the iconic form of the shoe to address philosophical preponderances of a pair. Practice-based methodology of making by textile processes, established visual outcomes of through shoe derived forms. The inquiry brings together a holistic approach to the specialist, uniting historical and contemporary design ethos, concept and theory of the practice that contributed to changing the field. This demonstrated the project's wider application through the "testing" of the outcomes for diverse audiences.

The expert knowledge of textile processes and proven creative practice determined outcomes and established connoisseurship knowledge, but the research moved into other scholarly domains. The research meant it had to have a rigorous knowledge and understanding of historical Venice and Venetian Design thinking (reasoning) to inform outcomes and determine what of the making process could illicit answers that could not otherwise have surfaced. The need to be an expert, extended into a key painting that of Carpaccio "Two Venetian Women", to understand the context in which this painting was made, for whom and how was the viewer to interpret it. Could this researcher be considered a connoisseurial authority of this painting?

Likewise, shoes as made objects needed to be understood as a 3D object, social signifier, form with function, and a motif of material culture. For the research to be answered an expert knowledge had to be gained of shoes. To the outsider viewing an interdisciplinary practice such as this, may view these different knowledge(s) as trite without the time invested like that of the core practice. Yet the expert exerts an expertise in directing and negotiating such research pathways, determining what other knowledge is needed to be gained before the

critical inquiry can be answered. If we think of connoisseurship to mean knowledge/command of a specific topic /subject, can the term be use for knowledge of a research strategy?

Often it is the made physical outcome as opposed the practice based mode of inquiry that causes most anxiety. How are they to be viewed in terms of their currency and value to research? Often physically made artefacts are seen as mere illustrations to the text or new art outputs. Bell (2008, p. 1) clearly has not been won over by practice based outcomes when he says, “not too many searching questions have been asked about …work….submitted for assessment (that) could be held to constitute research, an activity normally thought to involve the generation of new knowledge rather than the production of art objects”. Indeed this scepticism does suggest that practice based outcomes of art or the applied arts have still not argued with conviction to outside the field a rationale. The made object has to be paired with critical “reasoning” since “objects alone cannot embody knowledge because they need to be interpreted in order to communicate knowledge” (Biggs, 2002, pp. 23-24) There in lies the knob of the problem for practice based outcomes that another means of communication has to convey the knowledge. While this practitioner has empathy for what Edwards (1997, p. 349) describes as “the making articulates meaning, and can be an alternative to language and theory”. The objective researcher sees making as a theory that needs to find a communicative language for outside of the personal known knowledge. “Thoughts are in principle formed by means of language” (Nagai, Candy & Edmonds, 2003, p. 4) whether by speech/text, the recording and documentation is the means by which academic research of the experiential/making expertise is validated.

The imperative lies with the inquiry to articulate, (by various means and methods) that argue/debate/defend the personal (and therefore subjective) into a critical objective rationale. The knowing gained by the activity of “making” this researcher would contest, is in itself a theory formed by a synergy of experience and ownership. Biggs, says, “it is not the one who has thought or practiced these instinctive activities, it is the one who has critically recorded and disseminate to a critical audience that gets to take ‘ownership’ of this research”. (2006)

Outside–in

This paper set out to establish if the interdisciplinary practice based mode of research can be mapped against notions of the expert/connoisseur and researcher and what of the experimental methodology can meaningfully contribute to new or “changed knowledge” of the field (McAllister, 2009). The changed reasoning of the applied/experiential practices can inform and contribute to Design Research by:

1. The starting premise of the practitioner’s experience. “The self-reflective and self-critical processes of a person taking part in the production of meaning within contemporary art (and design), and in such a fashion that it communicates where it is coming from, where it stands at this precise moment, and where it wants to go” (Hannula, Suoranta & Vaden 2005, p10).

2. Strong sense of the visceral/sensory engagement of materials and relationship to objects. The emphasis on process, material properties should not just been seen as a periphery activity of Design but as crucial element to innovate and invent in Design’s fullest remit. At its least, making skills are distributed across large networks of people engaged with technology based manufacture. This does suggest that making might at least endure as a residual practice in industrial design” (Cohn, 2012, p. 37).

3. The key to the craft/applied practitioner is the engagement with making and in the

materiality. It is this intuitiveness that can make a contribution to design reasoning. Never the less the "reasoning", must be critical (objective) and outside of the expert/connoisseurship to convince peers of the new/changed field.

What results is an osmotic migration of knowledge of the insider expert to outsider expertise of the field. The subjective insider expert / connoisseur knowledge moves to that of the objective communicative critical outsider. While Orton was talking specifically about artworks when he says, "the evaluation of the work of art remains public: the work is measured against something outside the author" (1997, p. 137) this seems equally applicable to research as to its "value" measured outside of the author. In turn the outside evaluation feds back into and informs the practice. Practice methodologies determined research outcomes, research methodologies now inform and re-shape the practice whereby "actions or activities are changed as a response to the research; therefore the practice has to change, inform and have impact" (Biggs 2006). What results from the research practice of the practice-based making to inform outcomes, is the research is ***led*** by the experience of practice to answer questions, "in order to acknowledge the change in emphasis from the production of original artefacts to the integration of artistic practice into the research process", the term practice-led seems to reflect the changing nature of the research practice (Lycouris, 2011, pp. 62-63).

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The Expertness of Accounts of Typeface Design: *Locating the Emic and Etic*

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Abstract

This paper is written in response to problems arising from defining the term "expert" within the literature review of a PhD study that ultimately focuses on a Grounded theory approach, relating how typeface design "experts" describe their knowledge in connection with design processes, particular to their esoteric discipline.

The study was conceived as being emergent and inductive in nature as no prior studies of this area of typeface design process exist. It became clear that the study demonstrated a methodological fit with Grounded Theory Methodology in terms of being emergent qualitative research. However, questions raised within the initial background research and subsequent literature review – required as a standard approach in early PhD enquiry – pointed toward possible problems in explaining or defining the notion of "expert" with respect to the subject of type design process and how this may in turn, have implications regarding selection of possible subjects to be studied.

The aim of the research was to reveal and describe knowledge of contemporary typeface design processes. To determine whether such processes, or parts thereof, could be described theoretically rather than merely anecdotally or in purely descriptive terms. The author had identified that in both contemporary and historical contexts, paucity existed in relation to recorded epistemology regarding the processes of designing typefaces. What also became evident to the author was where accounts of knowledge of the practice of typeface design existed, perspectives from which these were written differed in relation to what may be deemed "expertness". It was in attempting to explain or rationalise differences in perspectives of such accounts of practice that the problem of describing "expertness" arose initially in the study. In terms of the empirical study connected with the literature review the problem above was obviated by the adoption of a Grounded Theory approach to the study in general, as Theoretical Sampling consistent with Grounded Theory allowed decisions being made on sampling to come from the emerging data and theory as they developed. However, initial problems raised perhaps determine the focus of future research in the area of defining "expertise" in typeface design and perhaps more generally beyond this field.

Keywords

typeface design expert; emic versus etic; vicinage; loci; epistemological/ontological positioning

Often seen as set within the wider subject domain of typography, typeface design, or type design is a specialist area that concentrates on the designing of letterforms, characters or glyphs conceived to work in relation to one and other within specific sets. These are in turn,

along with spacing designed relative to the glyphs, presented as a group of accessible functioning entities in the form of a font. Typeface design can often be a lengthy and solitary endeavour on the part of the designer. An endeavour for which, there is little in terms of guidance to draw upon regarding the processes involved in the designing of type. Few books or resources exist regarding this subject – this is not only a contemporary problem but also an historical one.

Early works relating to the subject of devising types also account for the crafts and trade of punch-cutting and type-founding (Moxon, 1683, Davis and Carter eds. 1958; Fournier, Carter ed. 1930). Of these early activities and professions, the punch-cutting of letters was regarded as one of the more highly skilled if not the most highly skilled crafts (De Vinne, 1900, p.11). Crafts where it is acknowledged a division of labour existed between the activies (p.11). Punch-cutters worked in minute detail to counter-punch and engrave the ends of steel bars in order to make reversed letterforms, that when struck into a softer metal such as copper could be used as a matrix (Southall, 2005, p. 3–4). This matrix would then be incorporated into a mould in order that a single lead type might be cast from it, these types being cast one at a time (Moxon, Davis and Carter, 1958, p. 134–184). The process of punch-cutting and casting the moulds would have to be repeated for every individual letter or character needed to create a font of type, each related by the characteristics commonly recognised as being distinctive to any given particular typeface or design.

Accounts of the divisions labour between the various stages in the process and manufacture of types meant that the “design” of letters, the cutting of punches and the casting of types could be conducted by different workers. Although type designs for hand punch-cutting would need to be “interpreted” by the punch-cutter, as until the late nineteenth century, and the invention of photographic transfer, there was no method to reduce the design of “model” letters to appear at text size on the ends of the small steel bar from which punches could be made. (Southall, 2005 p. 13–17). Prior to this, designs could only be used as a guide by the punch-cutter.

By the end of the nineteenth century, the move toward industrial mechanisation in many areas, meant the cutting of punches by hand was supplanted by mechanised methods of production (De Vinne, 1900, p. 348–350). This move toward industrialisation brought with it a clearer separation in the division of the designing and making of type (Southall, 2005, p. 19). Drawings relating to the designing of types from this point become less of a guide as was the case of model letters for the earlier punch-cutters, but from this point on become the “pattern” or “specification” of the final letter designs for types.

As times and technologies changed the manufacture and use of metal type gave way to photo-type and typesetting. The designing of types became closer still to that which appear as the final form or “image” of type, as the translation to physical metal letterforms was eliminated from the process. Within the last few decades digital type has taken its place as the common form of reproducing typographic matter either for print and modern on-screen renderings. Again, in terms of technology, the removal of the image of the letter as photographic film from the process of production, has meant that designers today working with digital media are working with forms of letters directly within the medium in which they will be delivered as final products – digital types.

Paucity – a lack of specific documented knowledge in relation to the process of text typeface design

To date little has been published that attempts to account for processes involved in the designing of typefaces. This is acknowledged by the marketing claim for the book *Designing Type* by Karen Cheng:

> The lack of a specific and comprehensive guide to type design has long been a frustration for typographers, graphic designers and students. *Designing Type* finally addresses this important need – and brings new depth and insight to the art and process of creating a typeface. (Cheng, 2006)

Whereas there is some useful information toward the grouping of some related letter shapes in terms of form and a delivery towards the sequence of designing letterforms for typeface design in Cheng's book (Cheng, 2006), it is questionable whether this brings insight and depth in terms of the process of designing typefaces. The book's core themes are based around comparative analysis of existing typeface glyphs with some commentary toward methodological approach.

In terms of research in relation to typeface design process there is a lack of published work in this area. Work published that offers some insight to aspects of the processes involved appear in some self-authored books (eg. Gill, 1931/2007, Van Krimpen, 1957), or as features within trade journals, eg. ITC U&lc Magazine and Typografische Monatsblätter, the latter tended to coincide with the release or publication of given typefaces/fonts from type foundries, often acting as a promotional vehicle also.

None of these works deal directly with establishing and describing a range of contemporary design processes relating to text types. They often offer historical or retrospective views, describing specific details relating to type design or the design of the types themselves.

Examples of restriction of type-founding as a practice and the secrecy of punch-cutting as possible contributors to a state of paucity in epistemological articulation.

Historically, the earlier related activity of type-founding in connection with type design suffered restrictive measures placed upon it by the state. There are also accounts of type-founders purposefully concealing methods of practice from those who worked around them. (Reed 1887 – Johnson ed. 1952 p.311).

Restrictions to the way in which type-founders could operate in terms of numbers allowed, along with restrictions in terms of who they could employ and in what capacity, also meant that type-founders could not or would not be able to freely communicate their knowledge in terms of the processes of letter-cutting or punch-cutting with a view to making types. The Star Chamber Decree of 1637 detailed the restricted number of type-founders in England to four. The maximum number of apprentices type-founders could have under their employ was restricted to two (p.120). The decree imposed in the UK was regulated by the Stationers' Company London and the law courts and was based upon an earlier decree of 1586. The Decree of 1637 was a measure to restrict activity of printing and type-founding and as a consequence of this, the knowledge of how this operated that would have accompanied such activities.

An anecdotal account given by Reed (1887) in connection with the secrecy of punch-cutting from the mid 1700s, is given with regard to Joseph Jackson, apprentice to William Caslon I. Caslon's punch-cutting was carried out in secret at the Chiswell Street foundry. We are told that Caslon and his son would lock themselves in a separate room whilst practicing the work. Apparently, so much was Jackson's desire to learn about the process, that he bored a hole in the wainscot to observe his master at work. From his observations Jackson was able to apply himself to the practice in his own time, and on the completion of creating a single punch, presented this to his master in the hope to find praise and reward. We are told Caslon's response was the dispensation of a hard blow to the apprentice and threatening Jackson that he would be sent to "Bridewell", at the time both a court and prison, if a similar attempt was made (p.311).

It can be argued that the restrictions imposed by the 1637 Star Chamber Decree and the above account of Joseph Jackson implies that meaningful patterns in relation to a process did or could exist with regard to punch-cutting, therefore these patterns of process could be observed, taught and communicated. However, this is not to say that mastery of the subject would be expedited in such a manner.

This argument can be reinforced by the comments made by Davis and Carter in their later edited full version of Moxon's *Mechanick Exercises*. Davis and Carter give brief accounts where it has been known of the imparting of knowledge relating to punch-cutting (Davis and Carter, p. 375). This does not make clear how such knowledge would be passed on, only that it was.

Extant texts in relation to typeface design process

Of the recent literature that offers insight to aspects of process of typeface design these do so from an historical perspective: *Letters of Credit* (Tracy 1986) gives some important insights into some aspects of processes of typeface design particularly on spacing letters. However, the content here is significantly historical and does not offer theory toward the development of form. Smeijers' (1996) *Counterpunch* describes certain key issues in relation to type design whilst also revisiting some of the historical processes of punch-cutting. This draws heavily from the writing of Fournier at times setting this to practice. Southall's (2005) *Printer's type in the twentieth century* describes some elements of the processes of type design. However, here the view is heavily based on the role of technology over a specific period in history.

None of the above works deal directly with establishing and describing a range of contemporary design processes relating to text types. They offer historical or retrospective views, describing some specific details relating to type design.

Writing which documents elements of typeface design process is scarce, where this information does exist, it is usually limited and/or incidental in nature (De Vinne, 1900; Earls, 2002; Graß, 2008; King, 1999; Klein, Schwemer-Scheddin & Spiekermann, 1991; Tracey, 1986), this is often contained in or found alluded to within books that cover a wider or broader scope including lettering (Kapr, 1983; Harvey, 1996; Noordzij, 2000, 2005). There is usually an emphasis on historical factors relating to type design (Morison, 1926; Updike, 1937; Johnson 1966), changes, developments and paradigm shifts in technology (Knuth 1986; Karow, 1998; Morris and André, 1991) and/or biographical accounts (e.g. Burke, 1998; Carter, 1995; Lommen, 2003; Macmillan, 2006). Other texts offer glimpses of fixed or ideological perspectives from the point of the practitioner/author (Gill, 2007; Goudy, 1940; Hartz, 1958; Unger, 2005; Van Krimpen, 1957), including reflections on methods employed in practice itself (Briem, 1998–2001; Harvey, 1996), those that relate specifically to the use

of particular technologies (Sassoon, 1993, 2002; Karow, 1998; Knuth, 1986; Moye, 1995; Lemon, 2005) and accounts that relate to specific aspects of form or visual qualities in type (Carter, 1937; Dertrie, 1999; Hersch, 1993).

The majority of that which currently exists will be found within: instructional textbooks; reflections on career and practice either from a practitioner's perspective; biography or articles within trade magazines and some journals.

In terms of studies of printing and type-founding that make reference to process, three early substantial accounts exist: Joseph Moxon's 1683 *Mechanik Exercises* (Davis and Carter (Eds) 1958), Simon Pierre Fournier's 1760s *Manuel Typographique* (Carter, Mosley (Eds) 1995) and Legros & Grant (1916) *Typographical Printing Surfaces*. Aspects of these accounts are important to consider for some particular detail and also in relation to each other because they allow us insight to the perspectives from which they were written. Perspective will be considered in further detail below.

Etic and emic accounts in relation to type design processes

In 1954 Anthropologist-linguist Kenneth L. Pike coined the words *etic* and *emic* from the words phonetic and phonemic, in relation to what became his "Tagmemic Theory". The concepts of "etic" and "emic" have since found application in subject domains such as Ethnology and Psychology. Pike describes "etic" and "emic" as: "The etic viewpoint studies behavior as from outside a particular system. The emic viewpoint results from studying behavior as from inside the system" (Pike, 1967).

And that in terms of partial versus total data:

> … Etic data are obtainable early in analysis with partial information. In principal, and on the contrary, emic criteria require a knowledge of the total system to which they are relative and from which they ultimately draw their significance. (Pike 1967)

This can been interpreted as that of the "insider" and "outsider" it can also be thought of in terms of the "expert" and "non-expert" perspectives.

It is useful for us to consider Pike's view of the etic and emic in connection to the literature that exists relating to type design. Accounts that exist in relation to text typeface design it can be argued either come from the "inside" – an "expert" view of the type designer or from the "outside" – an "non-expert" view of the observer. It can also be argued that a tension exists here similar to that which has been commented upon within areas of social science and anthropological research:

> For what the social scientist realizes is that while the outsider simply does not know the meanings or the patterns, the insider is so immersed that he may be oblivious to the fact that pattern exists… (Wax, 1971 in Patton, 2002, p. 268)

Wax continues to discuss that it is the social scientist's task to work between such etic and emic viewpoints in order to communicate and illuminate what has been learned (Patton, 2002, p. 268–9). Patton comments:

> Experiencing the setting or programme as an insider accentuates the participant part of participant observation. At the same time, the inquirer remains aware of being an outsider. The challenge is to combine participation so as to become capable of

> understanding the setting as an insider while describing it for the outsider. (Patton, 2002, p. 268)

This may highlight some ways toward an understanding the reasoning for why there is such paucity thus far in describing typeface design process. The immersed "insider" is could be considered too "close" to specific details and problems in relation to the activity to see clear ways of making meaningful generalizations of the process of type design. It is not just what is done that needs to be explained – procedure – but how and why, and in relation to what other examples processes of practice.

Typeface design is a complex and often lengthy practice. It can often be difficult even for those that work closely designing with type, namely, graphic designers and typographers, to appreciate such "meanings" and "patterns" as eluded to by Wax.

Type design, although a specialist activity in its own right, can perhaps be perceived also as a discipline within disciplines, an activity that serves the broader specialisms of typography, graphic design, communication design, media and new communication technologies. To an "outsider", there is perhaps a certain sense of invisibility that such specialisms as typography and type design perhaps exist, even when superficially these would appear to be closely related.

This argument can be illustrated by a criticism made by the Dutch writing master and type designer Gerrit Noordzij against Daniel Berkerly Updike and what is considered by many to be an authoritative history of type designs, first published in 1922 – *Printing Types: Their history, form and, use; A study in survivals*, Noordzij states:

> The judgement of Updike is amazing and perhaps, if you would happen to enjoy a very special sense of humor, even amusing, but everywhere it demonstrates painfully the absence of the most elementary understanding of type design and its history. (Noordzij, 2000, p. 63)

Noordzij makes this statement from the perspective of having a life and career immersed the creation of letterform, type design and teaching, although his own typefaces are not widely published (Middendorp, 2004, p. 150–157), he draws upon his expert knowledge in his criticism of Updike.

It can be argued here that Noordzij's knowledge – as type designer (Smeijers, 2003, p. 8) – is at odds with Updike's view – the type historian and printer. Although it would appear closely related in terms of subject and discipline the "world" views of this particular type designer and historian appear to differ. Noordzij's "insider" perspective does not align with Updike's "outsider" perspective in terms of the subject of type design.

Further considerations of etic and emic accounts

In terms of how we may consider etic and emic viewpoints and accounts, it is the concept of "relativity" in connection with the account – relative to what and whom – that may provide us with useful insights and tools for determining the value of such accounts for any given study. "Viewpoints" can be considered as perspectives from within and without. This is reflected in what William James argued as there being two kinds of knowledge, knowledge of "acquaintance" and "knowledge about" (James, 1890/1950, p. 221). The concentration on the conceptual "particular" is also offered by James as the relationship between a core "topic" and a "fringe of unarticulated affinities …" (p. 259). Therefore, it can be argued that if

we are positioned within the “fringe” we may know something “about” type design practice, this does not however, necessarily equate that we have “acquaintance” with designing type.

For example Joseph Moxon had produced some types in his lifetime. However, he is not considered to have been a type-designer per se. Although, that is not to say that he was not becoming a type-designer through his efforts. This consideration exemplifies the problem of categorizing with definitive of exact labels such as “expert” or “connoisseur”. There is also the nature of how we “delimit” or mark out the territory of type-design to consider. Type-design in the time of Moxon may not have had the same values in terms of technology, production, purpose and methods of application, yet there are fundamental or transcendental qualities and commonalities in terms of considerations of form, use and application of the type-design etc. that have similitude with the nature of type design today.

Epistemological and ontological proximity

In the example of Moxon becoming a type-designer, the statement above implies something of the contiguous nature of “being”. Being is in this sense, not fixed as is the label “expert”. It is relative to the knowledge, skill and ability of the type designer. This example may also extend to the notion of “connoisseur”, or onlooker/”outsider”.

Consideration can be given to factors of epistemology and ontology with reference to how this may be relative to or for particular study in terms of “viewpoint”. What proximity epistemological evidence or qualities of “being” have terms of those giving accounts of such evidence, must also be considered relative to understandings or expectations relative to study.

For example, if we consider William James’s view of the “topic” and the “fringe” (James, 1890/1950, p.259) as a model to position type design at an epicenter within the wider context of type production or typography. How close to this centre can we position the accounts of type design, or indeed where would we place those giving such accounts placed in relation to such a scheme, in that these may prove valuable or useful in terms of assisting or framing elements of enquiry? In terms of ontological understanding of what type design is, if type designers are what makes type design a subject of study, it would therefore be plausible that those with the greatest skill and knowledge of this subject reside safe within the epicentre of that same subject domain. It can also be asserted that those with great knowledge and expertise would be regarded as being experts in the subject. Nigel Cross (2003) highlights the lack of research involving exceptional or outstanding designers in terms of the expertise of exceptional designers:

> In order to understand expertise in design, we must study expert designers. In some instances, it will be necessary to study outstanding, or exceptionally good designers. This is analogous to studying chess masters, rather than chess novices, in order to gain insight of the cognitive strategies and the nature of expertise in chess playing … (p.85).

In this statement, Cross, implies that richer understandings of the subject can be gained by studies of knowledge or actions of the expert practitioners from within a given subject.

Vicinage

As part of the Grounded Theory approach to the overall study that the author was conducting, “Memoing” was used as a recognized aid in the development of analysis and theory building of the related empirical research. In their original book outlining the Grounded Theory Method – *The Discovery of Grounded Theory: strategies for qualitative research*, Glaser and Strauss describe the function of memos in Grounded Theory:

> From the point of view of generating theory it is often useful to write memos on, as well as code the copy of one’s field notes. Memo writing on the field note provides an immediate illustration for an idea. (Glaser and Strauss, 1967, p.108)

Charmaz (2006) in *Constructing Grounded Theory* describes memo writing as a link between coding and analysis, encouraging reflection on the data in order to abstract and develop new ways of seeing and describing data, from which themes emerge from the data.

As well as memoing on the data, this technique was also applied to problems found inherent within the developing literature review, using the literature as data, in the early stages to try to make sense of the problems mentioned above. From memoing on problems described within the literature review, the author developed the concept of “Vicinage” or “relational neighborhood” it terms of how we may conceptualize the contiguity between notions of levels of “expertness” or “connoisseurship”. This allows thinking towards “expertness” etc. not to be considered absolute, but flexible or relative. Thus returning to the Jamesian model of “topic” and “fringe” we can conceptualize “Vicinage” in relation to expertise as loci nearing the centre of a given domain with respect to increasing skill, knowledge and expertise for any such given discipline, belonging to the individuals that “make-up” that subject, either through their skill, knowledge or invention etc. The concept of “Vicinage” therefore allows us to place “experts” as instances, not only in relation to the “topic” and “fringe” of a subject but instances that in themselves help create such a centre and domain. Expertness then may be in the form such as described as “knowing how” (Dreyfus and Dreyfus, 1986, p. 17) in terms of the practitioner – the experienced expert type designer. Our view or perception of a subject is also created by description and explanation – or “knowing that” (p. 17) of the connoisseur. A connoisseur may also have an expert ability to identify, interpret, appreciate and articulate a subject, yet not have the experiential knowledge required to complete an undertaking successfully e.g. Designing type. The concept of “Vicinage” therefore allows us to “position” the expert and connoisseur in terms of “neighborliness” and vicinity to each other and also towards the centre or fringe of our discrete subject conceptualization, helping build our view of that subject domain. This allows us still to consider the “insider” and “outsider” – the etic and emic but acknowledges that each perspective can have its relative worth or value in helping conceptualize our view of the subject domain.

Conclusion

In relations to Cross’ argument (Cross, 2003, p. 85) that we must study expert designers to understand expertise in design, identification or definitive definitions of “expert” still remain somewhat problematic. This is perhaps particularly problematic for PhD students, where scrutiny is applied heavily at times by supervisors and examiners on such details or particulars. Details in themselves perhaps that require a certain level of tacit “connoisseurship” in order to able to identify such “expertness”. The author’s concept of “Vicinage” perhaps allows some flexibility to the otherwise rigid notion of the label “expert” as being absolute. Expertness may also be found in an expert ability to describe and appreciate. “Vicinage” may also allow us to consider rather than conceptualizing an “inside-

out" only view, a relational view of our concept of what constitutes a discrete subject domain may be useful for researchers and students to consider.

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Rendering the Tacit Observable in the Learning Process of a Changing Body

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Abstract

To address the visual bias in architectural design, we explore ways to include vision impaired persons in architects' design process. In this context we studied the development of non-visual experiential knowledge in the process of becoming blind to explore its potential in designing multisensory space. A postphenomenological framework provides us a way of understanding the continuum of different relations between body and world. How we gain knowledge of our world depends on the situation and ranges from more tacit background and embodiment relations to more explicit alterity and hermeneutic relations. By analyzing John Hull's written accounts of becoming blind, we learn how his awareness of a multisensory environment grew. Because of his changing body, he gradually built up *connoisseurship* in engaging with his environments. Due to the gradual nature of the process, his first experiences were still explicit to himself, and his written accounts thereof can make explicit his gradually acquired *connoisseurship* to us. Closer to architects' design process are the processes of becoming blind that practicing architects Carlos Mourão Pereira and Christopher Downey underwent. Our interviews with them, analysis of their design tools and observations of Pereira's engagement with buildings, suggest that they underwent a similar process as Hull in which their *connoisseurship* became explicit to them. Moreover, they recognized the potential of their newly acquired skills and knowledge for design practice. In making the move to design, their knowledge becomes explicit not only as verbal account, but also in the shapes and materiality of their designs. Their design expertise, acquired before losing their sight, becomes explicit too. As their body changes, their expertise in using visual design artefacts becomes obstructed. Observations of the learning processes of changing bodies (and thus also changing body-world relations) can thus make explicit both newly acquired *connoisseurship* as well as previously acquired expertise, the latter in its failing.

Keywords

Architecture; connoisseurship; learning process; visual impairment

Vision has a privileged position in architecture. The built environment is often designed with a visual appreciation or function in mind, to such an extent that some attribute a visual bias to architecture and architects' design processes (Frampton, 1983; Pallasmaa, 2005). A possible explanation for this visual bias can be found in the widespread use of visualisation techniques and the underrepresentation of the human body in architects' design process. However, we interact with the built environment using our entire body and all of its senses. Critique of this visual bias and architects' lack of attention to the multisensory qualities of the built environment comes from architects and theoreticians (see *e.g.* Pallasmaa, 2005; Dischinger, 2006; Franck & Lepori, 2007). It also comes from people living with a visual impairment, who daily deal with an environment that is often inadequately designed. On the

other hand, through their bodily interactions with their environment, they have built up nuanced knowledge of its non-visual qualities (Herssens & Heylighen, 2011). In line with a cultural model of disability (Devlieger *et al*., 2003), vision impaired people's knowledge may also challenge normative design practices and help to overcome the visual bias in architecture.

For this reason, we explore whether and how persons living with a visual impairment can be included in architects' design process. In this context we have studied how non-visual experiential knowledge is developed in the process of becoming blind in order to explore its potential in designing multisensory space. In this paper we set out to demonstrate how three persons, in losing their sight and learning to rely on non-visual perception to engage with their environment, develop a kind of differentiation or *connoisseurship*, a notion of expertise advanced by ecological psychologists (Gibson & Gibson, 1955; Gibson, 2000). In their view, expertise develops through perceptual learning, *i.e*., through discovering distinctive features and invariant properties of things and events. James and Eleanor Gibson (1955) explain: "In this theory perception gets richer in differential responses and not in images. Instead of becoming more imaginary it becomes more discriminating. Perceptual learning, then, consists of responding to variables of physical stimulation not previously responded to. The notable point about this theory is that learning is always supposed to be a matter of improvement—of getting in closer touch with the environment." As a result of this perceptual learning, experts are able to differentiate, in their body or surrounding world, variables that are meaningless to novices. A sommelier, for instance, is able to discern various types of bitterness in wine, which remain unnoticed to an amateur wine drinker. Yet, these types of bitterness do contribute to the taste of the wine, and thus to the pleasure it offers the amateur wine drinker. Besides by professional activities, however, the development of *connoisseurship* may be triggered by other embodied factors, such as cultural elements or—the focus of this paper—sight loss.

For this demonstration, we adopt a postphenomenological framework, which provides a way of understanding the continuum of different relations between body and world as mutually co-constituting each other, and the mediating role of technologies therein (Ihde, 1993, 2009; Verbeek, 2005). How we gain knowledge of our world depends on the situation and ranges from background and embodiment relations to alterity and hermeneutic relations. The former are more tacit, the latter more explicit. For instance, a blind person's cane as a technological artefact informs the person about the tactual and acoustic qualities of her surroundings in such a way that rather than the cane she perceives the environment. The cane as technology is embodied by the person who is involved in an embodiment relation with her body, cane and world. When the person is about to leave the house and searches for the cane, the cane is perceived in an alterity relation, as an object with its own qualities. When after a walk the person sits on a bench to rest and take up the acoustic landscape, she holds the cane loosely in her hand. The cane is still there, keeping contact with the person and the ground, but in terms of perceiving the surroundings, it disappears to the background of attention. Finally, when learning for the first time to distinguish between different textures through the cane, the person has to learn to interpret differences in cane movements as differences in shapes of material surfaces. Here the relation occurring with the environment, through the cane, is called a hermeneutic relation.

The different perceptual body-world relations defined in postphenomenology can occur within the same situation and involve the same technological artefact. They also form part of a continuum. When something in a situation changes—*c.q.* the person's body—the relations can shift as well. Starting from this hypothesis, the remainder of this paper reports on three case studies of persons who lose their sight and learn to rely on non-visual perception to engage with their environment and—in two cases—to give shape to that environment through design. The case studies rely on a variety of empirical material, collected through face-to-face interviews—both with the persons themselves and with their collaborators,

analysis of accounts written and design tools used by them, and participatory observation in combination with video-ethnography of a building visit by one of them.

John Hull: Learning from Sight Loss

John Hull, in his book *Touching the rock* (1990) with additions in *On sight and insight* (1997), gives an autobiographical account of the process of becoming blind and how this alters his perception of the (built) environment. Although he does not explicitly label it as such, the way he analyses the transition of losing his sight to becoming blind closely resembles a phenomenological analysis. His highly detailed descriptions of his changing experience take into consideration both his body and his environment. By analysing Hull's written accounts of his becoming blind, we can learn how his awareness of a multisensory environment grew over time. Because of his changing body, he has gradually built up *connoisseurship* in engaging with acoustic, tactual[1] and olfactory environments. Indeed, by losing his sight he has learned to differentiate and perceive variables in his body and/or the surrounding world that were meaningless to him before (Gibson, 2000). At the same time, however, because of the gradual nature of the learning process, his first experiences were still explicit to himself. It is then his written accounts of becoming blind that can make explicit his gradually acquired *connoisseurship*.

Hull (1990) describes how the loss of one of his sensory modalities step-by-step changes his world. At age 18, he lost his sight in one eye; 30 years later, after a gradual process of seeing less and less, he lost sight in the other eye as well. But even at the time he could not distinguish any light any more, he still did not consider himself as "being blind", but rather as "a sighted person who cannot see" (ref.). In the first few years, visual memories (of places he visited, or faces of people he met) formed a large part of his experience in revisiting places or meeting people he knew before. But over time these memories faded and others started to emerge. "[The memories of the blind adult] focus upon what his body experienced, or underwent. This is quite different from visual memory, because your body does not feel what your eye sees" (*ibid.* p. 138). His body has changed, but it still has to learn to interact with its environment, which in the process changes as well. Moreover, for Tim Ingold, the "[powers of perception] are rather cultivated, like any skill, through practice and training in an environment. For this reason they can vary from one individual to another, even within a single society" (Ingold, 2000, p. 283). This learning process takes time, the time that Hull needed to "become" blind.

The alterations in Hull's body, and thus also in the way he perceives his environment, include not only the gradual loss of his sight, but also the gradual embodiment of his cane. "It is natural for people to regard the white cane as a sort of walking stick. It is looked upon as something which gives support. It is not immediately thought of as an instrument of sense perception, as a way of gathering information about the world" (Hull 1990, p. 38). The cane is also a way to extend his tactual world a little, which is otherwise limited to his body.

The learning process of becoming blind was a reaction to his altered body, but his world seems to have changed as well. Part of it, the visual part, has simply disappeared. It is not as if it went dark; it just is not there anymore. When a sighted person shuts his or her eyes, the objects that make up his or her (visual) world are still there for that person. For Hull, these objects have disappeared and others have taken their place, or the objects have changed themselves. For instance, concerning the climate of his environment, he writes:

[1] In line with Loomis & Lederman (1986), we will use the term "tactual" to describe "what has to do with the sense of touch". This is comprises tactile, kinaesthetic and haptic perception, with the latter being a combination of the two previous ones.

"the wind has taken the place of the sun, and a nice day is a day when there is a mild breeze. This brings into life all the sounds in [the] environment" (Hull, 1990, p. 16). Aural and tactual qualities make up his world now. But again, it took some time to learn to perceive this new world in all its richness. In the beginning, the great variety in visual sensations in different places—in particular office spaces—did apparently not translate into the same variety when it comes to aural and tactual qualities. Later he found out that certain places do make a stronger impression as he mentions when richly describing a park visit in terms of the sounds of people, the wind he felt, the feeling and trajectory of the path he took, the dimensions of the place, the handrails he touched, etc. The more he learns about his new world, the more he can distinguish between different places and even judge the pleasantness of being there, as he sums up in one of the later sections entitled "Touch is beautiful" (Hull, 1990, p. 175).

One of the aspects of Hull's world that have changed is its size. Much of his world is made up of what is within reach of his body, whether or not this includes his cane. The haptic sense still allows him to "look" for things, helped by his memory of their position in previous encounters. But with sound, it is still different. Within a soundscape, he can still shift his attention to certain sound patterns within the whole. However, when the objects themselves stop making sound—because the wind drops or he stops walking and making sound with his cane and shoes—they disappear from his world. "Every point was a point of activity. Where nothing was happening, there was silence. That little part of the world then died, disappeared" (Hull, 1990, p. 82). Therefore, according to Hull, the way to disclose the auditory part of his world that most resembles the visual world, is through the rain. The sound that the raindrops make creates a soundscape in which every object has its distinct contour and position, all at the same time and constantly presented to him.

To summarise, Hull has put the process of becoming blind over time into a very striking metaphor of a cake. "One should not think of the life of a blind person as a cake which has had a slice cut out of it. Rather, it is like a smaller cake. It is experience as being intact, although the scope of activity has in many ways become smaller" (Hull 1997, p. xii). Although in the beginning, not being able to see was experienced as a loss, it later became irrelevant in how his body and world relates, or more specifically how he perceives his environment.

Eleanor Gibson (2000) understands the process of perceptual learning as "process of differentiation, the specification of significant information. It is[...] a result of selection from an array of information about the events, objects, and layout of the surrounding environment in relation to the readiness and state of the perceiver's own body structure and capabilities." (*ibid.* p. 296) Don Ihde (1993, 2009) adds to this relation between body and world the mediating role of technology, *e.g.* the cane as part and extension of the tactual sense. But important here is the focus on differentiation and the body-environment relation. Because of a change in Hull's body, his (mediated) body-world relation changed through a process of differentiating ever more other sensory qualities than the mainly visual ones. Because the substantial change in his body and through reflection, this process of differentiation became explicit to him, to the extent that he was able to give a written account of his altered perception. On the other hand, the kind of differentiations he relied on as a sighted person gradually disappeared from his conscious memories.

Designing from and for Blindness

One step closer to architects' design process are the processes of becoming blind that Carlos Mourão Pereira and Christopher Downey underwent. Both were practicing architects

when they lost their sight. In our interviews with both architects, our analysis of their design tools and our participatory observations of Pereira's engagement with an Art Nouveau building, we found that they are undergoing a similar process as Hull in which their own *connoisseurship* is becoming explicit to them. Moreover, they also recognized the potential of their newly acquired skills and knowledge for the architecture they design and their design process.

Building a Nuanced Understanding of Multisensory Qualities: Carlos Mourão Pereira

The process of becoming blind is for Carlos Mourão Pereira an inspiring learning process about, amongst others, the multisensory qualities of architecture and space. Trained as an architect, he acknowledges a visually oriented interest in architecture—his interest in the Modernist architecture of *e.g.* Mies van der Rohe which he himself now describes as highly visual. Though he states that he has always had an interest in the broader human sensorium as well, he now admits that his knowledge of it was fairly limited. When his vision became impaired, Pereira discovered the potential opportunity to expand his non-visual knowledge about the built environment. Similar to what Hull (1997) describes as becoming blind rather than being blind, Pereira discovers a greater distinction in non-visual spatial qualities. "Nowadays, and due to the fact that I cannot use my vision, I am more awake to the listening, olfactive [sic] and the tactile components of architecture. […] I am in a state of great receptivity to new influences, with particular emphasis to the ones of bigger sensory complexity." (Pereira, 2009a) For instance, he never could explain the why of his observation that people prefer 19th century houses to live in above modernist and contemporary houses. Now, through his bodily awareness of the complexity of auditory space, he has discovered differences in acoustic quality between houses from the respective architectural styles and thus attributes this preference to the acoustic qualities of a living space.

Eventually, this embodied knowledge helps him create richer architecture as he incorporates shapes and materials for their multisensory potential. In his design of a sea bathing facility at the Portuguese coast, for instance, the rounded shapes of the basin are chosen for their haptic qualities and seaweeds growing in the smaller basins are used for their olfactory and tactile qualities (see Fig. 1). At least for now, vision is still an important aspect of architecture for Pereira. When talking about the use of Lego blocks to communicate his design ideas with others, for instance, he hastens to point out that all blocks need to have the same colour (Peirera, 2009b). Also very telling is that in his design of an inclusive party installation—a bathroom that is accessible and comfortable for all users, including wheelchair users and people with low vision—a major concern for him was to avoid the typical medical "look" (*ibid*.). For this visual aspect, Pereira relies on his memories and collaborators. Yet Hull's description of fading memories of past visual experiences suggests that Pereira's work might change on this account. As we write, the sight loss is still recent and the process of becoming blind only just started. As much as he relies on his memory for visual spatial knowledge, he extensively uses his own body to gain spatial knowledge concerning other senses. Therefore, he prefers visiting a building or site in order to get to know it. In the context of his research on safety for blind persons, for instance, he deliberately chose to study cases he was able to visit "The selection was to have more contact with the case studies. They are in Portugal ... there are also specific islands for me interesting but I prefer ... to go to the place." (interview Pereira 2009) When describing a building or site he has visited, he mentions auditory qualities of sound and reverberation, olfactory qualities of smell and tactile qualities of shape, texture, temperature and pressure.

Fig. 1 Sea Bathing Facility, Lourinhã by Carlos Mourão Pereira

The reliance on his own experiences, bodily and mediated, is apparent in how he explores the building site, and similarly, projects designed by other architects. He engages an environment, a building or building element consciously with the whole of his body. During a visit to the Horta House in Brussels[2], he mostly used his hands to explore the complex shapes of the rich Art Nouveau detailing. Pereira even uses a repertoire of different gestures—going from pinching over grasping to subtle strokes with the back of his hands—to gain as rich an experience as possible (see Fig. 2). According to Gibson (2000) perceptual learning occurs through exploratory activity, of which Pereira's different hand movements are an example. "Exploratory activity is more than a mere motor process accompanied by registration of input from the existing layout. It is itself an event, a perception-action sequence that has consequences. It brings about new information of two kinds: information about changes in the world that the action produces and information about what the active perceiver is doing." (*ibid.* p. 296) This co-constituting body-world relation makes that some parts of the building or certain places invited him to touch with more than the hands: a waiting place near a heating element in the entrance hall invited to be experienced while sitting down; also sofas and chairs invoked feelings of attention, relaxation and listening by suggesting different body postures; his feet informed him of the many subtle differences in flooring material and transitions between spaces; when entering a winter garden, his first reaction was to comment on the change in smell; and engaging with different materials through touch made him also experience the acoustic qualities of materials as the interaction produces different sounds. Even visual qualities remain important for Pereira's experience. For many building elements he asked about their colour in great detail.

[2] The Horta House is the former home/atelier of Art Nouveau architect Victor Horta. Today, it is a museum exhibiting the architecture and furniture of the house and some design models made by Horta. For this visit, we obtained the privilege of touching the delicate details of the Art Nouveau building, which is normally prohibited by the museum conservator.

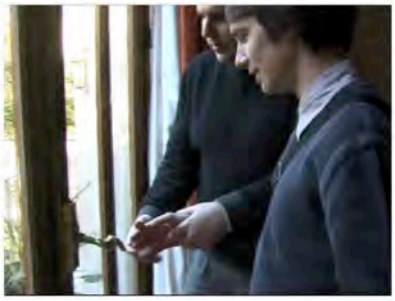
JH: "Do you like that door handle?

CP: "Yes, they have a human scale."

CP: "You have the very delicate size."

CP: "Well, what I see is incredible, because I know sometimes it's difficult with the design, to give very careful, the way of treating the steel or the metal. But they are incredible rounded finishes. But there are little contrasts, I'm very critical. What I see here is, for example the wood handrail has very different touch qualities than the steel, because the steel has a little arch, it's not completely rounded."

CP: "Do you want to touch?"
PW: "Yes."



CP: "Give me your hand."

CP: "So, here I think is very comfortable."

CP: "But here"
PW: "it's more sharp"

CP: "you find sharpness."

Fig. 2 Pereira engaging with a door handle and explaining his experiences through touch

Overcoming a visual bias: Christopher Downey

When Christopher Downey lost his sight he continued his design practice by working for Smith Group on the design of the Polytrauma and Blind Rehab Centre in Palo Alto. He helps the design team to understand the experiences of losing sight and learning to engage with the environment non-visually. He also consults the design team on communicating the design proposals to some of the blind staff working at the centre. To be able to understand the design and make propositions of his own he developed some tactual ways of

representing the design, something that proved helpful in communicating the design to other blind persons as well.

Even more than for Pereira, for Chris Downey the process of becoming blind related first and foremost to acknowledging and overcoming a visual bias in his earlier work. Similar to Pereira's concerns with creating an inclusive built environment, for Downey a multisensory design approach to architecture benefits everyone. "[I] start to build these multisensory design strategies for the building that you can, everybody can benefit from. You can give some extra richness to the building, but it's also just an exciting different way of thinking about architecture, [...], and it gives more richness to everyone. And it gives a different sensory structure to work with if you're blind." (interview Downey, 2011) Sensory richness is becoming a way for Downey to create interesting and supporting spaces for many activities. Creating acoustic or tactile landmarks helps in way-finding, but differentiation can also support resting places and places for informal encounters separated from a circulation space. Furthermore, sensory richness means paying attention to different senses. Touch and sound have received the most of Downey's attention in perceiving his environment.[3] Yet vision remains important in his work as well. For him, sensory richness means not only expanding his attention to different senses, but also striving for differentiation in acoustic, tactual or visual qualities *an sich*. His more nuanced understanding of acoustic qualities has taught him that many spaces are acoustically too uniform to navigate easily. And he extrapolates this insight to other sensory modalities, including vision. He then wants to bring his acquired skills in differentiating multisensory qualities to the spaces he designs, making them explicit to the blind students of the Polytrauma and Blind Rehab Centre (see Fig. 3). For instance, he designed the ceiling of the lobby space to create a similar acoustic space as he experienced under a metal vaulted roof which gave him a distinct sense of direction as the sound of his cane travelled across the length of the roof. Here, his acquired *connoisseurship* is made explicit through his design rather than in verbal descriptions.

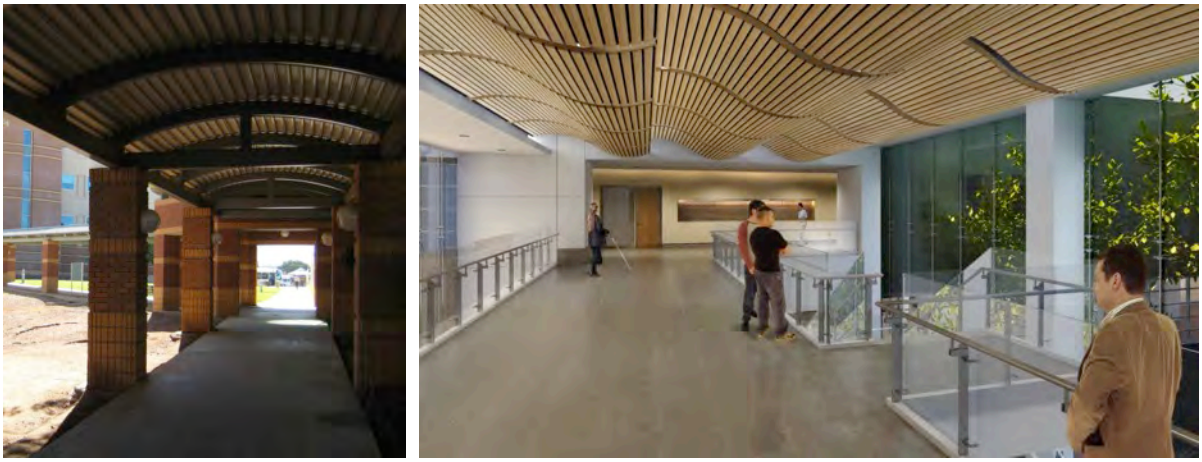


Fig. 3 Translation of auditory experience (left) to the lobby space in the Polytrauma and Blind Rehab Centre (right)

Downey's bodily experience has taught him more about engaging with the environment as a blind person. By working on the design of the Polytrauma and Blind Rehab Centre, he discovered a lacuna in the building codes when it comes to designing an environment that supports people with a visual impairment. And even if they are taken into account by codes, these mostly address dimensioning of circulation spaces and positioning of building elements to avoid collision. As he says: "Here in the United States we have the American Disabilities Act ... that was largely guided by, mostly physical disabilities. ... What I found is that there hasn't really been a way, a mechanism anticipated by the code available out there

[3] Downey underwent surgery that also influenced his sense of smell.

to really provide good way-finding ... if you're blind and enter a complex building." (interview Downey, 2009) But there also, Downey finds that a more nuanced understanding of multisensory space may contribute to buildings that are safer for and support people with a visual impairment. An important aspect of accessibility for him is way-finding and the use of signage. Although regulations concerning the integration of Braille in signs do exist, the codes do not describe adequately how to find the sign in the first place. Therefore, Downey advocates a larger multisensory specificity and intelligibility. In his experience, many environments are too monotonous when it comes to non-visual cues. The critiques he formulates start from his own bodily experiences and do not contradict the building codes, but certainly do add to them. Limiting protruding objects is a good thing, but for Downey this addresses only one aspect of the way a person relying on a cane uses space: tapping at the level of the floor and assuming a protrusion along a vertical axis of the shapes they perceive there. Adding Braille to signs can be helpful, but only when you can find the signs; these are now often placed in places that are easy to find visually, but not necessarily through touch, or through touch as it is used in traversing the built environment. Instead, Downey proposes a more multisensory diverse space with distinct tactile and acoustic landmarks using for instance different flooring and ceiling materials. As a person new to sight loss, those are qualities of the built environment that he is more attentive to. As an architect he then tries to find out what combinations of materials in what configuration enhance those qualities. As such, this attentiveness gets integrated in his approach to designing architecture. Accessibility for blind people and a multisensory architecture go hand in hand, both informed by Downey's bodily experience.

"Learning to be affected" in becoming blind

When Hull, Pereira or Downey lost their sight, they had to develop new ways of engaging with the environment, other than the very visual way they were used to (as architects). They became aware of other sensory capabilities of their bodies and Pereira and Downey developed them consciously as exciting new tools to learn about the built environment. Using Bruno Latour's (2004) terms, both are anew "learning to be affected" by their environment, which means in its broadest sense: being "effectuated, moved, put into motion by other entities, human or non-human." (*ibid.* p. 205) Both recognized that through their altered body, they started perceiving the world in a different way. By opening themselves to their new perceptions, they developed a richer and more nuanced understanding of non-visual qualities of materials, shapes and spaces. Latour has termed such learning of different layers of difference "articulation". Articulation is not only the ability to speak about differences in a sense of conscious and literary sophistication. More so, it has to do with differences eliciting different behaviour. "An inarticulate subject is someone who whatever the other [human or non-human] says or acts always feels, acts and says the same thing. [...] In contrast, an articulate subject is someone who learns to be affected by others—not by itself. [...] A subject only becomes interesting, deep, profound, worthwhile when it resonates with others, is effected, moved, put into motion by new entities whose differences are registered in new and unexpected ways." (*ibid.* p. 210) Both Downey and Pereira recognize that becoming blind can be one of such 'new and unexpected ways' to learn to be affected by the built environment. Furthermore, as being articulate manifests itself in a person's behaviour and reactions to others (*in casu* a building, a building element, a specific detail), for Downey and Pereira it becomes apparent in their bodily interactions with the built environment, even more so than in their verbal accounts of this interaction. For instance, as we observed during the visit to the Horta House (see Fig. 2), Pereira is more articulate in the different ways of touching a door handle than he is in describing verbally why this specific handle is so comfortable to touch. Also in the way he makes this knowledge explicit, he relies on talk in

concordance with the hands, both of himself and of the other, to explain the different hand positions involved and what qualities to perceive.

Conclusion

Observations of the learning processes of changing bodies (and thus also changing body-world relations) can make explicit both newly acquired *connoisseurship* as well as previously acquired expertise, the latter in its failing. When Hull, Pereira or Downey explain the process of becoming blind as a learning process, they are describing how they build a new sensory *connoisseurship*, how they learn to distinguish different qualities in their environment. On the other hand, because of the changes in their body, Pereira and Downey also describe an apparent visual bias in architecture and in the design tools used by architects. In trying to overcome this bias, they also recognize how parts of their previously acquired expertise fails in the act. As their body changed, they became aware of certain embodiment relations they developed in perceiving their environment or in their design practices since these relations became impaired. Gradually they developed new perceptual relations, going through more hermeneutical relations before they got embodied. Since these relations involve more explicit interpretation, they are more easily explained verbally, or through other bodily actions. The hermeneutic relations taking part in the learning process allow to pass on the knowledge and practice involved before it becomes embodied and thus more difficult to pinpoint.

As they make the move to design, their knowledge becomes explicit in a second way: not only as verbal account or bodily activities, but also in the shapes and materiality of their designs. They investigate the space and material configurations of their daily environment in relation to their bodily experiences as designers and translate those in their designs. Their intentions are to instruct people on the sensory richness that can be perceived in their environment. They thus try to make explicit their newly acquired *connoisseurship* through the spaces and building elements they design.

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Crafting Expertise

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Abstract

Throwing as a ceramic process of making is established worldwide in a variety of forms, but essentially the process has changed relatively little through the years; the method of learning the skills (Schön, 1991), from master to student, from expert to novice, is as old as the craft itself.

Expertise is defined as “expert skill or knowledge in a particular field” (Oxford English Dictionary Online, 2012), “a high level of skill or knowledge” (Cambridge Dictionaries Online, 2011), or “a special skill or knowledge” (Chambers, 2011). This raises issues of how an expert/high or special skill determined? Is it in the number of hours spent learning and honing skills? Or is it when individuals feel they can pass on their knowledge?

A comparison of The “Expert” status of the participant potters using the three different viewpoints. Collins (2007) outlines the knowledge levels of expertise across communities of experts in “Rethinking Expertise” which demonstrated in “The periodic table of expertises”. Cross (2004) uses a design lens to define expert designers; Dreyfus (1986) approaches expertise by skill set, which goes part way to expressing pot throwing expertise. The comparison of these three viewpoints can be used to further define the terms “Expert” and “expertise” within the field of craft. This understanding will aid the practitioner and student in the refinement or acquisition of the skills needed for the throwing performance. A national, purposive sample of throwing potters, with both experience and expertise has been used in this pilot study. The non-variable design intent for the study is three 1kg cylinder pots. Digital recording combined with interview and self-reflection by each potter helped establish their knowledge level and physical expertise. Further analysis of the recorded data provides an opportunity to understand the relationship between gender, scale and choice of technique at performance critical moments in time.

Keywords: Expertise; design; knowledge; craft

Crafting Expertise

Introduction

The documented study is part of a larger study which aims to enhance the quality of teaching of pot throwing skills across all levels of academia. The objectives of the documented study are to provide a consensus of what was good practice in the craft skill pot throwing from a review of literature; and, describe an initial evaluation of pot throwing using the defined consensus of “experts” in the field. This paper sets contextual boundaries, followed by an overview of the issues when defining expertise within crafts. The work of Dreyfus, Cross and Collins are used as a guide. The application of the three definitions, of “expert” and expertise to pot throwing are discussed. The optimum balance of metrics from

the three authorities will be suggested for use when choosing “expert” potters and recommendations for a wider application to craft skills in general. The outcomes of applying the metrics to a pilot study are documented. The paper provides some insights and indicators towards an explanation of what is craft skill.

Context

Throwing is only one form of making. It is a speedy method of creating pots using a potters’ wheel. Whether the pot is thrown on a wheel powered by electricity, by foot or by stick rotating the wheel, the potter has to respond to the material and forces being utilised to form the pot. These specialist skills have developed over the years being passed on from person to person, from master to student, expert to novice.

So as to achieve acceptable outcomes, the master or expert need to have honed their skills to an elevated level of awareness so as to be able to explain their skills to another. During the middle ages, trade practices were monitored by Guilds, where craftsman had to reach a certain standard of proficiency before admission to the Guild. Skills and trade relevant information were guarded within the confines of the Guilds. As far back as 1706, people have been trying to discover the expert knowledge of craft trades, Diderot and d’Alembert (Goodman, Popiel & Takats, 2002) tried to gain access to the less explicit knowledge of a range of crafts including potters’ for their publication *L’encyclopaedie*.

When learning; the apprentice does not need to rely on verbal explanations alone; but can combine observations (Zeki, 1998), (Onians, 2009, p. 2) with participation, enabling replication through practice (Ericsson & Charness, 1994); (Pountney, Mulcahy, Clarke, & Green, 2000, p. 137), in order to gain the skills for throwing. Therefore, apprentices who intend to learn the skills of throwing pots, need to learn from those “masters” exhibiting good practice. Good practice must be considered within the societal context and a given moment in time. Motivations for throwing a pot differ. Historically, what was good practice then might not be necessarily in contemporary times. Similarly, the motivation is different between the production thrower, throwing multiples of the same item to a regular size and shape, and the studio potter throwing for “art” using the material with expression.

The following literature review provides context and a refined definition of a craft skill. The defined qualitative measures, derived from the theories of authorities in field of “expertise”, enable metrics to be defined. A case study is used to validate these metrics for use in a larger study of pot throwing and craft skill.

Definitions of Expertise

The discussion around expertise has been explored since 1960’s. There has been much documented about expertise and music, chess and athletes (Ericsson & Charness, 1994). Initial studies in Expertise began around 50 years ago within the area of management. Figure 1 shows the development of the area of expertise as described by Germain and Ruiz (2009) expanding from Management expertise. The following figure illustrates that an understanding of what is expertise is constantly expanding.

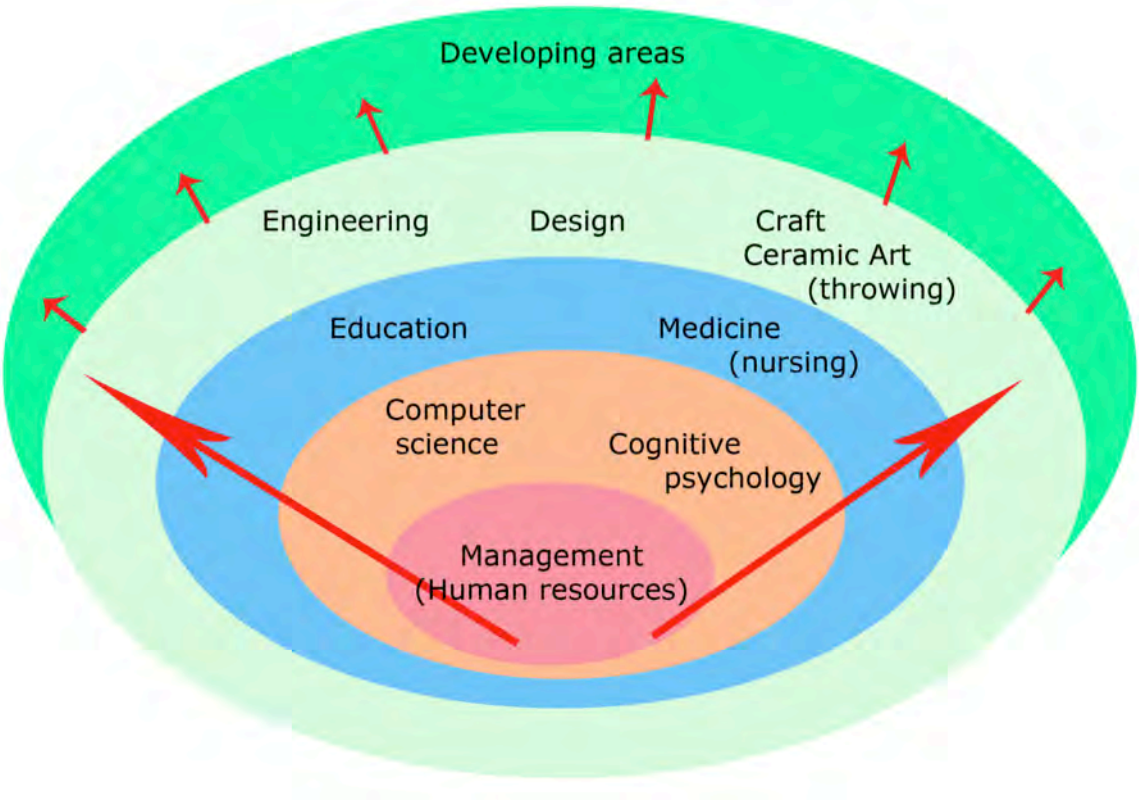

Fig 1. The development of the theme of expertise. Illustrated from Germain and Ruiz (Germain, 2009)

Reflecting on previous studies Brandsford (1999, p. 31) lays out what knowledge and behaviours experts can manifest. From an Education perspective Felton (2007) concludes that definitions of expertise are domain specific, due to the differing values of the criteria of expertise in differing domains. Some domains favour track-record expertise; and others on skill set and knowledge (H. L. Dreyfus, 1988). From a design perspective Cross (1998) discusses differences between novice and expert design behaviour. He concludes that truly expert designers have been omitted from studies, thereby giving an inaccurate picture of expertise within design. (Cross & Clayburn-Cross, 1998, p. 141) Dorst and Reymen (2004) expanded their review into levels of design expertise through Cross' eight basic abilities and Dreyfus' five degrees of expertise. They concluded by suggesting there was a need for more research. However, neither author seems to have explored this area further.

Cross makes a statement that "expertise develops over time as a person matures" and that performance will peak at different ages. In the arts, the suggestion is a person would be in their forties before a decline in performance (Cross, 2004). This view is reflected in the Crafts Council report "Crafts in an Age of Change" (Yair, Burns, Gibbon, & Rosemberg, 2012), where their data suggests that 25.8% of their respondents were between the ages of 45 and 54 slightly dipping to 25.3% between the ages of 54 and 64. The previous age group of 35 to 44 held 21.4%. Either side of these age groupings, the number of respondents fell significantly (Yair et al., 2012). However, the metrics used to support these statements are less well described or defined.

From an extensive literature review of academic journals and text books, the domain of Art and crafts appears to be in the early stages of research in this area. The reviewed literature suggests little exploration in the area of expertise. What has been done is embedded within education focused studies (Rust, 2009). Craft expertise as a factor of Aggrandizer strategies is discussed in an archaeological paper considering the case of flint knapping production in

late Neolithic times (Olausson, 2008). Therefore, it appears the craft area is lacking, as yet, in specific research about expertise within the area.

Collins on Expertise

The first selected consideration of expertise, without explicit links with craft, is from the sociologist Harry Collins. Collins has been working since 1990's developing knowledge and expertise from a sociology viewpoint; reviewing how experts gain expertise from a community aspect. Collins and Evans have developed a definition of expertise and expert knowledge from a linguistic and societal perspective, relating verbal and knowledge expertise. Intertwined into these definitions are elements of practical expertise at the more complex levels of expertise.

Collins and Evans have compiled a "periodic table" of their understanding of expertise entitled "Ubiquitous Expertise". The "periodic table" lays out in four strands, categories of expertise and expert knowledge, ranging from the personal; "dispositions", then "specialist expertise" and "meta-expertise" through to "meta-criteria". The following figure (Figure 2) is adapted from Collins and Evans

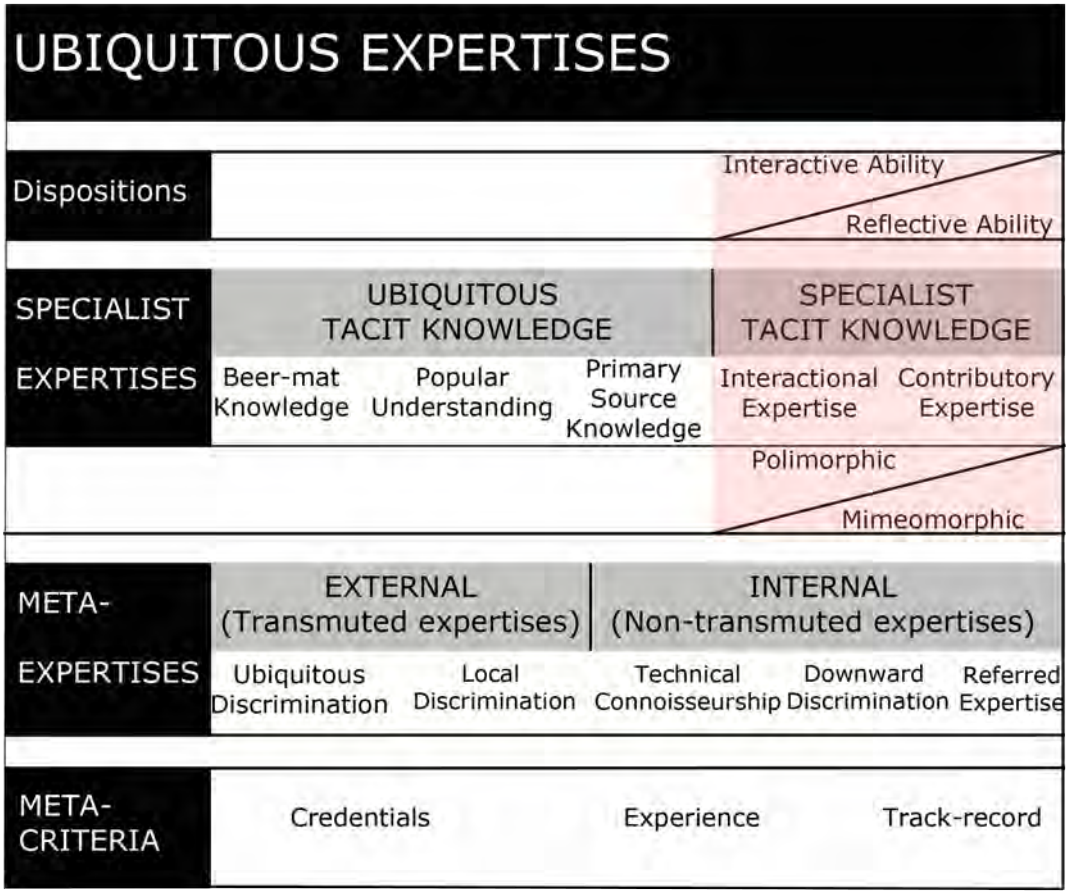

Fig 2. The periodic table of Ubiquitous expertises with highlighted area of interest. adapted from Collins (2007)

The strands which are pertinent to this paper are: "Dispositions" and the second strand laying out "Specialist Expertises". The model is human-centred design (Collins & Evans, 2007, p. 17).

"Dispositions" (Collins & Evans, 2007, p. 13) refers to the individual with an ability to interact and reflect. The interaction could include material for the purposes of this particular project clay. The ability to reflect; is an inherent part when acquiring skills and therefore with application, interaction and reflection can become an expertise. The second strand applying to the project is entitled "Specialist Expertise's". This strand covers "Ubiquitous Tacit Knowledge" explicit knowledge areas of, "Beer-mat Knowledge" and "Popular Understanding". "Primary source Knowledge" is a deeper knowledge area. A novice might have experienced the activity and accessed literature, where an individual might acquire knowledge about the throwing performance. Where knowledge is categorised into "Specialist Tacit Knowledge", the expression "expertise" is used in terms of "Interactional Expertise" and "Contributory Expertise". These terms imply that there is an increasing knowledge involved combined with a relationship with the community, knowledge and material.

The terms "Polymorphic" and "Mimeomorphic" apply within the "Specialist Tacit Knowledge" area. The definition of both "Polimorphic" actions and "Mimeomorphic" actions are outlined in Table 1 (See Table 1).

Table 1. The definitions of "Polimorphic" and "Mimeomorphic" actions

Polimorphic	Mimeomorphic
• Actions need social understanding • Behaviour responds to social changes • Cannot be mastered by machines	• Actions are mechanical thus do not need to turn on social understanding of their movements. • Can be reproduced by mimicking fixed behaviours • Humans cannot use some "Mimeomorphic" actions

Despite seeming opposites, these terms can be combined when considering such skills as bicycle riding. The physical riding of the bicycle is a "mimeomorphic" action, a repeated action. The social aspects and safety aspects of riding a bicycle are within the "polymorphic" actions, e.g. the application of a traffic code of conduct.

The remainder of information displayed in the "Table of Ubiquitous Expertises" outlines language expertise within societal groups.

Cross on Expertise

The second example that considers expertise is from the design commentator Nigel Cross. Cross points out that "Too many studies have been based on novices or, at best, average ability designers." (Cross & Clayburn-Cross, 1998) The focus on the baseline of novice and average designers may well have a limiting effect on the understanding of how expert, expert designer activity operates. Cross suggests a change in focus to the comparison of expert designers, which may highlight expert behaviour. Figure 3 outlines behaviours evident in both novice and expert designers referenced to journal papers.

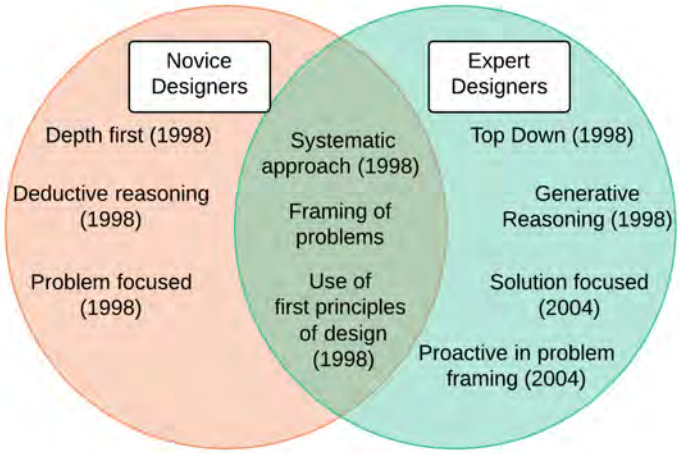

Fig 3. Cross: Attributes of expertise in novice and expert designers

Cross discusses the acquisition of expertise in broadly similar terms to Dreyfus in that design thinking suggests there are different stages in a designer‘s development (Cross, 2007). Cross explains that introduction/neophyte through education/novice and experience/expert to eminence/master, although sequential, is not time driven. Cross states some individuals may reach their potential at other than a level of master. He concludes that there is more to be explored in the acquisition of skills from novice to expert and master to enable the process to be better facilitated.

Dreyfus on Expertise

The structure of developing expertise has been applied across many fields requiring a structure for marking stages in progress towards expert status. This structure, developed in 1980, concerned mental activities and directed skill acquisition (S. E. Dreyfus & Dreyfus, 1980) affirming the need for concrete experiences. The featured examples are not confined to chess playing or learning to play a musical instrument, but learning to fly an aeroplane and foreign language acquisition. The range of application has led to adoption, possible adaptation and interpretation of the initial acquisition structure across many areas. The following table outlines the levels of acquisition from Dreyfus and Dreyfus (1988) (See Table 2).

Table 2. An adapted outline of the levels of acquisition form Dreyfus (1988)

Stage		Description
1	Novice	The instructor decomposes the task environment into context free features that the beginner can recognise without the desired skill. The beginner is then given rules for determining actions on the basis of these features.
2	Advanced Beginner	The novice gains experience in coping with situations. After seeing a sufficient number of examples, the novice recognises these new aspects.
3	Competence	A student may seem overloaded and seem not to be progressing with the skills, with targeted application understanding and decisions become easier
4	Proficiency	The information consuming disposition of the novice is replaced by involvement resulting in situational discriminations and associated responses.

5	Expertise	The expert not only sees what needs to be achieved; but thanks to a vast repertoire of situational discriminations they see immediately how to achieve the goal.

The Combination

The next stage; having considered Collins, Cross and Dreyfus separately, is to combine their findings into one taxonomy; demonstrating attributes of expertise found in a novice from the left of the table, gradually gaining skills across the table to those expert attributes listed on the right. It is interesting to note that both Cross and Collins refer to the findings of Dreyfus and Dreyfus (1980) as an integral part of their work on expertise. The following table (Table 3) outlines the work of Collins, Cross and Dreyfus and where they might align themselves in the field of experts and expertise. Included within this table is a consideration of the types of knowledge which the novice through to the expert might be using within level of expertise.

The comparison between novice and expert appears to be oppositional indicating that there must be a deepening of understanding between the two levels of experience. See Table 3.

Table 3. The application of Collins, Cross and Dreyfus

	Novice	- >	Expert
Collins	Interactive Ability/ Reflective Ability		
	Beer mat knowledge Popular understanding	Primary source knowledge Interactional expertise	Contributory expertise
	Polimorphic/ Mimeomorphic		
Cross	Deductive Reasoning		Generative reasoning
	Problem focussed		Solution focussed
			"ill-behaved"
Dreyfus	-Able to participate in a task with clear instructions and monitoring	-Further instruction but has experience of process. -More experienced, following guidelines. -Experience is vast; actions have become automatic.	-Actions are intuitive, can experience intense concentration on the process rather than on the mechanics of the process.
Dreyfus knowledge types (1980)			
Recollection	Non-situational		Situational
Recognition	Decomposed		Holistic
Decision	Analytical		Intuitive
Awareness	Monitoring		Absorbed

When applying the combination of the disciplines of Sociology with Collins, Design with Cross and the skill set of Dreyfus, the following table, Table 4, applies this combination to the skilled performance of throwing pots.

Table 4. The application of Collins, Cross and Dreyfus to pot throwing.

	Knowledge and expertise	Novice	Knowledge and expertise	Expert
Collins	Beer mat knowledge Popular understanding	Knows that clay, a potter's wheel and water is needed. Perhaps has seen a pot being thrown	Contributory expertise	Is able to converse and demonstrate refining facets of the process to novice and experts
Cross	Deductive Reasoning	Throw a cylinder pot: throw one kind of cylinder pot	Generative reasoning	Throw a cylinder pot: throw a range of cylinder pots.
	Problem focussed	Need to throw a pot	Solution focussed	Differing ways of throwing a pot
			"ill-behaved"	Dealing with material problems
Dreyfus	-Able to participate in a task with clear instructions and monitoring	Able to centre and throw a simple pot	-Actions are intuitive, can experience intense concentration on the process rather than on the mechanics of the process.	Whilst throwing potter can be engaged in higher creative thoughts
Recollection	Non-situational	Knows what but when to do an action but not why	Situational	Knows the what, when and why of actions
Recognition	Decomposed	Knows process as isolated movements	Holistic	Approaches all points of throwing process equally
Decision	Analytical	Focusing key points of the throwing process	Intuitive	Knows instinctively what next.
Awareness	Monitoring	Watching others engaged in similar process	Absorbed	The tacit points of the throwing performance self-monitoring progress.

Taxonomy of skill

This taxonomy of skill, (Table 5), has been compiled from the attributes from each research area, highlighting the attributes. There are two levels of attributes included within the table, firstly the main strands of knowledge, explicitly stated, highlighted in yellow, and secondly the implied strands of expertise are highlighted in grey. The attributes of expertise are not

listed firstly in any rank order, but purely in alphabetical order of attribute, this creates a seemingly random pattern of expertise. See Table 5.

Table 5. Attributes of expertise from Collins, Dreyfus and Cross

	Collins	Dreyfus	Cross
Ability			
Ability to apply new information quickly			
Automaticity			
Communication skills			
Contributory expertise practical skills			
Contributory expertise language skills			
Decision making			
Deductive solution of problems			
Deep understanding of subject			
Excel in domains			
Experience			
First principles			
Flexibility in approach to new problems			
Framing the problem			
Generative reasoning			
Intuitive action			
Repertoire of strategies			
Rule breaker			
Solution focussed			
Superior performance			
Systematic design			
Tactical decisions			

When like attributes are grouped in areas categorised as ability, knowledge, skills, decisions and approach, as shown in Table 6, a pattern emerges where it is evident that Collins is linguistically based and Dreyfus and Cross are more practically based. The striking difference, evident within Table 6, is that neither Collins nor Dreyfus appears to consider approaches to problems within their sphere of expertise study. This difference appears in this comparison to belong to the area of design. See Table 6.

Table 6: The grouped attributes of expertise from Collins, Dreyfus and Cross

	Attributes of expertise	Collins	Dreyfus	Cross
Ability	Ability			
	Excel in domains			
Knowledge	Ability to apply new knowledge quickly			
	Deep understanding of subject			
Experience	Experience			
	Automaticity			
Skills	Communication			
	Linguistic contributory expertise			
	Practical contributory expertise			
Decision making	Decision making			
	Generative reasoning			
	Intuitive action			
	Repertoire of strategies			
	Tactical decisions			
	Systematic design			
	Rule breaker			
Approach to problems	First principles			
	Flexibility in approach to new problems			
	Framing the problem			
	Deep understanding of subject			
	Solution focussed			
	Deductive solution of problems			
	Superior performance			

A pattern of agreement emerges when the attributes of expertise are grouped according to mentions from Collins, Dreyfus and Cross. A hierarchy of attributes of expertise is then evident. The following table starts with attributes that are common within the three considerations of expertise, which might be thought of as important, then attributes within two strands of expertise and then one strand of expertise (See Table 7).

Table 7: Attributes of expertise ranked in frequency from Collins, Dreyfus and Cross

	Attributes of expertise	Collins	Dreyfus	Cross
Section 1	Ability			
	Ability to apply new information quickly			
	Decision making			
	Deep understanding of subject			
	Experience			
	Practical contributory expertise			
	Repertoire of strategies			
Section 2	Communication skills			
	Linguistic contributory expertise			
	Excel in domains			
	Generative reasoning			
	Intuitive action			
	Rule breaker			
Section 3	Automaticity			
	Deductive solution of problems			
	First principles			
	Framing the problem			
	Flexibility in approach to new problems			
	Solution focussed			
	Superior performance			
	Systematic design			
	Tactical decisions			

The first range of attributes has elements of each grouped category, ability, knowledge, experience, skills and decision making except approach. There is a strong designer bias within “approach” from Cross which is not common in use with Collins and Dreyfus.

Section 2, grouping of elements is less defined and could easily have been considered as essential within the attributes of expertise. This grouping highlights that Collins is linguistically and societal-based. In his discussions of expertise an ability to excel in a domain is not necessary, because his focus is looking at how an expert functions within a group. The adoption of expert vocabulary of that group does not necessarily make for an expert in a practical domain. The lack of practical subject knowledge would prevent generative reasoning and to a certain extent intuitive action. Dreyfus lacks consideration of communication and language skills as these were not part of their studies into how proficiency and expertise is gained. Cross benefits here from the tacit understanding that skills in communication can be viewed as part of designer expertise.

The third grouping attributes have been considered only in one strand of research into expertise which seemingly makes them less strongly needed, yet all are considered important to have been included in the original area of expertise. The following seven

attributes of expertise listed below appear across the areas covered by Collins, Dreyfus and Cross making them the top seven attributes of expertise: -

- Ability
- Ability to apply new information quickly
- Practical contributory expertise
- Decision making
- Deep understanding of subject
- Experience
- Repertoire of strategies

The seven attributes may now be applied to differing domains of expertise; specifically, the skill of pot throwing.

Application

When applying this combination to the participants the seven most common attributes of expertise can be matched to the prospective participant potters. Table 8 outlines the application of the seven common attributes of expertise to potters.

Table 8: The seven common attributes of expertise applied to throwing potters

Ability	A potter needs an ability to interact with the material, clay with success.
Ability to apply new information quickly	When throwing a pot, the potter needs to react with immediacy to sensory information acquired through finger tips.
Practical contributory expertise	Throwing potters pass on skills to others through practical learning, writing or visually.
Decision making	Decisions are made throughout the throwing performance resulting from sensory input.
Deep understanding of subject	Will have a deep tacit understanding of the materials and the interactional forces involved in the throwing performance
Experience	Tacit implicit and explicit knowledge is involved in the levels of experience
Repertoire of strategies	Are needed throughout the throwing performance to counteract the problems that may arise.

The application of the seven common attributes of expertise to the throwing process is evident from Table 8. These brief outlines for each attribute are an initial response and need further and more precise application.

The Study

A grounded theory approach was considered the most cost-effective way of defining a consensus and commonality from a wide range of viewpoints. (Cohen, Manion & Morrison, 2007, pp. 491-500). The study was designed to combine and utilize both qualitative data with quantitative data. The methods used are outlined in the figure below, Figure 4. This mixed methods approach (Creswell, 2009; Teddlie & Tashakkori, 2009), provides a more complete data collection than using either qualitative or quantitative alone.

Qualitative methods	Quantitative methods
• Questionnaire survey • Verbal protocol	• Observation • Task analysis • Biomechanical/ ergonomic analysis

Fig 4. Qualitative and quantitative elements of the study.

The Sample

The national sample was gathered purposively (Cohen et al., 2007, pp. 491-500) with some viral sampling (Plowright, 2011) from the Crafts Council register combined with Arts in Action list of exhibitors Craft Potters Association. This established that the participants had national recognition as potters. The sample had an equal mix of genders and age.

The Design of the pilot study

The study was designed to be iterative and undertaken in the field with potters in their own studio. A protocol was followed to minimise the variables. A potter's wheel was transported to each venue so as to be able to capture the performance on a standard wheel. The clay used was to be the participants own chosen clay. The participants needed to be able to throw a cylinder pot from a 1kg ball of clay with a supplied potters' wheel.

The design of the study used mixed methods integrating both qualitative aspects and quantitative aspects to provide a more complete outcome relating to grounded theory (Cohen et al., 2007, pp. 491-500) Essentially, the study focused on the interaction and relationships between potter, material and technology when throwing a pot; looking for key variables and their similarity or difference so as to enable access to the skills needed when throwing a pot to be more accessible, efficient and inclusive. Potter's anthropometric data was to be collected focussing on upper limb and hand and finger measurements. These measurements would be correlated with performance to highlight any differences in size or gender when throwing. The throwing performance was recorded from two angles thereby capturing the most posture detail possible from available resources. The front positioned camera collected data on body positioning and general throwing events, a side positioned camera gathered data on body position and hand movement. The combined data provided a comprehensive explanation of the pot throwing performance. Wheel speed data was gathered in order to compare against other variables to identify relationships within a throwing performance. The recordings were evaluated using task analysis, for event, posture and hand position. Results from each participant were compared with those from the other potters. Qualitative background characterisation of participants was collected through an online survey prior to the practical session. Table 9 provides an overview of the application of mixed methods within the context of a grounded theory-based study.

Table 9: The application of data collection tools

Part	Title	Description	Application
1	Background Questionnaire	Collecting information from the participants about past experience, acknowledged skill level, professional practice, age and gender.	Variables compared against throwing performance and heuristics applied to identify relationships between them.
2	Anthropometric data	Length of upper limb, digit length, grip strength, ROM.	To compare scale and proportion of each potter against their throwing style; and then comparing the scale, proportion and style of one potter against each other potter.
3	Video observation Task analysis	Recording a task performance of cylinder pot thrown from 1kg of clay, recorded on camcorder.	To provide quantitative evidence of the application of design intent and heuristics of each potter for comparison with each other potter. Quantified description of performance against time.
4	Concurrent verbal protocol analysis	Participants giving a running commentary whilst engaged in a task	The descriptions can be matched and compared with visual data.

Results of the pilot study

The results of the elements of the pilot study indicate the efficacy of the tools used.

Questionnaire

The questionnaire was very time intensive at the point of throwing participation, the data was pertinent. The questionnaire was planned to be adapted to be offered as an online questionnaire.

Anthropometry

The anthropometric data collected was collected and analysed against a UK database to detect whether there were particular patterns within the sample. This was a time intensive activity, but has a key role within the study.

Task analysis/ video observation

The visual data was used for task analysis primarily so as to detect the key points within the throwing performance. The visual data was then used again acutely focussing on the biomechanical aspects of the key points of the throwing performances as a method of detecting similarities and differences between throwing performances.

Current verbal protocol analysis

The participants were asked to provide one throwing performance with a current description of what they were doing in "real-time". The cognitive challenge of verbalising as well as physically manipulating material at speed slowed the performances down, descriptive language in some participants became limited to the actions rather than supportive material therefore it was decided that the performances were key therefore performance participation became non-verbal.

The comparison table (Table 10) highlighted key consensus points for expertise. Some of the participant throwers involved in the pilot study fitted into the central area, being more experienced and knowledgeable than the novice participants.

Table 10: The application of Collins, Cross and Dreyfus to a group of pilot participants

	Novice	- >	Expert
Collins	Interactive Ability/ Reflective Ability		
	Beer mat knowledge Popular understanding	Primary source knowledge Interactional expertise	Contributory expertise
	Polimorphic/ Mimeomorphic		
Cross	Deductive Reasoning		Generative reasoning
	Problem focussed		Solution focussed
			"ill-behaved"
Dreyfus	-Able to participate in a task with clear instructions and monitoring	-Further instruction but has experience of process. -More experienced, following guidelines. -Experience is vast; actions have become automatic.	-Actions are intuitive, can experience intense concentration on the process rather than on the mechanics of the process.
Dreyfus knowledge types (1980)			
Recollection	Non-situational		Situational
Recognition	Decomposed		Holistic
Decision	Analytical		Intuitive
Awareness	Monitoring		Absorbed

The seven attributes of expertise

When the seven attributes of expertise were applied to the group of pilot participants, each achieved the attributes with varying degrees. All participants had ability as they created the design brief, a cylindrical pot from the 1kg of clay. However, as the statements of attributes recorded were in the form of abbreviated notes there needed some refinement of definition. For example participant 1 had considerably more experience than participant 6 but they were able to produce a satisfactory cylinder pot as requested. They both were able to adjust to the haptic feedback of the clay and make decisions, reacting to the continuously new information being sensed. Each participant was able to relay their actions through continuous commentary; however, participants 1, 2 and 3 were able to add reasoning to their commentary. Each participant had a repertoire of personal strategies and techniques they

used during the performance. Therefore further refinements are necessary to define the attributes of expertise.

Conclusions

The aim of this paper was to provide researchers with a set of metrics that define the term "expert". This has been achieved with the identification of the seven common attributes from Collins, Dreyfus and Cross. These have been applied to the pot throwing process outlined in Table 9.

An expert throwing potter would need to exhibit a throwing ability, the ability to apply new information, a practical contributory expertise, a deep understanding of the subject, experience, a repertoire of strategies and the ability to make decisions. As shown in section 1 of Table 7

Therefore, the combining of Collins, Dreyfus and Cross has attributes of expertise that can be applied to recognise expert status of the sample of throwing potters'. The success in the identification of the level of expertise could have applications in other areas.

The use of concurrent protocol analysis was effective in identifying a number of the attributes of an expert from a novice. In particular, it was successful in identifying the generic heuristics used and their complexity when pot throwing. However, to enable this method to be used the video recording is required. More detailed understanding may be gained about generic attributes of the pot throwing performance from the recorded data. Comparing the gender, scale and posture and performance of one potter against another in time may deliver a better understanding of why they used or changed to a specific technique at that performance critical moment.

The application of the seven attributes of expertise could be applied to future studies of crafts such as wood carving or stone masonry.

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Metaphors in Design: An Analysis of How We Represent Design Expertise

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Abstract

Design and design expertise are often argued about and rarely agreed upon by the design community, which is a result of their multifaceted nature and existing underlying assumptions, theoretical anomalies and fragmented knowledge in the field. Lakoff and Johnson (1980) suggest that metaphors structure our perceptions and understanding. Metaphors affect the way we categorise experiences and organise our ideas (ibid). Based on this argument, the paper investigates the visual and cognitive metaphors related to design, in particular, design expertise (DE), to address how these metaphors shape our understanding of DE. It examines how DE is represented through the use of metaphors and explores the use of metaphors as a tool to recognise, share and acquire expertise.

This paper examines several metaphors, which are identified mainly through reviewing the literature on design knowledge and skills and existing interviews conducted with designers. The metaphors are analysed in a framework that identifies the linguistic roots, associated meanings, underlying theories and their possible impacts on the design discipline.

The analysis of these metaphors reveals characteristics, strengths and limits of how we understand and describe DE. This analysis and discussion will contribute to strengthen an individual's comprehension and positioning on design expertise. It will also input towards how we communicate DE, and how we exchange knowledge, ideas, experiences and skills within the design and business communities, who often do not share the same language and mindset.

Keywords

visual metaphors; cognitive metaphors; design expertise; design knowledge and skills

Introduction

The light bulb, as a visual metaphor, often represents "I have an idea!". Despite the fact that the incandescent light bulb has become obsolete, it is still a symbol of a novel and innovative idea. One may associate it with the breakthrough the light bulb brought in the early twentieth century or with Thomas Edison, as a recognised innovator. Perhaps its real value as a metaphor is due to its connection with sudden illumination. As Wallas (1926) suggests "the art of thought" has four stages: preparation, incubation, illumination[1] and verification. Illumination, an observable property and effect of light, ends the darkness. It describes the moment of "Eureka", "aha!", or a "creative flash", which happens often after incubation, a long period of preoccupation with a problem or a process of hard thinking.

[1] Both illumination and incubation are also metaphors representing the thinking process.

Similarly, the phrases such as “a bright idea” and “it is brilliant” are also based on the implications of it. The light bulb metaphor can, therefore, be assumed to be still valid and relevant. For example, Gordon Murray, an automotive designer (in Cross 2011:33), describes his design process, “in the midst of the pressure, there appears a sudden illumination”.

Metaphors are not an ornamental aspect of language; they structure our perceptions and understanding (Gibbs, 2008; Glucksberg, 2008; Lakoff & Johnson, 1980). Metaphors serve to generate new ideas, solve problems and stimulate creativity (Casakin, 2007; Coyne, 1995). An extensive and well-reasoned discussion on how and why to use metaphors is found in the literature on interface design (Hutchin, 1989). The desktop metaphor should be mentioned here as an iconic example of how metaphors aid to solve design problems. Many elements of a physical office environment, such as files, folders and wastebaskets, were carried over to the construction of the digital interface. The visual correlation between the physical elements of office environment and the digital Macintosh desktop elements elucidates the concept and helps the user easily adapt to a new environment. Basically, the user automatically maps the desktop schema onto the interface in order to understand the concept. However, this kind of mappings sometimes remains very instrumental due to straightforward transferring. Metaphors essentially shape the way we value things as a result of “seeing as”. Schön (1979) discusses generative metaphors and implications of “seeing as” in social policy context.

Schön suggests that generative metaphors, which are constructed by individuals , represent a special way of seeing. In his first example, he refers to the opinion of the experts in the 1950s. That opinion concludes that the community would be healthy when there was no blight or slum area in a city; hence *the slum was seen as a congenital disease*. The existing buildings in the slum were regarded as unsanitary. The area, therefore, needed to be planned to eliminate the conditions of the slum. Redesigning the problem areas, as a result, was focused on building new housing, parks, streets and shopping centres; the disease was cured by the removal or treatment. In his second example, he refers to Herbert Gans’ Urban Village Project in 1962 through the metaphor of “seeing slums as natural communities”. Gans recognised the informal networks of the slum with its homelike stability. Hence, instead of dislocating people from their local areas and *natural communities*, ways of preserving and improving community cohesion were sought. Schön identifies our strong affinity with the *natural* (due to its romantic origins) and our distrust in the artificial, which continues to influence our understanding of the topic. Seeing the slums as health/disease in the first example and nature /artifice in the second had different implications on how the reality was constructed, the problem was framed, and the solutions were found.

Zinken *et al*. (2008, p.363) introduces the term *discourse metaphors* as “a relatively stable metaphorical projection that functions as a key framing device within a particular discourse over a certain period of time”. “Nature is a book” or “the state is a machine” are some of the examples given (ibid.). This paper identifies various discourse metaphors that are constructed by the individuals. It also includes generic-evolutionary metaphors, which are widespread and well embedded in the language, which have evolved and developed in time, and therefore are hardly noticeable when used, such as *collecting, recalling, capturing* and *building* expertise. They are often not specific to the design field. Lakoff and Johnson (1980) point out that metaphors are so frequently used in everyday language, people using them are hardly even conscious of how metaphors operate.

Lawson and Dorst (2009) discuss the versatile nature of design through categorising it under “design as”. For example, *design as problem solving*, *design as learning*, *design as evolution*, *design as integrating into a coherent whole*, and *design as a fundamental human activity*. Some others facets of design can be *design as form giving*, *design as a tool for innovation*. These examples highlight various values and outcomes of design activity.

Seeing design as problem solving has different implications for design practice than as form giving. However, these metaphor schemas hardly preserve a high level of specificity or rarely draw on relatively rich cultural knowledge in the source domain. *Problem solving* and *form giving* barely function the same way as *Europe is a house* and *nature is a book*, especially the way the meaning is constructed. Cross (2011) also discusses design activity and thinking by means of two metaphors; creative problem solving like the activity of an ant (Simon, 1969) and design as an explorer (Jones, 1980). However, how the design process or DE might itself be metaphorically conceptualised has been seldom asked.

This paper attempts to map metaphors used in design field. It reveals how we comprehend and communicate design expertise (DE) through several metaphors. It discusses the possible implications of these metaphors for design discourse and practice. Lakoff and Johnson claim, “the essence of a metaphor is understanding and experiencing one thing in terms of another” (2003, p. 5). Based on this argument, the metaphors serve to make the implicit explicit. It does not aim to find new metaphors, yet it acknowledges that the new metaphors will contribute to represent the richness of design.

Method

This paper identifies the related metaphors through reviewing, in a way meticulously scanning, the literature on DE and design process. The majority of these sources are fundamental writings on design including works by Schön, Cross, Lawson and Dorst. In order to understand the evaluation of DE and design practice, the researcher also examined twenty-five previously published interviews conducted with designers by various journalists and researchers in the last five years. It is not feasible to access and discuss all the DE related metaphors within a single paper. Therefore, this paper includes a selection of metaphors that are thought to be significant and relevant based on the following criteria:

- Re-occurrence (Is it frequently used? is it a repeating metaphor?)
- Representational quality (Is it clear and expressive? Is it valid?)
- Relevance (Is it related to one of these topics: the design knowledge, design skills, the design process, and the role of design? It is noticed that identified metaphors often do not represent the whole picture of DE, they represent some aspects of it.)

The metaphors are analysed within a framework that identifies their linguistic roots, associated mind-sets and underlying theories.

A limitation of this study is that it uses previously published interviews. Because these interviews are not tailored for this research, the relevant information discussing design process, skills or expertise was limited. In addition, interviewees may not share their experiences and opinions openly when the interview is published in a publicly available source. To overcome this problem, the researcher conducted four additional interviews with design practitioners and professionals using a semi-structured interview schedule to access their opinions on the implications and possible reasons for using metaphors in representing design knowledge, experience and skills. Another limitation is that this paper presents a small selection of metaphors. A great deal of effort has been made to identify as many metaphors as possible. However, many more remain to be discovered and explored. The majority of uncovered metaphors are dead or generic metaphors that are hidden from consciousness.

Findings and Discussion

The study first presents a selection of metaphors in a rather plain fashion. As Table 1 illustrates, the metaphors are listed under the core aspects of design expertise: design skills (as a composite of knowledge and abilities), design process, design outcomes, and design roles. Some of these metaphors are discussed in the following sections, the subsequent categorisation is formed on the basis of what the metaphor implies.

Table 1. A selection of metaphors for design and design expertise

Design Skills	**Design Process**	**Design Outcomes**	**Design Roles**
Thinking out of the box	Black box	Concrete solutions	Magician
Gut instinct	Fairy Dust	Blue sky	Path-finder, way-finder(Juninger, in Bühlmann & Wiedmer, 2008)
Magic	Mystical	Creative Flash	Competitive weapon
Illusion	Magic	Light bulb	(Fujimato, 1991)
Capturing, collecting, re-calling knowledge-experience	Myth	A mental block lifted.	Catalyst (Dunne, in Bühlmann & Wiedmer, 2008)
Building knowledge	Journey (Cross, 2011; Lawson & Dorst, 2009)	the Eureka	Explorer (Jones, 1992)
Design as tight rope walking(Schön, 1983)	Re-inventing the wheel	the aha! moment	Bridge (Lake-Hammond and Waite, 2010)
Repertoire	Incubation illumination (Wallas, 1926)	Signpost (Juninger, in Bühlmann & Wiedmer, 2008)	Link
Pencil as Spokesman (Richard MacCormac, practitioner architect)	Framing the problem (Schön, 1983)	Wild ideas	Connector (Leung, design practitioner 2012)
Fresh Eye	Problem structuring-formulating	Design as a marker of culture (Jacob Hashimoto, artist designer, 2012)	Integrator (Fujimato, 1991)
Connecting	Problem setting (Schön, 1983)	Design as political windows dressing (Sarasin, in Bühlmann & Wiedmer, 2008)	Midwife (Ingels, architect, 2012)
Bridging (Fruchter & Swaminathan, 2006)	Reflective conversation (Schön, 1983)	a messy divorce (Christopher Boots, design practitioner 2011)	Hero (Badke ShauB *et al*, 2010)
Cross-pollination (Kelley & Littmann 2005)	Drawing as a dialogue (Santiago Calatrava engineer-architect, in Lawson,1994)	Unique twist (Matik, 2011)	White knight, (Badke ShauB, 2010)
Repertoire of tricks (Richard MacCormac, practitioner architect, in Lawson,1994)	Catalytic		Illusionist (Jones, 1992)
	Reflective conversation (Schön, 1983)		Gambit (Lawson 2003)
	Dialogue (Calatrava, cited in Lawson,1994)		

Acquiring Design Expertise

The first categorisation is based on the conception that expertise is not a skill that an individual is born with; he/she acquires it in time after years of experience, after hours of deliberate practice and study (Ericsson, 2001; Christiaans & Dorst, 1992; Lawson, 1979). The metaphors discussed in this stream include repertoire vs. repository, collection, capturing, climbing stairs/ladder/levels, re-inventing the wheel, journey, pencil as spokesman. For example, Schön articulates (1983) designers' knowledge as a design *repertoire* rather than a set of abstract figures and scientific rules. Similarly, Jesse Catron (2012), a game designer, states that

> Of course familiarity breeds proficiency but I think it is important for a designer to have a versatile *repertoire* of mechanics to use according to the goals he is trying to accomplish or the problems he is trying to solve.

Repertoire, a theatrical and performance-related term, is a re-occurring metaphor and has a significant impact on design discourse (Bang, 2009; Lawson,1994; Stolterman, 2008). It often indicates that a design practitioner, whether consciously or subconsciously, draws from his/her own or other design professionals' previous experiences. Designers *acquire* knowledge intuitively, without the use of a reason or inference; thus, this knowledge is often implicit, tacit and experiential (Bang, 2009). Similarly, *repository* as a metaphor reflects the concept of reusing the design experience. The underlying theory for both metaphors is case-based reasoning. The repertoire refers to internal and digested knowledge, which is regularly performed i.e. reused; the repository, on the other hand, refers to using an external knowledge source. Ye and Fischer (2002) point out that a cognitive barrier to external reuse might stem from a user's unfamiliarity with the contents of the repository. Brown and Duguid (2000, p. 119) underlines, "knowledge is something we *digest* rather than merely *hold*", they suggest that it is reasonable to say, "I've got the information, but I don't understand it," rather than, "I know, but I don't understand" (ibid.). It might be argued that the repository keeps the design information, and the repertoire keeps the design knowledge. Attention should also be paid when internalising the design knowledge, learning to *perform*, and not learning to *store*. Other important aspects of knowledge reusability are the ability and the attention to "capture" and "recall" i.e. organise and retrieve the previous experiences, and use them regularly, which is perhaps a way of making it explicit. Each retrieval and re-use of knowledge is a way of rehearsing and making the knowledge tangible.

Another metaphor of acquiring expertise is "*climbing a ladder*" in which the first step is being a novice, ascending to the expert level, then becoming a master and a visionary. Dorst and Reymen (2003) mention this seven-stage DE model, shown in Figure 1, based on the philosopher Dreyfus and Dreyfus' previous five-stage model (1980).

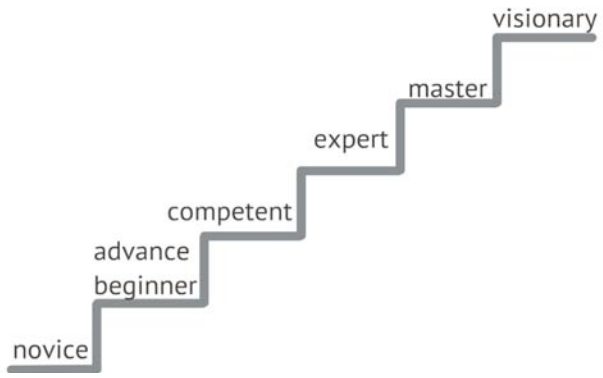

Fig 1. Seven stages of expertise

This metaphor demonstrates expertise acquired in a step-by-step fashion. For Lawson (2003), design expertise requires maturity; unlike musicians or sportsmen, recognition comes after years of practice. It is to a significant extent dependent on gathering experience through time rather than an innate ability. Ericsson (2001) claims that masters seem to consider inborn capacities and innate talent as relatively unimportant; rather, they emphasise the role of motivation, concentration, and the willingness to work hard to improve performance. This metaphor represents a linear and steady development. Yet, Schneider (1985) argues, “practice does not always make perfect”.

Efficiency, productivity and practical motivations are also concerns of this stream. Attempts wasting a designer’s resources by duplicating existing methods and optimised solutions are often avoided as the metaphoric idiom “reinventing the wheel” illustrates. The approaches that place an emphasis on reusing the knowledge, experience and existing solutions to achieve their innovation goals may rather lead to uninventive outcomes and be perceived as generating incremental designs or improvements.

Journey, as a metaphor, is used widely in various contexts; research and project-based studies, e.g. "Innovation journey” (Van de Ven *et al.*, 2008). MacCormac (cited in Lawson & Dorst, 2009, p.11) uses the journey metaphor to illustrate his design process:

> I mean the analogy of a journey is a very interesting one. The design process is a journey, an episodic journey towards a destination which you don’t know about, which is what life is and what writing and all arts like; a journey.

Cross (2011) also uses this metaphor to describe the design process; he contextualises design projects in particular. He treats the design brief as the starting point of the journey. So it is a known part of the journey in that sense. He points out the need to “stand back and adopt a fresh point of departure” to bring a new perspective to evaluate it. Similarly, Jones (1992) likened designers to an explorer looking for hidden treasure. To him, a new problem is like an unknown land, of unknown extent, in which the explorer searches by making a network of journeys. He sees design methods as navigational tools and maps. Design methods assist in plotting the course of the journey and maintaining some control over where design goes. On the other hand, Lawson and Dorst (2009, p.21) also use the journey metaphor to describe overall process of developing expertise: “we see the creation of DE as a journey”. For them, acquiring expertise is a long journey that starts with graduation (ibid.). The journey metaphor here implies acquired expertise. There is an emphasis on the movement; it is a dynamic process.

The word “journey” is derived from French, meaning "a defined course of travelling; one's path in life". Journey, as a metaphor, reflects a process-oriented mindset. Even though the definition states “a defined course of travelling”, the unknown seems like an important aspect of experiencing a journey as well as designing. Here, the emphasis is on relying on maps and tools, good equipment and experience rather than exceptional skills. This approach implies an open model that encourages designers to be curious and flexible. Since the designer cannot predict all the obstacles and opportunities that lie on their path towards the goal, all they can do is to deal with the obstacles, seize the opportunities and embrace the unknown.

Spokesman is another interesting metaphor used by Richard MacCormac, a British architect, interviewed Lawson 1994, stated that:

> Whenever we have a design session, or a crit review session in the office, I cannot say anything until I have got a pencil in my hand. I feel the *pencil to be my spokesman*, as it were… I haven’t got an imagination that can tell me what I’ve got without drawing it. I use the drawing as a process of criticism and discovery.

Spokesman, an expert speaker who talks on behalf of a group, is the embodiment of his drawing skills, expertise. This metaphor is an interesting articulation of the "show, don't tell" principle of design. His deep attachment to his pencil reminds us of Polanyi's (1966) example about how a person learns to feel a tool or a probe as an extension of his/her body and thinking in a similar way that a blind man feels his way by tapping with a stick. As he becomes more proficient in using the pencil, this object transforms into a sentient and independent extension of his hand. Clearly, his pencil is the manifestation of his thinking, so as drawing. This implies a deep relationship between articulation and drawing.

Using the drawing as a process of criticism and discovery can be also found in the metaphor "*reflective conversation* with the situation", constructed by Schön (1983). In this conversation, the designer reflects and, in a way, talks back towards the construction of the design problem. Similarly, the engineer-architect Santiago Calatrava interviewed by Lawson (1994) comments: "to start with you see the thing in your mind and it doesn't exist on paper, and then you start making simple sketches and organizing things, and then you start doing layer after layer; it is very much like a *dialogue.*"

All these metaphors above imply a cumulative process of learning and suggest that design expertise is acquired by stressing the value of experience, knowledge and deliberate practice. rather than individual strengths of a designer, unlike the metaphors of the next section.

Design Expertise as a special skill of a designer

The second categorisation builds on the idea that an expert displays a special skill (Akın,1987; Cross, 1990; Cross, 1999) for perceiving, formulating and solving problems, which is beyond knowing more facts, rules, principles, guidelines and examples (Newell & Simon, 1972; Anderson, 1983). Metaphors in this group may emphasise the value of creativity in DE and imply that expertise belongs to the personality of the designer, or can be understood as an outstanding performance- talent. In some situations, designer's self image appears as arrogance. This is referred to as a barrier when collaborating with different stakeholders (Rust, 2004; Rust, 2007). Forty (1986, p.242) says seeing design as a distinctive skill of designers may result in 'the myth of their own omnipotence'. He states "design has come to be regarded as belonging entirely within the realm of the designer" (ibid.). Badke-Schaub *et al.* (2010) criticised these special skills and functions ascribed to the designer, such as high-impact innovative solutions to be applied the market. They used the metaphors "white knight" and "hero" to point out how the value of DE is overestimated by designers.

The example of Juicy Salif the lemon squeezer, designed by Philippe Starck, can be mentioned as a narrative, a root metaphor,[2] (Sarbin, 1986) to illustrate the distinctive design skill. This root metaphor serves, perhaps strategically, to evoke emotions, to strengthen the design value and to increase sales. Starck claims that design ideas come to him quite "*magically as if out of nowhere"*(!) (Cross, 2011). After receiving the design brief for a lemon squeezer from Alessi, Starck's design story starts in a restaurant. (Carmel-Arthur, 1999) Starck explains "this vision of a squid like lemon came upon me, so I started sketching it…" (as seen in Figure 2). "If I'm quick", Starck thinks, "I can design this before the primi piatti" (ibid). In the story, the very next day, he called Alessi and said "your lemon squeezer is ready" (ibid). The story implies that the way he arrives at the design solution and his ability

[2] According to Sarbin (1986) narrative is a root metaphor (Pepper, 1942). Narratives, like metaphors, constructs the reality through shaping an individual's perception of the world. It builds on the idea that meaning is created and communicated through stories and experiences rather than logical arguments and lawful formulations.

of communicating his expertise are his individual skills, which is represented in a way that it is not a result of practice or design methodology. This story and other similar ones embracing design genius seem to embody the design expertise at first glance; however, it does not help to the design profession by attaching the value to the individual competence.

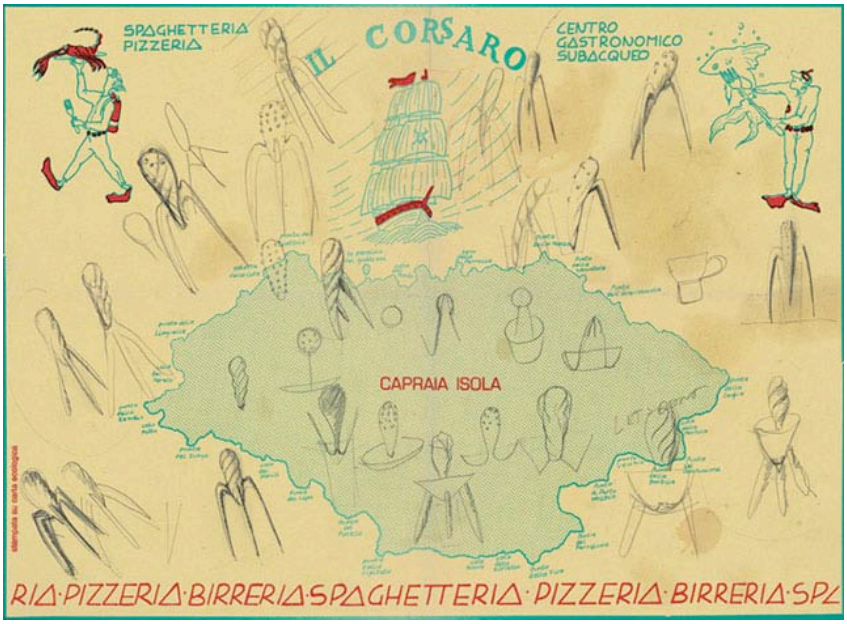

Fig 2. Sketches on service napkin, Juicy Salif, the lemon squeezer (Carmel-Arthur, 1999)

Design Mystery: Magic and Magicians

Magic is often viewed with suspicion by the wider community (Mauss,1972); thus, de-mystification of magic is sought after. The demystification of creative design has been the subject of much research. For instance, a positivist movement in the 1980s called “design science” (Cross, 2001; Bayazıt, 2004) influenced the design researchers who tried to explain design as a rational (or rationalisable) process, or as rational problem solving (Simon, 1969). A number of researchers, however, reacted against that rationalisation, rather emphasised a phenomenological approach and considered design as a subjective experience (Schön,1983). There were also attempts to explain the process of designing; Lawson’s book “How Designers Think –The Design Process Demystified” in 1980 and Kolko’s book “Exposing the Magic of Design” in 2011 can be included among them. There are reactions against mystification from practitioners; Vince Frost (2008), a graphic designer, comments, “we (designers) are not mysterious people, our work is really straightforward, it just takes a lot of effort to listen really hard and to explore.”

In 1990, Cross claimed that de-mystification is a deliberate act; he claims, “although there is such a great deal of design activity going on in the world, the nature of design ability is rather poorly understood. It has been taken to be a mysterious talent”. One can notice this statement is still valid (Cross, 2011). Cross claims there exist an interpretation of design ability as “ineffable mysterious art” (ibid). He argues, “so design is not obvious, or we don’t want it to be obvious” (ibid). The metaphors convey mystery and obscure design process include magic, black box, magician, myth, trick, and twist.

Designers sometimes use magic in a positive sense and associate with creativity. Thoreau (2013), for instance, describes himself,

> I am a graphic designer who loves creativity and magic, and my aim in life is to share these with you. I believe that we find our truest vision and purpose in the magical world of creativity.

Richard MacCormac (in Lawson, 2003) illustrates his practice as "having a repertoire of tricks" to exemplify to his original and surprising ideas. Lawson (2003) likens design to the activity of a gambit, a chess player who needs to create a new and unexpected move in a chess game in order to win. Kolko (2011) also suggests that clients may desire magic because a satisfying magic shows means that the money is well spent on the magician (ibid).

Many misunderstandings about design expertise are perhaps a result of the mystification of the design process. To Jones (1980), "the most valuable part of the design process is that which goes inside the designer's head and partly out of reach of his conscious control, *in the black box*". With the black box metaphor, the emphasis is on input and output, which leaves the process unobservable. Kolko (2011) recognises that much of the mystery is related to the synthesis stage of the design process and leaves this stage unresolved, informal, personal and rarely formalised. It leads to ignorance within the companies, he notices; professionals do not allocate enough time and budget to undertake the synthesis stage. Another outcome, Jones (1980) suggests, is that the most of the outputs of design, design thinking or writings are produced without being able to explain them; they remain inexplicable. Another implication was observed during an interview conducted with a respondent from an Innovation Centre, who indicated that they avoid using the word design in conveying innovation and growth message because it rarely communicates well with the business audience. He commented, "the design profession has long since sold themselves on a myth; as a result, people do not understand it."

Magic is commonly practiced in isolation and secrecy, and a magician never shares how he completes his tricks. Two interviews conducted with design practitioners suggest that the demystification serves to protect the intellectual property (IP). Making the design process inaccessible by putting it into a black box seems to help preserve the IP. Whether it is a reaction to silent design or "we are all designers" (Papanek, 1971) and "everybody designs" (Simon, 1969), or to prevent downgrading design skills is not clear; however, "seeing design as magic or mystery" hardly aid collaboration, design democratisation and participatory design. As a result of the increased importance of collaboration, co-design, and critical design, new metaphors have entered to design vocabulary.

The Role of Designer as Catalyst

Metaphors in design have been changing in parallel to the evolving role of the designer. Anthony Dunne interviewed by Bühlmann (cited in Bühlmann & Wiedmer, 2008, p. 241) the Head of Design Interaction Department at Royal College of Art (RAC) commented,

> They [designers] are catalysts, I think it is becoming well known. Certainly here in London-that one possible role for designers in the future is a catalytic role, and a facilitating role

Dunne suggests this new role is an engaging one, and the responsibility of the designer is to connect different audiences such as the public and professionals. Fiona Raby (from RAC) carried this conversation further by claiming that the expertise of designers is to generate questions and to reformulate the problems, rather than to solve them (ibid). In chemistry, when a catalyst participates in a chemical reaction, it often lowers the activation energy to start the reaction, or increase the rate of reaction. The expertise of the designer lies in aiding

collaboration between stakeholders, assisting the design process and increasing its efficiency. Similarly, Bjarke Ingels (2012), a Danish architect, indicates a facilitating role with his metaphor,

> In a sense we are facilitators or – I like this idea that the architect is a midwife that we help society continually to give birth to itself –

Some metaphors emphasise the integrating role of design, such as bridge (Lake-Hammond & Waite, 2010), connector (Leung, 2012), integrator (Fujimato, 1991) and link. Leung (2012), a designer who works for the design community in Canada, comments, "I consider myself as the connector, the community engager, the facilitator and the instigator within the industry." For instance, a bridge fills a gap between two points, so does a link, it connects a to b, a linear connection; whereas, an integrator can connect more than two points, it might be a more versatile role, integrating different stakeholders. These metaphors place an emphasis on the value of the process of design, collaboration, and democratisation of design. Designers take part in the solution finding, but do not own the solution. Design outcomes also depend on the expertise of collaborators, and the picture of this process is significantly different from Starck's representation or repertoire of knowledge.

A pervasive image to communicate this facilitating role is the designer + post it notes (Figure 3). The multicolour squares of paper cover walls and windows to convey the quantity of outputs resulting from creative collaboration, yet the overusing of this type of images without the necessary comprehension might downgrade the value of facilitation.

Fig 3. A facilitation image from a workshop

Conclusion

This study presented a number of metaphors that are relevant and significant for DE as different lenses to explain the way designers work and discuss various aspects of design activity. Designers may choose metaphors to communicate their expertise considering the meaning and implications which metaphors generate.

Metaphors affect how we exchange knowledge, ideas, experiences and skills between the design and business communities, who often do not share the same language and mindset. This paper suggests that some of the credibility issues or ambiguities of design stem from the metaphors that we use. Based on Schön's (1979) generative metaphor process, seeing

design as a black box or magic has different implications than seeing it as a reflective conversation or bridging. Similarly, the implications of unknown are different when unknown is created by a black box or a journey. Our associations with black box, darkness and myth influence the way in which design and design expertise are understood. Black box approach inhibits from observing design process, which makes it difficult to share it with novice designers. Mystified metaphors lead to an unresolved and informal design process in which solutions are often built on personal skills of the designer or simply on serendipity. In addition, this process is undertaken in an undefined period of time and budget. The question remains whether it is a deliberate confusion created by some designers to present each unknown aspect of a design project as a mystery. Acting like a magician and being wilfully obscure about the design process may create a sense of curiosity and help to protect the design knowledge partially but it may inhibit them from successfully collaborating with others. Participation and co-design are becoming increasingly important in the community. A role that encourages communication and creates community bonding seems to be adopted by numerous designers.

This paper should be considered as an introduction to the subject; it opens up a debate on the significance of metaphors on design expertise and discusses their implications on how design expertise is understood. Using metaphors as a way to discuss design expertise is a wide and comprehensive subject and there is room for further investigation. This paper has covered only a relatively small selection of metaphors; there are a lot more waiting to be discussed to represent overall complexities of design. Future research should focus on metaphor experiments that can be conducted with designers and non-designers to investigate the issue by deeper discussions: why they are using these metaphors, what they mean to them. The reflections and evaluations resulted from the experiment will contribute to the understanding of metaphors in design discourse.

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Connoisseurship as a Substitute for User Research? The Case of the Swiss Watch Industry

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Abstract

Conventional wisdom holds that new product development is more successfully undertaken when design is user led. An exception is the luxury goods sector, in which a common presentation of the brand is one where the customer should aspire to the vision of its designers. In such cases, the proprietor is often cast as a connoisseur, an expert in the brand's history who is intuitively able to give vision and direction. Within the Swiss watch industry, heritage and the illusion of exclusivity are vital strategies in the communication of products as luxury items. Connoisseurship plays a central role in this communication, establishing the boundaries of brands whose products might otherwise appear similar. In such cases, connoisseurship is presented to the customer as superior to user research, engendering products with a sophistication which customer insights cannot provide. Nonetheless, whilst conventional user research methods play little part in the design of Swiss watches, less formal methods are employed. These are shown to also have application in non-luxury sectors. The utilisation of strategies employed by the Swiss watch industry in future scenarios of new product development is also discussed.

Keywords

luxury; connoisseurship; user research; industrial design; Swiss watches

Introduction

Within the field of consumer product design, it often appears axiomatic that industrial design should be user-led. Products which focus on the needs of users at the specification and design stages are understood to better address those needs and thus lead to greater consumer satisfaction and, ultimately, greater profitability (Vredenburg et al., 2002; Design Council, 2008). Strategies such as user-centred design and co-design have emerged to systematise the integration of user needs into the design process (Sanders and Stappers, 2008), and whilst the implementation of such strategies is often criticised as misguided or ineffectual (Goodman-Deane et al., 2010; Steen, 2011), it is now commonplace for brands to talk of the extent to which they are customer-driven (Binder et al., 2008).

A notable exception to this focus on satisfying the expressed wishes of consumers is the luxury goods sector, in which “classical marketing is the surest way to fail," (Bastien and Kapferer, 2009). The aura which surrounds such products is built, in part, on luxury brands' communication of the notion that their products have innate qualities which are only appreciable by those with sufficient sophistication (Twitchell, 2002, p.98). Asking consumers what they want is clearly inconsistent with such myths: instead a common projection is that of the proprietor or designer as connoisseur, steeped in the heritage of the brand yet effortlessly able to carry it forward.

This paper presents two cases from the Swiss watch industry - those of Ulysse Nardin and Bell & Ross - whose brand communications deliberately and consistently present connoisseurship as a substitute for user research. It begins by discussing how the history of watch manufacturing has led to a situation in which “Swiss Made” has become synonymous with the notion of both technical quality and luxury. It then contrasts the traditional, 165-year history of Ulysse Nardin with the much shorter lineage of Bell & Ross, and shows how both draw on similar notions of the gifted auteur to establish their brand messages. The paper explores how both brands successfully reconcile the marketing paradox inherent in combining the exclusivity of “craftsmanship” with the desire for growth in sales, and illustrates the role of the connoisseur in negotiating this union in ways which are meaningful to their customers.

The paper then goes on to demonstrate that despite messages to the contrary, both brands do, in fact, conduct extensive user research, through informal channels such as hospitality events, through reports from authorised dealer networks, by the use of personal selling to valued customers, and through the use of limited and bespoke editions. Nonetheless it concludes that in an industry which has been superceded by more advanced, digital technologies, where innovations are incremental and where market volumes are relatively low, connoisseurship is an important strategy for demarcating the boundaries of more than 200 brands which make up the Swiss luxury watch industry. The paper ends by discussing whether similar approaches might also be relevant in markets not usually considered part of the luxury goods industry, and how they might be implemented.

The Swiss Watchmaking Industry

Watchmaking in Switzerland first appeared in the mid-16th Century, initially as a response by goldsmiths to Calvinist reforms which prohibited the wearing of jewellery (Fédération de l'Industrie Horlogère Suisse FH, 2012a). By the end of the century Geneva had established a reputation for its high quality timepieces and in 1601 the world's first Watchmakers Guild was established. As the city became crowded with watchmakers (by 1790 Geneva exported 60,000 watches annually) many moved to the Jura Mountains region, which remains the centre of Swiss watchmaking today.

Unlike the English watch industry, which in the 18th and 19th centuries was driven by the demands of maritime exploration and trade (Smith, 2009), in Switzerland improvements to watch design were driven largely by fashion and taste (Glasmeier, 1991). This placed the Swiss industry in a commanding position as watches became more affordable, and through the adoption of mass production technologies at the beginning of the 1900's Switzerland consolidated its domination of the world watch market (Knickerbocker, 1974).

This domination continued until the 1970's, when the introduction of quartz technology, combined with integrated circuitry, decimated the Swiss industry. Competitors from the U.S., Japan and Hong Kong were able to produce watches which were simultaneously much cheaper but also far more accurate, and in ten years Swiss exports fell from 40% of the world market to only 10% (Glasmeier, op. cit.). Factories were forced to close, and many brands consolidated or were bought out.

Throughout the 1980's and to the present day, the Swiss watch industry underwent a remarkable transformation, on two fronts. Firstly SMH (one of the conglomerates formed by the merging of previously independent companies) introduced Swatch, a precision-engineered quartz analogue watch, which once again signalled Swiss dominance of the low-cost fashion market (Norman and Verganti, 2012). Partly on the back of this success

(Swatch Group owns the Breguet, Blancpain and Omega brands, amongst others), Swiss watchmaking then aggressively marketed itself as the epitome of “fine timekeeping”. The notion of Swiss-made luxury was carefully managed (in order to claim “Swiss Made”, at least 50% of components by value must be Swiss, and assembly and inspection must take place in Switzerland) and assiduously protected: the success of this strategy is demonstrated by the statistic that in 2011, Switzerland manufactured only 2.6% of the world's watches by volume, yet accounted for 54% of the market by value (Deloitte, 2012).

Ulysse Nardin

Ulysse Nardin is an independent (i.e. not part of a larger conglomerate) watchmaker, based in Le Locle in the Jura mountain region of Switzerland. Whilst it does not have the public recognition of brands such as Rolex or Patek Phillippe, amongst watch connoisseurs and collectors it is regarded as one of the most innovative (Barge, 2012), having been awarded more patents than any other watchmaking company.

Established in 1846, the company initially made marine chronometers before expanding to manufacture pocket and wrist watches. Patents and prizes awarded in the late 19th and early 20th centuries attest to Ulysse Nardin's reputation as the leading pocket chronometer maker (Jaquet et al., 1970, pp.177-179), but after World War 2 the brand's reputation diminished and it existed only as a minor player among the Swiss manufacturers. This changed in 1983 when the company was acquired by Rolf Schnyder, who employed Dr. Ludwig Oechslin, known for having restored the Vatican museum's Farnesian clock, to design a wristwatch sized astrolabium (an instrument to measure the altitude and position of celestial bodies). Unveiled in 1985, the *Astrolabium Galileo Galilei* was a critical success, entering the Guinness Book of World Records as the most complex watch ever made (Paige, 1999), and presenting the brand's vision of itself once again as a leading Swiss watchmaker. Nowadays the company is known particularly for its perpetual calendars and jaquemarts, its “Freak” carousel tourbillon, and the use of synthetic materials such as silicium and polycrystalline diamond within its watch movements.

Bell & Ross

Bell and Ross was founded in 1993 by Bruno Belamich and Carlos Rosillo. Initially working in partnership with German watch manufacturer Sinn, the brand is known for large, legible displays intended to replicate aircraft instrumentation.

One of the youngest of the Swiss watch brands, Bell and Ross is now part-owned by Chanel and headquartered in Paris, though manufacture and assembly is based in La Chaux-de-Fonds in Switzerland. Unlike many other brands, including newer entrants to the market such as Urwerk and MB&F, Bell and Ross has not attempted to make a name for itself through the design of new complications. Instead it has sought to establish its reputation through association with organisations such as Recherche Assiance Intervention Dissuasion (RAID), the French counter-terrorism unit, and Groupe d'Intervention de la Gendarmerie National, the French hostage rescue unit (Hahn, 2012). In this way the company has become known as a maker of tough, reliable and overtly masculine watches.

The Reality and Illusion of Exclusivity

In order to appreciate the role that connoisseurship plays in the creation of Swiss watches, it is first necessary to understand a fundamental difference between traditional approaches to product marketing and the marketing of luxury goods, namely the importance of exclusivity.

Traditional marketing practice involves attempting to raise demand as high as possible, whilst at the same time ensuring that that demand can be met. Demand, i.e. popularity, is advertised as proof of the product's worth (Apple, 2011; Tucker and Zhang, 2011; Jeong and Kwon, 2012). Such an approach is tantamount to heresy for the luxury brand however, which continually strives to emphasise how *few* people have bought a particular product. Kapferer and Bastien (2009) highlight the counter-intuitive nature of luxury marketing strategy when writing that "In order to enter the luxury market, to build a successful luxury brand and to make it remain a luxury brand, one has to forget the classical marketing rules." An emphasis on rarity, often to the point where the customer must wait for the product to be made and delivered, is a key example of this abandoning of marketing principles.

A product's rarity, and the associated exclusivity of ownership which follows, is crucial for charging high prices (Kapferer, 2012) and maintaining the allure of the brand. Historically such rarity resulted from the use of materials whose supply was limited - precious metals, gemstones, exotic animal skins etc. More recently however, modern industrial mining methods and farming of previously rare animals has reduced the natural scarcity of such materials. One response of the luxury industry has been to seek out even less readily available supplies - platinum and rhodium, for example, or aerospace-grade ceramics. Another has been to communicate a material's scarcity, even when such rarity is a myth (Epstein, 1982). The requirement for rarity is also at odds with the desire of luxury brands to increase sales, in particular in emerging markets such as China and Russia. As Catry (2003) makes clear, "all companies in the luxury goods market face the question of whether exclusivity, so central to luxury appeal, is inevitably diluted by increased market share." To resolve this apparent paradox, luxury brands have engaged in the creation of "artificially induced" rarity (Kapferer, op. cit.), one in which "the product is not objectively limited in supply but luxury firms give their buyers an illusion of rarity through the information they deliver." (Catry, op. cit.). This communication of artificial rarity, and the illusion of exclusivity it creates, is a strategy at which the Swiss watch industry excels.

Swisstime, which advertises itself as "the reference for Swiss watches and jewellery" (Swisstime, 2012), lists 339 watch brands, of which approximately half are regarded as true watchmakers (usually defined by enthusiasts as those which manufacture their own movements). One feature of the Swiss watch industry's contraction in the 1970-80's was that few brands disappeared; despite being bought out by other manufacturers or absorbed into conglomerates, brands were retained as distinct entities. The Swatch Group, for example, owns 18 brands including Blancpain (established in 1735), Breguet (1775) and Omega (1848). Similarly Richemont owns 12 brands including A. Lange and Söhne (1845), Jaeger-LeCoultre (1833), Piaget (1874) and Vacheron Constantin (1755).

Retaining a high number of brands is one way in which Switzerland's watch industry has retained an aura of exclusivity. The history and heritage of each brand allows it to tell a distinct story to its customers, disguising the nature of its owning group's corporate structure. Furthermore, Swiss brands individually manufacture relatively few watches each year: Patek Phillipe, for example, produces approximately 40,000 units annually (KPMG, 2008). Thus a significant number of individual and distinct brands, each manufacturing small numbers of products each year, ensure that even while the total number of watches sold is significant (in 2011 Switzerland produced 31 million pieces (Eschmann, 2012)), the ability to appear exclusive is preserved.

The high number of Swiss luxury watch brands also disguises another aspect of the industry, namely the production of mechanical watch movements by what is known as the "ebauche" tradition (Perez, 2000). Luxury watch brands pride themselves on their production of movements, and almost all incorporate complications manufactured in-house in their high end and signature pieces. However the majority of brands also use OEM suppliers of movements in their lower price models, both to reduce costs and in order to concentrate on

those aspects which bring most value to the brand, i.e. the design of the visible exterior of the watch. In addition, the provisions of Swiss law require that a brand which claims its product is “Swiss Made” must use a Swiss movement (Fédération de l'Industrie Horlogère Suisse FH, 2012b). This has led to a situation in which only five manufacturers (ETA, Frederic Piguet, Sellita, TechnoTime and Zenith) supply movements to the whole of the Swiss industry.[1] Thus, at least at the lower end of the market, many brands share the same internal movements, despite their dissimilar outward appearances (Figure 1).

Fig 1. The Ulysse Nardin Maxi Marine Chronograph and the Bell & Ross BR03-94 share the same ETA 2894 movement.

The ebauche tradition is therefore an instrumental factor in the production of artificial rarity, in that it allows the continuation of small, distinct brands which would otherwise be unable to manufacture highly sophisticated movements (Baker, 2000). However it also plays a further role in the perception of exclusivity, in that it provides brands with platforms on which to create many variants of the same product. The supply of movements by an OEM demands that brands incorporate a modular (rather than integrated) architecture within their designs, one in which, simplistically, the movement can be “dropped in” to the watch case. This in turn allows brands to create small production runs of watches whose internal configuration,

[1] ETA is owned by Swatch group. As well as manufacturing under its own name, ETA also sells movements using the brand names Valjoux and Lemania. Blancpain, which is also owned by Swatch, manufactures movements under the brand name Frederic Piguet, but only supplies to Swatch Group brands.

parts and assembly are identical. The power of such a system is illustrated in Figure 2: the 39 Bell & Ross watches shown all use the same ETA 2892A2 movement.

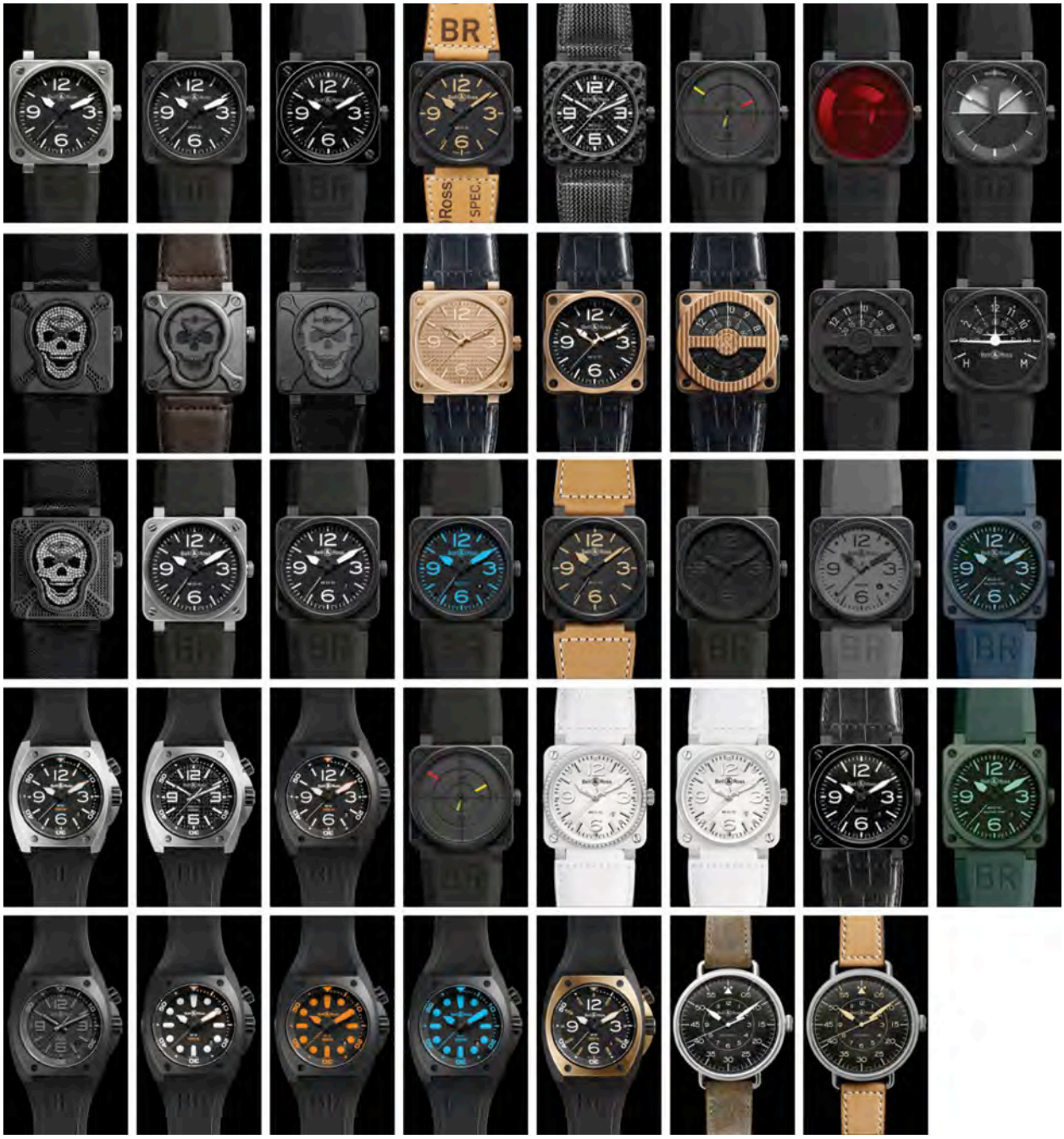

Fig 2. Bell & Ross watches using the ETA 2892A2 movement.

In parallel to the strategy of small production runs, the Swiss watch industry also uses limited editions to artificially induce exclusivity. Limited editions may incorporate a new design, such as the Ulysse Nardin *Tellurium J. Kepler,* limited to 99 pieces, but are more typically variants of standard designs, incorporating new material or colour combinations such as the Ulysse Nardin *Acqua Perpetual*, limited to 500 pieces (Figure 3). In both cases, production is limited to a pre-determined number of units even if customer demand suggests that more should be manufactured. This not only generates publicity (brands will often announce limited editions at major trade fairs such as Baselworld), it also ensures a second-hand market amongst collectors in which prices are kept high, further adding to the reputation of the brand.

Figure 3. The Ulysse Nardin Acqua Perpetual Limited Edition, number 397 of 500 pieces.

Connoisseurship as a Substitute for User Research?

In The Luxury Strategy (2012), Kapferer and Bastien note 24 ways in which traditionally accepted marketing principles are abandoned in the marketing of luxury goods. These include seemingly paradoxical strategies such as “forget about positioning” and “raise your prices to increase demand”. Of these 24 principles, which they term the “Anti-Laws of Marketing”, five are directly concerned with ways of ensuring the customer’s needs and wishes are kept removed from the product design and development process:

- do not pander to your customer's wishes
- do not respond to rising demand
- dominate the client
- do not test
- do not look for consensus

Such approaches are further supported by Okonkwo (2007, pp.132-133), whose seven stages of new product development in the luxury goods industry makes no mention of the consideration of user requirements during the generation or selection of new product ideas.

This disregard of customer needs is a deliberate and considered strategy. As Kapferer and Bastien (2009, op.cit.) make clear, nothing could be more alien to the luxury brand than "involving customers in the shaping of a brand, in co-creation, in consumer empowerment and in creating a relational intimacy." Consumers do not purchase luxury products because those products meet their functional needs, rather they do so because luxury products "fulfil ego and self esteem needs, reinforcing social status and projecting a self image” (Okonkwo, op.cit, p.62). A luxury brand which sought to portray itself as subservient to its customers’

needs would thus simultaneously destroy the image which caused its customers to aspire to it. By not listening to customers however, an obvious danger is that the luxury brand might appear directionless, either following whimsical trends or endlessly reinterpreting its own history. It is in giving luxury brands direction that the role of the connoisseur is critical.

Connoisseurship is intimately related to luxury because of luxury's intimate relationship with heritage and exclusivity. Heritage is what gives luxury brands depth and prestige (Kapferer, op. cit.); it is a core characteristic of a luxury brand (Okonkwo, op.cit, p.105) and is the reason why previously referred to brands such as Blancpain and Breguet advertise their date of establishment so prominently. In parallel with this exclusivity, style acts as the most important denoter of exclusivity in products whose functionality (as in the case of ebauche tradition movements) is indistinguishable. Thus the connoisseur, whose credibility relies on a sense of history and a "commit[ment] to the idea that style is meaningful" (Neer, 2005), is essential to the customer's belief in the validity of a luxury brand.

The connoisseur within a luxury brand has a dual role: to give creative direction to the brand's products as well as its image and communication, but also to act as a figurehead (Catry, op.cit.). This is not the same as that conventionally referred to in the literature of connoisseurship. The purpose of the art connoisseur, for example, is not to create new work, but rather to apply a considered discrimination which "helps him or her make a sophisticated judgment about the worth of a piece of art, a judgment that employs criteria appropriate for the genre in which the artist had worked" (Donmoyer, 2005). Nonetheless the skills of the art connoisseur are precisely those which the luxury brand's director must also employ.

Connoisseurship requires "judgment informed by intuition… but only if grounded in a thorough understanding of the work itself" (Robinson, 1998). It demands the application of discerning opinion, however that opinion only gains validity through a foundation of historical knowledge (Schwartz, 1988; Van Rees, 1989; Neer, op. cit.). Furthermore, an appreciation of quality is fundamental, since "distinctions of quality are both a tool and a goal of the practice of connoisseurship" (Ebitz, 1988). An identifiable figure possessing these skills is also essential to a luxury brand's image: within the Swiss watch industry this is typically the proprietor in the case of long-established brands, though with newer entrants to the market the figurehead is often a designer. (In both cases though, and unlike those who gave their names to many Swiss brands, the connoisseur is rarely trained as a watchmaker.)

The notion of the Swiss watch connoisseur as a devotee and defender of heritage is crucial to the luxury brand's presentation. In some cases (for example Audemars Piguet, Panerai and TAG Heuer) this is achieved by the involvement in the business of family descendants of the original founder. In other cases the allusion to heritage must be more carefully constructed. Thus in the case of Ulysse Nardin, the corporate myth is of Rolf Schnyder, an "adventurer" and visionary who spent much of his life "taking the path less travelled" (Ulysse Nardin, 2011), yet who "found his calling, to restore one of the world's greatest names in high-end watchmaking to its former glory" (ibid.). Since Schnyder had no previous involvement in Ulysse Nardin's history, it was imperative that his name be tied to the brand's heritage in other ways. His biography therefore talks of resurrection and rebirth, and "the opportunity to be involved in one of the truly great names in "horology" (ibid.). Schnyder's name and his recognition of Ulysse Nardin's historic achievements and value are consistently intertwined, such that the brand's vision and future direction are indistinguishable from his own.

For a company such as Bell & Ross, whose history is only two decades old, the task of invoking the heritage of connoisseurship is more complex. It is achieved through the brand's designer and co-founder, Bruno Belamich, whose story is one of a "passion for the 'instrumentation' look" (Thompson, 2010) of aircraft control panels. This is enhanced, and historicised, by references to Belamich's internship with the watchmaker Sinn, founded in

1956 by pilot and flight instructor Helmut Sinn. Finally it is grounded in the often told challenge of co-founder Rosillo to Belamich to "go back to our roots" when designing the BR-01, which was to become the icon of Bell & Ross's style. These roots were not those of a brand established in 1994 however, but rather the control panels of vintage aircraft.

The distinctive style of Bell & Ross watches is further legitimised through their use by professionals such as pilots, deep sea divers and bomb disposal experts, a fact mentioned in virtually all articles about the brand.[2] Yet despite an aesthetic which, it is implied, is highly valued by such users, nowhere is it suggested that the needs of such professionals might be taken into account when designing these watches. To do so would devalue the second requirement of the luxury connoisseur figurehead, that of the creative visionary.

Schwartz (op. cit.) writes that

> The connoisseur's sensitivity to style, at its best, can be compared to the ear of the musician with absolute pitch, the feeling for numbers of the computation whiz, the hunch of the crack detective or the practiced diagnostician. Without being able to tell us how they know certain things, they are sure that they do, and we believe them.

This ability to see what others do not is of central importance to the luxury brand. Since luxury products are aspirational, their design cannot be grounded in the requirements and experiences of their customers. Instead, luxury "is the expression of a taste, of a creative identity, of the intrinsic passion of a creator… [it] comes from the mind of its creator, driven by a long-term vision" (Kapferer and Bastien, 2009 op. cit.). In the case of Bell & Ross, this vision manifests itself in the image of Belamich as the "Young Turk", eager to shake up the traditional industry with products "way beyond the specifications that most watchmakers boast in their trendy catalogues" (Belamich, 2012). For Ulysse Nardin the approach is more subtle; Schnyder is cast as the inheritor of the founder's vision, as his company biography relates:

> he has enabled Ulysse Nardin to transcend its past and achieve an even higher place in the rarified constellation of watchmaking's legends… the spirit of the watchmaker Ulysse Nardin has… become inextricably intertwined with Schnyder's own (Ulysse Nardin, op. cit.).

Throughout the Swiss watch industry similar stories are invoked, though each with their own individual flavour: at Carl F. Bucherer for example, the company owner is the founder's great grandson, ensuring "the founder's philosophy continues to characterize the brand (Carl F. Bucherer, 2013); at Patek Phillipe the father and son presidents "personally stand by all the commitments embodied in the Patek Phillipe Seal" (Patek Phillipe, 2013) and advertise using the slogan "you never actually own a Patek Phillipe. You merely look after it for the next generation" (Leagas Delaney, 2013); whilst at Graham - "an unrepentantly English name for an exquisitely English watch" (Graham, 2013a) - the 17th Century watchmaker "would have been proud" of the founder's drive to "create a form of mechanical perfection that doesn't look or feel like just another Swiss watch" (Graham, 2013b).

Whilst the public presentation of a luxury brand precludes an interest in its customers' needs, in reality a significant amount of user research does, in fact, take place. This is not to say that luxury brands covertly engage in conventional practices such as questionnaires or focus groups, but rather that user insights are gained through less formal and more subjective methods. Some of the ways in which Swiss watch brands gather information about their

[2] See for example Disher, 2000; Hahn, 2012, Müller, 2012.

customers' aspirations and requirements include:

Hospitality: The provision of hospitality, whether at sporting events such as Wimbledon (sponsored by Rolex), cultural institutions such as the Bolshoi Ballet (sponsored by Audemars Piguet), or prestigious trade events such as the Monaco Yacht Fair (sponsored by Ulysse Nardin), is one of the most important ways in which luxury watch brands engage with their customers. Such events bear little resemblance to more conventional user research exercises: participants will be invited rather than recruited; "research sessions" will be more akin to friendly chats than formal interviews; and no attempt will be made at either consistency or impartiality. Yet the outcome, particularly when the event involves the brand's connoisseur figurehead, will be the accumulation of many small insights into the lifestyles of the brand's best customers (Tynan et al., 2010). These insights may never be formally recorded, but they will inform, or reinforce, the connoisseur's vision of how the brand should move forward.

Authorised Dealers: In accordance with Kapferer and Bastien's (2012, op. cit.) instruction to "make it difficult for clients to buy", most Swiss luxury brands sell exclusively through authorised dealers or their own boutique stores (Okonkwo, op. cit: p.80). Whilst the primary purpose of such a strategy is once again to communicate exclusivity, it also ensures the customer is served by trained staff with an understanding of, and loyalty to, the brand. This in turn provides a deep vein of customer insight into perceptions of the brand and why one product is purchased rather than another.

Limited Editions: As previously detailed, limited editions are production runs of designs where the number of pieces manufactured is deliberately restricted. As there is no expectation of high volume sales, a brand which is uncertain of a particular design is able to test it by launching the product as a limited edition and gauging its success. If the product sells well, a very similar design can be launched as a standard edition.

Bespoke Editions: Bespoke editions allow a small number of highly valued (typically wealthy) clients to request a unique treatment of a design, which will not be offered to other customers. Bespoke pieces are generally considered highly confidential and it is rare to find details of either the designs or the customers who commissioned them[3]. A typical bespoke design exercise will involve a commissioned piece, based on a model that already exists, and customisation will "include dials and cases with personalized designs and engraving as well as technical details such as adding functions to existing calibers... Movement parts, such as rotors and bridges, can be hand-engraved or skeletonised as the client wishes" (Doerr, 2009). Bespoke editions therefore provide brands with insights as to future themes which products might explore.

Mass Customisation: Mass customisation is defined as a flexible production system allowing individual products to be manufactured with near mass production efficiency (Tseng and Jiao, 2001). It is usually enabled by a web browser interface, known as a toolkit, which allows customers to experiment with different configurations in order to arrive at their ideal product (Hippel and Katz, 2002). Within the luxury industry it has yet to undergo widespread adoption (Okonkwo, op. cit: p.247), though a number of brands such as Fabergé and Jaeger-LeCoultre have attempted to reconcile the apparent tension between the need for exclusivity and the ubiquity of the internet. For brands which do adopt mass customisation, the opportunity exists to gather data in a similar way to that offered by Bespoke Customisation, though with a much wider customer base.

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[3] An exception is Andrew Luff, a collector who has ordered a number of bespoke pieces, one of which is based on the Ulysse Nardin Diavolo model. See: http://ulyssenardin.watchprosite.com/show-forumpost/f-13/pi-5106698/ti-768208/s-0/

A Model to be Emulated?

According to Tynan et al. (op.cit.), "luxury goods sit at one end of a continuum with ordinary goods, so where the ordinary ends and luxury starts is a matter of degree." Despite an earlier insistence that luxury goods and everyday consumer goods are fundamentally different, (Kapferer and Bastien, 2009, op. cit.), Kapferer appears to agree, writing that the "luxury business model can be applied to companies in any sector (Kapferer, 2012, op.cit.). It is therefore of relevance to consider ways in which non-luxury brands might utilise some of the strategies of luxury marketing, and the implications of doing so.

Kapferer (ibid.) cites Apple as an example of a non-luxury brand which adopts some of the traits of the luxury business model. One of the most immediate ways in which this appears to be true is in the position of the connoisseur, a role which Steve Jobs performed at least as well as his contemporaries in the luxury industry. Following his death, numerous commentators wrote of Jobs' “genius” (Gillmor, 2011; Isaacson, 2011; The Economist, 2011) and the ways in which other companies might follow Apple's lead. Undoubtedly the strategy adopted by Apple has been successful - it commands considerable brand loyalty and for a time was the world's most valuable company (Forbes, 2012). Yet Apple also demonstrates the risk involved in invoking connoisseurship without the additional support of heritage. With Jobs no longer the guiding figurehead, it is by no means certain that Apple can continue to build on its previous successes (BBC News, 2013).

A second way in which Apple emulates the strategy of luxury brands is in its attitude to user research and the extent to which it informs design. Apple's presentation of itself as a company which takes no account of user requirements is notorious, as exemplified in Jobs' exclamation "How can I possibly ask somebody what a graphics-based computer ought to be when they have no idea what a graphic based computer is?" (Sculley, 2010). By creating an image of the brand as one which knows what is best for consumers, better, indeed, than they know themselves, Apple clearly follows Kapferer and Bastien's (2012, op. cit.) command not to pander to customer's wishes. As such it has become something of a cause célèbre amongst designers annoyed by the extent to which they are required to take account of user needs.[4] Yet by dividing opinion with this apparent disregard for its customers’ views, Apple merely follows another of Kapferer and Bastien's instructions not to seek consensus.

A particularly interesting aspect of Apple's reputation with regard to user research is the way in which, similarly to luxury brands, it is largely a false construct. As Jobs himself admitted, Apple makes extensive use of user testing (Seeking Alpha, 2010), and the information gathered informs product development. Furthermore, Apple's own stores (and in particular the “Genius Bars” where customers receive one-on-one advice about their products), are rich sources of information with regard to consumers' use of products.

Clearly Apple does not follow a luxury business model in all its operations. Its outsourcing of production to China, and its increase of production to meet demand, are clear violations of the “anti laws” of marketing. Nonetheless, Apple demonstrates how a non-luxury brand is able to adopt luxury strategies. What these examples do not demonstrate however, is how the principles of luxury marketing might apply to future design scenarios.

Writing of the way in which tool-less additive manufacturing (AM) technologies enable small production runs, Campbell et al. (2003) have suggested the potential for the bespoke industrial designer. Such a designer would clearly have much in common with the designer of today's Swiss watches, which emphasise limited editions and low manufacturing cycles.

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[4] See for example http://www.linkedin.com/groupItem?view=&gid=111879&type=member&item=31995513

Whilst luxury brands engage in such strategies to promote exclusivity, they nonetheless create a marketplace in which many more variants exist than with conventional, mass produced products. In addition, despite its apparent lack of enthusiasm for mass customisation, the flexible modularity which such systems demand (Pine, 1993) is also closely aligned to the modular architectures required by the ebauche tradition of manufacture. Thus designers working for luxury brands, who are skilled at the creation of difference whilst simultaneously consolidating a brand's image, may find those skills are also ones which non-luxury brands find valuable as AM technologies become more common.

The bespoke industrial designer may also find it necessary to adopt other luxury strategies. Speaking at an RSA event titled “Twenty-First Century Manufacture”, Aldersey-Williams (2011) proposed that "in the coming decades, what we may see is that design and manufacturing look less like they did in the 20th Century, and more like they did in the 14th." In such a future, designers exploiting the ability of AM technologies to create unique designs may find themselves working directly with customers, following instructions in the manner of pre-Industrial Revolution craftsmen, and thus resembling those engaged in the creation of luxury bespoke designs.

One final scenario in which more conventional design practices might emulate those of luxury brands concerns longevity. It is a core principle of sustainable design that the lifespan of products should be increased (Cooper, 2010; Spangenberg et al., 2010). Yet this also appears to be at odds with consumerist desires to discard and replace products with newer models. However this conflict between longevity and consumerism is one which luxury brands navigate effortlessly. Luxury products such as Swiss watches have well established logistics of service and repair, and a vibrant second-hand market also contributes to their increased lifespan. Clearly the cost of a luxury product plays a significant role in deciding the ease with which it is discarded. Nonetheless, looked at over the product's lifetime, a luxury watch may cost little more than the buying and replacing of successive products. Thus it may be that the luxury business, often regarded as the epitome of consumption, offers clues as to how to conceive sustainable design processes.

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Controversy and Debate within Social media: Can Museums Improve 21st Century Democracy?

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Abstract

This paper describes the motivation behind proposed research that will investigate the quality and scope of public debate inspired by museums and galleries; namely the conviction that social media has yet to reach its potential for enabling innovative critical debate within society, and that museums might have a role in realising this potential. Key to this conviction is the example that connoisseurs and critics provide for how to behave in a constructive debate, by understanding and supporting valuable and challenging ideas. They achieve this by regulating, skilfully, the emotions caused by such (potentially shocking) new ideas, then discerning and disseminating the implications underlying such emotions. As providers of cultural and historical knowledge, museums are ideally placed to teach us, and enable us to practice, such connoisseurial and critical skills.

The research outlined by this paper takes two forms. Firstly, based on the assertion that innovation and inspiration manifest themselves in the form of a "change in shape" of networks (e.g. networks of neurons in the brain, or networks of people in a social network), longitudinal studies to show the states of museum social networks change during the course of exhibitions are proposed as a means to ascertain the kind of inspiration such events provide for the public. Secondly, based on the assertion that social media is yet to fulfil its potential to enable constructive democratic debate, research into the level, scope and quality of online debate within museum social networks, and related to their events and content, is proposed. The research will indicate how effectively museums are stimulating productive debate about important topics, and help museums become better at doing so.

Keywords

emotion regulation; innovation; social media; critical debate; museums

Introduction

By means of a literature review, this paper draws together ideas from aesthetic philosophy, psychology, neuroscience, politics and media studies, and proposes that connoisseurial and critical skills have a vital role to play in the spread of innovation and the improvement of democracy in 21st Century society, affected as it is by the internet and social media. The paper also proposes research into the role museums and galleries play in disseminating challenging new ideas, then helping the public acquire not only the connoisseur's ability to regulate emotion in order to assess the worth of such new ideas, but also the critic's ability to express opinions about such new ideas informatively and eruditely.

The paper begins by describing some connoisseurial skills and relating them to two aspects of psychology and neuroscience: the process of recognising and regulating emotions, and the generation of innovative new ideas when fresh neural connections form in the brain. The review is then "scaled up" to look the processes by which issues and ideas are disseminated and debated within society, the contribution museums make to these processes, and the effects new web and social media technologies have had. The paper concludes by proposing research that will analyse public social media activity for evidence of the effects that museums have upon the generation and dissemination of innovative and challenging ideas; research which could help them improve these activities.

Private Processes Relating to Knowledge and Experience

The assertion that connoisseurial skills are increasingly important to society begins by considering the sensations, emotions and thought processes that occur privately, in the minds and brains of connoisseurs when they make evaluations. Connoisseurial skills have been subject to analysis in the field of Evaluation since the 1970s, when Eisner proposed new approaches to the evaluation of education based upon the appreciation of art (Donmoyer, 2005). Eisner (1985) defined such connoisseurial appreciation as the process of comparing memory (typically gustatory, visual and kinaesthetic memory) with present experience, forming a basis for evaluating the meaning and significance of such experience.

Eisner (1972) proposed a connoisseurial process containing three components:

1. **The Descriptive Component:** in which sensory information about the properties of the object being evaluated is appraised in a dispassionate, methodical fashion.

2. **The Interpretive Component:** in which the connoisseur uses his or her skills, knowledge and expertise to consider the following aspects of the object and his or her interaction with it:

    i. **The experiential:** the emotional feelings engendered by the object.

    ii. **The formal:** the balance and interaction between the object's components.

    iii. **The material:** the meaning that can be attributed to the creator's choice and use of media.

    iv. **The thematic:** the ideas expressed by the object.

    v. **The contextual:** the environment the object came from, the tradition that the artist belongs to, and the relevance the object might have to the current culture and audience.

3. **The Evaluative Component**: only when the object has been described and interpreted thoroughly can a *genuine* evaluation take place. Such an evaluation is not devoid of feeling, but it is also not based entirely upon it, because the skills, knowledge and expertise deployed during the initial components can be used to justify such feeling (Eisner, 1972; Donmoyer, 2005).

Emotion regulation and connoisseurial skills

Eisner, therefore, considered that effective connoisseurship requires both skill and expertise. Arguably, the part of the process that requires these most is the experiential aspect of the Interpretative Component (2i above), because it depends upon recognition and regulation of emotion. Emotional processes are always fast and often subtle, so recognising their influence upon our judgement can be extremely difficult. When it comes to art, the hackneyed phrase: "I don't know much about art, but I know what I like" is potentially disingenuous; the viewer might not really *know* that they genuinely "like" a work at all (Melchionne, 2010). Connolly (2002) highlights the way emotions help select the memories triggered by sensation, and the way in which such memories turn sensory perceptions into experiences. Bodily sensation and emotion are *so* fundamental to our existence and intrinsic to our minds, therefore, that there is no basis for the Cartesian dualist separation between mind and body (Damasio, 2001; Pinker, 1998).

The complicated, but intrinsic, role that emotion plays in our lives ensures that there is a large body of research into the nature, recognition and regulation of emotion. Gross (1998), for instance, published a broad review of this literature from across neuroscience and psychology. From this, he produced a model of emotion regulation, which includes, but is not limited to, activities such as:

1. **Situation selection:** putting yourself in a situation from which you expect a certain form of emotional stimulus (or lack of stimulus). Gross suggests "taking a different route to the store to avoid a neighbour who tells offensive jokes" as an example.

2. **Situation modification:** attempting to alter a situation in order to modify its emotional impact (e.g. asking a neighbour to turn down irritating loud music).

3. **Attentional deployment:** adjusting emotional impact by:

    i. **Distraction:** focusing on a particular aspect of the situation or on a different situation entirely.

    ii. **Concentration:** focusing on an activity related to the situation (e.g. a task you are required to perform within the situation), or trying to perceive and understand the emotional feeling itself.

4. **Cognitive change:** both attaching meaning to the emotion and evaluating ones capacity to cope with it. This involves processes such as:

    i. **Social comparison:** e.g. "thinking of those less fortunate".

    ii. **Reframing:** e.g. looking at a failure to achieve one goal as a successful attempt at achieving another.

    iii. **Re-appraisal:** reconsidering and thus transforming the situation to alter its emotional impact.

5. **Response modulation:** adjusting behaviour in order to alter the emotional state; i.e. making a conscious effort to calm down or control one's temper.

There are some clear comparisons between Gross's model and Eisner's definition of the connoisseurial process. "Situation selection" and "situation modification" bring to mind a connoisseur visiting a gallery to view a masterpiece, and then viewing it from different angles; "attentional deployment" by focusing on a specific aspect of a situation (or object) and /or

concentrating explicitly on the emotion a situation creates corresponds directly to the Descriptive and Interpretive / experiential components of Eisner's model; while "social comparison", "reframing" and "re-appraisal" are all terms that resonate with Eisner's consideration of an object's thematic and contextual aspects. The whole connoisseurial process, in fact, could be considered an exercise in "Response Modulation": learning to recognise, understand and control our emotions. Could Eisner's connoisseurial process, therefore, provide a framework for improving emotion regulation, and thereby our assessment of the value of ideas?

Shock, Innovation and Changes in Networks

How might connoisseurs' enhanced ability to regulate their emotions help us assess challenging and controversial new ideas? Let us consider what happens when shocks and controversies occur. Art has always had the capacity to generate "sensation" (in every sense of the word), and for the past several decades the desire to shock and outrage the viewer has become more commonplace (e.g. Saatchi's infamous "Sensation" exhibition). The postmodernists explored themes of transgression and taboo, with Foucault and Derrida in particular highlighting how art can impact upon our sense of identity and tradition, sometimes violently, in ways that break apart networks of meaning and allow new ideas to be constructed from the pieces (Wicks, 2001; Boyne, 1990).

Another direct comparison can be drawn between these "destructive / creative" cultural processes and the processes of the mind and brain. Greenfield (2008) states that, at a physiological, neuroscientific level, ideas are formed by synaptic connections between neurons, and the mind is the overall sum of these connections, constructed in our brains as we grow, learn and experience life. She further defines "creativity" as the process where sensation and emotion break these connections. This breaking of links, in turn, can allow new, meaningful connections to form that extend and change the shape of the neuronal network.

While it is impossible, currently, to measure such changes of neuronal network shape in the brain of a live subject, it is worth noting that Greenfield and others (e,g, Bassett and Bullmore, 2006;Tang et al., 2006) note similarities between the structure of the brain, and the structures of both social and semantic networks, and also that attempts have been made to model the brain, social and semantic networks using the same techniques (Sporns 2002). So it may be the case that the changing shape of social networks and the fresh connections that form between individuals and institutions when social events take place could indeed provide a picture of inspiration occurring at a social level. Further research into this topic is proposed in the conclusion of this paper.

It is important, however, that the process of breaking networks apart is not *too* vigorous. Johnson (2010) suggests that *all* creativity (right back to the creation of life itself from the primordial soup) has a better chance of occurring in "liquid networks" (one of which he considers the brain to be). Liquid networks are environments that provide the correct balance of order and chaos, allowing molecules, neurons or ideas to rub up against each other, break apart and form fresh connections. Key terms here are "balance" and "meaningful": too much shock or chaos kills the new idea before it gains traction; and "meaningless" connections do not new ideas make.

How does maintaining a balance between order and chaos manifest itself in the connoisseurial world? Eisner was influenced heavily by the psychologist and pragmatic philosopher John Dewey (Donmoyer, 2005), who believed that hard-and-fast rules for the appreciation of art stifled innovation. Dewey (1934) pointed to contemporary reviews of the

masterpieces of Impressionism that criticised them for "sloppy technique" when the artists concerned were, in fact, masters of old techniques, but had gone on to invent new ones. If, rather than appreciating art by rote, the critics concerned had applied a wider range of expertise and contextual knowledge to their evaluations, they would have recognised the innovation inherent within Impressionism, and history would have judged their contribution more kindly. The successful connoisseur, therefore, expertly strikes a balance between remaining open to the "chaos" of sensational, challenging new ideas, while retaining the "order" of a knowledgeable and educated mind, and well-regulated emotion, with which to cope with shock and evaluate underlying meaning.

Public, Socio-Political Factors in the Dissemination and Debate of Ideas

The suggestion that connoisseurs can teach society to regulate emotion, and hence attain the perfect mental balance between "order" and "chaos" to evaluate the worth of challenging, innovative ideas, soon hits a problem, however: connoisseurship is a *private* activity. To contribute their knowledge and skill to society, connoisseurs must, therefore, become critics. To quote Eisner:

> Connoisseurship is private, but criticism is public. Connoisseurs simply need to appreciate what they encounter. Critics, however, must render these qualities vivid by the artful use of critical disclosure. Effective criticism requires the use of connoisseurship, but connoisseurship does not require the use of criticism. (Eisner, 1985, p.93)

Why does effective criticism require connoisseurship? Isn't everyone entitled to an opinion? Doesn't attaching conditions of knowledge, skill and expertise to participation in critical discourse make debate less, not more, democratic?

Eisner and Dewey believed that the critic must also be a connoisseur because criticism is (or at least has the potential to be) an art form in itself. Good criticism exists in a symbiotic relationship with the art or culture it criticises, and, by enhancing our connoisseurial skills it can in turn improve our appreciation of ideas, life and culture. Dewey states:

> The moral function of art itself is to remove prejudice, do away with the scales that keep the eye from seeing, tear away the veils due to wont and custom, perfect the power to perceive. The critic's office is to further this work, performed by the object of art. Obtrusion of his own approvals and condemnations, appraisals and ratings, is sign of failure to apprehend and perform the function of becoming a factor in the development of sincere personal experience. (Dewey, 1934, p.338)

For Dewey and Eisner, then, to be a critic obliges us to do more than merely state our opinions, unqualified, without the support of our knowledge and expertise. It obliges us to try and help others to see and understand what we perceive, and what know, about an object or idea, and in helping others see the value of an idea, we help it to spread, and generate support for it.

Museums, Democracy and The Public Sphere

The concepts of "criticism" and "democracy" have been inextricably entwined (in the West at least) since the Seventeenth Century, when liberal democracy first began to flower. One of the cornerstones of liberal democracy is, (in principle), public debate that enables the criticism of society and government. In order for such debate to be effective, so the principle holds, it must be carried out in a rational mode of discourse; free of emotion and self-interest. Habermas termed the space within which such "disinterested", rational, critical discourse happens, the "Public Sphere" (Calhoun, 1992).

Modern museums came into being around the same period as modern democracy, and have always been part of the Public Sphere, providing participants in public debate not only with subject knowledge, but also opportunities to assume "public personae", act with civility and practise behaving "in public". Some tension has always existed within the museum sector as to which is the more important function, rising from concern that a requirement to behave "civilly" dissuades some people from entering museums, either out of resentment at having their mode of behaviour dictated to them, or fear of behaving "inappropriately" (Barrett, 2011).

Difficulties with defining what constitutes "civility" highlight perhaps the biggest flaw in the Public Sphere concept; that it is based on the mythical separation of head and heart, formulated by figures such as Descartes and Kant, that, as discussed, has no basis in human physiology (Damasio, 2011; Pinker, 1998). This makes the type of "disinterested" behaviour required to participate in public debate, if not impossible, at least difficult to achieve: there are skills required to take part that need to be acquired. Also, as Foucault stated, control of the definition of "civility" enables the powerful to erect artificial barriers to entry into the debate for those that may threaten their power with innovative, alternative viewpoints (Boyne, 1990).

The Effect upon Democracy of Control over Information Channels

Another issue with the Public Sphere concept, then, is that it favours the powerful. While the debate is theoretically open to all, the need for knowledge and wilfully obscure etiquette among the participants effectively bars the time-and-money poor from entry (Barrett, 2011). Also, once some of these barriers start to break down, due to wider access to education, or an increase in wealth and leisure time in the population, further problems with the Public Sphere begin to emerge.

Habermas considered the golden-age of The Public Sphere to be its early days, the period he dubbed "the bourgeois Public Sphere", when participation in the debate was limited to the great and good, many of whom had altruistic beliefs about the betterment of society. Once participation spread, however, (due in part to the altruists' sponsorship of education and knowledge among the masses), opportunities for powerful vested interests to influence the debate began to emerge. This resulted initially in nation states and their dehumanising ideologies (imperialism, fascism, communism) co-opting the Public Sphere and supressing the critical activities of its participants. Even when such ideologies were rejected, however, the mechanisms of discourse (mainly the mass media) were still largely controlled by capitalist corporations, which use techniques like advertising and public relations to influence the debate unduly in their favour (Calhoun, 1992).

Mass media channels such as television and newspapers are used both to define "civil" behaviour (to justify excluding dissenting voices), and "reframe" the debate (to support the agendas of their owners while distracting attention from controversy) (DeLuca, Lawson et al., 2012). This societal-level attention deflection can involve prioritising the personal and private,

by using gossip about the private lives of celebrities, for example, thus causing the personal aspects of our own lives to assume greater importance and making the state of rational "disinterestedness" required for entry into public debate even harder to achieve (Calhoun, 1992). This is often conducted with a false coating of "objectivity" or "rationality", which either lulls us into belief that the "truth" exists on the side of the debate the mass media support, or raises cynicism to the level where we are demotivated from entering into the debate entirely (Connolly, 2002).

Along with the mass media, museums have also provided an effective tool for the powerful to maintain their influence upon society. According to Hooper-Greenhill:

> In the museum environment where equal rights offer (and indeed require) multiple perspectives, and thereby the articulation of many potentially conflicting points of view, newly pleasurable technologies of discipline and control have evolved to soften the contradictions and to disguise the inequalities. The total experience.., the total immersion.., can have the function, in the apparent democratised environment of the museum marketplace, of soothing, of silencing, of quieting questions, of closing minds. (Hooper-Greenhill, 1992, p. 214)

The state, then, may co-opt museums to house "national collections" and aggrandise the concept of nationhood. Private enterprises may also sponsor museum events and exhibitions for PR and branding purposes (Barrett, 2011). The potential for such influences to "sooth and silence" legitimate, democratic concerns about "contentious" topics in museums can thus have the effect of disconnecting museums from the communities they purport to serve (Russo, 2011).

Can Social Media Improve the Democratic Process?

One way to consider the attempts of the powerful to control critical public debate is as the imposition of "order", from "the top down". As discussed, at a personal level, the over-imposition of order (e.g. too many "rules" when appraising art) can stifle innovation. However, certain commentators (Johnson, 2001; Connolly, 2002) believe that the inherent flexibility of the people in society and their capacity for natural self-organisation can cause order to emerge naturally, in the form of micropolitical grass-roots movements that emerge from "the bottom up" as an alternative to order imposed from above. The natural state of a society of creative creatures such as humanity, therefore, may be that balanced zone, the "liquid network" between order and chaos within which creativity and ideas can thrive. Since the onset of the "New Museology" in the late 1980s, the idea has taken root that museums are in a perfect position to become the hubs around which self-organising, liquid networks of visitors and local communities form naturally, rather than being channels for the powerful to attempt to control the debate from above (Barrett, 2011).

Much has also been stated about the role social media has as a facilitator in the emergence of grass-roots political and protest movements, citing examples such as Occupy (DeLuca, Lawson et al., 2012) and the campaign for justice regarding abuse in the Catholic Church (Shirky, 2009). However, there are some who claim social media's potential for democratic change may be overstated. These dissenting viewpoints are discussed below.

One change that social media has made to the Public Sphere is that established mass media channels, if not threatened with obsolescence, now face strong competition for attention. Media channels are proliferating exponentially, both in the older technologies (there are now hundreds of television channels in the UK, compared to the tens there were twenty years ago) and also in relation to web-based media. Now billions of us have media

channels associated directly with our lives, in the form of blogs, Facebook pages, Twitter timelines and so on (Shirky, 2009; DeLuca, Lawson et al., 2012). The communities of shared interest that form online are also of increasing help to the filtration and management of this proliferation of channels (Johnson 2001). The museum sector is as involved in this revolution as anyone; even the smallest museums have opened multiple channels and are exploring their possibilities not only for marketing and visitor analysis, but also for the production and broadcasting of cultural content directly to their audiences (Finnis, Chan et al., 2011; Russo, 2011).

However, does the removal of technical barriers to getting our voices heard make the world more democratic, necessarily? There are several reasons why it might be too soon to make that statement. Dahlberg (2006), used Habermas's "theory of rational communication" as the basis for a review of the issues that might prevent social media from fulfilling its potential to facilitate truly democratic debate. He states that Habermas's theory lists the following six key factors within the democratic debating process:

1. Autonomy from state and economic power: the debate must concern issues relevant to citizens, not vested interests.
2. Validity claims must be exchanged and critiqued during the debate: the debate is a reciprocal, rational critique, not the repetitive restatement of dogmatic assertions.
3. Reflexivity: participants must be open to the process of self-criticising their own positions.
4. Ideal role-taking: participants must attempt to view the issues being debated from the point of view of their opponents.
5. Sincerity: each participant must make a sincere attempt to disclose all information about themselves and their background relevant to the debate.
6. Discursive inclusion and equality: every participant affected by the issues under debate has an equal right to contribute their point of view to the debate.

Dahlberg concludes that the web and social media have problems, currently, that relate to most of the six factors. On the positive side, while by no means ideal, some of the ways in which social media have improved the state of the first and sixth of the factors above have already been mentioned, and Dahlberg's review (perhaps surprisingly) also provides a positive picture of the second. So the discussion below concentrates more upon factors three to five.

As far as "sincerity" is concerned, many perceived problems with social media concern the issue of anonymity. Most social media platforms currently enable a high level of anonymity among their users, which in turn enables wild accusations (e.g. the "Trial By Twitter" furore in the UK involving false allegations regarding Lord McAlpine (Burrell, 2012)), and disingenuous propaganda (e.g. the humorous, penguin-based "amateur" video mocking Al Gore, uploaded to You-Tube by Exxon's PR department (Keen, 2007)). Allegations have also been levelled at the US government and military regarding "astroturfing"; the creation of numerous fake personae for posting comments or blog posts in order to imply greater support for a cause than really exists (Lovink, 2011; Monbiot, 2011).

With regard to factors three and four, other difficulties inherent in the practice of debate at a distance can be caused by the lack of immediate, non-verbal feedback of the sort received when interacting face-to-face (Pinker, 1998; Johnson, 2001). Lack of such feedback may encourage the high volume of amateurish, immature and ill-tempered behaviour that (at least the mass media would have us believe) takes place within social media, and some think this does indeed threaten social media's potential as a mechanism for democratic debate. Lovink (2011), for example, describes the "resentment and bad temper" contained in the "useless ballast" created by the vast majority of comments, placed online due to a "wasted human compulsion" on the part of the commentator to have their "micro-opinions" recognised by a

tiny and uncaring audience. Dahlberg also describes the ease with which it is possible to "opt-out" of the debate by restricting activity to sites where like-minded fellow users will congregate (e.g. left-wing people tend to leave comments on the fora of left wing newspapers). Keen (2007) refers to the "noble amateur" mythologised by social media's supporters, a term which he considers a modern version of the Romantic idea of the noble savage; symbolising the triumph of innocence over experience and wisdom.

Whether or not "amateurishness" is a major problem for social media per-se depends not only, of course, on the context of the debate, but also upon whether or not, like Keen, "amateurishness" is defined as a "lack of expertise". If so, then amateurishness is indeed likely to lessen the quality of debate. But isn't an insistence that expertise belongs in "the proper channels" (as at appears Keen prefers) encouraging a little too much order, and perhaps stifling creativity as a result? In other words, does it matter greatly if someone is a "noble amateur", if he or she is also a connoisseur and critic, and can discern the most meaningful details of the debate, then contribute an articulate and erudite response?

Conclusion: Proposed Research to Help Museums Improve Inspire Society and Engender Informed Debate

As institutions which house and display objects of historical and cultural significance, and which have networks of visitors and followers, museums and galleries ought to be well placed to help members of the public attain and practise connoisseurial and critical skills, and in doing so make a vital contribution to the improvement of democratic critical discourse in the modern world (Russo, 2011). Taking this statement as a starting point, research is proposed that will monitor the spread of ideas engendered by museums, then capture, analyse and assess the quality of the debate that ensues regarding these ideas. This research, described in more detail below, will be conducted with the intention of suggesting changes to social media usage and online practices that will help museums improve their performance in these areas.

Museums and galleries now have the tools they need to be able to tackle the challenge of stimulating, facilitating and moderating genuine, creative, democratic critical debate among the population. The research proposed here will help them by monitoring the activity that occurs in their social networks as they hold exhibitions, display new items; and generally challenge the intellects of their visitors. It will analyse the changing shapes and demographic compositions of the social networks surrounding museums, and indicate whether or not visitors are debating about topics inspired by museums and galleries on their own social networks. The underlying intent of the research is to measure how successful museums can be at stimulating, then moderating, debate regarding topics of direct relevance to today's society. In taking measurements of this sort, the proposed research will provide tangible evidence of the value that museums and galleries can deliver to modern democratic society.

How do Museum Social Networks Enable Innovative New Ideas to Form and Spread?

If we consider, like Greenfield (2008), Johnson (2010) and others, that innovation springs from the formation of fresh connections in liquid networks such as the neurons in the brain, or the set of connections in a social media network (such as a set of Twitter followers or Facebook friends), then an analysis of the fresh connections that form within a museum or gallery's social media network as the institution in question holds and promotes an event or

exhibition may point to empirical examples of inspiration and fresh ideas that were engendered by that event.

To this end, longitudinal studies of museum social networks are proposed, to map the new connections formed, or existing connections strengthened (e.g. by observed interaction between the museum and the individual concerned), in the run up to, during and after an event held by the museum in question. The number of connections broken during the period of the event will also be considered, in order to judge whether any controversy stirred by the event may have caused pieces of the network to break apart,

Can Museums Improve the Quality of Debate Regarding Contentious Issues?

It can be claimed that museums are in a convenient position to tackle some of the problems that arise concerning the particular factors of "reflexivity" and "ideal role taking" that influence rational communication as discussed by Dahlberg (2006). For instance, it is perhaps the case that museums could provide a more neutral, pluralistic environment for debate than, say, a newspaper site could offer. Russo, however, describes the state that museums can sometimes fall into when they attempt to tackle controversial topics:

> Contentious topics are often difficult to represent; they can involve conflict and are challenging to values, beliefs, and ideologies, and consequently have tended to be seen as challenging to institutional foundations and the philosophical integrity of the museum. This lack of self-critical reflection has resulted in problematic cultural exchanges in which museums have held a privileged existence: often unaligned with government policies; repeatedly creating their own polemics by reiterating their existing conventions; disconnected from either community or commercial concerns.(Russo, 2011, p. 332)

According to Calhoun (1992), Habermas considers the "bourgeois Public Sphere" to be its golden age not because exclusion of the masses from the debate allowed the wheels to turn more efficiently, but because the debate was based upon "universal characteristics of human communication" that created a "normative ideal" that enabled productive debate. Debate during the bourgeois Public Sphere took place in an atmosphere of erudition and eloquence, close to that described by the theory of rational communication, in which emotion was well regulated, and where the participants were not merely stating dogmatic opinions as irrefutable facts, but trying to express the meaning in their arguments with which their opinions were underpinned – just as the critic described by Dewey and Eisner would.

Research is proposed, therefore, that will analyse the scope, volume and quality of the online debate that surrounds museum activity, with particular emphasis on the points of view of the participants. The research will, in particular, look for examples of how consensus may have been reached by the participants. This research will also consider whether there is indeed something about museum content and activity in particular that enables effective online debate, and will provide valuable information for museums about how to use their content and information to better facilitate such debate in future.

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Improving Brand Recognition through Sensory Design: A Case Study of H&M

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Abstract

Situated within the clothing retail industry H&M are discovered to be struggling in making each of their stores unique yet recognisable. Thus, this study aims to investigate and develop a sensory design strategy for the improvement of H&M's in-store brand identity. A conceptual framework has been developed based on theoretical models of brand identity, sensory marketing and Brand Recognition. In order to achieve the research aim, an ethnographic approach that combines direct observations and interviews, a party group and a questionnaire survey were employed as research methods in this study. The field-based ethnographic approach focused on developing a good understanding of how sensory design has currently been implemented by H&M in comparison with other fashion brands. In the party group, power of the sensory stimuli was tested via activities and greater discussion on sensory design and brand recognition was initiated. Finally, a questionnaire survey was conducted to quantify the key findings from the ethnographic approach and party group so as to identify the most powerful sensory stimuli for improving H&M's brand recognition. It has been found that most of H&M's stores did not have strategic implementation of the senses that could be considered as expressive of brand recognition. An overall agreement saw the H&M shopping experience was neither memorable nor expressive of brand recognition. Effectiveness of the olfactory sense has been found as the most powerful sensory stimuli for improving of brand recognition.

Keywords

brand Recognition; Sensory Design; H&M

Prevalent within fast fashion, branding has rapidly evolved from a distinguishing name, to an important and lucrative source of competitive advantage. Delivered through numerous channels, branding within stores in particular is becoming more imperative than ever in such a saturated market place (Berry, 2013). As new technological innovations surge, the clothing retail industry is progressing leaps and bounds through digital forms of marketing and online shopping. Hughes (2012) highlights that this is having a detrimental effect on the success of many brick and mortar stores. As a result, a fundamental shift from product orientation to in-store customer experience upon us. Many high street fashion brands are struggling in this volatile climate, in particular, the international fashion brand H&M. Due to the rise in Internet shopping and as a result of the constantly changing streetscapes of each store, H&M are finding it a challenge to make each of their stores unique yet recognisable amongst their competitors (Annual Report, 2011). As expansion is a large part of H&M's growth strategy, and they aim to increase the number of their stores by 10-15% each year (Annual Report, 2011), it is even more difficult for H&M to improve their customer experience and maintain

Brand Recognition (BR). Meanwhile, due to the economic downturn and rapid growth of competitors within the fast fashion industry, BR is more valuable than ever. It has been agreed that strong BR will help companies to create lasting customer loyalty and increase market share (Wheeler, 2009). Therefore, H&M do need to improve its BR to survive in this fast evolving industry. Many studies have suggested multiple approaches to improve BR, such as social media, advertising and store design (Kotler *et al*., 2010; Bruich *et al*., 2012; Berry, 2013b). However, few of them have discussed the application of sensory design in BR.

In the field of design research, Sensory Design (SD) has been well discussed for the improvement of customer experience, especially for in-store shopping (Ebster & Garaus, 2011). Bypassing ones rational decision making to their emotional state, sensory design is a valuable asset to a brands strategy (Hultén *et al.,* 2009). Also, some studies highlighted that our sense organs are strategically targeted within everyday design to influence consumer perception and increase desirability of a product/experience (Lindstrom, 2010). For instance, the Bentley Continental GT has adapted car acoustics for reduced noise and an identifiable "Bentley sound" arousing the olfactory sense (Lindstrom, 2010). It also has a carefully considered interior for the stimulation of the touch and sight senses in accommodating a supreme driving experience. Thus, effectively applied SD can have a great impact on consumer experience and purchasing behavior. Therefore, this research aims to investigate and develop Sensory Design strategies for the improvement of H&M's in-store Brand Recognition.

The structure of this paper will proceed with a literature review of BR, SD and Brand Identity (BI) theories, followed by a methodology of research. Subsequently this paper will see a discussion of the findings within the format of BI, In-Store Experience and Personal Perception. Finally, a conclusion highlighting the most significant results and recommendations for H&M to improve its brand recognition will be presented.

Literature Review

Brand Recognition

According to Wheeler (2010) BR is the outcome of a strongly expressed brand image. It has been applied to increase the level of brand awareness within the consumers mind as a result of the experiences they encounter with the particular brand (Childers, *et al.,* 2012). Wheeler further stated that BR could also result in growth opportunities and provide the means for the consumer to distinguish one brand from another. Kapferer (2012) and Kotler *et al.,* (2010) highlight that the attainment of sustainable BR requires a greater connection with the consumer due to the changing demands of the economic climate; a connection that engages the consumer on the level of Mind (M), Heart (H), and Spirit (S). Thus the need for a brand to provide a more meaningful experience representative of their identity is reiterated. To be meaningful is to be memorable, and this can be attained through both tangible and intangible experiences that interact with the human senses. The brands personality must be at the heart of the experience to allow the consumer to identify with the brand (Klink & Athaide, 2012). Thus, enforcing applications of BR will help H&M to provide better customer experience and increase customer loyalty so as to improve its business performance.

Many studies and examples have suggested numerous approaches to improve BR, from diverse aspects such as celebrity endorsement and collaborations (Seno & Lukas, 2007; Rindova *et al*., 2006), visual merchandising (Kerfoot et al, 2003) and social media (Bruhn et al, 2012). For instance, singer Rihanna has paired with the fashion brand River Island to launch a fifty-piece collection (Jones, 2013); Kelly Brooke has her own lingerie line with the

high street chain New look, and a current celebrity endorsement is actress Milla Jovovich for Sisley's spring/summer 2013 advertising campaign (Ramirez, 2013). "Pop up" shops are a new method for increasing BR; they are regarded as a retail strategy to reach a larger amount of consumers for increased BR (Morris, 2013). Nike, Dior and Louis Vuitton are brands known to have recently used this new method. From a social media viewpoint, the online fashion brand ASOS are a prime and successful example for this method in which they created a campaign on Facebook whereby consumers were encouraged to play games to earn points that placed them closer in the virtual queue for their online sale. Though studies of BR research are extensive, there is a paucity of studies discussed application of SD in the improvement of BR. Therefore the following section presents a review of related studies in SD research area.

Sensory Design

SD is a strategy that is developed around the five human senses; taste, touch, smell, sight and sound (Hultén *et al.,* 2009). It has been widely applied to enforce and clarify brand identity through the arousal of each sense (Kuikka & Laukkanen, 2012). As a fuel for brand awareness, SD has the power to instill sustainable brand image within the consumers mind (Lindstrom, 2010).

Hultén *et al.,* (2009) and Lindstrom (2010) view sensory design as a salient strategy in the journey to brand awareness. They believe that the sight sense has dominated almost all marketing practices even though there is an increasing application and awareness of the other four senses within store and experiential design. They also persuaded that sensory design has the ability to encourage self-actualisation for the creation of meaningful relationships between consumer and brand on the level of heart, mind and spirit. Due to the route sensorial data travels within the brain, neuroscience suggests that decisions based on logic are inferior to emotional ones (Carter, 2010). Thus sensory design has the power to arouse the consumers' emotional state and obtain a more meaningful relationship that will ultimately fuel recognition (Carter, 2010).

In respect of store design, an engaging experience via the sense organs is fundamental. Involving aspects of store design, application of the sensorial stimuli can be achieved in numerous ways, some of which involving a branded scent pumped through the stores ventilation system, or associating a certain type of food to the brand that is made available within store. Visual aid can be applied through type, lighting, graphics, colours and media. The sense of touch can be stimulated through an interactive store layout and textured interiors, and music associated to the brands personality could be played, or even the invention of a jingle can be developed to arouse the sense of sound.

Development of a conceptual Brand Recognition Sensory Cycle framework

According to the literature review, many researchers have discussed the development of BR mainly from three perspectives: BI (Kapferer, 2012; Keller, 2013), in-store experience (Floor, 2006; Joshi & Kulkarni, 2012) and personal perception (Ha *et al.,* 2012).

Brand Identity

BR is reliant on the expression of BI at every touch-point that appeals to the human senses (Childers, *et al.,* 2012). It is suggested that this expression is consistent and representative of what they are, what they stand for, and their values, rather then focusing solely on their product offering (Wheeler, 2010). Furthermore, a prominent feature within literature is the

creation of meaningful relationships between brand and consumer that can offer them value, and appeal to their needs and desires on an emotional level particularly in a time of economic downturn (Hughes, 2012). As ones emotional state lies within their Heart, Mind, and Spirit (Kotler *et al.,* 2010), it is visualised that all efforts of creating BR are targeted and attained through these three perspectives.

In-Store Experience

For a long time, the senses have been incorporated within store design to enhance the consumers shopping experience. Known as "in-store atmospherics" sensory stimuli has been employed on a discrete level throughout store environments to encourage purchase behaviour (Ebster & Garaus, 2010). However, now that the economy is seeing a shift from a product to human focus, in-store experience is becoming enforced to a theatrical degree (Pine & Gilmore, 2011). Pine and Gilmore (2011) also suggested that these theatrical experiences provide for a stimulating and memorable experience beyond the result of purchase behaviour but for self-fulfillment. Thus it is depicted at the heart of the framework that sustainable BR will develop through the resonance of the brand and perception of ones self. To achieve this, the next stage of the framework is transforming the brands identity into an in-store experience. It sees the physical implementation of sensorial stimuli that exude the brands personality; as a result the consumers' perception of the experience is formed supporting the development of BR.

Personal Perception

Beyond the experience itself, a large part of SD is the perception that is formed as a result of the experience. As previously acknowledged a brand is in need of communicating with consumers on a more meaningful level to which studies by Hultén *et al.,* (2009) and Joseph, (2010) explain that SD is a logical strategy to apply in obtaining this meaningful engagement. Perceptions are continually created within ones mind as a result of sensory stimulation (Carter, 2010), and whilst a company can't force consumers to perceive their brand in a way to ensure customer loyalty, a brand can persuade the form the personal perception makes; by controlling the environment and type of experience the consumer is exposed to, ones senses can be stimulated to an optimum arousal level that can endorse pleasant feelings towards the brand (Ebster & Garaus). Furthermore, Carter (2010) explains that repeated exposure of amiable experiences increases the rate of memory formation as well as its longevity within ones mind. Therefore personal perception is key to the success of BR and is depicted as the third step within the conceptual framework.

Based on these three perspectives of BR, a "brand recognition sensory cycle" framework has been developed and visualised in Figure 1. This framework has been applied as theoretical foundation and led the research design of this study.

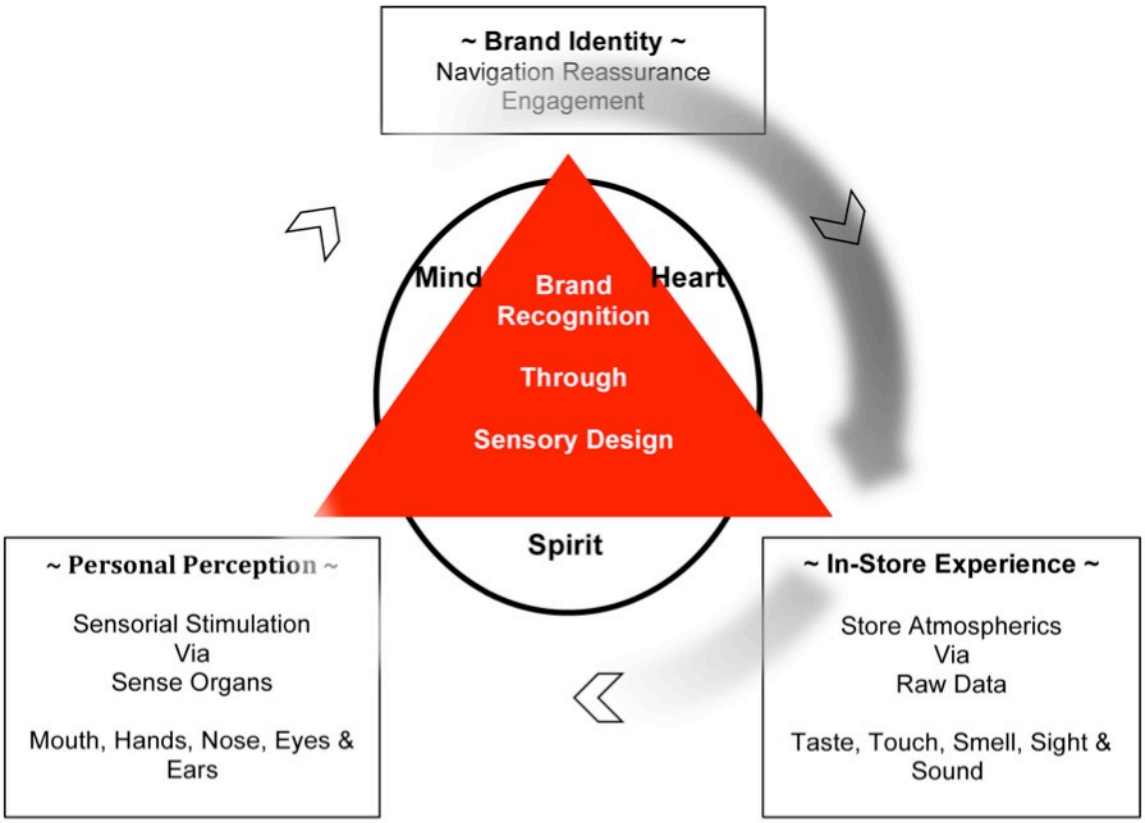

Fig 1. Brand Recognition Sensory Cycle

Methodology

In order to achieve the research aim, an ethnographic approach, party groups and questionnaires were employed in this study, as seen mapped out below in Figure 2.

Ethnographic Approach

An ethnographic approach combining interviews and observations was applied, to discover H&M's customers' current in-store experience against its competitors. Defined as the observation of lived human experiences, an ethnographic approach is an effective qualitative process that can uncover and highlight patterns within a natural environment (Angrosino, 2012, p. 15). Thus, this method was chosen for its experiential nature, and has been applied to uncover key patterns of in-store experience for brand recognition, as well as highlight opportunities in which brand recognition can be improved. Interviews were specifically applied to investigate H&M's customers' personal perception and emotional feelings towards H&M's brand recognition. In order to find out which sensorial stimuli has been the most effective for recognition, it is important to obtain the consumers' interpretations of the use of sensorial stimuli within a shopping experience. Based on many researchers recommendations as a result of its effective approach in understanding people's perceptions, experience, and emotional feelings by providing a more in-depth discussion than other research methods (Laurel, 2003), the method of interviews have been employed to assess the current level of recognition within the consumers mind. Moreover, observations were conducted to address the mechanical aspects of the sensory design related shopping experience, including lighting, sounds/music, and merchandising.

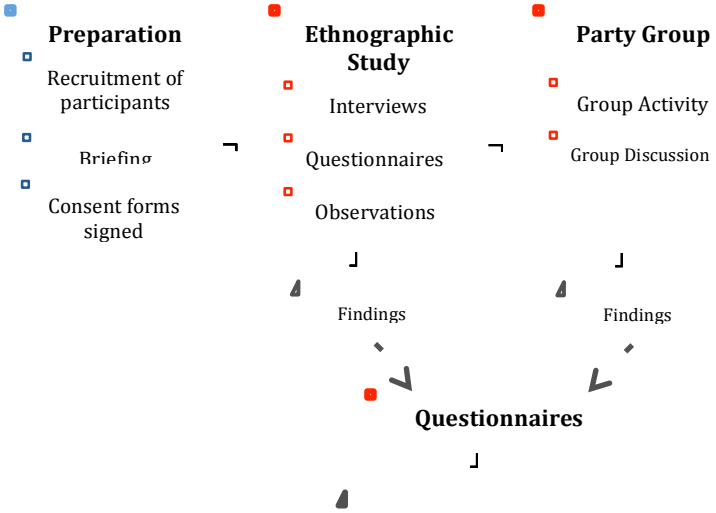

Figure 2. Methodology Map

There were three stages in the ethnographic approach: prior to the shopping experience interview, in-store shopping observation, and post-shopping interview. The first stage was designed to gain a brief understanding of the participant's current viewpoint toward in-store atmospherics, their shopping habits and perception of the H&M brand. It helped set the scene and get to know the participant. During the second stage, the researcher observed the participants' shopping behavior and experience. The final stage focused on discovering the participants' immediate post-shopping in-store experience and awareness of the brand. Six participants were invited to this ethnographic study, including equal amounts of both men and women. The participants were asked to visit H&M as well as one other chosen store. Prior to their shopping experience they completed the first stage of the interview process; they were then required to spend at least fifteen minutes within each store on their own as to not impede on their thought process. Following this, they returned to complete the final post-shopping interview stage. Taking field notes, the interviews were documented on an interview sheet compiled with systematic pre-designed questions. Although built up of mostly categorical questions, they were used more as starting points to initiate greater discussion on the topic at hand. Within the scope of "H&M's brand identity" and "in-store atmospherics" the questions were grouped into themes suited to the different stages of the interview. This structure of this research design was employed to provide consistent and thorough data collection from each participant that was interviewed. All information was collated and formatted into a table for the ease of coding in which links and patterns of significance were analysed, using pie charts and graphs that brought the data to life.

Party Group

Drawing upon the results from the ethnographic approach, a party group was applied involving the same six participants for further discussion of sensory design within a store environment. In particular, a sensorial stimulating activity was carried out for the identification of the participants' current level of recognition toward the H&M brand and its competitors; this was designed to support suggestions to improve H&M's in-store recognition. A party group was selected as it lends itself to deeper discussion on a specific topic (Laurel, 2003). It obtains qualitative data via a fun and relaxed environment, thus stressing the relevance of this chosen method over a traditional focus group, whereby the

outcome can collect the participant's honest opinions and finer details of their experiences that may not be identified within a heavily scripted focus group (Laurel, 2003). Most importantly, a key characteristic of a party group is that each of the participants already know and are comfortable with each other, another way that evokes sharing of their experiences on more personal level. With more flexibility than a focus group the research topic is more in the participant's hands, and as a result the relaxed nature of this process has the ability to access a greater emotional connection, thus resulting in meaningful and genuine feedback in support of the research aim (Shedroff, 2003). Therefore, this research method can provide valuable insight into the factors of brand recognition within an in-store environment. With support of pre-designed activity sheets that each participant completed, field notes were also documented in a shorthand fashion to record the event. Following this, charts and graphs for ease of analysis represented key findings and patterns.

Questionnaire

Questionnaires were lastly applied to quantify the key findings of personal perception and in-store experience from the ethnographic approach and party group so as to identify the most powerful sensory stimuli for improving BR. Designed and distributed via the social media site "Facebook" on the Internet, this method was chosen for its ability to reach a vast sample size in an instantaneous manner. Although this digital distribution prevents the ability to clarify questions or resolve issues, the strengths outweigh the weaknesses. The consistency of questions to all who receive it, as well as its non-timed self-completion method is ideal for a larger sample size and will therefore support the purpose to quantify the key findings and obtain a better representation of the population. The structure of the questionnaire was based on the three perspectives making up the conceptual model. Divided into these three sections the design of the questionnaire saw categorical questions rather than open-ended questions to maintain a purely qualitative result. Distribution via Facebook provided the potential of unlimited responses however data was only collated and analysed from a sample size of one hundred completed questionnaires.

In obtaining the most relevant data for this study, participants who know and shop with the H&M brand were targeted for all research methods. This involved an age range of eighteen to thirty, a cross section of H&M's broad target market. Aside from the questionnaire in which a sample size of one hundred was used, the interviews and party group involved the same sample size of six participants. This enabled fair and consistent data collection particularly as one method followed on from the other.

Data Analysis

Developed around the conceptual framework, the ethnographic study was designed to understand the current level of BR H&M display within their store via sensorial stimuli, the consumers' perception towards their in-store BI and how memorable it was. Furthermore this ethnographic method sought to understand the engagement between the consumer and H&M's in-store experience. The significant results obtained were extracted and synthesized within a table to identify relative patterns to the production of a SD as well as inform the next stages of research: The Party Group and Questionnaire. Informed by the ethnographic research, the party group was looking to see the effectiveness of brand to sensory stimuli association. Activity sheets were used to accumulate the data from the sensory test in which the answers were calculated. Furthermore field notes from in-depth discussion over sensorial stimuli for improved recognition were used to develop the questionnaire design to quantify the findings of the party group. Submitted via an online social networking site the questionnaire results were accumulated digitally. The frequencies of answers were calculated and then transformed into pie charts to present the data. One hundred complete questionnaires were included in the analysis.

Findings and Discussion

Based on the research, the following key findings stood prominent:

- An overall confirmation to the lack of a strategic implementation of the senses not just in H&M, but in almost all stores.
- An agreement to the importance of in-store experience for brand recognition was concurred; yet insight demonstrated that this had not been fulfilled.
- A divided opinion to the employment of sensory stimuli within a store environment presented a controversial outlook to the use of sensory design.
- Supported by both qualitative and quantitative results was the unsurprising prevalence of visual stimuli, yet interestingly followed by the preference toward a scented experience.

Brand Identity

In regards to H&M's in-store experience, visual stimuli were the only apparent aid for the creation of in-store recognition. One participant mentioned that the most prominent reference to the personality of the H&M brand was within the window display, in which imagery of their latest ad campaign was presented. Some participants highlighted in the post-shopping interviews that although the store layout was simple to follow, well signed and brightly lit, identical sensory related brand elements were not well presented in the store. In other words, no strategic sensory design such as mood lighting, application of colour and texture or scent, has been applied in H&M.

Despite strong opinions towards the use of SD, the overall perception of H&M's in-store experience and representation of BI was found to be neither inspiring nor memorable. Two thirds of the participants felt that they had an easy shopping experience in terms of a simplistic layout, yet the in-store atmospherics did not stimulate them or exude the identity of the brand. The participants could only identify with visual stimuli and felt that their experience was in no way enhanced. Moreover not one participant felt that their experience had left a distinguishing impression of the brand. One participant in particular stressed within the interview "my in-store experience was uninspiring in H&M, the clothes were in a jumble everywhere, and there was no thought to making it a pleasant experience." Another participant added that "it was cheap and cheerful" further suggesting a lack of consideration to an inspiring and branded store design.

In-Store Experience

It has been found that a better implementation of sensory design in a store environment can support H&M to gain greater brand recognition. Based on the ethnographic study, it has been observed that very few fashion brands had achieved strategic recognition in respect of sensory design theory, in which all the senses must be applied. With the employment of four out of the five senses, only the Hollister brand provided the most superior sensory experience beyond the competition in which their store designs were very generic and similar.

Based on participants' shopping experience within H&M and Hollister, half of the participants expressed discontent toward sensory stimulation within a store environment. One participant stated that they found the Hollister experience over-bearing, to the point that they felt their senses were being abused. They were particularly irritated that they could not see the products well enough due to such dim lighting. On the other hand, the remaining three participants expressed a rivaling opinion of enjoyment towards the stimulating experience, in particular the use of scent throughout the store.

As a result of the Party Group, expected yet insightful suggestions were obtained. Further discussion prompted a second thought to the Hollister experience. It was revealed that the remaining participants would enjoy their experience if the level of stimulation were to be reduced; for example slightly brighter lighting. Further thought towards the H&M experience reiterated its lack of memorability thus preventing BR. In regards to the activity, a scent test was arranged in which fragrances sold in H&M and three of its competitors were used to test the participants level of BR. Proving in favour of the olfactory sense, results showed recognition of the Hollister scent over all other brands. This is not such a surprise as the ethnographic research identified Hollister as the only store with olfactory implementation, of which the participants will have been exposed every time they shopped. This stresses the powerful affect of memory formation through the continual exposure of scent within a store environment. Moreover, a preference to interactive and stimulating shopping experiences was emphasised as well.

Overall the level of sensory application was very minimal and not evident beyond the senses of touch and sight. Far from reaching the consumer on the level of heart, mind and spirit, the result of this ethnographic study remains in favour of a SD for the improvement of H&M's in-store brand recognition.

Personal Perception

Based on the participant's feedback from the pre-shopping interviews, all participants agreed with the importance of in-store atmospherics within a store environment for both engaging experiences and distinguish between brands. One participant felt that in-Store design should represent the brands personality, they stated, "store design expresses the unique qualities of the brand that distinguishes them from its competitors".

Based on the ethnographic observation, it has been found that two thirds of the participants generally spent a longer amount of time within the Hollister store over H&M. They confirmed that Hollisters' in-store environment was more attractive than H&M in the following after-shopping interviews. This interestingly notes a correlation between the time-spent in-store to the level of sensory stimuli within it. Prolonged contact time between consumer and brand naturally increases the ability to make a connection and increase their recognition of the brand. Thus the relevance of implementing a SD strategy within H&M's stores is supported.

According to the questionnaire results, 81% of the participants believed that sight should be considered as the most important sense for improving brand recognition. And smell was believed to have the power to create lasting recognition within a store environment. These results are consistent with outcomes from the interviews. Steering the responses around H&M, participants intriguingly concluded that scent would have the ability to create recognition within H&M's store more than sound. Further agreements suggested that H&M would suit a more contemporary and subtle scent over an exotic and vibrant scent.

As a result of these findings the following recommendations have been suggested for H&M to improve their brand recognition within each of their stores.

1. **Touch**: It can be argued that the more styles the clothes are laid out within H&M's store the more the touch sense is applied, however it is suggested that a more innovative way of using this sense is employed within the store through packaging. An idea is that H&M could create an economical bag (in particular the texture of the handles) that sits in line with their sustainability values and yet unique to the H&M brand for improved BR.
2. **Taste**: Like the previously identified collaboration between singer Rihanna and fashion brand River Island, it is suggested that H&M could collaborate with a particular food brand like Ben & Jerrys or Nandos. This would associate the brand

to a certain taste and moreover, a lifestyle. Furthermore, this could be expanded into a form of loyalty scheme to further improve customer loyalty for both collaborators. For example, the purchase of a certain item of clothing or accessory could provide you with points to receive a free or discounted meal or item of food from the chosen brand.

3. **Sight**: Although this was the one sense H&M had employed in the attempt of brand recognition, this paper suggests further use of graphics within their store to maintain their identity beyond a window display. Associated to excitement, love and stimulation the colour red of the H&M logo could be considered within the interior design of the store to make it more distinctive and memorable.
4. **Sound**: Currently without music, it is recommended that H&M identity a genre of music they feel is best suited to their personality and play this within their store.
5. **Smell**: As the preferred stimuli within a store environment it is proposed that H&M select an existing fragrance that they sell in-store or create a new signature scent to be diffused throughout the store via their ventilation system for great impact or through a stand alone devise for a subtle engagement on entering and exiting the store. For example, floral scents could be used to increase the time consumers spend in-store: important for the improvement of BR.

Despite the research and preference of one sense over another, congruence is key throughout all the experiences. Rather than deciding which is the most important component, it is how they work together in achieving consistent brand recognition that is key (Ebster & Garaus, 2011, p 133).

Conclusion

Investigating Brand Recognition (BR) and Sensory Design (SD) theory, this study was motivated around the volatile state of the fast fashion industry. Specifically concerned with the growth of the fashion brand H&M, it sought to improve the recognition of their brand within each of their stores.

A literature review was carried out to which substantial research supported an argument as to how and why H&M need to improve their in-store recognition to remain competitive and ensure the survival of their expansion strategy. Key studies expressed the need for sensorial in-store experiences that engage with the consumer on the level of heart, mind, and spirit, for sustainable recognition.

Based on the “Brand Recognition Sensory Cycle” framework, a methodology of research was presented. Built up of three different research methods. It involved an extensive three stage ethnographic approach, party groups and questionnaires. The data collected from the research provided this study with salient insight into H&M’s current employment of the senses, the participants’ personal perception of the H&M brand and their in-store experience.

As a result, five recommendations for a complete sensorial strategy have been concluded for the resolution of the research aim. Based on sound theoretical underpinnings combined with relevant primary research, it is suggested that H&M can improve the recognition of their brand in-store if they were to implement this strategy on a consistent level across all of their stores.

This studies future orientation seeks the application of sensory design strategies to other fashion brands that desire a truly unique and branded experience.

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Experiences on Developing Intuitive Thinking among University-level Teachers

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Abstract

This study investigates the impact from two courses focusing on the development of intuition. Intuition is an integral part of human thinking, and its role is essential in all creative processes. Yet the potential of intuition is completely ignored in school education.

The data consists of 20 University level teachers who joined a course in intuition development. The teachers represent domains varying from design to architecture, engineering and economics, and the major research goals shared in these domains are production of creative ideas, innovation and complex problem solving skills.

The focus of the study is to research how the course affects teachers' *opinions* on intuitive thinking, their *use* of intuition, as well as the *utility* of the methods used to develop intuition. Teachers' opinions and experiences of intuition were asked *before* and *after* the course. The follow-up part of the research aims at measuring the actual *impact* of the course: the change in frequency of utilizing intuitive thinking in their personal life and in teaching, as well as if the teachers were supporting students' intuitive faculties.

The outcomes suggest that even a single course encourages participants to pay more attention to intuition and increases the awareness and use of intuitive faculties. Most of the participants felt that they had learned new methods of observing and utilizing their intuition during the course, and most of them had deepened their understanding of their personal intuitive process.

An interesting outcome is that after the course the amount of time used for thinking about intuition-related issues had increased remarkably. Furthermore, most of the teachers had found brand new methods of developing their intuition further.

Keywords

intuition; design; higher education; tacit knowledge; learning

Introduction

Intuition is an integral part of human thinking. Together with conscious reasoning it forms a pair which is an essential component of human thinking. Intuition is considered to be an instant and rapid process of knowing, which relies at least partially on unconscious knowledge structures (Bastick, 2003; Glöckner & Wittermann, 2010; Polanyi, 1958). Research on people suffering from specific neurological damages confirms that even simple everyday life is impossible without intuition (Volz & Von Cramon, 2008). Even though recent research proposes that there are several types of intuition, very little agreement remains as

to what the specific types are. However, the effects of using intuition are well recognized. Numerous studies in art, science and business have proved that intuition has a central role in the development of breakthrough innovations and novel ideas (Klein, 1998; Gigerenzer, 2007). Several Nobel-laureates have mentioned intuition as their primary tool. (Shavinina, 2009; Larsson, 2002)

Researchers in the area of decision-making have noticed that in some problem-solving situations intuition generates solutions that are remarkably better than with conscious reasoning. Intuition can be superior especially if there is either too little or too much information, or even simultaneous over- and under-load of information: too much information and lack of essential information at the same time. The analytical mind usually chokes with too many alternatives and starves by the lack of information. Under these types of conditions the advantage of intuitive thinking is profound. (Dijksterhuis, Bos, Nordgren, & van Baaren Klein, 1998; Frank, O'Reilly & Curran, 2006; 2006; Gigerenzer, 2007.) Increasing amount of problems in design – as well as in the world in general – tend to be like these, tangled knots, which cannot be solved by conscious reasoning alone. We need the ability to utilize intuition to solve these types of wicked problems.

Conscious Reasoning vs. Intuition

In psychology, the most prevailing theory of human mind is the dual-process model, where our thinking is divided into two parts: conscious reasoning and non-conscious, intuitive faculties. Both of them are integral and essential parts of our everyday thinking (Kahneman & Tversky, 1982).

While our conscious mind is analytical, linear, controlled and based on rules, the intuitive mind is non-conscious, automatic, quick, associative, parallel, and can process huge amounts of information simultaneously (Kahneman, 2003). Our thinking hovers between these two different faculties mostly automatically. When working with challenging cognitive tasks, such as visioning and complex problem solving, we need to integrate them.

Research findings confirm that without intuitive faculties a human cannot cope with everyday life (Volz & Von Cramon, 2008). Damasio researched persons whose faculties of intuitive thinking had been damaged, and as a result, their ability to make good decisions, or to make any decisions at all, had been severely compromised (Damasio, 1994).

If simplified, the difference between these two different thinking modalities can be illustrated as follows: when reasoning consciously "we know consciously that we are thinking this thought", and when intuiting "we know without knowing how we know".

Several Nobel-laureates from Einstein to Pauling and Schrödinger mention intuition as being indispensable for new inventions – conscious reasoning is then used for argumentation (Shavinina, 2003; Shavinina, 2009; Larsson, 2002). Most of the designers interviewed in our earlier research mention intuition as their primary tool (Raami, Mielonen & Keinänen 2010; Raami & Mielonen, 2011).

The majority of the problems designers are facing today are so complex, multi-dimensional and wicked that conscious reasoning is simply not enough (Rittel & Webber, 1973). We need both the potential of intuition and expanded intelligence. However, the paradox remains: intuition in the educational system is ignored, or even destroyed, and therefore its potential is lost. Formal teaching in schools, as well as in Universities, focuses firmly on developing the rational faculties and conscious reasoning.

Defining Intuition

Intuition is still lacking a clear identification and definition (Betsch, 2008). In the dual-process model intuition is considered an umbrella term, including all forms of non-conscious thinking such as instincts, fears, automatic reactions and over-learned skills, which are not of interest for the purpose of this study. Therefore the dual process model is not detailed enough when researching intuition in connection with design creativity.

Based on recent research and understanding, intuition is used as a general label for a variety of phenomena that are most likely based on completely different cognitive mechanisms (Glöcker & Witterman, 2010; Shefy, & Sadler-Smith, 2004). Most definitions agree that intuition is based on automatic processes, which rely on knowledge structures that are acquired by different methods of learning. They operate, at least partially, without people's awareness and result in feelings, signals, or interpretations. Intuition is a phenomenon for complex information integration processes, and usually described as a flash-like, sudden, immediate form of knowledge (Bastick, 2003; Dörfler & Ackermann, 2012).

Glöckner and Witterman (2010) have categorized intuition in four general types: associative intuition, matching intuition, accumulative intuition and constructive intuition. Each type is a mental activity, which is based on a slightly different integration process utilizing pattern matching, memory traces and currently perceived information. Researchers stress that it is not useful to argue which kind of intuition is "real", but to clearly define which kind of processes one is investigating and refrain from using the term intuition without further qualification.

Even though all these forms of intuition may be present when designers are inventing and designing, at the same time they ignore something essential. Consequently, I find the above-mentioned categories limited and the definitions too narrow. Through my personal experience and study of the stories told by many designers, intuition has aspects which are not included in the models. For example, none of these definitions include a possibility of intuition coming outside of professional expertise or personal experiences. Yet many designers describe these types of intuitive insights and consider them to be among the most valuable and desirable ones.

Therefore, in this research I use the definition by William H. Kautz who, for several decades, has been researching highly intuitive persons he calls expert intuitives. Kautz is among those few researchers who acknowledge a specific type of intuition, so-called "true" intuition, as opposed to other types of "general intuition" in current psychology.

> Intuition is the mental process of acquiring information and knowledge directly into the mind, without the use of [conscious] reasoning, sensing or even memory (in the usual sense of that word). This definition implies that, if one is to show that a piece of new information is truly intuitive, he must demonstrate that it could not have been obtained by one of these other three means. (Kautz, 2005, pp. 8)

This definition includes the possibility of insights coming out of thin air – a situation described by several designers (Raami & al, 2010). However, in this study I am neither focusing on the source of intuition nor on the type of it, researching instead the developmental aspects and utility of intuition.

Utility vs. Validity

When coaching intuition, I always focus on the experiences of intuition and the personal aspects of it. For me it is essential to stress the meaningfulness and the *utility of it* for a person, not the *validity*. That is, if the methods, theories or experiences are *usable* and help a person's creative process, it doesn't matter if they are objectively perceived as *true* or not.

We cannot fully understand intuitive thinking since at least some parts of intuition are hiding under our conscious thoughts. There is always something unexplainable and mysterious. If we try to fully understand the intuitive process, or we try to make a model of it, we most likely set ourselves inside of a box (Surel, 2012). Usually, we are not very aware of how we make decisions. We tend to think we are thinking rationally, yet we may be using intuition as well. Even when consciously using intuition, we may dress our arguments to be rational since in many situations only rational explanations are accepted. We have a cultural tendency to deny intuitive experiences (Mayer, 2007).

However, intuition can be researched. Even though we cannot understand the insight itself, we can research the intuitive process, that is, right before and after intuitive insights (Klein, 1998; Petitmengin-Peugeot, 1999). Also, we can rely on the experiences and research them, which is my focus in this paper. At the beginning of the course the teachers were asked to describe their personal intuition. The answers were then compared with the definitions given in the end of the course. Intuitive experiences are usually unique, very personal and hard to verbalize. This may be illustrated with a couple of examples.

One teacher described her/his personal intuition in the beginning of the course:

> *Intuition is a part of my own inner world, part my real self. I want to be in good terms with my intuition, otherwise "it doesn't feel good". Emotion and balance are included, as well as an experience being a part of a bigger plan. My intuition is probably quite strong, but often it's also covered under "noise".*

After the course she/he described:

> *Earlier emotion and suspicion were mixed with my intuition. Now my intuition is becoming clearer and more lucid. It has become smooth and trustworthy.*

Another teacher described:

> *There is some kind of pressure or anxiety involved. Two simultaneous directions and the contradiction between them, a struggle.*

And afterwards:

> *Describing it [intuition] is difficult, but I'll try. My intuition is very rational, real and strong. It is hard for me to accept that I argue against it, consider it and have doubts. I want to make difference between intuition and imagination.*

It is important to make these observations even it is not always easy to step out of one's comfort zone or to face something which cannot be fully understood or even turned into words (Hogarth, 2001; Kautz, 2005; Raami & Mielonen, 2011). It requires courage to linger in sensations without a need to rationalize them. Sometimes this can be easier with the support from others. Most of the students, as well as the teachers, joining the courses have stressed the importance of group discussions. It is easier to accept and credit personal experiences through stories told by others. Through these, one can find similarities, as well as contradictions, which can help to understand the varying process in others.

Coaching Intuition

I have been running courses focusing on intuition development for MA-level design students and professional designers since 2003, coaching more than two hundred students. The corner stones of my intuition coaching are removing blocks that hinder intuition as well as strengthening each person's bond with their personal intuition.

Some research suggest that intuition can be developed (Seligman & Kahana, 2009; Vrugtman, 2009). One of the most essential aspects in developing intuition is to unlearn earlier beliefs and habits. Kautz (2005) mentions three things which hinder intuition: beliefs, mental habits and emotional conditioning. All these require inner work and introspection and intentional quieting of the mind. We also tend to be so trained to rely on our rational mind that it may block intuition even before we are able to identify any intuitive insights. Indeed, the rational mind is the one which most effectively blocks intuition (Surel, 2007).

We may also be too dependant on instructions and truths coming from outside. In the course of my teaching experience, many design students have expressed the will to know “the correct way” to be creative, or to learn how “the professional creative design process ” proceeds and follow that. In many cases they have very little trust in their own creative process and seek outside experts to tell them the correct answers.

Beliefs that block intuition may, at least partly, be removed by giving valid and supportive arguments to the rational mind about intuition (Surel 2009). Therefore, in the coaching sessions I am using recent research material related to intuition. This material usually challenges participants – the more one’s perspective is based on a purely materialistic worldview, the more it challenges. However, I have found this method conducive since intuition does not happen in material dimensions, and therefore it is essential to open one’s thinking into other dimensions as well. The focus of presenting these theories and research is to encourage out-of-the-box thinking when a person is ready to expand his thinking (Surel, 2012). Personally, I think that we all are inside various boxes all the time, but the smaller the box is, the less room there is for conscious use of intuition (Adair, 2007).

Strengthening personal intuition takes place through practical exercises, which rely on two major components: perceptions and the discernment skills. That is, developing sensitivity to notice even weaker signals and to better evaluate the significance of the signals. Intuition may easily be mixed with emotions, fears, wishful thinking or emotional attachments. If these are not recognized, they may distort one’s intuition or even be confused with intuition. Therefore, it is essential to reach for the original perceptions as directly as possible.

During the coaching sessions we are going through various kinds of exercises so that everyone can find support for their personal way of intuiting and not vice versa, that is, to attach a method on top of one’s personal way. From my experience, everyone has their own way of perceiving information as well as subjective ways of gathering and processing it.

At any given time an enormous amount of information passes through our mind, but only a fraction of it is noticed. Our subconscious mind processes several orders of magnitude more information that the conscious mind (Lipton 2005). Those things our mind picks to be noticed are presumably significant to us – for some reason. All of us sense in slightly different ways and use different sensory channels. Through exercises we can expand our way of sensing so that we are able to either recognize weaker signals or learn new ways of sensing. Some of the designers describe even extraordinary or highly personal experiences while receiving intuitive insights (Raami et al., 2010).

Sharing these experiences takes place in discussions, and therefore it is important to create an atmosphere of trust inside the group. Many students have described their experience

when learning to tune into intuition as “homecoming” (Raami & al., 2010). They describe it as getting closer to themselves or closer to their own way of creating. Intuition has also been compared to the mental capacity to learn a language: it is innate, everyone can do it, but there has to be an intention or need before the development occurs (Kautz, 2005).

Focus of the study and data collecting

During the academic term 2011-2012, I ran two courses for University-level teachers focusing on the development of intuition. The courses were targeted Aalto University teachers who wanted to develop their personal intuitive skills, integrate intuition as part of their teaching as well as support the development of intuitive faculties in their students. The backgrounds of the teachers varied from design (8/20) to architecture (3/20), engineering (4/20), economics (4/20) and education (1/20). Six of the participants were males and 14 females.

The number of participants was limited to ten in both of these courses, since the contact hours focused on intuition exercises reflections about personal experiences and discussions, which cannot take place in a big group. The courses lasted for one semester and consisted of 7-10 contact lessons, each lasting 3 hours at a time. The first course had 21 contact hours and the second one 30 hours. Additionally, there were 100 hours reserved for personal study and practice at home.

The research focused on opinions and understanding about personal intuitive processes and changes in the use of intuition. I was interested in teachers’ experiences and descriptions since the development of intuition is hard to measure objectively. The follow-up part was targeted to observe if there had been any actual impact, especially on the amount of thinking used towards intuition, utilizing it in one’s own teaching as well as encouraging students to use their intuition. Moreover, one of my main interests was to find out whether teachers found any new, personal methods to develop their intuition further after the course.

The data was collected through three questionnaires which were handed out at the very beginning of the course, at the end of it and 6-10 months later. The answers of the first two questionnaires were compared in order to define the impact of the intuition course. Both questionnaires were filled-out anonymously – teachers were using pseudonyms in order to allow the matching of both answers with the same person. Altogether 20 persons joined two courses, and 15 persons returned both answers with matching names (N_1=15). Eighteen persons returned the follow-up questionnaire (N_2=18).

I was interested in finding out if the course gave the teachers a better understanding of their personal intuition, and if they were able to use intuition better after the course. The questions were phrased so that the issues were not addressed directly. Instead, the ways of using intuition were queried more indirectly, and then the answers, before and after the course, were compared. For example, the teachers were asked to *describe* the ways of understanding their personal intuition, the ways of using it and the ways of encouraging students to use intuition. Only the question “have you learned new methods of utilizing intuition” was asked directly in all of these three questionnaires.

The answers were classified in simple “yes”, “no” and “interpretative” categories in order to identify the changes and differences before and after the course. Since the teachers were asked to write descriptions, it was easy to notice the direction of change and classify the answers with simple “yes” and “no” categories in most of the cases. However, there were some descriptions using different verbal output, so I decided to classify all these even

slightly unclear answers as “interpretative”, as well as the answers with no significant change.

The first two questionnaires focused on different aspects of personal intuition. The questions focused on personal intuition, the ways of using it, expectations of developing it further, and how intuition could possibly help them at work. In the latter course I also asked about the possible methods of enhancing students' intuition and ways of utilizing intuition in studying.

Discussions that took place in the group also played an important role in the research. They broadened my understanding and gave new perspectives and background information to the answers.

Experienced Changes after *Developing Intuitive Thinking* Course

After the intuition development course I was able to link 15 answers with matching names. 3 persons had forgotten their pseudonyms, but I decided not to match the answers based on the style of handwriting. The answer percentage was 75% (N1=15).

Most of the teachers felt they had acquired more methods for utilizing intuition after the course. One answer was negative, and two answers were interpretative and therefore were not classified.

Most of the descriptions of personal intuition were more unique, detailed and specific after the course. Only one description was not more personal. It was mostly the same detailed and specific version as the earlier one since it was visible already in the first answer that the person in question had been using a lot of intuition already at the beginning of the course. In five cases the results were unsure, described either vaguely or just in such a different way that it was not possible to compare the answers. None of the descriptions had changed to more abstract or vague direction after the course.

Based on the questionnaires, the course did not have a significant impact on increasing the understanding of personal intuitive process or trust in personal intuition.

The table below is the summary of the results.

Experienced changes after the course	**Yes**	**No**	**Interpretative / Can not be classified**
More methods for utilizing intuition	12/15 (80%)	1/15 (6,7%)	2/15 (13,3%)
Description of intuition more personal and specific	9/15 (60%)	1/15 (6,7%)	5/15 (33,3%)
Increased understanding of personal intuitive process	6/15 (40%)	3/15 (20%)	6/15 (40%)
Increased trust in personal intuition	4/15 (26,7%)	2/15 (13,3%)	9/15 (60%)

Table 1. Experiences reported after the course.

Many teachers reported that the encouragement towards their students' use of intuition has increased. This was not asked directly, but instead the questions focused on the methods of supporting student's intuition, and these aspects were asked only in the questionnaire of the latter course. The percentage of answers was 90% (N_3=9). The methods for encouraging the use of intuition that were mentioned in most answers were conscious presence, self-trust, sensitivity and courage, including general encouragement.

Change in encouragement while teaching	**Yes**	**No**	**Interpretative / Cannot be classified**
Encouraging students to utilize their intuition more	6/9 (66,7%)	2/9 (22,2%)	1/9 (11,1%)

Table 2. Change in encouragement towards use of intuition after the course.

Experienced Changes Six Months Later

The follow-up questionnaire was carried out 6-10 months afterwards (10 months after the first course and 6 months after the second course). Some discussions taking place during the course had indicated that the course most likely activates a lifelong process, where intuition related issues start to unfold. In this study I was also highly interested in the actual impact of the course, that is, if teachers have long lasting interest on issues related to intuition, and if they have adapted a habit of encouraging their own students to use intuition.

In this last questionnaire teachers answered with their names – even though they were given a possibility to answer anonymously. This enabled me to match the answers with the discussions that took place earlier during the course. The percentage of answers in this study was 90% (N_2=18).

The questions were worded so that the teachers could not give direct yes/no answers to the questions, but they were asked to describe their observations or methods of using intuition. I asked them to *describe* the ways and the amount of thinking about intuition, the use of it and the methods used. I also asked them to describe *how* they had been observing and utilizing intuition as part of their work, if at all. Furthermore, they were asked to report *what kind of* new applicable methods they had found in order to utilize their personal intuition, if any, and *how* they have been supporting students to utilize their intuition while studying.

The answers were classified as previously, in "yes", "no" and "interpretative/cannot be classified" – categories. However, there was one question where I wanted to illustrate the outcome differently. When I asked about the amount of thinking intuition, the answers clearly indicated two types of differences in the amounts. Therefore, I formed two categories based on given answers: "A lot / every day" reporting an enormous growth in thinking, and "yes, sometimes" reporting a significant amount, or at least more than before. Nobody mentioned thinking about intuition less than before or ignoring intuition related issues altogether.

The amount of thinking 6-10 months later	**A lot / every day**	**Yes, sometimes**	**Less than before / no**	**Interpretative/ Cannot be classified**
Thinking about intuition after the course	10/18 (55,6%)	7/18 (38,9%)	0/18 (0%)	1/18 (5,6%)

Table 3. Change in the amount of thinking intuition related issues after 6-10 months.

Most of the teachers described that they were thinking about intuition a lot, even daily. One teacher did not answer whether she was thinking about intuition or not, and therefore her answer was classified as interpretative. She reported neither having found new methods of intuition nor encouraging students to use their intuition. So this can be expected to imply that she had not been spending time thinking about intuition related issues either. In the "yes, sometimes" category most of the persons reported a change in the quality of thinking. They described that they had been thinking about intuition "more consciously" than before even if there had not been a big change in the amount of thinking.

Two other aspects I was interested in were if any of the teachers had discovered (new) personal methods for utilizing their intuition, and if they were utilizing intuition as part of their teaching or encouraging their student to use intuition. The question about the discovering of new methods was the only one which I asked directly.

Experienced changes 6-10 months later	**Yes**	**No**	**Interpretative / Cannot be classified**
Discovered (new) personal methods for utilizing intuition	12/18 (66,7%)	6/18 (33,3%)	-
Encouraging students/other people to use intuition	12/18 (66,7%)	2/18 (11,1%)	4/18 (22,2%)

Table 4. Experienced changes in "discovery of new methods" and "intuition encouragement" 6-10 months afterwards.

The number of persons who had found new methods surprised me in a positive way. Even some persons who had been utilizing intuition for many years described they had found brand new ways to use intuition. One teacher described: *"I am thinking about intuition daily, which is remarkably more than before. … There are several methods coming to me constantly, even out of the blue. It feels like a good journey."* Most common methods mentioned were quieting the mind, calming down, listening to sensations, and openness.

The "No" answer category contained roughly two different types of persons. Some of the persons answering "No" were intuitive and using many different methods already in the beginning of the course, while some persons in this "No" category did not have a flowing contact with their intuition and wished to discover good working methods to develop their intuition.

I also wanted to know if teachers encouraged their own students to accept and promote intuitive knowledge, and what kind of methods they were using. The majority encouraged students and other persons, and only in two questionnaires I did not find any sign of

encouragement. I was not able to classify four answers. The most common methods mentioned were general encouragement through discussions, support towards openness, and tuning into observations of inner feelings and sensations.

Several persons mentioned growth in appreciation of intuitive knowledge or intuition as a new dimension in their life. Some mentioned that during the course intuition became "named" and therefore accepted. A few persons also mentioned increased dissonance in thinking, and new challenges in balancing intuition with conscious reasoning or previous ways of doing. This may be illustrated with a following quotation: *"Now I am encouraging children to listen to themselves – which contradicts educational advice in general".*

Comparison with students' experiences

One of my interests in this research was to find out whether the results were different from the earlier studies with MA-level design students and their intuition development. The intuition development courses for students took place two years earlier and the data consists of two different courses on intuition development (Raami & Mielonen, 2011).

When these results from the teachers' intuition development course were compared with the ones from the students' courses, some differences were found. Students reported the following after the coaching course (N=21):

Experienced changes after the course by students (vs. teachers)	**Yes** Students (teachers)	**No** Students (teachers)	**Interpretative** Students (teachers)
More methods for utilizing intuition	100% (80%)	0% (6,7%)	0% (13,3%)
Description of intuition more personal and specific	48% (60%)	43% (6,7%)	9% (33,3%)
Increased understanding of personal intuitive process	86% (40%)	10% (20%)	4% (40%)
Increased trust in personal intuition	76% (26,7%)	10% (13,3%)	14% (60%)

Table 5. The reported experiences of teachers compared with experiences of students after the course.

One possible explanation for the changes in results is experience as some teachers already had functional methods for utilizing their personal intuition when joining the course. Moreover, teachers can generally be expected to have more life experience than students. They also have more professional expertise, and many of them have been using intuition as a part of their, especially artistic, work for many years or even decades. Even if the use of intuition among teachers was not so conscious or intentional before the course, it was used in many situations – based on the comments and discussions taking place in the course. Therefore it is natural that there is such disparity compared with students' answers, especially in the two last aspects, "increased trust in personal intuition" and "increased understanding of personal intuitive process ". This hypothesis is aligned with previous

interviews made with expert designers. Most of them mentioned intuition as their most valuable tool (Raami & Mielonen, 2011).

Discussion

The results of this study strongly suggest that intuition can be developed. A single course can activate and enhance the use of intuition and increase the acceptance of it, which is promising. Most of the teachers felt they had acquired new methods for utilizing intuition and were increasingly encouraging their students to use their intuitive faculties.

Many teachers pointed out the importance of group discussions and sharing when talking about intuitive experiences, which I think is one of the cornerstones in accepting intuitive information, since our culture often dismisses intuition.

If compared with earlier intuition researches with MA-level students, the understanding of personal intuitive processes during the course did not increase to the same equivalent. However, those teachers who had deepened their understanding of intuitive process during the course reported a major change in quality.

Methods of utilizing intuition increased during the course, but they increased also *after* the course. I think this aspect needs further studying. It is still unclear if the exercises used and theories presented during the course actually caused this development, or was pure *intention* and *paying attention* enough? Is it enough to tune into intuition with an open mind? This is plausible since most persons reported that also *the amount* of thinking about intuition had grown remarkably after the course. This is an area for further research.

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Developing Intuitive Thinking in Designers: Creative Process and Criticism in Tertiary Foundation Studies

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Abstract

Self-awareness and confidence have been identified as necessary attributes for "design thinking" and "creative design action". In order to communicate within a global "networked knowledge society", designers need to possess breadth and depth of knowledge, skills and understanding that can be adapted for use in different situations. In design, outcomes are purpose driven and practical, and as the complex field of design bridges art and science, it is argued that "designers create culture", and as such theory and practice should be integrated. Gaining knowledge of the visual language of art and design, and a critical awareness of "core ideas" in design, should be addressed from foundation level. The significance of the integration of theory and practice needs to be emphasised from the beginning. In this paper it will be argued that tertiary foundation education in design is crucial to development of self-confidence and self-awareness in design students, achieved through curriculum development and the studio group critique. Specific reference will be made to an integrated, multidisciplinary foundation course in the South African context. Emphasis will be placed on "learning to see". It is argued that the creative process is key to the development of "design thinking" and "design action". The iterative nature of the creative process through criticism leads to the expertise needed for intuitive thinking, allowing for the "white space" and the manifestation of innovative creative outcomes – the integration of theory and practice.

Keywords

Iterative creative process; integrating theory with practice; tertiary foundation education in design; longitudinal interpretive study; studio-based subjects; "core ideas"; "learning to see"; group critique; self-confidence, expertise; intuitive thinking; "white space"

Introduction

> … some things *are* better than others, that is, they have more quality … What else are the grades? Why else would people pay fortunes for some things and throw others in the trash pile? Obviously some things are better than others … but what's the "betterness"? (Pirsig, 1978, p. 178).

With the accepted view of design's bridging art and science (Cross, 2007, pp. 122-125; Goldstein, 1996; Lecanides-Arnott, 2012, pp. 19-26), design is well positioned to contribute meaningfully in a complex, changing world due to constant technological advancements (Ranjan, 2005). It is required of designers to function within the global "networked knowledge economy" and to collaborate closely across disciplines (Leifer, 2010; Manzini, 2009; Ranjan, 2005). Designers need to develop a critical awareness (deep understanding)

of different cultures and of the varying social and economic environments for which they design.

Self-awareness and self-confidence are seen as necessary attributes for “design thinking” and for creative design action (Cross, 2007; Leifer, 2010; Nelson & Stoltermann, 2003; Sonntag, 1969). It is argued that critical awareness of art and design leads to self-aware and self-confident designers able to engage successfully within the global “networked design community” (Leifer, 2010; Manzini, 2009; Ranjan, 2005).

If the view is taken that “designers create culture”, design education needs to be more than just handcraft and technological design skills training (Drew, 2007; Buchanan, 2006; McCoy, 1990; Sonntag, 1969). In educating the designer, emphasis should be placed on the artist (designer) and the object (design outcome) by the integration of theory and practice through criticism (Buchanan, 2006; Magee, 1975; Schmitz, 2006; Sonntag, 1969). However, it has also been identified that with design becoming a knowledge-driven discipline due to the extensive use of computers, there has been a loss of basic design skills. This has highlighted the need for the traditional hand skills of the artist/designer, which are seen to be as essential as current technological skills (Arens, 2010;Ferraris & Rampino 2010; Ranjan, 2005). Theory and practice need to be integrated from the start.

A critical awareness of the “visual language” of art and design needs to be developed from foundation level in tertiary education. It is argued that “design thinking”, described as “research in context” (Dorst, 2010; Leifer, 2010), needs to be seen as a “core idea” and should be addressed at an appropriate level from early on together with the development of handcraft and technological design skills, so that students can learn to move with ease from the real to the virtual world, engaging in purpose-driven design action (Arens, 2010; Ferraris & Rampino, 2010; Lecanides-Arnott, 2012, pp. 19-29; Ranjan, 2005).

The view that epistemological access to foundation education establishes building blocks for lifelong learning, and provides the grounding for successful further study through curriculum development, is widely held (Arens, 2010; Boughey, 2005; Ranjan, 2005; Sonntag, 1969; Tynan, 2006). In order to inculcate a culture of future learning, particular emphasis should be placed on “core ideas” in design from foundation level, achieved through “learning to see”, and through the transference of knowledge and skills from one design discipline to another. It is argued that the iterative creative process (“design thinking” and “design action”) as the basis for curriculum development in design education should establish lifelong learning patterns – patterns that foster the expertise that leads to intuitive thinking and the “white space”. (Arens, 2010; Bruner 1977; Dorst, 2010; Leifer, 2010; Tyler, 1949; Wiggins & McTighe, 2005). The “white space” accommodates ambiguity by keeping the problem and solution space open as long as possible to allow innovative design action to occur (Bierut, 2010; Cross, 2007, p.114; Lecanides-Arnott, 2012 pp. 58-60).

The Design Foundation Course at the Cape Peninsula University of Technology (CPUT) in South Africa (Lecanides-Arnott, 2012) is the context for this longitudinal interpretive study (Denzin, 2002, pp. 349-365), with specific reference to studio-based design subjects. It is argued that “design thinking”, and the development of handcraft and technological design skills, should be addressed from foundation level and that foundation studies should be seen as the “core” of design education (Arens, 2010; Ranjan, 2005; Sonntag, 1969).

The suitability of the iterative design process as the basis for curriculum development and the verbal group critique in the development of confident, generative self-criticism in students is investigated. The intention is to demonstrate that from foundation level, the integration of theory and practice should foster the expertise and connoisseurship required by designers to meet the demands of a complex world – of critical awareness that will

encourage intuitive thinking and allow for the “white space” for innovative design action to manifest.

Research approach

The intention is to integrate theory (“design thinking”) and practice (“design action”) (Raein, 2004; Ranjan, 2005) and to provide a conceptual and practical framework for designers to “learn to see” and to gain a critical awareness of design, which should lead to self-awareness and self-confidence. These attributes are necessary for positive design action and the eventual development of intuitive thinking in designers. As such, Popper’s practical and action-based creative/scientific method (Popper, 1978, p. 132) and Deutsch’s theory of optimism (Deutsch, 2012), together with the principle of continuity and change, were selected to underpin the research framework (Lecanides-Arnott, 2010, 2012).

Based on my written personal narrative as an educator in art and design (Lecanides-Arnott, 2012, pp. 191-231), “grounded theory” (Urquhart, 2002) and “theory building from case studies” (Eisenhardt, 1989) were chosen for the development of the theoretical approach at the start of my master’s study. The inductive methods of grounded theory and theory building from case studies fitted in with the view that practitioners in the visual arts tend to develop theory from practice (Goldstein, 1996; Raein, 2004; Ranjan, 2005) and seemed suitable theoretical approaches. However, as the master’s study progressed it became clear from the literature that the visual arts as a complex field of study required an in-depth investigation of the body of knowledge (Hart, 1998, p. 22).

By taking the position that modernism and post-modernism are part of a long tradition in the field of the visual arts (Goldstein, 1996, p. 299; Margolin, 1989, p.10; Tyler, 1949, p. 90), it became clear that “the inductive method of theory building from case studies should rather be seen as part of the existing continuum” (Lecanides-Arnott, 2012, p. 82). It was confirmed by the literature that as a field, design bridges art and science and that it draws on theories from education, the social and the natural sciences. Thus the research approach evolved into a research framework, comprising aspects of action research, constructivism and design research (Lecanides-Arnott, 2012, pp. 79-85).

The longitudinal interpretive study of the Design Foundation Course made specific reference to the 2008 student group with feedback from this group of students on completion of the National Diploma in Design at the end of 2011. Combined data collection methods were used (interviews, staff observations, questionnaires, assessment marks, documents, student design project outputs), and the data were analysed by means of coding and pattern (Huberman & Miles, 2002, pp. 7-9; Lecanides-Arnott, 2012, p. 92).

For the requirements of this paper, emphasis is placed on a filmed interview of the 2008 foundation student focus group; responses to a questionnaire addressed to the 2008 foundation group of students when they completed their diploma studies in 2011; responses from design staff to a staff questionnaire in 2009; and student studio-based design outputs from the Design Foundation Course from 2006 to 2011. In keeping with the interpretive nature of the study, and the practical and outcomes-based nature of design, the use of combined collection methods helped to strengthen grounded theory by the triangulation of qualitative and/or quantitative evidence (Huberman & Miles, 2002, p. 9; Lecanides-Arnott, 2012, pp. 329-351).

Significantly, the research approach confirmed the view from the literature, that in educating the designer, consideration needs to be given to the artist (designer) and the object (design outcome) (Leifer, 2010; Sonntag, 1969, p. 132). It also confirmed that specialist educators,

experts in design foundation and specialists in the design disciplines are essential to the teaching and assessment process (Bruner, 1977, p. 22; Lecanides-Arnott, 2012, p. 124), as the "interpreter must be 'an informed reader' of the phenomenon" (Denzin, 2002, p. 363).

Foundation education in design

Unprecedented urbanisation and globalisation have led to a greater cultural and socio-economic diversity in the student bodies of higher education institutions. As a result there has been extensive research in foundation education and academic support internationally and in South Africa, particularly in language and numeracy (Bernstein, 1999; Rose, 2008, p. 15; Volbrecht & Boughey, 2004).

It has been demonstrated that the "widening of access and participation" in work-based foundation degrees in art and design in the United Kingdom, and the educational needs of the "non-traditional" culturally diverse student body from different socio-economic backgrounds, are best addressed through the curriculum (Bernstein, 1999, p. 171; Tynan, 2006, p. 39). Similarly, in the context of South African foundation education, there is an emphasis on providing epistemological access and participation through the integration of language skills, academic skills and subject content (Boughey, 2005, pp. 230, 240; Scott, 2000).

It has also been demonstrated that the field of art and design has a grammar and a vocabulary, as in any other field of knowledge and science. Gaining an understanding of the "visual language" and a critical awareness of design should begin at foundation level with the first two years of study having been identified as the most important for students of art and design (Sonntag, 1969, p. 388, 392; Tyler, 1949, pp. 28-33).

Table 1: Big ideas at the core of various fields of knowledge contrasted with basic terms, from Wiggins & McTighe (2005, p. 67), and in addition from G. F. R. Ellis (personal communication, May 9, 2013) for Science

Basic Terms	**Core Ideas**
Ecosystem	Natural selection
Graph	"Best fit" curve of the data
Four basic operations	Associativity and transitivity (cannot divide by zero)
Story	Meaning as projected onto the story
Composition of a picture	Negative space
Offense and defense	Spreading the defense, thus opening up space for the offense
Experiment	Reliability and repeatability of experimental methods and results (Ellis, 2013)
Fact versus opinion	Credible thesis

It is recommended that the fundamental principles, “core ideas” related to a specific field or subject, should be introduced from foundation level and that it is never too early to deal with “big ideas” (see Table 1), so that critical awareness can develop over time. Transference and use of “core ideas” in new and more complex situations, should lead to self-awareness and self-confidence in students (Bruner, 1977, pp. 52-54;Tyler, 1949, pp. 83-86).

Some of these issues are addressed in this paper with reference to my longitudinal interpretive study from 2008 to 2011, of the Design Foundation Course in the Faculty of Informatics and Design at the Cape Peninsula University of Technology (CPUT) in South Africa (Lecanides-Arnott, 2012).

The Design Foundation Course

The Design Foundation Course has been developed to address the needs of a diverse group of students (Scott, Yeld & Hendry, 2007) from different cultural and socio-economic backgrounds with different levels of understanding and academic ability and proficiency in the visual arts (DHET, 2012; DoE, 2006). The target group comprises underprepared students, with preference given to those from disadvantaged backgrounds. Academic support in South Africa is essential to redress the legacy of decades of poor education under the apartheid regime (Kloot, Case & Marshall, 2009).

The developmental function of the Design Foundation Course is essential to foundation education in all fields of study in South Africa. This can be seen from the national statistics of the generally poor pass rate with respect to the completion of National Diplomas in different fields of study (see Table 2) (Scott et al., 2007, pp. 12-17).

Table 2: Performance of the 2000 technikon cohort (many universities of technology in South Africa grew out of the previous technikons by the mid 2000s)

A. National Diplomas, by selected CESM: All first-time entering students excluding Technikon SA (distance learning institution) (Scott et al., 2007, p. 15)

CESM	**Graduation within 5 years**	**Still registered after 5 years**
04: Business/Management	33%	8%
06: Computer Science	34%	11%
08: Engineering	17%	14%
21: Social Services/Public Administration	29%	6%

B. National Diplomas, by selected CESM: All first-time entering students including Technikon SA (distance learning institution) (Scott et al., 2007, p. 15)

CESM	Graduation within 5 years	Still registered after 5 years
04: Business/Management	21%	7%
06: Computer Science	23%	9%
08: Engineering	15%	12%
21: Social Services/Public Administration	12%	8%

The throughput rate of Design Foundation Course students, who completed the National Diploma in Design in the prescribed four years, was an average 38 percent in 2007, 39 percent in 2008 and 52 percent in 2011 (Lecanides-Arnott, 2012, pp. 301-307). Based on his experience, it is Professor Scott's opinion (personal communication, May 12, 2013), that a 40 percent graduation rate under the prevailing circumstances in South African Higher Education is "very acceptable" when considered in relation to overall graduation rates. However, there is no official data to back this up, as there are as yet no national cohort studies on extended programmes.

Significantly, the diagnostic function that emanates from the multidisciplinary nature of the curriculum, and which serves to assist students to gain an understanding of the "visual language" and a critical awareness of design, is seen as key to the success of the Design Foundation Course (Lecanides-Arnott, 2012, p.104). This is achieved through imaginative experimentation, which builds up confidence and self-belief (Gombrich, 1984, p. 444; Sonntag, 1969, pp. 388, 393). The objective is for all students to benefit from the foundation course by gaining an understanding of the "core ideas" in design, at the same time gaining exposure to the fundamentals of each of the seven design disciplines (fashion, graphic, interior, industrial, jewellery, surface design and architectural technology) represented in the Faculty of Informatics and Design at CPUT (Lecanides-Arnott, 2012, p. 110).

Complex, Integrated, Multidisciplinary Curriculum

The essential difference between the Design Foundation Course curriculum, and the historical foundation courses of the Bauhaus at Weimar and Dessau, Germany (1920 – 1933), the Institute of Design, Ulm, West Germany (1953 – 1968) and more recently the National Institute of Design (NID), Ahmedabad, India (1970 –), is that generic design principles are taught through the specific content of the design disciplines. Unlike the assignments at the Bauhaus and Ulm, which were generally abstract and non-object oriented, the Design Foundation Course projects are contextualised within the frame of the different design disciplines with specific practical and functional outcomes (Lecanides-Arnott, 2012, pp. 08-113).

The benefits of this approach have been described as follows by a past foundation student: "Having worked through all the different design disciplines gave me a broader outlook on how to solve design problems" (architectural technology graduate 2011, from the 2008 Design Foundation Course) (Lecanides-Arnott, 2012, p. 107). In response to the staff questionnaire (2009: Question 1), specialist design lecturers were unanimous that

underprepared students benefit from participating in the Design Foundation Course (Lecanides-Arnott, 2012, p. 104).

An important aspect of the curriculum is that it incorporates language skills, numeracy skills and life skills, which together with drawing and design communication studies, provide an embedded framework to support and facilitate a greater understanding of the studio-based design subjects (see Fig.1).

The curriculum has been developed so that the different components slot into one another with learning experiences delivered in a planned sequence that works both horizontally and vertically (Lecanides-Arnott, 2012, pp. 68-69; Tyler, 1949, pp. 83-84). There is a conscious attempt to develop conceptual, formal and technical skills incrementally throughout the year with emphasis placed on the revisiting of “core ideas”. The result is that certain components of the course such as drawing and colour studies have developed into what is described as a “spiral curriculum”, by applying “core ideas” to different and more complex situations as the year progresses (Bruner, 1977, pp. 12, 40, 52, 54).

The development and refinement of an interactive student-centred approach is a continuing process that is constantly adjusted to meet the aims of the different learning experiences that make up the curriculum.

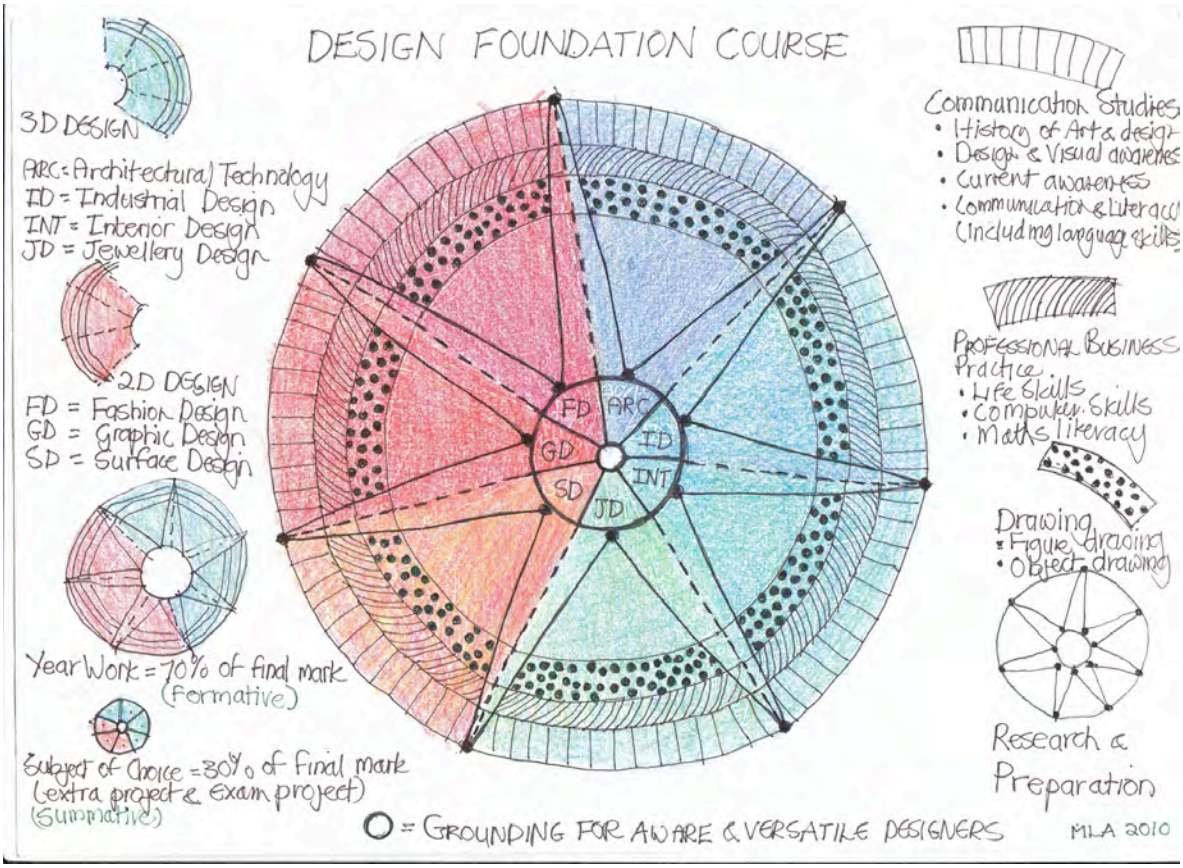

Fig 1. Diagram of the complex, integrated, multidisciplinary Design Foundation Course (Lecanides-Arnott, 2012, p.179)

"Core Ideas" in Design

Addressing fundamental design principles in the foundation course provides the basis for lifelong learning, which should lead to the necessary expertise in designers. The "core ideas" that will be investigated emerged as being significant in developing self-awareness, building up self-confidence, and enabling intuitive thinking.

"Learning to See"

As the language of design is largely visual, "learning to see" is a "core idea" which should be addressed from the start in educating the designer (Berger, 1972; Bruner, 1977, pp. 40, 54; Sonntag, 1969; Wiggins & McTighe, 2005, p. 296). The curriculum should be developed so that the core idea of "learning to see" is incorporated into long and short learning experiences in both the practical design studio-based subjects and the theory subjects (Tyler, 1949, pp. 83-84; Wiggins & McTighe, 2005, p. 292). In order to be reinforced as a core idea, "learning to see" needs to be dealt with in different situations using a variety of methods (Cronjé, 2006, Ranjan, pp. 5-6) (see Table 3) to build up knowledge and understanding in "seeing" by developing different skills, and thereby encouraging a greater critical awareness of design (Hall, 2008). Through the careful sequential organisation of learning experiences in both studio-based design and theory subjects, the core idea of "learning to see" and a critical awareness of design can be developed concurrently (Lecanides-Arnott, 2012, pp. 125-126).

Table 3: Summary of Otl Aicher's teaching models at the Institute of Design in Ulm (Ranjan 2005, pp. 5-6). Table by researcher (Lecanides-Arnott, 2012, p. 39)

Model 1: Pedagogical principle **Organisation**	Model 2: Pedagogical principle **Free Community**
Formal lecture	Free form of instruction Discussion
Authority of teacher and of the material	Teachers only in auxiliary capacity From practice to theory
Mass processing Facts	Working independently Enjoying the work Going deeper Unfolding of personal talents
Examinations Supervisions	Independent critical judgement Personal interest incentive
Syllabus	Teaching framework Experimental learning

Drawing as "Learning to See"

Drawing is an activity that is fundamental to design, a foundation from which ideas are realised and developed visually. Drawing is about learning to see. "Seeing" in this context is not just looking, but observing and understanding (Tzonis, 2001, p. 22). "Seeing is about making use of all the senses through the portals of the eyes. It is about engaging with the world in a tangible and tactile way" (Lecanides-Arnott, 2010, p. 4). Quality of drawing is directly related to how well a student is seeing (Nicolaïdes, 1969, p. 5).

The approach to teaching drawing is based on how I was taught as a student, experience gained from my own creative work and in my years of experience teaching drawing to students in the field of the visual arts at different levels of study. It has evolved over the years and is adapted to fit the needs of the foundation students, which vary from year to year (Bruner, 1977, p. 40; Lecanides-Arnott, 2012, pp. 128-130). It includes two opposing ways of "learning to see" based on concepts put forward by Kimon NIcolaïdes (1969), which he named "gesture" and "contour" drawing.

Gesture drawing (see Fig. 2) is done in quick energetic spurts, and is made up of many loose, broken lines searching for form through movement. In gesture drawing the main idea is to develop visual perception through direct experience, by persuading the students to work from "within themselves". Contour drawing (see Fig. 3) is done slowly, in a careful considered manner, focusing on eye-hand co-ordination, defining the edge of a form, and is made up of continuous clean lines (Lecanides-Arnott, 2010, p. 4; 2012, pp. 128-130).

Fig 2. Gesture drawing (student work Design Foundation Course, 2008. Charcoal on paper)

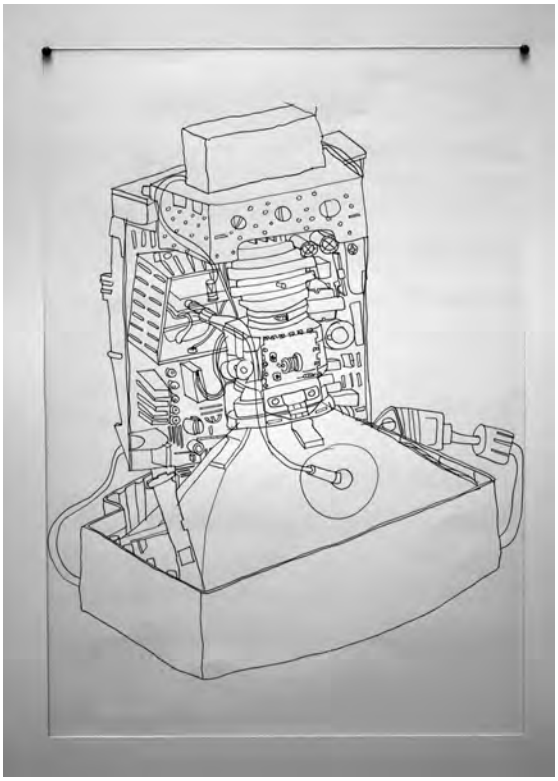

Fig 3. Contour drawing (student work Design Foundation Course, 2006. Black fine-liner pen on paper)

"Learning to See the Whole", and the Creative Design Process

Learning to see the figure as a whole and learning to move through it, relating the different parts to one another, is one of the most significant aspects of the life drawing process. The fragmented way in which students approach their drawings is symptomatic of how they approach studio-based design projects in general.

Both gesture and contour drawing deal with seeing "the whole". The ability to relate different parts of the human figure, and to link different forms by connecting them through the surrounding negative space in object drawing, is a first step in learning to see "the whole". The aim is to transfer the fundamental principle of "working with the whole" to the design process.

The "desired result" (Wiggins & McTighe, 2005, p. 338) is to get students to see that the different parts of a design should be developed together from the beginning; from the self-research stage to when the idea is first visualised, through to the making of the final product (Lecanides-Arnott, 2012, p. 130). The ability to see the whole and to develop the different parts at the same time should be considered as a "core idea" in the iterative creative process of designing (Lecanides-Arnott, 2012, p. 131; Magee, 1975, p. 70-71). With time, the development of the ability to see "the whole" should assist with framing the problem and keeping the problem and solution space in a state of flux, to enable creative design action (Cross, 2007; Dorst, 2010; Leifer, 2010).

During the filmed interview of the focus group of students (2008 Design Foundation Course), insightful observations were made regarding "learning to see" through drawing, and the

transference of skills from the drawing subject to other studio-based design subjects, particularly through the design process.

"Glenda" described how drawing was used to initiate the creative process for the visualisation of ideas: "It's like a key for a door, and when the door opens … that's what I have learnt from this course" ("Glenda", interior design student, filmed interview of focus group, Design Foundation Course, 2008) (Lecanides-Arnott, 2012, p.149).

The principle in life drawing classes that drawing should not be an end in itself, but a way to "see the whole" during the design process, was recognised by "Ingrid" during the filmed interview of the focus group:

> In terms of figure drawing, that is one of the most essential parts of this course, because you know, you like, apply it to everything, every [studio-based design] project that you do. To conceptualise as a whole, is basically what you're doing when you're doing figure drawings, and to take that back into your projects ("Ingrid", industrial design graduate 2011: filmed interview of focus group, Design Foundation Course, 2008) (Lecanides-Arnott, 2012, p. 149).

Comparative Analysis and the Group Critique

In the foundation course at the Bauhaus, Joseph Albers introduced the studio group critique as a method of assessment and learning (Schmitz, 2006, p. 375), described as "reflection in action" (McCoy, 1990, p. 20; Schön, 1983, p. 276, Yorke, 2003). In the Design Foundation Course at CPUT, with the guidance of the drawing teachers, the students use the group critique as a means to learn to critique and assess their own and one another's drawings (Lecanides-Arnott, 2009). "The physical act of 'learning to see' through drawing is transferred to the cerebral act of 'seeing' by looking at the drawings critically" (Lecanides-Arnott, 2010, p.4). Observation is about the interpretation of what is being seen, "we unconsciously interpret the image as we view it; thus interpretation is inherent in visual perception itself" (Kandel, 2012, p. 208).

As explained by Bourdieu, in order to understand something, one has to be able to compare it to something else, preferably its opposite. Bourdieu uses Classical and Baroque painting as examples of comparative analysis (first expounded by Wölfflin) (Bourdieu, 1967, p. 46; Lecanides-Arnott, 2010, p. 4; Wölfflin, 1950).

The students engage in the lower levels of the cognitive domain according to Bloom's taxonomy of learning (knowledge, comprehension, application, analysis, and synthesis). However, through the use of the group critique in figure drawing they also engage in the highest level of cognition, of evaluation (dealing with complex ideas early on) (Arens, Hanus, & Saliklis, 2009, p. 1; Bloom, Engelhardt, Furst, Hill, & Krathwohl, 1956; Bruner, 1977, pp. 33, 40, 52; Wiggins & McTighe, 2005, pp. 292, 314). "As the students' levels of visual literacy and critical thinking abilities increase, they use comparative analysis incrementally to evaluate work, not only in drawing, but in the theoretical and studio-based design subjects" (Lecanides-Arnott, 2012, p. 134)

Transference of knowledge and skills develops confidence

The forming of new learning habits needs to be reinforced through repetition in studio-based design subjects. Learning habits are not reinforced by drilling, by repeating the same thing in the same way, but through curricula that accommodate learning experiences of different duration comprising "core tasks" which reinforce the understanding of fundamental principles, "core ideas" in design (Wiggins & McTighe, 2005, p. 292).

"Thinking through doing" in different but related and progressively more complex situations through the transference of knowledge and skills (Bruner, 1977, pp. 12, 52; Illich, 1973, pp. 9-31; Schön, 1983; Voulgarelis & Morkel, 2010; Wiggins & McTighe, 2005, pp. 82-104), is applied to all fundamental design principles such as simplification and stylisation, working with the whole, composition, the use of negative space and colour as "seeing" (Gage, 2006; Hall, 2008; Livingstone, 2002). These "core ideas" are reinforced in the studio-based projects through the content of the different design disciplines.

The development of self-awareness and self-confidence in students by means of transference of knowledge and skills during the foundation year of study was described by a senior graphic design lecturer, who identified the benefits of the diagnostic function of the foundation course as providing an environment of possibility, and as being significant to the development of the student as a whole person:

> Mainly the development of emotional preparedness, alongside the exposure to possibility, development of work ethic, development and improvement of skills such as visualisation, colour awareness, and knowledge of the idiosyncrasies of the various fields. The ability to discern one's aptitude is invaluable for students' confidence … (response to design staff questionnaire, 2009: question 4) (Lecanides-Arnott, 2012, p.147).

Developing self-awareness and self-confidence in students, by emphasising an integrated approach to learning during the foundation year, was also identified as a strength by one of the history and theory of design lecturers, and was described as "developing inter-personal and personal life skills", and as "giving students confidence in their abilities and in themselves" (response to design staff questionnaire, 2009: question 4) (Lecanides-Arnott, 2012, p. 148).

Negative Space "White Space", Intuitive Thinking, Possibility and Innovative Change

In order for form and/or positive shapes to be seen in pictorial composition (in a figure drawing or in an object drawing) there has to be negative space to connect the forms/shapes. When dealing with the whole in designing (be it a design for a chair, or a design for a building), it is the negative space that frames and contextualises the problem and the solution.

In the visual language negative space has been identified as a "core idea", as opposed to composition, which is defined as a "basic term" (see Table 1) (Wiggins & McTighe, 2005, p. 67). It is also to be understood that the relationship of form and meaning in shapes/objects is determined by the space that exists between them (Arens, 2010, p. 5; Bierut, 2010, Lecanides-Arnott, 2012, pp. 54, 58-59).

Awareness of negative spaces encourages students to work with composition as a whole. It is the space between the shapes/forms/objects that determines the relationship between those shapes/forms/objects in two-dimensional and three-dimensional designs in all the design disciplines (see Fig. 4, 5, 6 & 7). Most significantly the "core idea" of the negative space is analogous to intuitive thinking and the "white space" which allows for creative action and innovative change (Arens, 2010; Bierut, 2010).

Fig 4. *Pumpkins and boxes*, Design Foundation Course, 2006 (preparatory gesture compositions, compressed charcoal on paper and final composition, chalk pastel on card). The drawings investigate the relationship of organic and man-made geometric forms through the negative spaces that define them within a given format. The shapes cast by shadows onto the negative spaces become active elements in the composition, communicating the mood in the drawings. The principle of working with the whole in drawing is transferred to the design studio-based subjects.

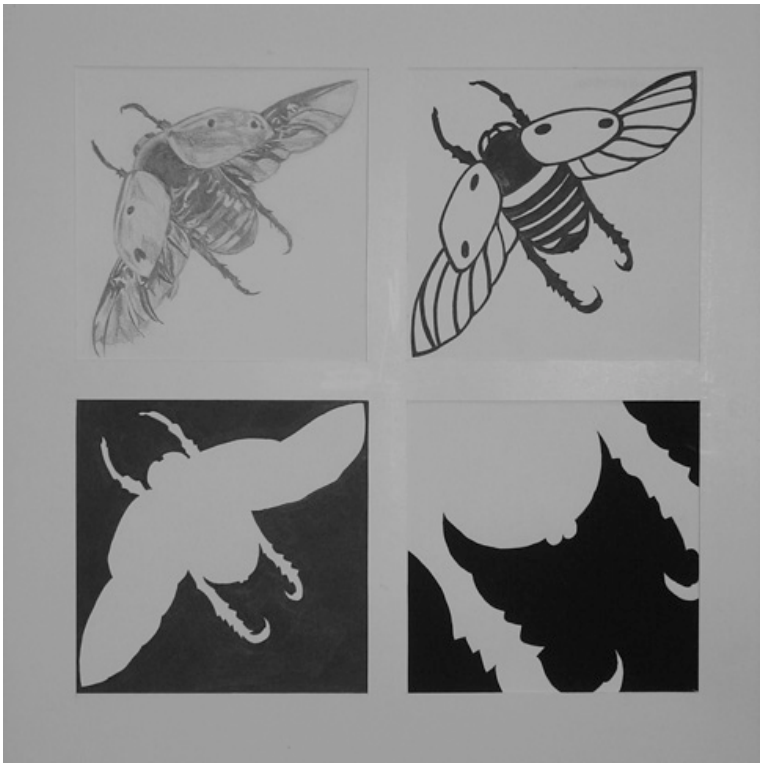

Fig 5. *Less is more,* graphic design. This first project of the year deals with the “core ideas” of simplification, stylisation, the relationship of positive shapes and negative space. It also deals with the visualisation of a design (telling a story sequentially) in four successive frames, which is important for developing an understanding of the idea of the pictogram and logo (Design Foundation Course, student work, 2007, pencil, marker, gouache on paper).

Fig 6. One of the main purposes of the graphic design *Less is more* project in Fig. 5 is to make students aware that the successful kerning and character formation of type is dependent on how the negative spaces surrounding the type are seen. The form and meaning of the type are determined by the negative spaces as much as by the black characters. The project emphasises the “core idea” of” learning to see” and the development of hand skills through “thinking by doing” (student work, Design Foundation Course, 2009, black gouache on paper).

Fig 7. Industrial design 3-D puzzle constructions, inspired by the Venice Carnival (student work, Design Foundation Course, 2011, Corex card and coloured stick-on film) Working with the negative space has been understood in Fig. 7 because the designs function well as freestanding 3-D forms in space. The application of coloured film articulates the 3-D puzzles without detracting from the open spaces formed by the white card which function in a similar way to the negative spaces that form “the whole” in the Less is more compositions in Fig. 5. Students learn to develop 3-D designs using thumbnail prototypes, gaining necessary skills to measure and cut accurately.

Flexible Structures Needed to Create the "White Space"

Careful organisation of learning experiences and the way the curriculum is structured (Tyler, 1949, p. 83) can create the necessary "white space".

In the Design Foundation Course spreading the figure drawing teaching blocks throughout the year creates space between the blocks. During the periods between drawing blocks, students engage in alternative studio-based design projects, allowing enough time for what they have learned in the figure drawing sessions to be absorbed. The time between the drawing blocks is comparable to the "white space" referred to in the literature, space that is necessary for intuitive thinking to take place, and which allows for the "imaginative leap" needed for creative change to occur (Cross, 2007, pp. 51-54). When students return to draw in a new drawing block after this "white space", exponential development in the drawing may often be observed, particularly between the drawing blocks in May and July, after the long midwinter recess.

Creation of "white space" should occur at many different levels in order to enable the intuitive leap. When "Katherine" was describing her experience in the Design Foundation Course, she was speaking about a nurturing environment of possibility, which allows for creativity to take place. "I think we all come here with our own creativity and this course just exercises that creativity to lead us to where we want to be … " ("Katherine", surface design graduate 2011: filmed interview of focus group, Design Foundation Course, 2008) (Lecanides-Arnott, 2012, p. 159).

Without structure there will be chaos, and too rigid a structure will inhibit an environment of possibility in which creative action and innovative change can occur. A structured environment (on all levels: physical, conceptual, theoretical and practical) in which the students can function is essential, but it has to be an open and flexible structure that will allow for the "white space" of possibility (Arens, 2010) – the space where problem and solution are kept open and ambiguous for as long as possible to allow for intuitive thinking and the creative leap that is needed for intentional and innovative change to take place (Cross, 2007, p. 114; Dorst, 2010; Ellis, 2005; Leifer, 2010; Nelson & Stolterman, 2003).

Integrating theory and practice to allow for the "white space" to occur

The findings from the research endorse the view that Design is a complex field that bridges art and science (see Table 4).

Table 4: The researcher's understanding of the key educational functions of language and art from Tyler (1949, pp. 28-33), and for science from Tyler (1949, pp. 28-33), Ellis (personal communication, May 9, 2013), (Lecanides-Arnott , 2012, p. 20)

Main educational functions of language, art and science as fields of study		
Language and literature	**Art**	**Science**
Language is about the communication of ideas.	Art provides a visual language, a parallel medium to verbal media for communicating ideas and feelings.	Science helps people "to see the nature of cause and effect in the world around us" (Ellis, 2013).
Language and literature involve critical thinking and critical interpretation and are not only about the gaining of knowledge, skills and habits.	Art extends the student's range of perception through art production and art criticism.	Science develops an understanding of the use and conservation of natural resources (Tyler, 1949).
Literature can extend the reader's understanding of the world (internally and externally) through vicarious experience.	Art leads to personal integration, through the use of symbolic expression.	Science leads to a clearer understanding of the world and the place of humanity in the world and in the larger universe (Ellis, 2013; Tyler, 1949).
Two further educational functions have been attributed to art as a field of study for which there were not parallel functions for language and science		
	Art encourages the development of interests and values, particularly the development of aesthetic values, which are seen as significant in the formation of high life values	
	Art develops technical competence (e.g. acquiring skill in drawing or music or dance), which can have meaning and significance to the student.	

It is essential for designers to start off with an understanding of how to use the visual language of art and design. They need to have a critical awareness of the visual arts as a

field of study and of how their chosen specialisation in design relates to other disciplines in design.

Taking the position that design bridges art and science, as specialists in their particular area of design, designers should be able to collaborate and work with colleagues from other disciplines. They should also be able to collaborate with specialists from other fields of knowledge in order to address the needs of a complex and constantly changing world, clearly articulated by scientist and mathematician, George Ellis:

> So I recommend becoming an expert in some subject area first, understanding it in full depth, and then broadening out and seeking the deeper relationships and understandings that come from broad-based engagement across subjects. But in so doing make sure you engage experts in the new area … to ensure that you know what the relevant historical and current debates in the other areas are (Ellis, 2011, p. 124).

As self-confidence and self-awareness are necessary attributes for design action to take place, "core ideas" need to be dealt with from the start, from foundation, when educating the designer. Lifelong learning can lead to the necessary expertise and connoisseurship – the critical awareness that will encourage intuitive thinking and the "white space" of possibility for innovative design action to manifest.

Popper's scientific/creative method, which is open, iterative and evolutionary in nature, is appropriate as the basis for the research framework. It is synchronous with the iterative creative process of design and encourages continuity and change, essential in a constantly changing and complex world.

$$P_1 \rightarrow TT \rightarrow EE \rightarrow P_2 \ \ldots$$

Fig. 8: Karl Popper's method (*problem (P_1) → a tentative theory (TT) → error elimination (EE) → new problem (P_2)*), (Magee 1975, p. 65; Popper 1978, p. 132)

The method begins by describing a problem, followed by finding a tentative solution to the problem through error elimination, and finally leads to the investigation of a new problem.

As design outcomes are practical, comparing the iterative nature of the creative process in design with the iterative process of problem solving, the scientific/creative method is a convincingly appropriate basis from which to establish a research framework. "Instead of encouraging one to think about building utopia … it starts with human beings, and involves a permanent active willingness to remould institutions" (Hughes, 1980, p. 211; Magee, 1975, p.85).

Popper's approach is based on the advancement of knowledge through criticism (Deutsch, 2012, pp. 8-9; Magee, 1975, p. 67); "the real key to science is that our explanatory theories – which include those interpretations [of what our senses say] can be improved, through conjecture, criticism and testing" (Deutsch, 2012, p. 8).

Conclusion

This longitudinal interpretive study, with particular emphasis on the 2008 Design Foundation Course student group, including feedback from this group of students on completion of the National Diploma in Design in 2011, confirmed the necessity for further research to address the growing requirements of a diverse student body. The issue of breadth versus depth in the one-year foundation course needs further investigation, particularly with regard to curriculum development beyond the foundation year.

The study also established some broad principles for the development of a conceptual framework for foundation education in design (Lecanides-Arnott, 2012, pp. 72-73), for lifelong learning to take place to enable the continuity and change that is necessary in an increasingly complex world (i.e. the use of open and flexible structures that encourage continuity and change).

Many of the aspects of the curriculum in the historic foundation courses of the Bauhaus and Ulm are still relevant for design education in the 2000s. In particular, that although design is a separate field, it is strongly related to art and science (Buchanan, 2006, p. 15; 1989, p. 103; Cross, 2007, p.123; Livingstone, 2002; Nelson & Stolterman, 2003, p. 4). It was established that the integration of theory and practice, “design thinking” and “creative action” from foundation level, is essential to development of generative self-criticism in students of design.

Perhaps it is only through intuitive thinking, arising from the expertise and connoisseurship gained from lifelong learning and generative self-criticism, that designers can attempt to address the conundrum of “quality” posed by Pirsig: “Obviously some things are better than others … but what is the ‘betterness’?”
(Pirsig, 1978, p.178)

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Global Creativity: Intercultural “Hands-On” Workshops for Pre-Service Primary Art Teachers

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Abstract

This seminal paper is presented against the background of a “hands-off” approach to teaching visual arts in most of the Western world where visual arts education is often considered by the school community as peripheral to the real “mission” of education. Most scholars agree that the role of pre-service teachers in the twenty-first century is to develop creative thinking and action in children. However limited research has been conducted into this area of study. The basic aim of this study is to use arts-based research inquiry to investigate Australian primary pre-service teachers' situated knowledge, experiences, and implicit theories using empirical and interpretive data. In this small-scale arts-based research inquiry a mixed-method approach was developed using multiple case studies, a questionnaire, participant observations, semi-structured interviews and critical friends groups (collaborations with artists). In order to understand how “creativity” is fostered in pre-service teachers, artist-led intercultural “hands-on” workshops were used in both formal and informal settings. The data analysis revealed that pre-service teachers' visual arts practices are influenced mainly by inconsistent implicit theories on “creativity” and are often limited by access to the necessary skills and knowledge needed to effectively teach visual arts education. The study revealed that 80% of the cohort felt limited in their confidence to teach visual arts education indicating that they lacked the necessary prior knowledge needed to effectively teach visual arts education. These findings positively correlate with the qualitative semi-structured interviews conducted with twelve of the final-fourth year pre-service teachers who participated in the workshops. Some of the inhibiting factors discussed by pre-service teachers were inadequate initial teacher education and limited time to practice new “creativity” teaching approaches during their teacher training. In addition, the paper discusses future recommendations for researchers and policymakers about how to foster “creativity” through new approaches to learning and teaching within the primary educational framework.

Keywords

global creativity; visual arts education; the role of pre-service primary teachers

Come to the edge, He said. They said, we are afraid.
Come to the edge, He said. They came.
He pushed them... and they flew.
Apollinaire (1880 - 1918).

The purpose of this seminal paper is to investigate the role of pre-service primary teachers in visual arts education and investigate how pre-service teachers are applying creative and innovative learning and teaching approaches in their practice. Against the background of a “hands-off” approach to teaching visual arts education in most of the Western world (Robinson, 2009) visual arts education is often considered by the school community as

peripheral to the real “mission” of education (Eisner, 2006). Most scholars agree that the role of pre-service teachers in the twenty-first century is to develop creative thinking and action in children. However Kampylis (2010) claims limited research has been conducted into this area of study.

The basic aim of this study is to investigate Australian primary pre-service teachers' situated knowledge, experiences, and implicit theories of “creativity” using empirical and interpretive data. This small-scale arts-based research inquiry uses a mixed-method approach incorporating multiple case studies, a questionnaire, participant observations, semi-structured interviews and critical friends groups (collaborations with artists). In order to understand how “creativity” is fostered in pre-service teachers, the study used artist-led intercultural “hands-on” workshops in both formal and informal settings. The questionnaire indicated that 80% of participants had limited prior knowledge of visual arts practice. The paper is divided into three sections: The first section discusses the literature review, fieldwork research and theoretical framework including the presentation of a new intercultural approach to teaching visual arts education. The second section introduces the methodology and methods and discusses this new approach to teaching “creativity” through intercultural “hands-on” workshops. Finally, the paper gives examples of practice and comments on some of the preliminary results from a mixed methods questionnaire and semi-structured interviews.

The Literature Review

Researchers from different fields such as anthropology, cognitive science, history, neuroscience, psychology and sociology have studied human “creativity”. Reaching a common understanding about a definition of the nature of “creativity” can be problematic. There are literally hundreds of definitions available and Eisner (1972) says “creativity” is impossible to define due to the vagueness of the term. Therefore, in this paper, the term “creativity” means creative thinking and action and emphasis is placed on the creative activity that leads towards the product or outcome. Some critics (Sternberg, 2006) stress, “creativity” is as much a decision about and an attitude toward life as it is a matter of ability” (p.93). The literature review revealed “creativity” is complex and often hard to measure (Eisner & Day, 2004). Other concerns are that many schools are not teaching children to think creatively (Sternberg, Jarvin, & Grigorenko, 2011; Torrance, 1974) and this could be because teacher’s confidence to teach “creativity” is often limited as they try to maintain a learning environment that is conducive to “creativity” (Evans-Palmer, 2010; Hudson & Hudson, 2007; Palmer, 2001).

Another issue highlighted in this paper is that many scholars believe every child should be given access to an arts education(Australian Council for the Arts, 2012). Stressing arts education plays an important role by integrating “creativity” across the curriculum. However, recent studies revealed many pre-service primary teachers do not feel competent in teaching visual art education (Bamford, 2002; Bowell, 2010; Hudson & Hudson, 2007; Welch, 1995; Wright, 2010; Wu, 2011). The scholars indicate that there is a lack of resources, confidence, priority, time, knowledge and experience in teaching visual arts and these have been documented as the major inhibitors for generalist classroom teachers (Kampylis, Berki, & Saariluoma, 2009). (Bamford, 2006); Russell-Bowie (2012), research revealed that non-specialist preservice primary teachers were limited in their confidence to teach visual arts to children. Their studies indicated that the pre-service generalist teachers had limited access to new techniques and skills in their professional development programs and are not developing the necessary competencies and skills required to teach “creativity”

in visual arts education. These researchers claim this is because of the pre-service teachers' lack of self-confidence and self-awareness about their own levels of artistic ability.

This paper draws on UNESCO (2013) Learning Metrics Task Force Report which aims to develop universal learning and defines global "creativity" in young children as "the ability to go beyond the techniques normally used to approach a problem and generate innovative solutions" (p.35). Furthermore, it states "creativity" can be demonstrated in how children communicate their ideas, such as through the creative arts (visual arts, new technologies, music, dance, dramatic play). The UNESCO (2013) Report suggests there are two basic domains where teachers can develop competencies, skills and knowledge in "creativity" these are developing different approaches to learning and fostering cognition and general knowledge. Achieving "creativity" in the classroom occurs through "understanding and expressing, creating, receiving and responding in personal, social, cultural and historical contexts" (p.26). This paper is mainly concerned with developing innovative global "creativity" approaches that foster creative thinking and action in and through the visual arts.

Fieldwork Research

In order to understand first-hand how visual arts teachers are teaching "creativity" in classrooms, the artist/researcher/teacher conducted field research in two schools, one in Italy and the other in Hawaii, and two creative industries in Taiwan and United Kingdom. The knowledge gained from these tacit experiences was necessary for the progression of her Doctorial studies. The first fieldwork was during 2009, at Reggio Emilia School in Italy. The Reggio Emilia School focuses on the co-creation of learning from early infants to pre-primary age children. The term co-creation means that the curriculum is not static or prescribed and both the children and specially trained teachers create the curriculum based on the experiential learning of the children. Fraser (2000), states that the Reggio Emilia philosophy is complex and organic, drawing on a variety of theorists and philosophers such as Dewey, Piaget, Vygotsky and Bruner. Significant understandings gained from this fieldwork were, firstly, how the learning environment itself can be used as a "creative" aesthetic space. Edwards, Gandini, and Forman (1998) suggest that the creative environment becomes the "third teacher" in the learning process and this was an important aspect to consider when designing visual arts programs. Secondly, I observed both adults and children as active citizens co-creating curriculum within shared learning spaces where meaning-making was derived based on children's thinking and actions. Another observation was that the creative process became fluid and flexible when "creativity" was made visible through authentic pedagogical documentation (Fleet, Patterson, & Robertson, 2006).

The second fieldwork was conducted at the Assets School in Honolulu, Hawaii, in 2010. The Principal informed the researcher that the aims of the school are:

> To provide a place for gifted and/or dyslexic children, who provide an individualized, integrated learning environment. Small classes, multisensory curriculums and structured behavior management programs allow students to maximize their potential and find their places as life-long learners in school and society (Singer, 2012).

School children range between lower and middle school till upper high school. Teachers are perceptive and mindful of creative thinking differences and they design their curriculum using thematic, multisensory approaches to teach the children (LaFrance, 1997, p. 164). The Assets school has an extremely high success rate in getting their students into university and beyond (Singer, 2010). The main observations made during a tour of the school were that class sizes were kept small and lessons were student-centred around areas of multiple

intelligence (Gardner, 1983).The particular intelligence emphasised was the spatial and kinetic intelligences because these are the areas that support children with dyslexia.

The following year, the author presented at the “Imagination and Creativity” international conference (2011) at the National Sun Yat-sen University, Kaohsiung, Taiwan. This was an important step in understanding the flourishing of global “creativity” in the Asian–Pacific region. The Taiwan “White Paper on Creative Education, 2001-2002” (Wu, Lin & Lin, 2002), points out how “creativity and imagination” are becoming increasingly important to society due to basically two reasons. The first reason is that technology creates many new industries, which in turn require creative thinking and action to navigate. The second reason, is that a shift seems to have occurred in the creative economy with an upsurge in creative industries as a response to the global economic downturn (Wu, 2011). These observations on the future direction of “creativity” influenced the future direction of this project to include more intercultural aspects and work more closely with artists on creative partnerships. Partnership were formed between 2009 to 2013, with artists from China, Singapore, Taiwan and Australia and these artists performed the role of critical friends to the pre-service teachers in the study. For example, in 2010, a creative partnership was formed with a Shanghai Chinese contemporary artist. Consequently, from this encounter, the artist exhibited in the Sydney Biennale and this exhibition became the creative space for the pilot study for this research. For further information read article “Fire, Ink and Play” Wade-Leeuwen (2011). Working as residence artist at the Taiwan Artist Village, the researcher meet Chen-Cheng Lee and his six-year-old daughter, Mu-Yun Lee, (2002). This encounter and viewing Lin Hwai-min’s “Cursive Trilogy” choreographed calligraphic dance chronicle (Szeto, 2010), formed the basis of the Chinese case study: “Linear Motion”. Following this, an artist colleague from Nanyang Academy of Fine Arts in Singapore (Tan, 2011) contributed in a critical friend’s interview. Excerpts from this interview have been documented in the journal article: “Boundary Breaking”, (Wade-Leeuwen, 2013a).

In 2012, the researcher conducted fieldwork in the United Kingdom. This time, she was particularly concerned with the way creative spaces were created within institutes through a community of practice framework (Lave & Wenger, 1991; Wenger, 1998). The creative spaces created between diverse audiences and the TATE Modern, TATE Britain and TATE Liverpool Galleries were of particular interest because these museums and art galleries collectively placed the artists as central to learning (TATE Britain, 2012; TATE Modern, 2012). Prominent artists facilitated artist-led workshops designed to encourage children, teachers and adults to foster their imagination and “creativity” in culturally safe and aesthetic learning environments. TATE Britain, 2012; TATE Modern, 2012, states the aim of these artist-led workshops is “to explore possibilities for teaching and learning through the creative arts such as action, film, installation, participation, speech-based events and performance” (p.2). The strength of these arts-based programs from the researcher’s perspective is that they bring teachers together from across the globe to participate in free culturally inspired creative real or virtual spaces. Another important observation was that in these creative spaces there is no pressure to work for the tests and no demands for quick results such as with the various school-based national testing regimes currently sweeping the Western dominated world. In summary, all of these lived experiences were significant and became the foundations for the design and development of a new Eastern/Western approach to fostering “creativity” in visual arts education. The researcher discovered over these four years that by working collaboratively in creative partnerships with diverse artists, she could experience the world through multiple perspectives. This allowed for better understanding of how to foster creative thinking and action in pre-service teachers because she had experienced first-hand what children and their teachers were feeling, learning, thinking and expressing across the globe.

Theoretical-Framework

Three key premises about "creativity" underpin this study. Firstly, the definitions of "creativity" vary according to application and theorist (Cropley, 2001; Kampylis et al., 2009). Secondly, as specific explanations regarding the implementation of "creativity" within the primary school context are not explicitly explained, pre-service teachers are often unsure about how to foster "creativity" in children. Thirdly, the prior knowledge of pre-service teachers has a significant role to play in the way children respond and experience creative learning. The concept of creative learning supports the "Arts in Education" (AiE) approach from UNESCO (2006), which uses the concept of "multiple intelligences" (Gardner, 1983). The multiple intelligences approach to learning reflects the belief that there are many kinds of intelligences and a number of ways of learning (UNESCO, 2006). Therefore, the view of this research is that all learners are capable of fostering "creativity" to some degree through multiple intelligence approaches. Creative thinking and action occurs in learners when they are given opportunities to work through some of the different "creativity" levels within visual arts provided there is a creative environmental space (Cropley, 2001; Kampylis et al., 2009; Sternberg, 2006; Taylor, 1959; Wade-Leeuwen, 2011; Wade-Leeuwen, 2012; Wade-Leeuwen, 2013b). Therefore, in order to investigate some of these aspects of "creativity", the researcher developed a new model called "Mo-ku-chi" (Ink splash with spiritual energy). This innovative approach to learning and teaching visual arts education is both intercultural and intergenerational based on the literature review and experiential knowledge gained during this dissertation.

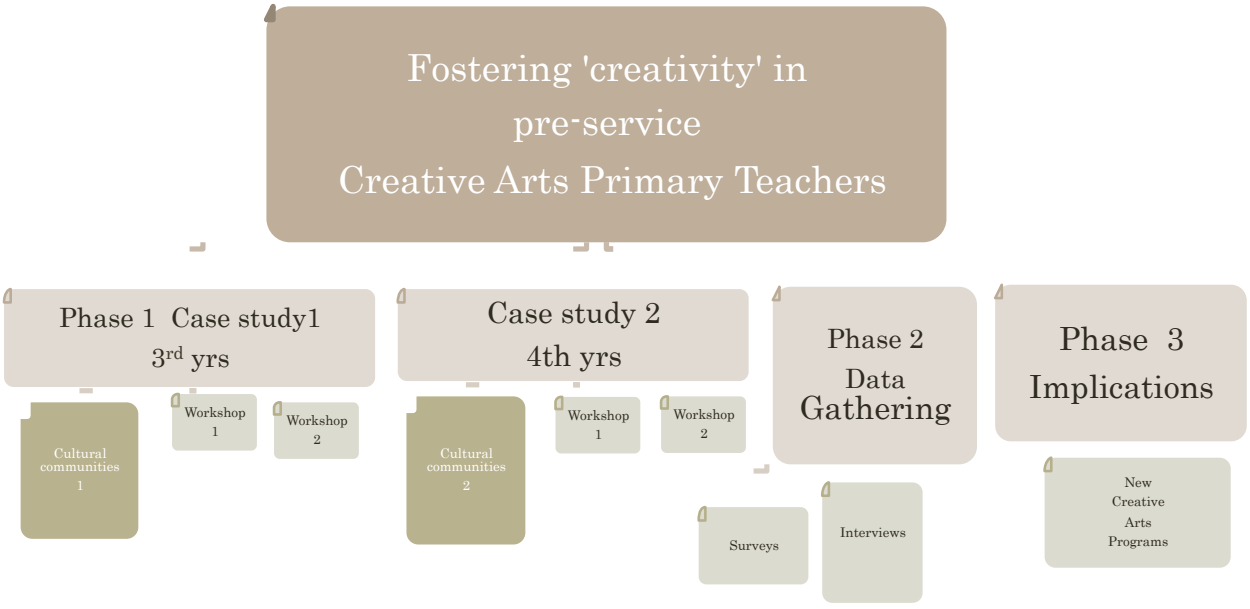


Fig 1. Mixed methods model used in the research

Methodology

Arts-based research inquiry (Barone & Eisner, 2012; Eisner, 2006) was a term introduced by Eisner (1993). It is an approach to social research that recognises arts-based methodologies as a valid way of doing research inquiry. Barone & Eisner (2012) define arts-based research inquiry as a process that "uses the expressive qualities of form to create meaning" (p.xii).

Several social researchers value this mode of researching (Barone & Eisner, 2012; Eisner, 1997; Finley, 2005; Finley and Knowles, 1995; Greene, 2001 and Sullivan, 2005). Arts-based research practices include methodologies such as dance and drama performances, narrative inquiry, performances including poetry, music and installations. The study is concerned mainly with visual arts education. However, this can be integrated with the other art forms such as music, poetry and dance.

The methods

The study was conducted with a total of 335 mixed gender pre-service primary art teachers. The participants were third and final-fourth year students in a two-year teacher-training program offered in primary curriculum and teaching at an Australian city-based university. The course structure consists of twenty-four hours of teacher training in Creative Arts education including: dance, drama, media, music and visual arts. In the course, eight of those hours are designated to Visual Arts, with two hours for theory and two hours for Visual Arts practice (Macquarie University, 2013).

The study was structured in two phases (Layder, 2013). The first phase was the quantitative data collection using a quantitative questionnaire given to all participants during the first creative lecture of the semester. This was followed by a two-hour experimental intercultural "hands-on" workshop. The second phase used qualitative data collection methods by interviewing twelve of the final fourth year pre-service teachers who had participated in the workshops. The interview questions were designed to reveal any personal feelings, ideas and attitudes related to his or her experiences in the workshops. The ethics proposal and application were submitted to the university's Ethics Committee and approved. Access to participants was made through the Master lecturer and course convenor and through a volunteering process within the program. The volunteers for the semi-structured interviews included twelve pre-service teachers from diverse cultural backgrounds. The age range was between 20 to 40 years of age with nine females' participants and three males' participants.

Multiple case study techniques (Stake, 2006; Stake, 2010; Yin, 2009) were used to document the course content in the project. The research project consisted of two pilot studies and two case studies (see the three phase model diagram). For example, the case study discussed in this paper is based on the Chinese Mo-ku-chi workshop. The visual arts provided opportunities to open creative spaces in the individual as well as generating studio-based practice, which provided opportunities for visual literacy discussions and meaning-making possibilities to emerge from the student-made artefacts during the workshops. There were two pilot studies and two case studies in the research. The first case study: "Bwo-me" or Life's Breath based on Australian Aboriginal art and culture works closely with critical friends such as urban Aboriginal artists (Wade-Leeuwen, 2013b) was conducted with these third year pre-service teachers and will not be discussed in this paper.

This paper is mainly concerned with the second case study: "Linear Motion," which is designed on Chinese language, arts and cultural studies. "Linear Motion" works with creative cultural communities called critical friends groups. These include experienced Chinese artists and creative cultural partnerships from Australia, Shanghai, Singapore and Taiwan. This case study was conducted with a cohort of one hundred and fifty, final-fourth year pre-service teachers where they were divided into groups of thirty pre-service teachers in a two-hour "hands-on" workshop. The purpose of these intercultural "hands-on" workshops was to stimulate the participants into creative thinking about new ideas, approaches and actions where they could experience different levels of "creativity" through the visual arts. Teachers were encouraged throughout the creative process to observe, reflect and experience "creativity" through participatory and reflexive arts pedagogies.

An Intercultural Approach

These intercultural “hands-on” workshops provided opportunities for pre-service teachers to break boundaries and shift attitudes and behaviours. The reason intercultural “hands-on” workshops were used is that they can develop critical awareness and observations of the culture embedded in language, arts and culture which operates within, and shapes, communication (Moloney, 2010). Intercultural “hands-on” workshops also provided opportunities to focus on art and cultural experiences from the past and into the present. In the “Linear Motion” workshops, a broad range of Chinese cultural and creative arts activities were organised to reach a variety of audiences. These included briefly exploring rock art and the oracle bone strokes including simple seal carving designs (Wade-Leeuwen, 2010). A video of the links between calligraphy and dance was also shown during the workshops. These intercultural “hands-on” workshops supported inclusivity and diversity as the pre-service teachers came from diverse cultural background experiences and because they were preparing to teach inclusive practices with primary aged learners. This construct provided opportunities for pre-service teachers to work collaboratively with experienced practicing artists from the Asian Pacific region. The multiple case studies method provided opportunities for flexible forms of delivery either virtual or on-site such as through exhibitions, lectures and artist-led discussions.

The “Mo-Ku-Chi” Model Approach

The Mo-ku-chi approach to creative learning and teaching, designed by the researcher (Wade-Leeuwen, 2010), means “ink-splash-spiritual-energy” in the National Chinese Pinyin language. The Mo-ku-chi approach draws on experiential knowledge by applying both Eastern and Western arts-based theories to provide opportunities to break boundaries beyond normal techniques and practices (UNESCO-). This intercultural approach has the potential to open new ways of experiencing “creativity” within specific creative spaces. The unique features of the Mo-ku-chi approach to “creativity” is that it adopts elements from the Integrative Pedagogy Model (Mattsson, Eilertsen & Rorrison, 2011) this will now be discussed briefly. For instance, in the Mo-ku-chi model there are four integrated knowledge elements that influence its functioning. These diverse knowledge elements are: (theoretical knowledge, practical knowledge, socio-cultural knowledge and self-regulative knowledge). These diverse and integrated forms of knowledge significantly influence the ways participants behave and perceive the world. For example, in the “Mo-ku-chi” approach the pre-service teachers who felt limited in their prior knowledge of visual arts education were encouraged to draw on the knowledge and experience of the critical friends groups consisting of experienced artists and creative partners in the project.

The Mo-ku-chi approach has four main aims: Firstly, to work within creative spaces with experienced artists and creative cultural partnerships, secondly, to use arts-based research inquiry, thirdly, to foster an understanding of the different levels of creativity and fourthly, to encourage “mindful creativity”. The first aim is to experience a studio-based environmental creative space under the direction of a studio leader (experienced artist) so that the space becomes the “third teacher” (Edwards et al., 1998). The second aim of this approach is to use arts-based research inquiry as a way of stimulating creative activity through a “sense of play” with material exploration and sensory engagement (Eisner, 1972). The third aim of this approach is to experience and identify different levels of “creativity” (Taylor, 1959) and discuss participant’s responses to the artefacts or outcomes created during the workshops. The Mo-ku-chi approach is illustrated below.

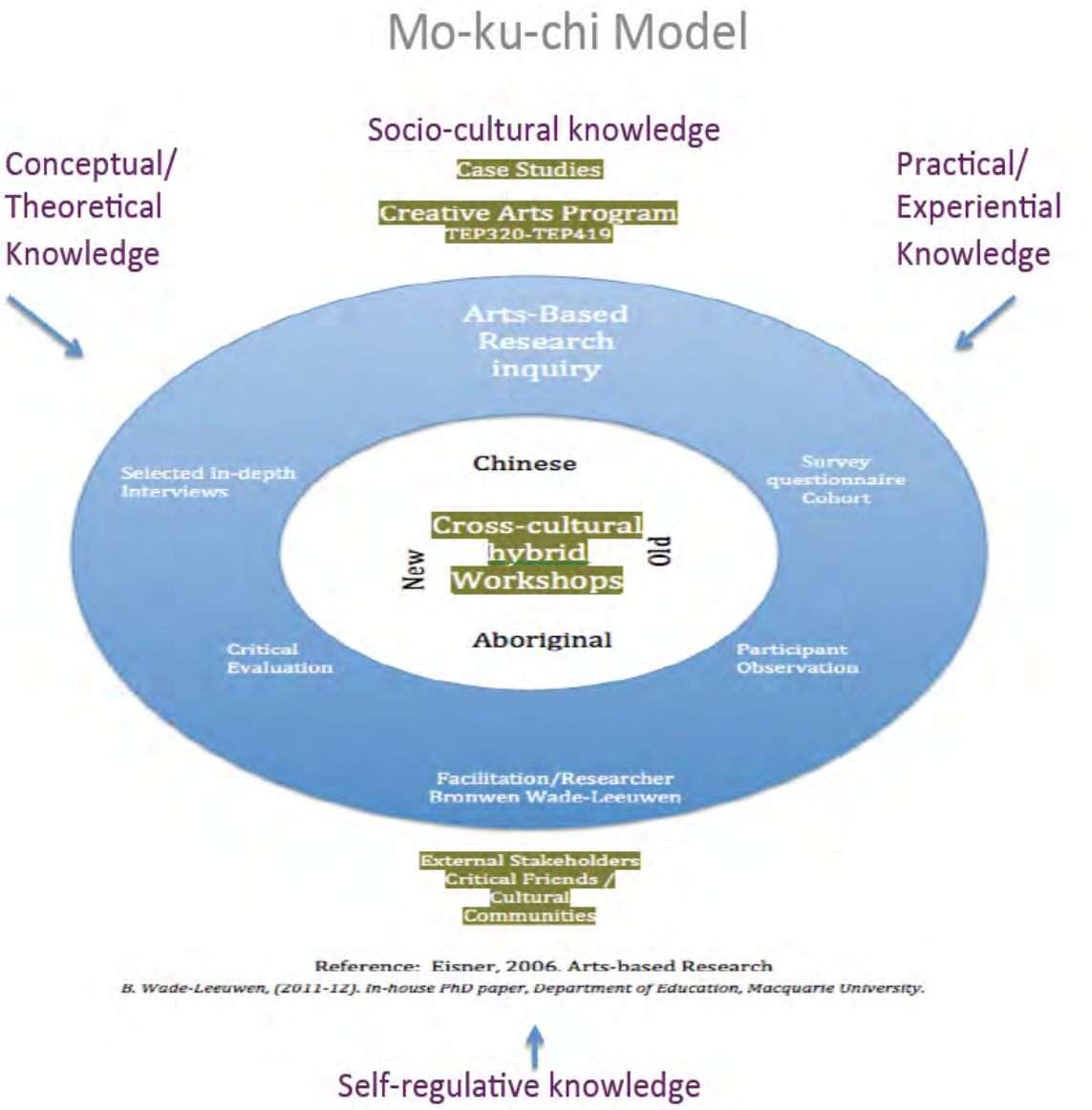


Fig 2. Illustration of the Mo-ku-chi model

A fourth aim of the Mo-ku-chi approach is to engage participants in the creative process by fostering mindful "creativity" (Langer, 2006). "Mindful creativity" focuses more on the creative process rather than on the product or outcomes. For example, as the participants are actually experiencing the dynamic nature of how different art forms in visual arts develop, they begin to recognise the potential for making mistakes. The motto of the Mo-ku-chi approach is "we love mistakes" because we perceive mistakes as *happy accidents.* These *happy accidents* can occur when someone has too much Chinese black ink on Xuan paper and the ink is out of control. Rather than trying to follow the original set plan, the artist is free to explore and experiment with the medium. In the Mo-ku-chi approach, there is no one functional fixedness (Sternberg, 2006) the approach offers opportunities for multiple perspectives and this is the power and delight of this approach. According to Langer (2006) when artists perceive mistakes as *happy accidents* or potential opportunities, this allows for new ideas, approaches and actions to be generated. The Mo-ku-chi approach uses *happy accidents* in mindful ways and the concept of *happy accidents* in people's thought and action provides the fertile grounding for stimulating further research investigation.

The Mo-ku-chi model uses a blended approach to learning and teaching through direct instruction and discovery learning. This usually commences with direct instruction strategies connected to specific cultural tools (Vygotsky, 2004). For example, in the case study "Linear Motion" the skill-set taught consisted of the Chinese four treasures. The Chinese four treasures are: the ink stone for water, black Chinese inkstick, Xuan paper and the Chinese brush (Jiang, 2001). It is through these cultural tools the three perfections are created which are: painting, poetry and calligraphy (van Leeuwen, 2000). Participants are shown how to hold the Chinese brush, mix ink with the Chinese black inkstick in the carved out stone as a form of meditation before beginning painting. The second strategy uses a form of discovery learning (Eisner, 1972). The studio leader discusses some suggested ways of breaking boundaries by using other “creative play” objects or found materials such as pegs, twigs, sponges, and sharp tools for incising. These play objects help to stimulate their imagination because they are being used out of context in a way that is both playful and explorative. These strategies to learning and teaching provide opportunities for the participants to learn new skills and knowledge before experiencing the expressive nature of which according to (UNESCO, 2013) is to break boundaries and moving beyond the normal techniques used to generate creative solutions. The Mo-ku-chi approach adapts elements from Taylor (1959) levels of “creativity” these five levels are briefly described below:

Free expression

Free expressive “creativity” is the fundamental form. This level or dimension of “creativity” focuses on developing self-expression, some basic skills, personal mark-making and does not focus on the end production. The Characteristics being developed are: “spirit of play” and developing spontaneity and freedom.

Technical skills building

Artists proceed from the expressive free-expression level to the technical level of “creativity”. This level is where learning new ideas; approaches and actions are explored to develop finished artworks, artefacts or products.

Inventiveness

This level is about developing new relationships where “creativity” reaches a new level of accomplishment. This is an area where the artwork or artefact maybe different from others as the artist is moving from a known area to an unknown area. The characteristics are new diverse relationships are evident and according to (Golann, 1963; Kampylis et al., 2009; Taylor, 1959) most artists remain in these earlier levels of “creativity”.

Innovation

This innovative level of “creativity” shows transformations and flexibility in perceiving new and abstract ways of thinking. The artworks are shifting from a space of unknown to another unknown. Often new insights are experienced through the processes of divergent and convergent thinking.

Emergence creativity - Changing cultures

The fifth level of “creativity” is where changing cultures occurs. This level of “creativity” offers entirely new principles at the most fundamental and abstract levels (Golann, 1963; Taylor, 1959). When discussing “creativity” Taylor (1959) believed most researchers instinctively use the fifth level, and most rare, definition of “creativity”. He emphasised the heart of the creative process is the ability to mould experiences into new and different approaches and then communicate these unique experiences to others.

Fig 3. Collaborative responses using a “spirit of play”.

In the first level of “creativity” the participants were shown the traditional way of mixing the black ink and holding the Chinese brush however, they were not shown how to paint. The group photograph shows the participants using free expression to collaboratively paint through a “spirit of play” and how they are exploring mark-making through a variety of free expressive lines. The stimulus for this intercultural "hands-on" workshop was integrated between visual arts, music and performance. For example, the participants were mark-making as they moved around the creative space while listening to the rhythm of Chinese flute music. This collaborative creative activity was designed to release tension and develop risk-taking attitudes in the participants. The strength of this arts-based research inquiry is that it transforms diversity by bringing participants together in a culturally inspired creative space. Another important observation of this creative activity was that the participants were not pressured to work towards any testing regimes and there were no demands for quick results, which can inhibit “creativity” in the classroom.

Fig 4. The second level of “creativity” developing new techniques

In the section of the workshop, participants were using the second level of “creativity”. This means they were developing technical skills and competencies using the materials. Firstly, they were encouraged to express their own personal feelings and thoughts about Chinese culture and arts through imaginary images connected to a poem told by the studio leader. This section of the workshop worked with their imagination (Brooks, 2002) where they recalled memories of past experiences and using other forms of sensory materials to assist “creativity” to flow (Csikszentmihalyi, 1988). The sensory stimuli in this workshop came from listening to classical Chinese pan flute music and smelling the scents from lemon and sandalwood oils. The benefits of working independently in this manner is that time and space are given to the development of fundamental skills and techniques which enables the participants to gain confidence in the use of these materials and to create something for display or exhibition.

Responding to Visual Arts

Responding to the different visual arts artefacts and outcomes created during the workshop sessions were significant because these sessions provided opportunities to work collaboratively with peers and artists. In the workshops the participants were continually exploring new ideas, approaches and actions, which encourages new schematic ways of operating by opening spaces for previously hidden images to become visible. Participants

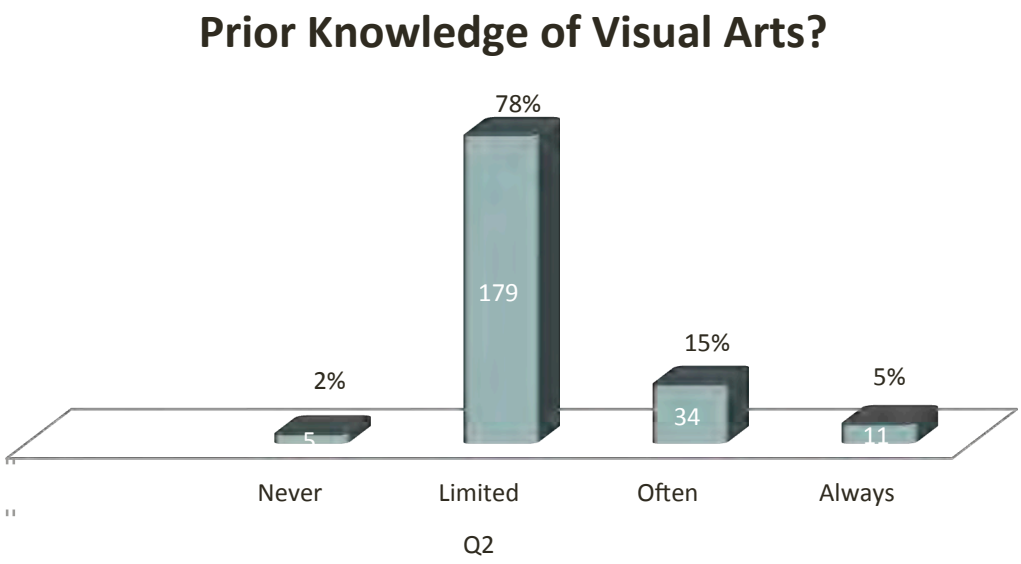
were responding both individually and collaboratively by sharing their interpretations and personal aesthetic or emotive responses within a safe and supportive environment. Taylor's levels of "creativity" were explored during the display and discuss segment of the workshops however; these will not be expanded on in this paper.

The quantitative results

The final section of this paper on arts-based research inquiry presents preliminary results from the data analysis illuminating the inter-relationship between the individual, the visual arts and the socio-cultural context. The preliminary findings from the quantitative data collected from the pre-workshop questionnaire conducted with two hundred and thirty-five pre-service primary teachers in third-year and fourth-year are discussed below.

What is your prior knowledge in visual arts?

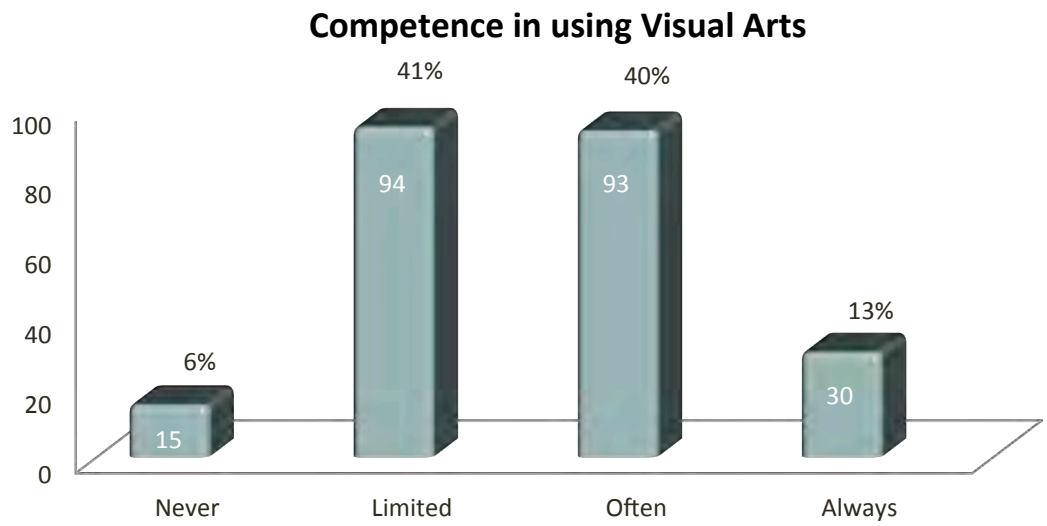
The pre-service teachers' prior knowledge of visual arts and their background experiences in this area were diverse. The preliminary findings from two hundred and twenty-eight respondents showed many of the pre-service teachers came from a variety of cultural backgrounds and diverse abilities. The pre-workshop questionnaire indicated 80% of participants had limited prior knowledge of visual arts practice. This is consistent with other scholars' research as discussed in the literature review.



Graph 1. Showing the pre-service teachers prior knowledge of visual arts

Do you feel competent to use visual arts?

The questionnaire reported on the competence of pre-service teachers to teach visual arts. It showed that from the two hundred and thirty-two respondents, 47% of the participants reported they felt limited and 53% felt competent to teach visual arts. These preliminary results indicate around half of the third and fourth year pre-service teachers who responded to the questionnaire, felt competent to use visual arts practices. It was not possible, from the questionnaire, to investigate whether those participants who had already mastered some form of visual arts practice before their teacher training had increased levels of competence. However, this was expanded on in the semi-structured interviews and could be further investigated.



Graph 2. Showing the pre-service teachers competence in using visual arts

Definitions of creativity

The study shows that the participants struggled with defining "creativity". This highlights the literature findings where most theorists believe "creativity" is almost impossible to define (Taylor, 1959; Eisner, 1972; Sternberg, 1999; Lubart, 2001, Wright. 2010; Barone, 2012). 60% of the questionnaire respondents thought that "creativity" related to some form of self-expression. Others thought "creativity" related to divergent thinking, uniqueness, imagination, inventing and meaning-making with unusual associations. This result highlights studies in the literature (Kampylis et al., 2009) that found teachers were often influenced by misconceptions and inconsistent implicit theories of "creativity".

The qualitative outcomes from the semi-structured interview

Responses to the semi-structured interview questions are discussed below.

Finding 1. Can you give me three elements that surprised you in the workshop?

"Since the workshop I feel a lot more confident. I feel I gained lots of confidence and it's encouraged me even to think, go further, beyond- to do more research and hopefully I'll be able to adopt them to the classroom." *Nina from Malta, age in her 40's (Participant interview, 2011-2012).*

Finding 2. Another participant responded to the above question:

"The way people in the class were switched on to painting with brushes on long sticks. Many people had never had a connection like that before and they could not stop. They were doing wiggles, and squares, making marks it was very exciting watching the ink lines emerge on the paper. The rhythm in the paintings that came from listening to the music created a senses response. This happened when they combined two or more senses together- hearing, feeling, sensing and making a mark." *Kitty from Vietnam, Age in her 20s. (Participant interview 2011-2012-*

Finding 3. What do you think inhibits creativity in schools?

“It's just - too many rules, too many boundaries. There's a lot of emphasis on technique and skills and I think that's important. I think that should not be the main objective, whereas I think that can hinder the way people express themselves, because they're too conscious of the restrictions. There's just not a lot of importance placed on Art or the Creative Arts. A good example of this is the NAPLAN - standardized testing.” *Joo from Korea Aged in his 20s. (Participant interview, 2011-2012).*

The preliminary findings reveal that the absence of explicit well-defined approaches to fostering “creativity” in pre-service teachers has created challenges in their teacher training programs both at university and while on practicum training in schools. Some of the main themes emerging from the data analysed are that there is a need for a more supportive environment where pre-service teachers can develop their confidence and understandings of the nature and levels of “creativity”. Another emerging finding was that pre-service teachers could benefit from learning explicitly about the nature of “creativity” and the various ways it can be fostered in order to develop their self-confidence. The qualitative evidence indicates that the intercultural “hands-on” artist-led workshops seemed to build their confidence, develop their personal “creativity” capabilities and enhanced the skills required to engage children in learning.

Limitations

Though this small-scale study was limited to Australia, the research was informed by movements in global “creativity” and investigated diverse approaches to teaching pre-service teacher in visual arts education. However, future recommendations for researchers and policymakers about how to foster “creativity” in pre-service teachers could be broaden to include educational knowledge and understanding of the intercultural possibilities of visual arts pedagogies. Other areas for improvement is to demonstrate explicit theories of “creativity” through innovative approaches to integrated learning and teaching within the primary educational framework.

Conclusion

This arts-based research inquiry applies innovative approaches to fostering “creativity” in pre-service primary art teachers during their tertiary training. An important focus of this study was on the role of pre-service teachers, their knowledge, wants, and beliefs about “creativity” in visual arts education. The main research question investigates how to foster “creativity” in pre-service primary art teachers so they can better mentor the children they teach. The data analysed from the questionnaire, participant observations and semi-structured interviews reveal that teacher’s practices were influenced by many inconsistent implicit theories and their limited “hands-on” experiences in the visual arts. The paper attempts to demonstrate how pre-service teachers can develop “creativity” through new ideas, approaches and actions that extend beyond the normal techniques used in the classroom. In order for this to occur, a new innovative Eastern/Western approach to learning and teaching was introduced. The data indicates that it has the potential to lead to creative thinking and action. The Mo-ku-Chi approach requires “mindful creativity” and a risk-taking attitude with emphasis placed on the creative process rather than the end product or outcomes.

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