DESIGN ACADEMICS’ EXPERIENCES OF DESIGN PRACTICE AND TEACHING

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ABSTRACT

My thesis explores design academics’ qualitatively different experiences of design practice and teaching, and the relationship between the two. Past studies investigating the phenomenon of teaching have reported a hierarchy of conceptions of teaching ranging from categories where teachers focus on themselves and on conveying their knowledge, through to categories where teachers are student-centred and learning focussed. More recent research has suggested that the nature of the discipline may influence the teachers’ conceptions of teaching and several studies have found that, contrary to teachers from other disciplines, design teachers tended to be more student-focussed. I used a phenomenographic perspective and interviewed 10 design academics in a research-intensive university to capture their experiences of design practice and teaching. I found four categories of experience of design practice: design as a problem solving, outcome generating activity; design as an affective agent; design as a strategic act resulting in benefit to humanity; and design as an affective, socially embedded reciprocal domain. The current study is the only one known so far, to describe dimensions of design practice and how they are variously experienced across the categories. The four dimensions were: communication; research; creativity and ideation; and transformation. I also found four categories of design teaching: teaching as providing a pattern of practice; teaching as providing an environment enabling autonomous practice; teaching as causing a change in understanding; and teaching as enabling relational meaning making. Unlike other studies, the design academics in my study did not express more teacher-centred, knowledge conveying conceptions of teaching. The dimensions of the experiences of design teaching were: outcomes of the teaching learning process; the nature of taught knowledge; teachers’ perceptions of student teacher relationships and their roles; and assessment practices in the experience of design teaching. This last dimension appeared to have a significant impact on the pedagogy of design teaching. My study also confirms that domain beliefs influence academics conceptions of teaching, their teaching practices and the ways in which they variously utilise the signature pedagogies of design. It is hoped that my study will be of benefit to both design practitioners and design teachers, and by providing a basis for dialogue, result in enabling designers and design teachers to understand/perceive the phenomena in new ways, perhaps resulting in richer and
more sophisticated experiences. It is also hoped that my study will raise awareness in designer teachers, of the affective relationship between design and teaching beliefs, and of the ways in which design beliefs may impact on teaching practices.
ACKNOWLEDGEMENTS

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My heartfelt thanks go to:

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To the staff of the University Disability Services, for their understanding, advice and parking permit.

I am also indebted to all those researchers whose works provided the foundations for this study and thus made it possible

‘Our lives we borrow from each other...
and we, like runners, pass along the torch of life’

Lucretius

On The nature of Things

De Rarum Natura
# TABLE OF CONTENTS

**ABSTRACT** ................................................................................................................................. ii

**ACKNOWLEDGEMENTS** ........................................................................................................... iv

**LIST OF TABLES** .................................................................................................................... viii

**LIST OF FIGURES** ................................................................................................................... ix

**CHAPTER 1 - INTRODUCTION** ............................................................................................... 1
  1.1 Introduction .......................................................................................................................... 1
  1.2 Background and rationale ................................................................................................. 1
  1.3 Overview of the thesis structure ....................................................................................... 3

**CHAPTER 2 - REVIEW OF THE LITERATURE** ...................................................................... 4
  2.1 Introduction ......................................................................................................................... 4
  2.2 Research on conceptions of teaching ................................................................................ 4
      2.2.1 The experience of teaching ....................................................................................... 5
      2.2.2 Categories of conceptions of teaching ...................................................................... 7
  2.3 Dimensions of the experience of teaching ........................................................................ 11
  2.4 Research on approaches to teaching .................................................................................. 14
  2.5 Relations between teachers’ approaches to teaching and learning and students’ approaches to learning .................................................................................................................. 17
  2.6 Disciplinary differences ..................................................................................................... 18
  2.7 The signature pedagogies of design .................................................................................. 20
  2.8 Research on design teaching ............................................................................................. 20
  2.9 Research on design practice ............................................................................................. 24
  2.10 Summary ......................................................................................................................... 25

**CHAPTER 3 - METHODOLOGY** .............................................................................................. 27
  3.1 Introduction ......................................................................................................................... 27
  3.2 Research aims .................................................................................................................... 27
      3.2.1 The philosophical underpinning of the research ....................................................... 28
      3.2.2 Phenomenography .................................................................................................... 31
      3.2.3 Conceptions research ............................................................................................... 33
  3.3 Method ................................................................................................................................... 35
      3.3.1 Rationale for interviews ............................................................................................ 35
      3.3.2 Design of the interviews ............................................................................................ 36
      3.3.3 Procedures ................................................................................................................. 38
  3.4 Chapter summary ................................................................................................................. 41

**CHAPTER 4 - THE VARIATIONS AND DIMENSIONS OF THE EXPERIENCE OF DESIGN** ........ 42
  4.1 Introduction ......................................................................................................................... 42
  4.2 The Variations of the experience of design ......................................................................... 42
      4.2.1 Category A. Design as a problem solving, outcome generating activity ............... 43
      4.2.2 Category B. Design as an affective agent ................................................................. 45
LIST OF TABLES

Table 2.1 Ways of conceptualizing / experiencing teaching........................................8
Table 2.2 The Dimensions of the Experience of Teaching .............................................13
Table 2.3 Summary of approaches to teaching after Ramsden (1992) and Trigwell et al. (1994) .........................................................................................................................16
Table 2.4 A summary of Drew’s (2000) study of ways of conceptualising / experiencing design teaching .................................................................................................22
Table 2.5 Relationships between professional design practice and teaching ...........23
Table 2.6 Summary of the research on design teachers’ experiences of design practice .................................................................................................................................24
Table 4.1 Focus of design practice, and boundary of experience .........................43
Table 4.2 Focus and role of communication in the experience of design ...............54
Table 4.3 Research focus in the experience of design ..............................................56
Table 4.4 Creativity in the experience of design .......................................................59
Table 4.5 Transformation in the experience of design ..............................................62
Table 5.1 Focus of design teaching experience and teacher role .........................68
Table 5.2 Outcomes of the teaching learning process ............................................74
Table 5.3 Assessment practices in the experience of design teaching ...................75
Table 5.4 The nature of taught knowledge ...............................................................78
Table 5.5 Teachers’ perceptions of student-teacher relationships and their roles .....79
Table 6.1 Design aims and the means to achieving them .......................................85
Table 6.2 Comparison of categories of the experience of design between this study and Reid and Davies (2003) .........................................................................................88
Table 6.3 Comparison of conceptions of teaching studies with conceptions of design teaching only studies .................................................................................................95
Table 6.4 Comparison of dimensions of teaching with dimensions of design teaching ..............................................................................................................................98
LIST OF FIGURES

Figure 6.1 Transformational boundaries of design practice........................................92
Figure 6.2 The structure of the phenomenal field of design practice showing the relationships between the categories of description and the dimensions of the phenomenon. ........................................................................................................106
CHAPTER 1
INTRODUCTION

1.1 Introduction
This thesis explores design academics’ qualitatively different experiences of design practice and teaching, and the relationship between the two. The aim of this exploration is to understand the various ways in which the domain of design is experienced and to provide an explanation of the ways in which these various experiences and design specific epistemologies might influence design curricula and teaching practices. It is hoped that the understandings resulting from the research will provide a basis for dialogue amongst practitioner teachers of design, and that these discussions will further inform design practice and teaching. In this chapter I provide a brief background and rationale for the study, and an overview of the structure of the thesis.

1.2 Background and rationale
As a longstanding design teacher and practitioner, my interest in this topic was awakened, while undertaking a post-graduate diploma in tertiary teaching, and a project in which I compared my beliefs and conceptions about teaching with literature on teachers’ beliefs (Shanks, 2000). In that project, I gained an understanding of how beliefs and conceptions relate to and influence teaching, and I became aware of the beliefs I hold and how they provided the underpinning and rationale for much of my teaching and curriculum planning. Moreover, the project clarified my understanding of the nature of design, the kinds of knowledge I believed I needed and how I used it. These personal insights suggested that this area warranted further investigation.

In the Diploma study, I used interviews to explore two design lecturers’ conceptions/beliefs about the nature of design and their related teaching practices. The outcomes, two case studies, provide the inspiration for this thesis. At the time, I chose a case study approach because it provided a richly contextualised picture of the academics’ beliefs about their discipline and how they approached
their teaching. As part of the study I explored a number of related issues including: the nature of beliefs and their relationship to teaching practice, conceptions of teaching, and, conceptions of design and its teaching. Aspects of the case studies could be related to existing literature. For instance, the data revealed the link between conception and practice that has been the focus of two decades of educational research. Furthermore, in the two case studies the notion of design as a problem solving activity manifested itself in teaching practices as a problem solving approach. The lecturers evinced a recognisable structure of thinking and design reasoning that appeared to be specific to the discipline - perhaps akin to design pedagogic content knowledge (Wilson, Shulman & Richert, 1987). However, the data that contributed to the case studies were insufficient to explore this further. A related area that was hinted at but remained relatively unexplored was the relationship between a sphere of intellectual activity, and the way in which its distinctive nature might influence conceptions of teaching and learning. This idea was implied in several studies (e.g., Shulman, 1987; Jenkins, 1996; Murray & MacDonald, 1997), where it was proposed that it is domain beliefs which influence teachers’ teaching practices as these are formed prior to practitioners commencing teaching. Hofer and Pintrich (1997) too, indicate a need for further investigation into epistemological beliefs and the disciplinary specificity of such beliefs.

At a general level both Pajares (1992) and Brookfield (1990) also provide a rationale for undertaking such a study:

> Few would argue that the beliefs teachers hold influence their perceptions and judgments, which, in turn, affect their behaviour in the classroom, or that understanding the belief structures of teachers... is essential to improving their professional preparation and teaching practices (Pajares, 1992, p. 307).

Pajares then proposes that teachers critically examine their belief structures to determine how they influence their teaching practice. Brookfield suggests that teachers provide themselves with a critical rationale for their teaching practice based upon a set of values and beliefs, which equips them with an organising vision of where they are going and why they are going there. For both of them the word "critical" is crucial. They argue that unless teachers have exposed and unpacked their beliefs, they cannot accurately determine in what ways they are affecting the curriculum, teaching and assessment practices, nor can they create a rational and justifiable set of values and beliefs upon which to base their vision of
teaching. Furthermore, Calderhead (1996) argues that the aim of research into teachers’ beliefs is to uncover the kinds of conceptual frameworks that are implicit in teachers' talk about their practice. This kind of investigation facilitates self-disclosure and so makes explicit the beliefs and assumptions of the practitioner / teacher, raising the level of consciousness of their practice. However, despite the general direction of research into the relationship between a domain and its teaching, there is little focus in the literature on the substance of design as a domain or a profession, and the ways in which design specific epistemologies might influence its curricula and its teaching practices. Consequently the aim of this thesis was to explore design academics’ qualitatively different experiences of design practice and teaching, and make explicit the relationships between the two phenomena.

1.3 Overview of the thesis structure

Chapter 2 provides an exploration of the literature that underpins the study. The main foci are: conceptions of tertiary teaching; approaches to teaching; the relationship between teaching and learning; disciplinary differences and signature pedagogies; conceptions of design and design teaching. Chapter 3 describes the methodology utilised, which was phenomenography. This methodology enables the variations between qualitative experiences of phenomena to be explored, meanings to be derived, and possible explanatory relations between phenomena to be discerned. The chapter also describes the methods used to effect the research. Chapters 4 and 5 present the results of the research, with designers’ conceptions of design practice reported in chapter 4, and design teachers’ conceptions of design teaching described in chapter 5. Chapter 6 discusses and compares the results of chapters 4 and 5 with existing research, presents the key findings of the study, considers the limitations of the study and provides an answer to the research question. Chapter 7 concludes and summarises the research.
CHAPTER 2

REVIEW OF THE LITERATURE

2.1 Introduction

My study explores design academics’ qualitatively different experiences of design practice and its teaching, and the relationship between the two. Consequently, the literature informing this study derives from several different areas. These are: university teachers’ conceptions of teaching; approaches to teaching and their possible influences on learning; the possible influences of discipline specific pedagogies; the domain of design; and tertiary design teaching. Much of this literature focusses on peoples’ understandings of the world. People’s understanding of the world frames their actions on the world. In the experiential literature, on which this study is based, understandings of the world are called conceptions.

2.2 Research on conceptions of teaching

There is general agreement that the conceptions and beliefs teachers hold influence the ways in which they define their teaching tasks and organise the knowledge associated with those tasks (Nespor, 1987) and the way in which they conduct their teaching (Kagan, 1992). Ramsden (1992) presents this research in an interesting way by providing an example of conceptions of teaching as three distinct varieties. These range from: teaching as transmitting knowledge, to teaching as managing student activity, and teaching as making learning possible. He goes on to suggest that teachers who conceive of teaching as transmitting knowledge perceive student learning as something distinct from teaching; teachers who manage student activity see a connection between what they do and student learning; and teachers who conceive of teaching as making learning possible see teaching and learning as part of the same whole. This suggests that although the same phenomena are represented, they are conceived of very differently. Research on teachers’ conceptions of teaching focuses predominantly on teaching in the tertiary education sector, and the focus of this research is to elicit the collective variation in the meanings that are attributed to teaching, and subsequently, by means of analysis, to enable the features of the
phenomenon to emerge and to demonstrate how these, too, are variously experienced.

2.2.1 The experience of teaching
Marton and Booth (1997) suggest that the different ways of experiencing a phenomenon, when described by the researcher, can subsequently be hierarchically ordered, where some can be considered as more complex or controlled than others. The categories are constructed when the same one, or several concepts or beliefs are commonly expressed by the studies’ participants. These hierarchically ordered experiences have been termed “categories of description” (Marton, 1981) (Table 2.1). In order to determine how one category of description differs from another, Marton and Booth (1997) propose that it is the participant’s focus that reveals to the researcher those aspects of a phenomenon that are of importance to the participant - what they are aware of, focus on and describe at a given moment, and that these differences in focal awareness point to the different ways of experiencing a phenomenon. In this chapter I have categorised and analysed the literature similarly, in Table 2.1, grouping the categories as proposed by Kember (1997a), as less complex knowledge conveying categories, intermediate student / teacher interaction categories, and more complex student-centred and learner focussed categories of experience. The categories demonstrate a consistency between the finding of the various studies which suggests that in the less complex categories the focus of teaching is the transfer of the teacher’s knowledge. In the intermediate categories, the teachers focus on enabling students to learn to become experts, whereas in the most complex categories, the aim of teaching is to change student understanding. Here teaching is student-focussed and learning-oriented, and is concerned with conceptual development.

Many studies of conceptions of teaching propose that the primary distinguishing characteristic between the conceptions of teaching may be attributed to the directionality of focus of the teachers, with many early studies (Dall’Alba, 1991; Martin & Balla, 1991; Martin & Ramsden, 1992; Samuelowicz and Bain, 1992; Prosser et al., 1994) arguing that there is an intermediate stage in which the focus begins to shift from the teacher and course content and reorients towards the student, a transitional stage in which the teacher becomes aware of students. Kember (1997a) maintains that academics who expressed this focus were in transition from a
transmissive to a facilitative perspective and that interaction between student and teacher was the active agent in the change process.

Samuelowicz and Bain’s (2001) study provides a reappraisal of their (1992) research in which they present seven categories of conceptions of teaching, and discern and describe the fine distinctions between them. Their later study also presents nine dimensions of the phenomenon. They propose that the categories are hierarchically related to each other and inclusive with the more complex categories building on and incorporating aspects of the less complex ones. Furthermore, they argue that the intermediate categories of teaching proposed by earlier researchers do not portray the different views of teaching accurately and that teachers are either teacher-focussed or student-focussed.

Although it might have been thought that after nearly two decades the area had been fully explored and developed, in the last decade studies have not only provided different perspectives on the experience of teaching, but also more dimensions of the phenomenon. For example, Åkerlind (2003) presents categories of conceptions of teaching in line with previous studies, however, the aim of her work was to understand academics’ conceptions of their own growth and development and to explore the relationship between the conceptions of teaching and conceptions of growing and developing as a teacher. She aimed to explore academics’ experiences from the perspective of ‘being’ a university teacher rather than engaging in teaching as previous studies have done (Åkerlind, 2004). This shift in focus has produced results that show what teachers may gain personally from the process of teaching. Moreover, both Åkerlind (2004) and González’s (2011) results support the assertions of Samuelowicz and Bain (2001) that conceptions are related and inclusive; that the intermediate categories proposed in earlier studies do not exist; and that teachers either focus on themselves or on students.

Other research has extended this literature on experiences of teaching. For example, communication was emphasized by Åkerlind and Jenkins (1998) and Carnell (2007). Carnell (2007) explored teachers’ conceptions of effective teaching and found that one of the most significant factors described by her participants was the role of communication. The participants suggested that dialogue and collegiality were key factors in enabling them to “transform their teaching to transform learning” (p. 30). Moreover, teachers and learners shared the responsibility for teaching and learning “forming a community of learners where knowledge is created through dialogue” (p.
30). Here, teaching, learning and research shared a “symbiotic relationship” (p.36). Other research, too, stressed the importance of dialogue in teaching. For example Bruce and Gerber (1995) argued that teachers’ conceptions of learning encompass a component of personal interaction. In the more complex conceptions there is greater emphasis on the social aspects of learning, and learning is seen to be achieved through interaction between the learners and wider social groups.

2.2.2 Categories of conceptions of teaching
This section elaborates on the conceptions of teaching discussed above. Table 2.1 provides a summary of sources of most of the literature on conceptions of teaching. Literature to 1997 is well documented (e.g., Kember, 1997) so in the section below the categories that derive from research after Kember are summarised to show the development of the research. I have clustered the categories according to the foci identified by the various authors, as either ‘Knowledge conveying’ and Teacher-centred, or ‘Intermediate’ and teacher activity focussed, or as ‘Facilitation of learning’ and Student-centred.

Knowledge conveying / Teacher-centred categories

Teaching as transmitting information
In these categories the aim of teaching is to transmit the teachers’, or textbook knowledge, to cover the syllabus or meet exam requirements. The course content is what anyone in the discipline should know, although the knowledge components are compartmentalised. Teachers tend not to focus on students, so the students’ role is not emphasised and nor do teachers expect to motivate them. If the teacher is very familiar with the material of the discipline the teacher may gain little of personal benefit from the teaching/learning process.

Teaching as transmitting structured knowledge
In this cluster of categories the teacher’s understanding of the discipline is the focus of teaching, and the aim of teaching is to transmit it to students. Teachers recognise the importance of arranging and simplifying the information in a logical manner so it can be understood by students, suggesting an emphasis on quality of presentation. Here, although teachers are more aware of students, they are still seen as passive recipients whom teachers do not expect to motivate, and whose prior knowledge is not considered.
### Table 2.1 Ways of conceptualizing / experiencing teaching

<table>
<thead>
<tr>
<th>Study</th>
<th>Knowledge conveying categories</th>
<th>Intermediate categories</th>
<th>Facilitation of learning categories</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Less complex and teacher focussed</td>
<td>Teacher/student activity focussed</td>
<td>More complex and student focussed</td>
</tr>
<tr>
<td>Fox (1983)</td>
<td>Transfer</td>
<td>Shaping</td>
<td>Building</td>
</tr>
<tr>
<td>Dall’ Alba (1991)</td>
<td>Imparting information</td>
<td>Transmitting information</td>
<td>Connecting theory to practice</td>
</tr>
<tr>
<td>Martin and Balla (1991)</td>
<td>Presenting information</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Samuelowicz and Bain (1992)</td>
<td>Imparting information</td>
<td>Transmitting knowledge</td>
<td></td>
</tr>
<tr>
<td>Pratt (1992)</td>
<td>Delivering content</td>
<td></td>
<td>Modelling ways of being</td>
</tr>
<tr>
<td>Martin and Ramsden (1992)</td>
<td>Presenting content of process</td>
<td>Organising content/or process</td>
<td></td>
</tr>
<tr>
<td>Prosser et al. (1994 &amp; 1997)</td>
<td>Transmitting concepts of the syllabus</td>
<td>Transmitting teacher’s knowledge</td>
<td>Helping students acquire syllabus concepts</td>
</tr>
<tr>
<td>Kember (1997a) (synthesis of literature)</td>
<td>Imparting information</td>
<td>Transmitting structured knowledge</td>
<td>Student-teacher interaction</td>
</tr>
<tr>
<td>Prosser and Trigwell (1999)</td>
<td>Presenting information</td>
<td>Transmitting information</td>
<td>Showing how to apply theory to practice</td>
</tr>
<tr>
<td>Study</td>
<td>Knowledge conveying categories</td>
<td>Intermediate categories</td>
<td>Facilitation of learning categories</td>
</tr>
<tr>
<td>------------------------------</td>
<td>---------------------------------------------------------------------</td>
<td>----------------------------------------------------------------</td>
<td>----------------------------------------------------------</td>
</tr>
<tr>
<td></td>
<td>Less complex and teacher focussed</td>
<td>Teacher/student activity focussed</td>
<td>More complex and student focussed</td>
</tr>
<tr>
<td>Kember et al. (2001)</td>
<td>Passing information</td>
<td>Making it easier for students to understand</td>
<td>Meeting student’s learning needs</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Facilitating students to become independent learners</td>
</tr>
<tr>
<td>Samuelowicz and Bain (2001)</td>
<td>Imparting information, teacher focus</td>
<td>Transmitting structured knowledge teacher focus</td>
<td>(no intermediate categories)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Providing and facilitating understanding teacher focus</td>
<td>Helping students develop expertise student focus</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Preventing misunderstandings student focus</td>
</tr>
<tr>
<td>Åkerlind (2003 &amp; 2004)</td>
<td>Imparting information</td>
<td>Developing good relations with students</td>
<td>Engage students with course content</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Enabling student development and change</td>
</tr>
<tr>
<td>Carnell (2007)</td>
<td>Didactic: transmitting information &amp; increasing it</td>
<td></td>
<td>Empowering: providing experiences that encourage understanding</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Cooperative: Group working together to examine existing knowledge</td>
</tr>
<tr>
<td>González (2011)</td>
<td>Transmitting basic discipline information</td>
<td>Transmitting lecturers’ understanding</td>
<td>Changing students’ understanding - developing critical thinking</td>
</tr>
</tbody>
</table>
Intermediate categories, teacher/student interaction/activity focus

Teaching as helping students acquire concepts of the syllabus
In these categories, teachers do not focus on transmitting concepts of textbook or syllabus but instead see themselves as helping students acquire them, and see the relationship between them. The teacher is aware of students and their prior knowledge is seen as of importance.

Student teacher interaction
Teachers in these categories realise the importance of interaction with students. Consequently, the teaching emphasis is on developing good relations with students. There is a greater focus on what students are doing, and teachers are aware that students may have differing learning needs and work to help them realise these. Here, the aim of teaching is to engage students in order to develop their understanding of concepts, enthusiasm and self-motivation to learn; this is achieved by involving them in real-world type learning activities so that students learn to perform like experts. The teacher is a facilitator and students are active participants. The outcome for the teacher of the teaching/learning process is seen as potentially gaining both new content knowledge and a sense of satisfaction from the experience of teaching.

Student-centred / Learner focussed categories

Teaching as facilitating students to become independent learners
In these categories, the aim of teaching is on the intellectual development of students, and on enabling them to become independent learners. Students are recognised as individuals, whom teachers realise may not have interpreted what was said in the intended way. Here, teachers focus on the individual’s conceptions of the subject matter rather than on their own. The learning outcome is understanding, and students demonstrate this by applying their knowledge.

Teaching as changing student understanding
The aim of teaching is to enable students to gain a deeper understanding of the world by changing their understandings. Teachers are facilitators who share the learning process with students by encouraging active learning and dialogue. Critical and original thinking, reflection and questioning by students are practices
encouraged with the aim of changing students’ understandings. Students’ experiences are taken into account and used to engage and motivate them in learning. Here, teachers gain both knowledge and enjoyment from teaching, and an opportunity to extend their own understanding. They see the potential for benefits to their discipline and or society arising from student learning. This broader benefit may form part of the social mission for the teacher.

*Teaching as a community of learners generating knowledge.*

Samuelowicz and Bain (2001) report this conception of teaching only in the context of postgraduate teaching, a result also implied by Carnell (2007). Here, the teacher focuses on enabling a holistic developmental process by communicating, supporting, gaining and sustaining student confidence. Students are expected to be responsible for their own learning process and to be in control of the content of their learning. The teachers’ role is to help them organise their work, give feedback through discussion, and help with conceptual difficulties. Teaching is conducted on an individual basis in response to particular problems. Teachers provide a collegial environment where knowledge is collaboratively constructed.

### 2.3 Dimensions of the experience of teaching

The aim of conceptions research is to describe the variation in the ways of experiencing a phenomenon and to reveal the meanings of the different experiences. The whole of the experience, the parts, and the relationship between them are discerned in terms of various aspects, themes or dimensions. Dimensions are derived through a cross category meta analysis looking at cross category themes. It is these differences within the dimensions that demarcate one category from another as the distinctions imply both increasingly complex experiences of teaching, and a shift in focus away from the teacher and their activities towards students and their needs.

Researchers (e.g. Trigwell & Prosser, 1996; Entwistle & Walker, 2000; Kember, 1997a; Samuelowicz & Bain, 2001) have identified a relationship between teachers, students, content and knowledge, as illustrated in Table 2.2. For example, in the less complex categories teachers appear largely unaware of students and focus entirely on their own knowledge and activities. In the marginally more complex categories teachers are aware of students and work to help them adopt either the teachers’ concepts, or, in a slightly more complex experience, to develop their own concepts. Here students
and teachers interact. In the complex categories, as the aim of teaching is to bring about a change in an individual’s understanding, the teachers focus on students, perceiving them as co-learners and constructors of knowledge, and as individuals with individualistic needs and ways of learning. In contrast, in the less complex categories teachers control all aspects of the learning environment and students are perceived as passive recipients.

While earlier studies focussed on what students gained from the teaching/learning experience, more recent research has also suggested that the practice of teaching may encompass positive outcomes for teachers.

The dimension identified by Samuelowicz and Bain (2001) as ‘teacher student interaction’ in Table 2.2, is not identified in any other research. However, its underlying premise - that teachers focus either on themselves or on students for a reason - is expressed in later studies as ‘role of lecturer’ and ‘role of student’, a distinction that reflects the shift in focus from teacher to student and allows a more detailed description of students’ experiences.

Table 2.2. not only presents Samuelowicz and Bain’s (2001) synthesis, but also includes the results of subsequent research providing a comparison of the dimensions of the experiences of teaching.
Table 2.2 The Dimensions of the Experience of Teaching

<table>
<thead>
<tr>
<th>Dimensions</th>
<th>Samuelowicz &amp; Bain, 2001</th>
<th>Other studies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Desired learning outcomes</td>
<td>from retention of atomised information to reproductive understanding, to changed ways of thinking</td>
<td>(i) from reproduction of knowledge, to purposeful use of knowledge (Dall’Alba, 1991; Martin &amp; Balla, 1991; Pratt, 1992)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(ii) academics’ conceptions of learning: from accumulating more information to satisfy external demands, to acquiring concepts to satisfy external demands, to acquiring concepts to satisfy internal demands, to conceptual development to satisfy internal demands, to conceptual change to satisfy internal demands (Prosser et al., 1994)</td>
</tr>
<tr>
<td>Expected use of knowledge</td>
<td>from within the subject, to within the subject for future use, to interpretation of reality</td>
<td>from curriculum bound to interpretation of reality (Pratt, 1992)</td>
</tr>
<tr>
<td>Nature of knowledge</td>
<td>from externally constructed, to personalised</td>
<td>(i) taken for granted, to structured by teachers, to discovered by students, to socially constructed (Martin &amp; Ramsden, 1992); (ii) “what there is to be revealed” to socially constructed (Bain et al., 1998); (iii) possessed by lecturer, to discovered by student within lecturer’s framework, to constructed by students, to socially constructed (Kember, 1997)</td>
</tr>
<tr>
<td>Agent responsible for transforming</td>
<td>from teachers, to teachers showing how knowledge can be organised and questioned, to students with teachers, to students</td>
<td>(i) from teacher to students (Martin &amp; Balla, 1991; Pratt, 1992; Prosser et al., 1994); (ii) external agency (textbooks, syllabus, teachers) to students (Prosser et al., 1994)</td>
</tr>
<tr>
<td>knowledge</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Teacher-student interaction</td>
<td>one-way, teachers to students, to two-way, to maintain students’ attention, to two-way to check/clarify students’ understanding, to two-way to negotiate meaning</td>
<td></td>
</tr>
<tr>
<td>Students’ existing conceptions</td>
<td>not taken into account, to taken into account</td>
<td>(i) from taking, to not taking students’ conceptions into account (Dall’Alba, 1991; Martin &amp; Balla, 1991; Pratt 1992; Prosser et al., 1994)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(ii) students’ prerequisite knowledge (Prosser et al., 1994)</td>
</tr>
<tr>
<td>Control of content</td>
<td>from teacher to students</td>
<td>teaching focus on student development (an analogous rather than full belief dimension) (to the academic discipline, Fox, 1983)</td>
</tr>
<tr>
<td>Students’ personal/ professional</td>
<td>not stressed vs stressed</td>
<td>teaching focus on student development (an analogous rather than full belief dimension) (vs the academic discipline, Fox, 1983)</td>
</tr>
<tr>
<td>development</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Interest and motivation</td>
<td>from teacher-initiated interest, to student-based interest</td>
<td>(i) teacher responsibility for stimulating students’ motivation and interest (Dunkin, 1990; Gow &amp; Kember, 1993); (ii) teacher responsibility for inspiring and engaging students apparent only in more complex categories (González, 2011)</td>
</tr>
<tr>
<td>Dimensions</td>
<td>Samuelowicz &amp; Bain, 2001</td>
<td>Other studies</td>
</tr>
<tr>
<td>------------</td>
<td>--------------------------</td>
<td>---------------</td>
</tr>
</tbody>
</table>
| Role of lecturer | not identified | (i) from transmitting information, teacher expert to providing experiences that encourage understanding; teacher as facilitator, to teacher decides/sets tasks with defined parameters, to learning through co-constructed dialogue, teacher & learner have joint responsibility (Carnell, 2007)  
(ii) provider of information to provider of teacher’s understanding; to facilitator, to facilitator challenger (González, 2011) |
| Role of students | not identified | (i) passive recipients to recipients who relate to and feel satisfaction with teacher, to active learner, to active creators in development of understanding (Åkerlind, 2003 & 2004; Carnell, 2007)  
(ii) students share responsibility for learning (Carnell, 2007)  
(iii) from passive recipients to active learner, to active developer of understanding (González, 2011) |
| Content | not identified | delimited by syllabus & external demands to delimited by lecturer, to constructed by students within lecturers’ framework, to constructed by students (González, 2011) |
| What students gain from learning | not identified | from knowledge and facts to problem solving and technical skills, to active engagement in learning process and enjoyment from learning, to personal development and awareness of how discipline/society operates (Åkerlind, 2004) |
| Teacher gains from teaching/learning process | not identified | little, to new techniques, examples or content knowledge, to satisfaction and enjoyment from interacting with students, to impact upon the wider discipline and the society in which it is embedded (Åkerlind, 2003 & 2004) |

(Adapted from Samuelowicz & Bain, 2001)

### 2.4 Research on approaches to teaching

A related area of research, ‘Approaches to Teaching’, also provides an understanding of the various ways in which teaching is experienced. Its significance for this study, which aims to explore the relationships between a specific discipline and its teaching, lies in the research’s facility to explain relationships between aspects of educational environments. For example, the approach adopted by teachers has been shown to be related to their conceptions of teaching (Carnell, 2007; Kember & Kwan, 2000; Trigwell & Prosser, 1996; Trigwell et al., 1999); and to their perceptions of their teaching context (Prosser & Trigwell, 1999). Research has also shown that a relationship exists between teachers’ conceptions of teaching and students’ approaches to learning (Gow & Kember, 1993; Kember & Gow, 1994); and between teachers’ approaches to teaching and how students respond to that approach (Martin & Ramsden, 1992). Research by Hounsell (1997), Kember and Gow (1994), Gow and Kember (1993), Martin and Balla (1991), Marton et al. (1997), Murray & MacDonald (1997), and Prosser et al. (1994) explored relationships between teachers’ conceptions
of learning, the way they approach their teaching, and the influence of these conceptions and approaches on student learning outcomes. Importantly, later research also recognised that different disciplines may influence teachers’ approaches to teaching (Lindblom-Ylanne et al., 2006; Lueddeke, 2003; Trigwell et al., 1999). All of which implies that causal relationships exist between the various features of teaching. For example, Martin and Ramsden (1992) suggest this when they propose that there is a relationship between how teachers describe their approach to teaching and how students respond to the approach, reporting that a match exists between the approach taken by the teacher and the learning approach adopted by students.

It is apparent that there are parallels in the results of research on approaches to teaching with that on conceptions of teaching, with studies indicating that the distinguishing characteristic between the teachers’ different approaches to teaching may be attributed to the directionality of focus of the teachers, where it is either directed towards themselves and their strategies, or towards students and what they do (e.g. Trigwell et al., 1994; Trigwell & Prosser, 1996). Carnell (2007) too proposed an either/or teacher focus, arguing that the way academics approach their teaching “relates to differences in their conceptions of teaching” and that “those who conceptualise teaching as transferring information see the teacher as pivotal. Those who conceptualise teaching as knowledge construction focus on student learning” (p. 27).

Two studies (Ramsden, 1992; Trigwell et al., 1994) explored the aims/intentions associated with the teaching strategies of academics and reported similar results in the ways teachers focus on and approach teaching. Ramsden (1992) proposed three approaches to teaching (termed ‘theories’), while Trigwell et al. (1994) proposed a hierarchy of five qualitatively different approaches to teaching. The two studies are summarised in Table 2.3.

Ramsden argues that the approaches have a hierarchical structure, with for example, approach B incorporating the concepts of approach A, but also including additional concepts. Trigwell et al. (1994) state that some teachers describe their approach as mainly student-focused, and aim to help their students change their worldviews. The authors term this a conceptual change/student-focused approach. Conversely, they argue, other teachers describe an approach where the transmission of information is the aim of teaching, and where teachers focus largely on what they do.
This approach has been described as an information transmission/teacher-focused approach to teaching.

### Table 2.3 Summary of approaches to teaching after Ramsden (1992) and Trigwell et al. (1994)

<table>
<thead>
<tr>
<th>Studies</th>
<th>Teaching aims and strategies</th>
<th>Focus &amp; intention of teacher</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ramsden, 1992</td>
<td>Teacher’s content knowledge and fluent presentation enable transmission of facts and skills.</td>
<td>Teacher focussed</td>
</tr>
<tr>
<td>Trigwell et al., 1994</td>
<td>Teachers transmit facts and skills but not relationship between the two. Prior knowledge of students not considered. Students learn without engagement in teaching/learning process</td>
<td>Transmit information</td>
</tr>
<tr>
<td>Trigwell et al., 1994</td>
<td>Students acquire concepts of discipline and understand relationship between them by being told or shown. Students expected to recall facts, solve problems and relate concepts</td>
<td>Teacher focussed</td>
</tr>
<tr>
<td></td>
<td>Teacher focussed</td>
<td>Transmit concepts &amp; their relationships</td>
</tr>
<tr>
<td>Trigwell et al., 1994</td>
<td>Students acquire concepts of discipline and understand relationship between them by interacting with teacher and engagement with teaching/learning process. Teacher responsible for teaching /learning situation</td>
<td>Provide appropriate activities</td>
</tr>
<tr>
<td>Ramsden, 1992</td>
<td>Teacher’s content knowledge, fluent presentation, addition of skills and student activity together enable learning</td>
<td>Teacher / student interaction</td>
</tr>
<tr>
<td>Trigwell et al., 1994</td>
<td>Students acquire concepts of discipline and understand relationship between them by interacting with teacher and engagement with teaching/learning process. Teacher responsible for teaching /learning situation</td>
<td>Provide appropriate activities</td>
</tr>
<tr>
<td>Trigwell et al., 1994</td>
<td>Teachers believe that what the student does determines what students learn. Students assume responsibility for their own learning and construct /develop own conceptions consistent with discipline</td>
<td>Student focussed</td>
</tr>
<tr>
<td></td>
<td>Help students to develop understanding</td>
<td></td>
</tr>
<tr>
<td>Ramsden, 1992</td>
<td>Teacher recognises that knowledge of subject content is actively constituted and imaginatively interpreted by the student. Teaching, students and content comprise a linked system.</td>
<td>Student focussed</td>
</tr>
<tr>
<td>Trigwell et al., 1994</td>
<td>Students confront their world-views, which may differ from those of the discipline, thus students may need to re-construct and change their understanding. Students interact with teacher and each other.</td>
<td>Help students to change understanding</td>
</tr>
</tbody>
</table>

Table 2.3 indicates that in both studies the focus of the teacher and the teaching intentions supply the primary features used to categorise approaches to teaching. However, additional features also suggest distinctions between the approaches, for example, expected learning outcomes differ (knowing more vs a change in understanding), as do conceptions of knowledge (unrelated facts and skills vs a linked framework). Trigwell et al. (1994) propose not only that in all the approaches, “logical relations were found between intention and strategy” (p.75), but also that the variations between the approaches are significant because they have been found to relate to students’ qualitatively different approaches to learning, and, that these learning approaches have been found to relate to the quality of the outcome of student learning (Marton & Saljo, 1997). These relationships are discussed next.
2.5 Relations between teachers’ approaches to teaching and learning and students’ approaches to learning.

So far, this chapter has focussed on the development of ways of understanding the experiences of teachers by exploring their conceptions of, and approaches to, teaching; an emphasis which suggests that it is the teachers’ foci, aims, intentions and practices, that comprise the teachers’ educational world. However, the previous section introduced the idea that this world also encompasses other factors and that as they form part of the teachers’ world they may have an impact on teaching. One such factor is the teacher’s conception of learning, a conception which research suggests (Kember & Gow, 1994; Ramsden, 1992) impacts on their approach to teaching.

Kember and Gow (1994) imply a relation between teachers’ conceptions of learning, their approach to teaching, and learning outcomes. They report that teachers who conceive of learning as the acquisition of information conceive of teaching as transmitting information to students, and are more likely to utilise teacher-focussed strategies. In contrast, teachers who conceive of learning as developing and changing students’ conceptions, conceive of teaching in terms of helping students to develop and change their conceptions and are more likely to “establish a learning environment that encourages meaningful learning” (p. 69).

Furthermore, several studies imply that relationships exist between the teacher’s approach to teaching, their teaching practice, and learners’ approaches to learning. For example, Trigwell et al. (1999), exploring the association between teachers’ approaches to teaching and their impact on students’ approaches to learning, reported that teachers who adopted a teacher-focussed approach to teaching were more likely to utilise teaching practices which encourage a surface approach to learning. Ramsden (1992), too, argued that teaching practices which suggested that learning entailed a quantitative acquisition of facts or procedures, and which required students to memorise, rote learn, and later “regurgitate” this material in final assessment, encouraged students to adopt a surface approach to learning. In this approach they distort and segment the structure of material to be learned and focus on its parts. Conversely, if the learning tasks required students to understand and make meaning they were more likely to adopt a deep approach, where they focussed on concepts or an author’s intention, and where they worked to understand the whole in relation to the parts. According to Biggs (1999) such teaching activities are likely to focus on practices which: “bring out the structure of a subject; build on
what students already know; challenge students’ misconceptions; and assessment which looks for structural understanding and meaning” (Biggs, 1999, p. 16-17).

Several studies which explored conceptions and approaches to teaching and learning also presented results which suggested that teaching conceptions and approaches may be influenced by the nature of the discipline (Kember & Gow 1994; Lindblom-Ylanne, et al., 2006; Prosser et al., 2003; Quinlan, 1997; Virtenan & Lindblom-Ylanne, 2010). For example, Prosser et al. (1994) suggest that there is growing evidence that conceptions of phenomena associated with teaching and learning are relational within the discipline, meaning that conceptions of teaching science might be different from conceptions of teaching history. Therefore, they argue, conceptions need to be identified and described “within particular contexts” (p. 219).

2.6 **Disciplinary differences**

Research into disciplinary differences has emerged in the past couple of decades. Shulman (1987), Jenkins (1996), and Murray and MacDonald (1997) argue that the primary allegiance of most academic staff is to their discipline. Consequently, if they wish to have a significant impact on staff development, educational developers should pay attention to the particular contexts created by specific disciplines. Lueddeke (2003) too, proposed that, “advances in the scholarship of teaching will occur more readily if they are closely aligned to the conceptual structure and epistemology of the discipline” (p. 217). The relationship between teaching practices and the particular nature or characteristics of a discipline is discussed by Schulman (2005). He identified “signature pedagogies” (p. 52) that can inform people about the “personalities, dispositions and cultures of a particular field” (p. 52) and reveal the types of teaching that organise the fundamental ways in which future practitioners are educated. Schulman goes on to say that although all disciplines have signature pedagogies to some degree, that professions are more likely than other academic disciplines to develop distinctively interesting pedagogies because “their pedagogies must measure up to the standards not just of the academy, but also of the particular profession” (p. 53).

Becher and Trowler (2001) state that there are reasonably clear distinctions between the knowledge domains in terms of: characteristics in the object of enquiry; the nature of knowledge growth; the relationship between the researcher and knowledge; enquiry procedures; extent of truth claims and criteria for making them;
and the results of research (p. 36). Moreover, disciplines, they argue, may be clustered as ‘hard’ (e.g., sciences) or ‘soft’ (e.g., humanities) and may also be categorised as either ‘applied’ or ‘pure’ (p. 36).

Although past research on disciplinary differences had different aims, there is a consistency in the various findings, which suggests that some generalisations can be made regarding the influence of the inherent characteristics of different disciplines on conceptions and approaches to both teaching and learning. Taken together, the research suggests that in the sciences and engineering, (hard disciplines) teachers tended to adopt an information transmission/teacher-focussed and content oriented approach, and were therefore clustered in the less complex categories of conceptions of teaching. Whereas, in the arts and humanities (soft disciplines) the teachers were more likely to adopt a conceptual change/student-focussed approach to teaching and therefore tended to cluster in the more complex categories. Lindblom-Ylanne et al. (2006) proposed that these differences were possibly due to the typical teaching practices of the different disciplines, where teaching in hard disciplines was more likely to involve mass lectures, problem based seminars, simulations and case studies in relation to professional situations, whereas teaching in the soft disciplines typically involved more face-to-face meetings and tutorial teaching, discussion and debate. These observations reflect the argument of Schulman (2005) mentioned earlier.

Kember and Gow (1994), when discussing the influence of teaching approaches on studying, argued that “a predominant orientation towards learning facilitation has influenced the Design School lecturers to introduce a project based curriculum that is conducive to meaningful learning” (p. 69). They go on to suggest that, “unless key figures in the department conceive of teaching in terms of learning facilitation, it is difficult to see how such a course could be planned” (p. 69). Thus they are implying that it is the governance of an academic department that directs the teaching practices adopted by staff. However, Åkerlind and Jenkins (1998) found that academic staff within a single department held very different conceptions of teaching from each other. This raises the possibility that academics in other departments may also hold similarly varying conceptions of teaching. Thus, although strong academic leadership may influence the teaching approaches of the academics of an entire department, other factors may also be important, for example, the culture and characteristics of the discipline.
2.7 The signature pedagogies of design
Two studies (Davies & Reid, 2001; Swann, 2002) although not providing any data to support their assertions, propose that design teaching entails four key practices: project based learning; public critique; studio-based teaching; and the final show. Davies and Reid argue that all four of these practices strongly suggest close and personal contact with students in small groups implying a strongly student-focussed approach to teaching (Trigwell, 2002). However, the effectiveness of these practices has been questioned by both Swann (2002) and Davies and Reid (2001), the latter arguing that “the actual environment established for learning will depend on the appropriateness of the context and on the conceptions of learning and teaching held by both teacher and student” (p. 183). Although most of these signature pedagogies are reported by Shreeve (2011) in the results of an empirical study of design learning activities, Shreeve also proposed that the paramount intention of the teachers was to provide the opportunity for students to develop as practitioners, and that this aim to inculcate an understanding of practice beyond the university was key to the signature pedagogies of design, suggesting an ontological knowing of what it means to be a designer. She proposed that it was the studio that provided the particular culture which replicated the world of practice, and which thus supplied an opportunity to experience the kinds of working environments likely to be encountered in professional life – a learning environment which also helps in forming disciplinary ways of thinking. Moreover, she argues that the studio also provides a safe location for the development of the kinds of creative thinking approaches required when contending with the uncertain and ambiguous problems encountered by designers. Rittel and Webber (1973) characterise design and planning problems as ‘wicked’ and fundamentally unamenable to the techniques of science and engineering, the nature of whose problems, in contrast, are deemed to be ‘tame’. Shreeve (2011) too, proposes that the public critique is a signature pedagogy; a practice which yields the opportunity to debate and explain ideas, and “articulate the often tacit understanding and evaluation of design processes enabling the development of critical thinking skills” (p. 118). The various dialogic practices that take place in design teaching are also thought to provide a significant design pedagogy.

2.8 Research on design teaching
The nature of design as a discipline may lend itself to learner-centred approaches. For example, de la Harpe and Peterson (2008) undertook a comprehensive review of
design, art and architecture teaching literature with the aim of examining what academics in these areas focus their learning and teaching publications on, and whether the writing was informed by contemporary learning theory. They found that a learner-centred approach was implicit in over half the article abstracts, although this was explicitly referred to only once in the design literature. However, Trigwell (2002) in a study of design teachers’ approaches to teaching suggested that, “the approaches adopted by design teachers are more student-focussed than in most other areas of higher education teaching” (p. 69); an assertion substantiated by other studies which also concur that teachers in design contexts showed high levels of adoption of student-focussed approaches (Drew, 2000; Drew & Trigwell, 2003; Swann, 2002).

Two studies informed by contemporary educational theory have been found that relate to design teaching (Drew, 2000; Drew & Trigwell, 2003). These two studies respectively explored design teachers’ conceptions and approaches to design teaching. A third study (Shreeve, 2010) examined relations between an individual’s design practice and teaching it to others.

Drew (2000) in research on conceptions of design teaching, explored the phenomenon with the data obtained from the reflective journals of seven design teachers. Drew proposed five qualitatively different conceptions of design teaching ranging from teaching as offering something to students, to teaching as helping students to change their conceptions (pp. 186-188). Here too, in keeping with Ramsden (1992) and Trigwell et al. (1994), the difference between the two most complex categories is indicated by a distinction between developing student’s understanding and changing it. The conceptions are summarised in Table 2.4. Only one category is wholly teacher-focussed, with the remaining four incorporating an increasing degree of student-centeredness. These results differ from those of Trigwell et al. (1994) who reported that only two of five categories of science teachers were found to be student-focussed.
### Table 2.4 A summary of Drew’s (2000) study of ways of conceptualising / experiencing design teaching

<table>
<thead>
<tr>
<th>Offering students a range of practical and technical skills</th>
<th>Design Teaching is</th>
<th>Developing students’ critical, practical and technical skills through interaction with students</th>
<th>Developing students’ skills and conceptions in the context of professional practice</th>
<th>Helping students change conceptions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aim: to instill technical ability show individual students ways of making/doing. Students follow technical topics prescribed by teacher Learning emphasis on creating a product or artefact</td>
<td>Aim: developing and practising skills in different contexts to perfect techniques</td>
<td>Aim: enable students to develop a critical language by working in groups to present their own, and see others work Emphasis on peer learning and process. Teacher works with individuals/groups to enable students to form opinions and ideas</td>
<td>Aim: professional preparation; students manage projects involving complex problem-solving skills in professional contexts Emphasis on peer learning &amp; process. Teacher helps students develop conceptions, increase self-awareness, and individual and team autonomy</td>
<td>Aim: enable students’ to undertake self-directed original research, improve conceptual skills, and change their conceptions Learning emphasis on peer learning and process</td>
</tr>
</tbody>
</table>

In a subsequent study, Drew and Trigwell (2003) described the qualitative differences in art, design and communication teachers’ approaches to teaching. They proposed that the teachers in their study adopted two approaches, either a skills development approach, or a ‘real-world’ problem approach. The results showed that a skills development approach is “strongly and statistically significantly correlated with Information Transmission/Teacher Focussed approaches to teaching” (p. 7). Using a ‘real-world’ problem approach to teaching correlated positively and was statistically significant with Conceptual Change/Student Focussed approaches to teaching. In this study, the authors proposed that “in the teaching of creative practices the student-focussed approach aligns with an approach in which teachers encourage their students to learn through authentic practices (‘real-world’ projects)” (p.8). However, when teachers describe a teacher-focussed approach, they report focussing on the development of skills.

Research bringing together the phenomena of design and the teaching of design, was undertaken by Shreeve (2010) and Reid and Davies (2003). Shreeve (2010) explored the relationship between the two worlds. She proposed an inclusive hierarchy of five categories whose differences depended upon the degree of separation between the two worlds. These differing ways of experiencing a relation between two areas
provided, she argued, different kinds of learning experiences for students and different kinds of access to practice knowledge, variations implied in Table 2.5.

<table>
<thead>
<tr>
<th>Teaching is:</th>
<th>Relational Component</th>
<th>Structural Component</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transferring knowledge from practice</td>
<td>Using knowledge from practice</td>
<td>Teaching dominates practice</td>
</tr>
<tr>
<td>‘Dropping in’ dropping in to pass on practice knowledge</td>
<td>‘Moving across’ Using knowledge to develop understanding</td>
<td>Both teaching and practice present in equal measure</td>
</tr>
<tr>
<td>Practitioner as expert</td>
<td>World of practice recreated to enable students to know what it feels like to become a practitioner</td>
<td>Teaching and practice are equal. Knowledge from each area may benefit the other</td>
</tr>
<tr>
<td>Knowledge focus; transfer of skills</td>
<td>‘Two camps’ A tensioned relationship limits the knowledge students can access as teacher unwilling to allow two worlds to meet as teaching drains energy from practice, but not the reverse</td>
<td>Holistic</td>
</tr>
<tr>
<td></td>
<td>Both these categories use practice knowledge when teaching</td>
<td>Teaching/practice are integrated</td>
</tr>
</tbody>
</table>

| | Exchanging knowledge between practice & teaching | ‘Integrating’ Integrates practice and teaching in a holistic experience of the relationship |
| | ‘Balancing’ An exchange of knowledge between practice and teaching | Students engaged in debates central to the world of practice. Students seen as partners in learning |
| | Dialogue between teacher and students enables students to gain insights into practice | Teachers dovetail practice and teaching using activities that have objectives for both worlds |

| | Eliding knowledge between practice & teaching | |
| | ‘Integrating’ Integrates practice and teaching in a holistic experience of the relationship |

Table 2.5 Relationships between professional design practice and teaching

(Adapted from Shreeve, 2010)

The results of these two studies, although guided by different research questions, suggest similarities, and therefore, consistency. For example, in all studies, as the categories become ever more complex, the teaching focus and intention changes, ranging from the transfer of skills, to students practicing skills in a realistic environment, to enabling students to know what it feels like to be a practitioner.
A phenomenographic study, which also examined the relationship between design practice and teaching, was undertaken by Reid and Davies (2003). The aim of the study was to explore the way in which teachers’ and students’ perceptions of professional work provided a context for situating their conceptions of learning within an institutional environment. As the set of results linking the practice of design and its teaching focussed on student learning, the results have not been included here as students’ conceptions of design learning are outside the scope of this study. However, the study also identified seven categories of design experiences, and these are reported in the next section.

### 2.9 Research on design practice

Research in design tends to focus on artefacts, despite a suggestion that design academics produce more publications (McCarthy & Walliss, 2003). Consequently, there is a paucity of published articles about the practice of design.

Although the aim of a study mentioned above (Reid & Davies, 2003) was to examine both design and its teaching, nevertheless, the study explored design academics’ conceptions of design as an entity distinct from design teaching, enabling the authors to present seven qualitatively different understandings or conceptions of the practice of design (summarised in Table 2.6 below).

<table>
<thead>
<tr>
<th>Category / understanding</th>
<th>Category description</th>
</tr>
</thead>
<tbody>
<tr>
<td>A ‘end-product’ oriented - making</td>
<td>Designer’s intentions: to make a product, resulting in the learning of skills</td>
</tr>
<tr>
<td>B ‘trying to satisfy other people’ - problem solving</td>
<td>Designer’s intentions: to solve clients’ design problems, and satisfy their wants. Problem seen in terms of the relationship between aesthetics and functionality.</td>
</tr>
<tr>
<td>C ‘being able to identify problems’ - e.g., function / aesthetics</td>
<td>Designer’s intention: identify client needs, and actual problem facing client (problem-finding) convince client of this, and then present a solution. Success is a having a good design process and re-educating client</td>
</tr>
<tr>
<td>D ‘like orchestration’</td>
<td>Designer’s intention: perform as a conductor of an orchestra to ensure that all elements of the design process work in harmony</td>
</tr>
<tr>
<td>E ‘being open to possibilities’, a questioning condition - analytical</td>
<td>Designer’s focus on the critical and analytical aspects of design. Successful design is about questioning and looking for possibilities</td>
</tr>
<tr>
<td>F ‘other ways of seeing’ - cognitive creative</td>
<td>Focus is on the imagination. Design relates to alternative ways of perceiving the world</td>
</tr>
</tbody>
</table>
The results of this study suggest that the primary foci of these participants is on the technical aspects of design, the process of designing and the relationships between clients and users of design outcomes. Whether and to what extent the results of these studies of designers/teachers relate to or concur with this study is discussed in chapter 6.

2.10 Summary

The categories of teaching that emerge from the majority of the early conceptions of teaching research are consistent in showing a range of teaching experiences which progress from teaching as transferring the teachers’ knowledge, to teaching as developing student understanding, to teaching as changing student understanding. Moreover, the research has also shown that the focus of teachers not only shifts as the conceptions of teaching gradually become more complex, but that this shift in focus influences teachers’ roles and relations with students. These develop from a perspective in which students barely feature, to one where students are conceived of as collegial co-learners and constructors of knowledge.

More recent research into teaching in specific disciplines has suggested that the nature of the discipline may influence teachers’ conceptions of teaching. Results indicate that in design, teachers not only tended to focus on enabling an ontological understanding of design, but moreover, that unlike most other disciplines, in design, student-focussed conceptions of teaching predominated. So far, research has not been undertaken which seeks to account for this anomaly. This may be linked to the particular practices of the profession, and research into signature pedagogies has begun to identify those that are specific to design and explore their influence on design learning. What research has so far failed to do, is to ask whether these design specific teaching practices are experienced and utilised differently, and if so, how this might impact on learning outcomes. Furthermore, no studies have been located which explore the connections between the experiences of design practitioners and design teachers. Although Shreeve’s (2010) participants were both design
practitioners and design teachers, her study did not explore how they experienced design, but instead focussed on how design practice connected with teaching.
CHAPTER 3

METHODOLOGY

3.1 Introduction
In this chapter I discuss the theoretical aspects of the study, that is, the philosophical considerations underpinning and affecting the research and how and why they direct the rationale for the choice of methodology; and how its precepts and practices facilitate the generation of the kind of knowledge sought. Secondly, the chapter describes the methods utilised to affect the study, the choice of which was influenced by the research questions and precepts of the methodology.

3.2 Research aims
This study sought to understand the various ways of experiencing two phenomena, design practice and design teaching, and to explain the underlying meanings and relationships between the two. Moreover, in chapter 2 it was suggested that design teachers consistently described sophisticated conceptions of teaching. This was in contrast to teachers in almost all other disciplines where the teachers’ conceptions of teaching spanned the entire range of conceptions, a result noted in a number of different studies. Therefore, this study also aimed to discover what it might be about the nature of design practice that might lead to such an anomaly - an explanatory relationship. These aims suggest that the research undertaking should provide a qualitative understanding of the differing life worlds of others and of their possible impact upon each other.

In this study, the data results from the integration of two ‘voices’; firstly the voices of the participants who describe their experiences; secondly the voice of the researcher, who interprets and attributes meanings to the various experiences. An issue for qualitative research is the use of these voices. Eisner (1998) suggests that a sense of these voices should be present in the research and that honesty in research is facilitated when authors do not hide their signatures, but rather seek to show the person behind the words. With this advice in mind, the following information
attempts to place me as researcher in the study and to state how it impacted on the research undertaking.

As this study aimed to set aside the researcher’s views and understand others’ experiences from their various perspectives, I found it hard as both a designer and lecturer, to stand outside my own ideas concerning both the practice and teaching of design. This initially made it difficult to frame the interview questions from an outsider’s perspective. An additional difficulty arose from fact that many of the chosen participants were known to me. Creswell (1998) identifies and describes this issue as ‘backyard’ interviewing, and suggests that prior knowledge of others’ views may make it more difficult to be objective. To attempt to mitigate against these difficulties, at every part of the research process I have attempted to: focus on the voices of the participants; to hold myself in abeyance; to immerse myself in the individual worlds they shared with me; and, to understand their worlds from their perspective. Here the individual voice of the other matters because it is the particular language used by the participants which portrays their experiences. Therefore, to accurately reflect these experiences to an outside world, the researcher must enable the voices of the participants to be present in the research. Eisner (1998) proposes that:

For feeling to be conveyed the language of the arts must be used, because it is through the form a symbol displays that feeling is given virtual life. The point, therefore, of exploiting language fully is to do justice to what has been seen; it is to help readers come to know (p. 4).

This idea of enabling the voice of the other to be heard is of significance for the validity of the research. Because not only may the accurate portrayal of the other’s voice provide a means of reflecting as honestly as possible an experience as ‘given’ to the researcher, but moreover the use of quotations supplies a means of substantiating the researcher’s interpretation of the participants’ life-worlds.

The concept of research as interpretation providing an understanding of other’s life-worlds, which in turn enables an audience to perceive something differently, is discussed next, a debate that provided the rationale for the choice of methodology.

3.2.1 The philosophical underpinning of the research

As previously stated, the aim of this study was to understand design academics’ qualitatively different experiences of design practice and teaching, and to discern the
relationships between the two phenomena. Therefore, to provide answers to these questions an appropriate methodology needed to be chosen, a methodology, that would enable the variations between qualitative experiences to be explored, meanings to be derived, and possible explanatory relations between the phenomena to be discerned. Together, these answers should provide an understanding of the two phenomena under investigation, and their possible impact or influence upon each other.

Some researchers distinguish between knowing and understanding, for example, Eisner states that, “Human knowledge is a constructed form of experience and therefore a reflection of mind as well as nature: Knowledge is made, not simply discovered” (1998, p. 7). And Wolcott (1990) suggests that there is a difference between knowing and understanding when he says,

Perhaps that is the critical point of departure between quantities and qualities-oriented research. We cannot ‘know’ with the formers’ satisfying levels of certainty; our efforts at understanding are neither underwritten with, nor guaranteed by, the accumulation of some predetermined level of verified facts (p. 147).

And, quoting Vendler (1984, p. 204) who contrasts knowing and understanding, he suggests that, “the latter a more ambitious activity requiring one to be able to interpret and explain, (a distinction implied between claiming to know, and claiming to understand, a poem or person)” (1990, p. 147).

Crotty proposes that, “the interpretivist approach ... looks for culturally derived and historically situated interpretations of the social life-world” (1998, p. 67). It was an approach that emerged in research attempts to understand human social reality, and in contrast to positivism which sought to explain the natural sciences. However, Weber proposes that interpretivism’s aim is to explain as well as to understand, and he writes of “explanatory understanding” and a “causal interpretation of a concrete course of behaviour” (1962, pp. 35-40). Similarly Denzin states that “interpretations require the telling of a story or a narrative that states ‘things happen this way because’” (1994, p. 500), suggesting that interpretation incorporates an explanation of causal relationships. He goes on to propose that, “I call making sense of what has been learned [from empirical research] the art of interpretation” and “The practice of this art allows the [researcher] to translate what has been learned into a body of textual work that communicates these understandings to the reader” (p. 500). Here, interpreting is making sense of something, of creating meaning. Kvale proposes that
this is achieved when “the interpreter goes beyond what is directly said to work out structures and relations of meaning not immediately apparent in a text” (1996, p. 201). However, the caveat to this form of understanding is that there will be no absolute meanings, that further interpretations may be revealed, and that ambiguity should be expected. And Scheurich in a critique of research interviews quoting Mishler (1991) provides a reason for the idea of ambiguous and evolving meaning when he says, “The relationship between language and meaning is, contextually grounded, unstable, ambiguous, and subject to endless reinterpretation” (1995, p. 240), and:

What a question or answer means to the researcher may change over time or situations. What a question or answer means to the interviewee similarly may change. What occurs in a specific interview is contingent on the specifics of individuals, place and time (1995, p. 240).

With these arguments in mind, to effect the research the chosen methodology should:

• Adopt an interpretive practice which respects and reflects the voices of the participants, allowing their experiences to be ‘unpacked’ to enable the attribution of meanings;
• Enable the different ways of experiencing phenomena through a richly contextualised holistic picture to be portrayed;
• Allow relations between the features of the experience to be deduced, and explanatory relationships to be discerned;
• Report results in a way that will encourage readers to believe in their veracity.

Phenomenography, a qualitative, empirical research approach in the interpretivist paradigm, provides a way of exploring the kinds of research questions that seek to explain how people experience aspects of their worlds. For instance, Svensson proposed that phenomenography entails a view of knowledge where “knowledge is a question of meaning in a social and cultural context” (1997, p. 163) and that it is “relational, not only empirical or rational, but created through thinking about external reality” (1997, p. 165). Here, Svensson argues, it is description that provides knowledge, and such knowledge concerns “meaning and similarities and differences in meaning” (1997, p. 167).
3.2.2 Phenomenography

Phenomenography adopts a subjectivist ontological perspective; the world exists and
different people construe it in different ways (Svensson, 1997). Phenomenography
assumes a non-dualist viewpoint (Marton & Booth, 1997; Åkerlind, 2004) which,
according to Åkerlind, leads to the expectation that “different ways of experiencing a
phenomenon would typically be internally related - related through the phenomenon
being experienced and through the inherently related nature of human experience”
(2004, p. 366). She goes on to argue that, as a result, it can be expected that,

the qualitatively different ways of understanding a phenomenon
constituted during a phenomenographic analysis would typically represent
more or less complete experiences ... rather than different and unrelated

Phenomenographic research therefore, focusses on the ways in which different
phenomenon may be experienced, and the aim is to find the variation and the
structure of this variation. This is achieved by reporting peoples’ accounts of their
qualitatively different experiences as categories of description derived from an
analysis of peoples’ accounts of their qualitatively different experiences.

An approach to research - a second order perspective

Marton and Booth (1997) distinguish between a first and second order perspective
towards research. They argue that in a first order approach, researchers orient
themselves towards the world and describe aspects of it from their own perspective.
In contrast, in phenomenography, researchers orient themselves towards other
peoples’ experiences of the world, and pose questions from a perspective that will
enable an understanding of other’s worlds to be derived and subsequently
represented. This research orientation adopts a second order perspective and
enables researchers to describe the critical differences between possible ways of
experiencing something.

To expedite the understanding of the experiences of others from their perspective,
the phenomenographic method provides a structural framework. This framework
not only enables a whole/part exposition of the experience, but also facilitates an
understanding of the internal relations between these wholes and parts, and enables
the changes between the various ways a phenomenon may be experienced to be
discerned. This framework encompasses the range of categories of description
The conceptual framework of experience

In order to accomplish its aim of understanding the qualitatively different ways in which a phenomenon may be experienced, researchers need to understand what it means and takes to experience in a particular way. In phenomenography this is achieved through a process of discernment, where an object is perceived as both a thing distinct from its context and as an object forming part of the context; a process enabling the relations between them to be discerned. Moreover, in different experiences, the parts and the relations between them may be discerned differently.

Marton and Booth (1997) propose that the ‘what’ and ‘how’ of an experience comprise inseparable aspects of it, where the ‘what’ aspect is concerned with the meaning of a phenomenon, (referential aspect) with what it is, and the ‘how’ aspect consists of the act of the experience (structural aspect). For example, ‘what is design, and how do you do it?’ In this study, questions were put to participants directed by this ‘what/how’ framework, resulting in descriptions of experiences from which structural and referential aspects could be deduced.

In phenomenography, it is participant awareness that enables the researcher to determine how one experience differs from another. The researcher looks for the aspects of a phenomenon that participants focus on. These may be either explicitly expressed or implicit and tacit conceptions. It is these differences in focal awareness which point to the different ways of experiencing a phenomenon, and which reflect more, or less, complex or sophisticated categories of ways of experiencing (Svensson, 1997; Marton & Booth, 1997). A category of description is a description of the common meaning of a way of experiencing a phenomenon, while descriptions of the range of categories reflect the common meanings of the differing ways of experiencing a phenomenon.

The conceptual framework of experience described above, not only enables meaning to be derived, but explains how all aspects of an experience are internally related to each other and to the whole. Åkerlind proposed that each way of experiencing could be understood as “part of a larger whole, the collective sum of ways of experiencing” and that “different ways of experiencing a phenomenon would typically be structurally related in a part-whole relationship, through shared discernment of
some of the same aspects of the phenomenon” (2008, p. 635). These statements suggest that not only are the whole and the parts of an experience internally related to each other, but that each way of experiencing is part of a collective whole - a whole referred to by Bond (2000) as the phenomenal field.

### 3.2.3 Conceptions research

Svensson (1997) proposed that phenomenography is both a research programme and a research tool, and that the former focusses on “what objects should be investigated and how they form a field of research and knowledge” (p. 161), whereas phenomenography as a tool, uses “descriptions of conceptions to study various phenomena” (p. 161). Moreover, what phenomenography as a research programme and as a research tool have in common is the ”focussing on and describing of conceptions” (p. 161). Here, the knowledge conveyed by participants is “described in terms of conceptions, that is meanings and understandings of phenomena” (p. 163), and the differing conceptions emerge through analysis as categories of description.

**The ontological assumptions underlying categories of description**

An ongoing debate concerns the ontological assumptions underlying the nature of conceptions as either stable or relational entities, and the nature of the structural relationships between categories of description. For instance, categories of description may be hierarchical, although not necessarily so. Samuelowicz and Bain (1992) distinguish between an ordered hierarchy and an inclusive one, maintaining that for a scheme to be truly hierarchical, “characteristics present at lower levels should be present at all levels” and that “other characteristics should be added to delimit subsequent categories” (p. 96), a position which assumes that higher categories subsume lower ones. Conversely, they suggest that in an ordered hierarchy “higher level conceptions do not include lower level ones” (p. 96), and that here, conceptions can be seen as bi-polar or oppositional. Moreover, in an ordered hierarchy, categories of description are exclusive and independent of each other, even if they can be ranked according to their complexity and breadth of focus (e.g. Kember, 1997; Samuelowicz & Bain, 1992). For instance, Kember (1997) suggested just such a bi-polar structure when he proposed two broad orientations to teaching positioned on a continuum with a teacher-centred/content-oriented conception towards one end of the axis and a student-centred/learning-oriented conception at the opposite end. Similarly, Samuelowicz and Bain (1992) argue that dimensions,
which distinguish between the categories, are often bi-polar in nature so that one cannot subsume the other, and that consequently, they too are best portrayed as extremes of an ordered continuum.

In contrast, recent studies have maintained that categories are related to each other suggesting an inclusive hierarchy (e.g. Prosser and Trigwell, 1999; Prosser et al., 2005; Åkerlind, 2004 and 2008; González, 2011). Prosser et al. (2005) and Åkerlind (2004) argue that conceptions are both relational and hierarchical, with Åkerlind proposing that in phenomenography the different ways of experiencing a phenomenon would be “internally related” (2004, p. 366), and that therefore, the different ways of understanding a phenomenon would “typically represent more or less complete experiences of the phenomenon rather than different and unrelated experiences” (2004, p. 366). She argues that it is this view of experience as relational which indicates that categories may be “ordered along a hierarchy of inclusiveness” (2004, p. 366) where a complex category subsumes the less complex ones - a structure indicated by her research results where categories of description showed references to aspects of the phenomenon present “lower in the hierarchy but not vice versa” (2004, p. 366).

This distinction between conceptions as relatively stable constructs requiring substantial effort to shift (e.g. Kember, 1997) or as a relational response to varying contexts and situations (e.g. Prosser & Trigwell, 1999; Prosser et al., 2005; Åkerlind 2008) must be kept in mind in decisions concerning the strategies believed to be effective in bringing about conceptual development.

Åkerlind (2008) distinguishes between the two structures suggesting that one implies a change, while the other suggests expansion. She proposes that when conceptions are perceived as independent, yet ordered on a continuum, it implies a conceptual change approach, and that conceptual development can only be effected by “the replacement of one system of beliefs or concepts with another” (p. 636). Alternatively, when conceptions are believed to be an inclusive hierarchy, it implies a “conceptual expansion” (p. 636) approach, where conceptual development is effected by an expansion of an individual’s awareness to include additional aspects of the phenomenon (p. 637). This ensues from the view that less sophisticated conceptions are seen “not so much as wrong, but as incomplete, lacking awareness of key aspects of the phenomenon that are focal in more sophisticated conceptions” (p. 637).
As described in chapter 2, the features of the whole phenomenon and the various ways in which they are experienced emerge through a cross category meta analysis looking at cross category themes. These cross category themes comprise the dimensions of the phenomenon, and in phenomenography, it is the variations within the dimensions that differentiate one category from another as the variations imply increasingly complex experiences, and shifts in focal awareness. Together, the categories of description and the dimensions enable a representation that is able to reflect the pluralistic experiences of the phenomenon.

3.3 \textbf{Method}

Having described the research methodology, the focus now turns to an explanation of the rationales for the method of data generation, the selection of participants and the interview questions. It also describes research procedures, for example, analysis and reporting, and discusses ethical issues.

3.3.1 \textbf{Rationale for interviews}

As stated at the beginning of this chapter, the form of knowledge this study aimed to generate is a qualitative understanding from the perspectives of the participants, of the various ways in which design practitioners and teachers experience phenomena. In order to achieve this, data must be generated in a manner that provides a detailed description of their worlds. Accordingly, interviews were the method chosen by which to generate the required data, and Kvale (1996) provides the rationale for this choice. He suggests that if we want to know how people understand their world and their lives, we “talk with and listen to what people tell about their lived world and hear them express their views and opinions in their own words” (p. 1), and that this conversation takes the form of an interview. For Kvale, the aim of the qualitative research interview is to “understand the world from the participants’ point of view, to unfold the meaning of their experiences” (p. 1) by obtaining “open nuanced descriptions of different aspects of the subject’s life world” (p. 30). This assertion has implications for the design of the interview and the types of questions asked of the participants.
3.3.2 Design of the interviews

The interviews were semi-structured, meaning that although each participant was asked the same six basic questions, which provided the underlying structure of the interview, their individual responses to these questions often provoked further exploratory unstructured probes aimed at eliciting a fuller description, a more precise meaning or clarifying an issue. The interviews were designed so that the participants focussed on each of the two phenomena being explored in turn. The first group of questions were intended to encourage them to describe their current experience of design - what they thought it was, and then to focus on their individual design practices by describing a recent design undertaking, and detailing how they went about designing, for example, why they did it that way. The second group of questions asked them to focus on their design teaching. For example, participants were asked what teaching meant to them, and how they went about it; and to provide specific examples of their teaching. These questions were directed by instances mentioned by the participant.

The interview questions attempted to elicit thematic knowledge, which reveal the participants’ personal experiences of both design and teaching practices and depict the features, or dimensions of the two phenomena. The questions posed were underpinned by phenomenography’s intention to reveal the ‘what’, ‘how’ structure of an experience and were therefore couched in those terms, for example, ‘What did you do, and why?’ and ‘What does this mean for you?’ The questions were also intended to enable the participants to show how the phenomena were variously experienced by focussing on the individual’s way of experiencing.

Although the interview questions separated the phenomena out, the participants frequently talked about their teaching practice when describing their design practice, and vice versa, demonstrating that the separation was a research device and that in reality the phenomena were experienced as a totality of experience.

Interview questions

Although questions 1 to 6 comprise the basic questions asked of all participants, further questions were asked depending on their responses, seeking for meaning or specific examples, although these are not definitive.

Q1. Can we start with you telling me, about something you’ve designed recently?
Probes
   a. What did you do first? Then what did you do? What made you do it that way?
   b. What was the most important bit of doing it? Why?
   c. You seem to have emphasised ...why is that?

Q2. What is ‘design’ as a notion or a concept for you?
Probes
   a. What do you mean by ... ?
   b. Can you say a bit more about ... ?

Q3. What makes a good designer?
Probes
   a. Why do you think that?
   b. What are the most important skills or characteristics?
   c. What about your own work?

Q4. Can you give me a recent example of teaching design?
Probes
   a. Something you’ve taught recently? Why did you teach it that way?
   b. How did the students respond?

Q5. What is teaching for you? What does it mean for you?
Probes
   a. What are you doing when you teach?
   b. What kind of information do you think is important for design students to know?
   c. How do you teach that / get that idea across?

Q6. Can you tell me about learning design?
Probes
   a. Something about your own learning for example.
   b. What did you learn from doing that?
3.3.3 Procedures

Setting up the interviews

The research was approved by the University of Otago Human ethics committee, and the Head of the Design Department was then approached for approval to involve his staff if they were willing and interested. Once his approval was given, ten staff members, complying with the criteria below, were contacted by letter and given an explanation of the research intentions, their part in it, and informed that the interviews would be audio taped. All agreed to participate and gave their written informed consent, and understood that they could withdraw at any stage. Each interview was between one and one and a half hour’s duration and notes of possible relevant material, such as visual material used to illustrate a point were also noted during the interviews. The interview audio tapes were transcribed verbatim, and subsequently a copy of the transcript was sent to each participant for acknowledgement that it provided a true record of the interview.

Choice of participants

The criteria for selection of participants was based on a number of factors directed by the research questions. As the study aimed to explore the experiences of professional designers, and their beliefs about design and its teaching, the participants needed to have been both practicing designers, and teachers of design at tertiary level for a number of years. Furthermore, it was believed that having involvement in, and making decisions about, curriculum development, and having responsibility for guiding course tutors should have caused the participants to critically examine what they were teaching and why, and to be able to articulate this rationale to others.

The ten staff members ranged in age from late twenties to late fifties, and came from New Zealand, Australia, the Americas, and Europe, thus providing a range of different experiences, and life-worlds. The participants also practiced in a range of design fields - with some working in more than one. The fields represented were: architecture; product design; systems design; and communication design. Their years of teaching experience ranged from two, to sixteen years.

Ethics

An issue of concern entails the ethical principles involved in research that utilises others to provide research data. The problem lies in the need that social research has, when trying to understand how our social world is constructed, to depend upon those who have constructed the parts of the world in question for a description of it.
Without their input researchers cannot proceed. The idea of involving others in research indicates that we are using them for our own ends, implying an unequal partnership. Kvale (1996) suggests this idea of inequality when he proposes that, the research interview is not a conversation between equal partners because the researcher defines and controls the situation, and the topic of the interview is introduced by the researcher, who also critically follows up on the subject’s answers (p. 6).

However, there is an approach that, if adopted, might go some way towards mitigating against perceiving of others as tools for use. If I conceive of research as an undertaking where participants, as collaborators, can proactively contribute to something that will be of interest and perhaps benefit to others, and prioritise that reason, then it may go some way towards addressing the power imbalance. This view of research recognises the agency of both parties, each contributes in different ways to the formation of new knowledge.

Additionally, to enable the participants to feel comfortable talking about their personal experiences, the interviews were conducted at a time and place of the participant’s choosing to foster a sense of ease and authority by means of a familiar environment. Of critical importance to me was the privacy of the participants, as I believe that a betrayal of their confidence would constitute a profound breach of trust. Therefore, to facilitate privacy and anonymity each participant was given a pseudonym, and all interview material is kept in a secure place.

**Analysis**

Drawing on the principles of phenomenography outlined by Åkerlind (2003, 2004) and Marton and Pong (2005), I adopted the following analytical process. Once all the interview transcripts were compiled I read each transcript through a number of times to provide a general sense of the participants’ experiences, and to get an idea of the most obvious similarities and differences between them. As mentioned earlier I had decided to analyse the two phenomena independently, and to integrate them only in the results and conclusion chapters. Having completed the overview, I concentrated on the practice of design and divided the transcripts into groups of those that contained similar views. As I identified themes and similar conceptions I put them in lists on vast sheets of paper, identifying which participant had said what. These lists enabled me to be more sure of the category allocations. I then read and re-read one group of transcripts at a time, focussing on details and phrases of similar
meaning, once again making lists of these until they enabled me to determine a ‘work-in-progress’ meaning for each category. At the same time as I worked at the detail level, I also looked for the themes described by the participants. These themes, or features, provided the dimensions of the experience; for example, communication was a topic described by all the participants, but in very different ways. The process was one of constant comparison and contrast, moving between part and whole, of comparing one phrase with another to determine their similarity of meaning. Initially the shuffling of categories was pronounced with some meanings constantly shifting between adjoining categories, but as the process progressed the movement became less, until the categories were stable. This same procedure was then followed to determine the teaching categories and dimensions of the phenomenon. Basing my decisions on Marton and Booth’s (1997) suggestions for determining distinctions between experiences, I devised criteria intended to enable participants to be allocated to a category, for example, the similarities of conceptions of design as a practice, the parts of that concept, and whether they were related or discrete aspects.

Although the interview questions focussed on the two phenomena in sequence, firstly on design practice and then on its teaching, the participants frequently described a design practice and then went on to explain how they taught it. The reason the practice of design was introduced first was because as the participants trained and practiced as designers before becoming teachers, that it would be their domain experiences that might predominate, and several studies have argued that this is indeed the case (e.g. Jenkins, 1996; Lueddeke, 2003; Murray & MacDonald, 1997; Shulman, 1987). This argument was also supported by the results of my study. The second reason was that in the initial readings, it could be discerned that an individual participant’s conceptions of design and design teaching were not in alignment across the two sets of categories. For example, two participants who expressed moderately sophisticated conceptions of design, then expressed far less complex conceptions of its teaching, while another participant described the opposite. Therefore, they could not have been allocated to categories that encompassed both phenomena. Consequently, it was considered that the most truthful way to reflect these disparities was to devise two separate sets of conceptions and dimensions, and these are presented in the next chapter, while the possible reasons for these disparities are discussed in the discussion chapter.

Phenomenography does not claim to provide definitive descriptions of phenomena, but rather, presents a moment-in-time representation of others’ life-worlds. Other
studies exploring the same phenomena may therefore construct different categories and dimensions as various factors may impact on their studies. Validity in phenomenographic research depends on reflecting as faithfully as possible the experiences of others as ‘given’ to the researcher.

3.4 Chapter summary

In this chapter I set out the research aims/question, describe the methodology of phenomenography, and explain why it provides the appropriate methodology with which to generate answers to the research question. I describe the way in which phenomenography’s categories and dimensions, constructed by the researcher from participants’ descriptions of their experiences, enable the various ways in which phenomena may be experienced to be structured and revealed. I also argued in this chapter, that the methods of phenomenography would facilitate an understanding of the relationships between the parts. I also provided a rationale for the choice of method utilised in the study (semi-structured interviews) and a copy of the interview questions. The study sample, comprising design academics selected from a single tertiary design institution was also detailed. The phenomenographic analytical processes utilised were described and ethical issues were also discussed.
CHAPTER 4
THE VARIATIONS AND DIMENSIONS
OF THE EXPERIENCE OF DESIGN

4.1 Introduction
The aim of this chapter is to describe both the ways in which the participants variously experience the practice of design, and present the dimensions of the experience of design.

In Section 4.2 four categories of experiences of design are described. The categories were derived from an analysis of the participants’ descriptions of their various design experiences. For each category, Table 4.1 gives the focus and boundary of the experience, and the role of the designer, these are: A. Design as a problem solving, outcome generating activity; B. Design as an affective agent; C. Design as a strategic act resulting in benefit to humanity; D. Design as an affective, socially embedded and reciprocal domain. Each category of experience is explained in turn by the quotations characteristic to each experience. Section 4.3 presents the dimensions of the experience of design. These were derived from a cross category meta analysis of the results reported in Section 4.2. These dimensions are based on the features of the experience of design expressed in each category but which are variously experienced and therefore change across the categories.

4.2 The Variations of the experience of design
This section presents the four categories of the experiences of design, which are illustrated in Table 4.1.
Table 4.1 Focus of design practice, and boundary of experience

<table>
<thead>
<tr>
<th>Design is</th>
<th>Focus of experience</th>
<th>Design process approach</th>
<th>Boundary of experience</th>
<th>Role of designer</th>
</tr>
</thead>
<tbody>
<tr>
<td>A: A problem solving, outcome generating activity</td>
<td>Use a process to resolve a problem and produce a design outcome which may communicate</td>
<td>Individualistic, non-linear &amp; intuitive</td>
<td>Process &amp; outcome recipients. Ever changing domain</td>
<td>Deviser</td>
</tr>
<tr>
<td>B: An affective agent</td>
<td>Use a process to devise design outcomes which beneficially affect others</td>
<td>Individualistic, non-linear, controlled &amp; intuitive User oriented</td>
<td>Process, outcome, humanity &amp; its society</td>
<td>Effective agent</td>
</tr>
<tr>
<td>C: A strategic act resulting in benefit to humanity</td>
<td>Use a strategic process to understand humanity &amp; generate innovative outcomes which enable change Contextual</td>
<td>Standardised strategy Human centred</td>
<td>Socio/cultural matrix in which domain of design is embedded</td>
<td>Benefactor</td>
</tr>
<tr>
<td>D: An affective, socially embedded reciprocal domain</td>
<td>Create innovative design experiences by using strategies &amp; engagement. These change both other’s understandings &amp; future. Reciprocal Contextual</td>
<td>Individualistic &amp; strategic Socio/politically oriented</td>
<td>Socio/cultural matrix in which domain of design is embedded</td>
<td>Facilitator of transformation</td>
</tr>
</tbody>
</table>

4.2.1 Category A. Design as a problem solving, outcome generating activity

In this experience, design is described as a problem solving activity. For example, Philip said, “I think design is part of problem solving...” This problem solving is expected to result in the generation of a design outcome of some kind (Table 4.1). While Ken said, “[design] it’s certainly about problem solving [and] half the people who do it, are driven by the outcome [and] it’s not design until you’ve made it.”

These comments suggest that the aim of problem solving is to produce design outcomes. Here, the outcomes are expected to express originality. This is illustrated by comments such as “I’ve designed a new kind of [product]” (Matt) and “here’s a new idea... it’s created something new ...that hasn’t been seen before...” (Ken). In this experience originality is believed to be achieved by problem solving that entails a distinctive way of thinking about the known. For example Rod said, “a designer is someone who is able to challenge issues” while Ken proposes, “there’s... people out there who can problem solve in a limited way... but is it problem solving in a sense that you are prepared to entertain unprecedented ideas [and] design is a state of mind... it’s about being able to suspend your judgement about what you think you know... so you can go where you’ve never been before” (Ken). This implies a frame of mind that intends to confront and venture beyond the known.
In this experience, a distinction is made between design as noun and verb, “design is the finished object, it’s this thing, and designing is the process... how to achieve it” (Ken). Rod, too, suggests this: “Design is... what... it has done, literally... the gadgets and the logos... [but] what design actually is about is, it is a process... So it’s... designing.” So in this experience there are two separate aspects to design, the problem solving process of designing and the resulting outcome (Table 4.1).

The design process in this experience is individualistic. For example, Philip said, “there are lots of different ways to get to [a solution]... [and] it [the process] is so different for each person.” Matt, too, said, “that’s where every one is... unique, and there’s no formula for the exact outcome.” So in this experience the design process is not only individualistic but is also non-formulaic because it needs to be adaptable to meet the differing demands of each problem.

As the aim of design is to devise a design outcome, the focus in this experience is directed towards the means of doing so (Table 4.1), with the following comments suggesting that designing is a transformational undertaking where an initial concept is changed, by means of an individual’s design process, into a reality. Philip said, “design is that process that people go through to get from a moment of inspiration... and where they took that and got to the final result.” And Ken adds, “and that’s about getting the vision right... so you go from the general to the particular and back to the general again to try and achieve that feeling that you started with.” These comments imply that here, a design outcome is created by a non-linear process where all parts must eventually align.

In this experience, design concepts are formed either subconsciously and spontaneously - “the imagery, the connotation and the symbolism, it’s just never been pieced together... it was a flash of insight” (Matt) - or by deliberately adopting procedures. For example, “I come up with ideas by scoping out the problem and looking at the issues that are there...” (Philip) and, “If I’ve got a design problem to sort out I’ll go and [do something] for half an hour... when I [stop] I’ll have thirty ways of doing it” (Ken). Concepts are also derived from information gained by research, for example Rod proposes, “you do your research and figure out if there is anything [already] in that area” and, “checking for production methods, checking for marketability” (Rod) and, “I’ll look at...their [client’s] bits and pieces and what people specifically said and see if I can work the design into all that” (Philip). Creativity, too, is believed to enable ideation. For example, Philip said, “creativity
comes on a bit of a sliding scale... some people ...don’t have brains that can come up with things spontaneously.”

In the design processes described in this experience, two forms of communication, verbal and visual, fulfil a number of functions. Verbal communication, for example, enables understanding. “A lot of it [design outcome] depends on the relationship I have with the client... [so] I’ll do a lot of talking with the clients to get a really good idea of what they want” (Philip) and, “know how to talk to others who are making it...”(Ken). It is also used to persuade: “working with [clients] trying to convince them that the idea is good enough to spend money on...” (Matt). Visual communication on the other hand enables the designers to resolve and represent imaginary concepts both to themselves, “you’re doing a drawing to solve a visual problem” (Philip) and to clients, “It’s hard for clients to conceptualise what they want to say [visually] so I suggest making up a [prototype] based on what they’ve told me” (Philip). Moreover, the final design outcome is then expected to convey a message about the client as Philip suggests, “looking at the issues that need to be communicated... like the atmosphere ...of the business.”

Here, the reasoning skills of analysis, synthesis, and value judgement are expressed. For example, “Every job has its own peculiarities, and it is understanding and identifying those” (Ken) implies analysis. Philip’s comment, “I feel happiest when I can solve several problems...with one tight concept,” implies synthesis, while judgement and evaluation are suggested by “[this] is more aesthetically pleasing” (Matt) and “know when to stop” (Ken).

In this experience, the role of the designer is to use a problem solving process to devise a design outcome, thus the designers perform as devisers. As a result the focus of the experience encompasses the problem and client, the process required to resolve it and the resulting design outcome, suggesting a local boundary.

4.2.2 Category B. Design as an affective agent
In this experience, design is a means to beneficially affect others in some way, for example, “the bottom line is... if it actually helps to increase the profit of the business that you’re working with...” (Ian) or, “Design is making things better...[and] design is that link between the exciting technology... and being able to use it ...because we have to interact with these things” (Marg). As a result, Marg proposes that in order
to produce design outcomes with which an audience can interact designers must try to understand both the problem “design does it, by understanding...what the problem is” and the audience, “designers should... understand the problems that... people have with everyday things” (Marg). This suggests a focus encompassing both the problem and audience capabilities, both of which must be understood before a problem can be resolved. Design, in this experience, is also a body of some kind (Table 4.1) as Marg implied, “design is always changing... there’s so many new things happening in [design]... it’s just this amorphous thing that’s constantly... changing and developing into something else.”

In this experience too, the design process is described as an individualistic and non-linear way of working (Table 4.1). For example, Marg said, “you’ve done the research bit, then you start formulating more things in your head... well [that’s] how I do it anyway... Everyone does it in a very different way” and, “that’s not a linear process. That’s a very organic process and I go back and forth until I have a fairly clear idea about what the outcome is...” (Ian). However, here, the process is not expected to end with the production of an outcome, but rather, is expected to have a life beyond that: “design... means the entire process of design from the very beginning to the distribution of it and even after that, it’s not finished” (Ian). The design process of this experience incorporates measures to both control the process and generate ideas. For example Ian said, “it means breaking the task down into a series of discrete elements and working with them... [and] I’d start with serious research... And that would lead me to a series of visual conclusions.” Here, in keeping with the aim of using design as a means to affect others in some way, the target audience forms an integral part of the design problem and accordingly, comprises part of the research field. For example, Marg said, “well I look at what it is that I have to design and then I go out and try and find out more about... who uses it, how they use it, what they want to use it for.” Creativity, too, enables ideation. Here, creativity is an ability to perceive the known differently and subsequently utilise the altered perception to generate new concepts. Marg said, “creativity is... somebody who ...not just ...thinks in black and white but... they have a way of thinking... you can see things in a different way than they are presented to you ...so that you can turn things around into something else.”

In this experience, verbal communication provides the means by which both client and audience needs are understood. For example, “I think...designers should be able to interact with everybody so that they can understand the problems that those
people have with everyday things... [and] you have to talk to the client a lot to be able to ensure that you’re getting the right thing” (Marg) and “I would then... have a serious discussion with the client about my conclusions” (Ian). Once the design problem is understood the designers then utilise visual communication, “once I’ve started to get a feel for what I’m trying to do... then I start putting pen to paper...” (Marg). These visual images are then used as a further means of communication with the client, “when I’ve got a... neat drawing that I can then talk to clients with... or... a model that gives off what I’m trying to talk about” (Marg). And “I would lay them up in a professional way [in] a state of... finish that hopefully is persuasive” (Ian). These comments imply that visual communication is used to represent and explain a solution, and persuade a client to approve it.

As design outcomes are intended to affect an audience, they need to be able to convey messages, as Ian suggests, “[design is] communicating the message [and] it’s... about inspiring and provoking... the person who’s receiving the message.” For example, Marg proposes, “instead of having people looking at this incredible technology and going, I have no idea how to use that... I think design is that link between the exciting technology... and being able to use it” suggesting that in this instance, the message conveyed should be an immediate comprehension of the modus operandi of the design outcome.

In this experience too, the reasoning skills of analysis, synthesis and reflective judgement are expressed. For example, the comment, “Is the brief we’re trying to do, the right type of thing... is it what they really need?” (Marg), implies analytical thinking. While ”and each time you go back to it you’re refining it and evaluating it all the time” (Marg) implies synthesis. Reflective value judgement is also implied by “I would put so many ideas down...[and] then... start picking out all the best ideas of this and that” (Marg).

Here, designers use a problem solving process to devise a design outcome, which is expected to affect an audience in some way. This suggests that the designer’s role is to perform as an effective agent. As a result the focus of the experience encompasses the problem, the process required to resolve it, the resulting design outcome, and the audience for whom it is intended, suggesting a regional boundary.
Category C. Design as a strategic act resulting in visionary outcomes enabling change and benefit to humanity

In this experience, the aim of design is to bring about positive change, “design is an...intentional [and] multidisciplinary act that carries in it expectations of ...a positive change, to ...a system ...or product or a new generation of stuff” (Jim). This change results from the production of ‘visionary’ outcomes of some kind which improve other’s lives: “it’s ...the process of combining different technologies ...it’s visionary. We’re talking about the next generation of [products]... related to...how we can work better... in life and people’s environments” (Jim). Here (Table 4.1) the role of the designer is to focus on the strategies that will enable innovative design outcomes, resulting in change, to be created. For example, Jim said, “[I] started to become strategic” and, “I try to plan the strategy [and] I’m there, helping them through the process of design... of achieving innovation... how to do that.”

The design process in this experience is described as having two sides: “one is understanding and one is creating innovation” (Jim), and, “There’s a framework I use ...So the first thing you do is research to understand... the context [and] the people... for whom you design. So my design strategy is... I ask three questions. There’s for whom... then what and how...” (Jim). Accordingly he proposes, “[design is] multidisciplinary, because it involves multiple perspective and disciplines” each of which contribute to an understanding of humanity and the contexts in which it operates. “I have studied so many disciplines... human orientated ...like anthropology, philosophy, politics, psychology, and biology.” Jim then describes his strategy of understanding in detail, “first, I do research on the user... how they live, how they work ...what tools and technology [and their] social and cultural trends ...what is the whole context?” (Table 4.1).

This understanding of humanity is also gained by communicating directly with people. Verbal communication is expected to provide a contextual understanding, ”So it’s a combination of listening to [their] answers... listening to their needs... it’s about finding what they value” (Jim). It is this human centred research which enables innovative products to be created: “you’ve got all this mass of information because a product is ...condensed information [and] good products come from good research.” In this experience, research on its own is not sufficient to enable the necessary understanding, rather, it is used as the basis for a process of meaning making:
So here is research. Then ...analysis. In analysis, you’ve got all this data and you start to make connections. You say, this data with this theory means something... So on the analysis of this data, they can see patterns. They can see the trends ...it’s about... what are the social/cultural trends? What does the market need? (Jim).

Here, the patterns of meaning derived from analysis enable ideation, “So from good analysis you see patterns ...you see from a broad perspective, from different angles, you start to develop ideas” (Jim).

In this experience, creativity is making deliberate choices about how to approach and proceed with the entire design undertaking, and is not restricted to the generation of design concepts. “Creativity happens everywhere ...you can be creative in the research, the way you do ...activities ...whom you will talk to... how you collect information... creativity is a better way to do things...” (Jim). Once concepts have been developed “the next ...part is prototyping. It’s... testing the concept...” (Jim) and then, “I’m the guy who sells the concept to the client but then when the client approves ...I’m out of the scene” (Jim). Here, the focus is on the knowledge and strategies necessary to achieve a “visionary” outcome.

Here, the role of the designer is to use a strategic process to enable a design outcome to be produced that will benefit humanity, thus the designer performs as a benefactor. The focus of the experience encompasses the design process and the relationship between humanity and society, suggesting a global boundary.

**4.2.4 Category D. Design as an affective, socially embedded and reciprocal domain**

In this experience, design is a means of communicating an idea to an audience who are expected to engage with and respond to design outcomes. For example, Jen said, “it [design] is a form of communication [but] it’s something that’s more affective than just providing a transit of information ... it’s how people relate to information in our every day life.” Alan too suggests this, “it’s presenting information to an audience in a way that makes it easy to digest [and] respond in a particular way” and “design is about how we create engagement” (Evan). The following comments suggest that here the aim of engaging an audience is to change their understanding (Table 4.1). For example, Jen said, “[I’m] trying to engage people in their technology in a way that is going to change their perspective” and “fracturing their expectations in order to create new perception” (Alan). While Evan proposes, “I saw it very much about
entering and leaving an experience... you need a way of drawing people in, so that as they come out they perceive the change that’s happened to them through that experience”. Accordingly, “design is about designing experiences” (Evan), suggesting that the audience has an active and participatory role in design undertakings (Table 4.1). Jen, too, implies this when she says, “what I do could be called participatory design, which asks and expects... other humans to use your design to complete it.” Here, audiences are conceived of as collaborators in an undertaking, without whom design outcomes cannot fulfill their purposes suggesting that the audience’s response/change process forms part of design.

In this experience the word design denotes both noun and verb (Table 4.1). “So [design] it’s like a verb and a noun, I design. This is a design” (Jen), and, “design is a verb... so it’s designing” (Evan). Although these comments suggest that the two aspects are separate, they are experienced as an interconnected whole, “I like it when nouns move like that... there’s a relationship between forming ideas that may be possible solutions and then performing those ideas” (Jen). This idea is also implied by Evan in the following comment:

look at the productivity of a designer, you’ve got this river of ...doing design. And in amongst there are little ...marker points that say here’s a design output... different rocks along the river... The outside world sees those rocks but the design community sees that river (Evan).

Here, design does not end with the production of an outcome. Rather, design outcomes continue to have a life as a record of a designer’s practice. “We, by creating things, create stepping stones into the future...” (Evan) and, “design is ...saying, well if we go that way, what might that do? [We] put those little experiments out into our world rather than just sit and wait for something to happen” (Evan). So design outcomes form and create part of society and thus influence its future. However, in this experience, design not only influences the social world but is in turn, influenced by it:

I’m a believer in there being politics behind everything... what was the agenda that made that chair ...look at the reasons why it might have happened, these things don’t just happen in a vacuum... they are a response to something... there was something afoot in the cultural fabric of the time, there were ...new technologies happening... new kinds of cultural structures going on... (Alan).

This suggests that design outcomes emerge in response to the cultural milieu in which the designer works. Jen, too suggests a relationship between design and
society proposing, “design is... part of high culture, because designers... have this capacity to make an object that can be critiqued [and] theories aren’t just ideas... they’re embedded and a part of the things that we are responsible for creating” (Jen) suggesting that design is not only informed by theory, but provides the substance for it. Here, design and society influence each other, implying a reciprocal relationship in which both have active roles (Table 4.1).

In this experience, the process of designing is an individual way of working (Table 4.1), “there isn’t a design process model that is universal...” (Evan) which depends on organisation and stratagems. For example, “the process of design is one of both being really organised and really thoughtful [so] I scribble things to try and separate the problem into its parts” (Jen) and, “I have strategies for how to come up with ideas” (Evan).

In keeping with the idea that the aim of design is to engage an audience and change their understanding, and, that design outcomes form part of the social world of that audience, research is expected to provide a broad understanding of the social and cultural context in which the design outcome will need to perform. For example, “researching at libraries ... talking to their people on the ground... getting existing data... there’s previously existing information [and] cultural information to do with that area, and, through the people in [area] you get access to local folk lore” (Alan). Research is also expected to enable an understanding of both the audience, “the thing that makes it work for me, is ...to know enough about your... client’s audience... to put yourself into that brain space...” (Alan) and their response to a design outcome, “I thought, well, that was interesting, that... has completely changed the message.” And subsequently, to control and direct the response towards a desired end, “design ...is finding out why that [response] happened, then finding very accurate ways to make sure you get the right response” (Alan). For example, by understanding the mechanisms by which design messages communicate and are processed, “the result of [my] research... it’s provided a huge breakthrough to be able say why is it that something ...can communicate more powerfully” (Alan).

Having understood the problem by means of research, the resulting information base enables concepts to be generated, “it’s like visualisation of information” (Jen). In addition to research, cognitive strategies are also used to enable ideation, for example, “It’s how you apply design thinking to the situation... it’s a creative way of looking at things,”(Evan). Evan then said:
if someone says, I want a kitchen, a lounge, a living room ...those labels design the house... Whereas, if you want to come up with interesting perspectives, you get rid of those labels and you focus on ...the experiences of the place, so bathing, washing... then you say, well, what are the artefacts that you need around them... so if I look at a situation through those lenses ...and analyse the different experiences, I screen myself out from preconceived concepts (Evan).

Here, creativity is a strategy that is deliberately utilised to reconceptualise the known and consequently devise innovative concepts.

In this experience, several forms of reasoning are implied, notably, analysis, synthesis and reflective judgement. For example, analysis is implied by, “you’ve got to weigh up which is going to be more important in the long term for the company” (Alan) and “trying to work out how much information to put in to get a response” (Alan). Whereas synthesis is suggested by “it’s ...trying to encapsulate [and] distilling this thing down...”(Alan) and, “creative brainstorming solutions come together...” (Jen). Reflective judgement is suggested by “the editing process... going back through all your [work to] trim down that list” (Alan) and, “eliminating the ones you don’t want” (Jen) and, “always, in design, things can be improved ...that’s the nature of the beast [but] you’ve reached a point that you’re happy to say, well the next project’s going to work those issues out better” (Evan). These statements imply that judgement is used to assess degrees of quality in order to decide between competing options, and, in a non-finite process, determine when an acceptable solution has been reached.

In this experience, verbal communication is directed by the communicative function of the design outcome. For example, Alan said, “sometimes it’s difficult convincing the company who are your immediate audience... that their audience is almost more important than themselves [because] you’ve got to consider where the finished product is going to end up.” So here, the aim of verbal communication is to direct attention towards the audience receiving the message. Verbal communication, in conjunction with visual communication is also the means to develop an understanding of client needs, “often it’s hard to get a decent brief out of people...[so,] the first showing of your visual concepts can lead to a better brief” (Alan). In this experience, it is implied that verbal communication is a conversation between equals. For example, Alan said, “it’s not a matter of dictating to these people. It’s a matter of discussing with them and getting their feedback on it”. While
Jen proposes, “I am ...interested in this idea of ...interaction where... your relationship with a person changes what you do.” Such comments suggest that in this experience, the nature of the interpersonal relationships may affect what the designer does, implying a mutuality of influence. As the aim of this experience is to communicate with an audience and change their understanding, the communicative focus is directed towards this end. For example, Alan said, “presenting information... in a way that makes it easy to digest... to get maximum response”, while Jen proposes, “[design is] the bridge that we build between each other to communicate” implying that here, communication is a reciprocal exchange.

In this experience, the role of the designer is to use strategies to devise design outcomes/experiences that are expected to change the understanding of those who engage with them. Moreover, design outcomes are expected to contribute to, and change, the future. Thus the designers perform as facilitators of transformation. As a result the focus of the experience encompasses the strategies and knowledge required to produce design outcomes, which use socio/political contexts to engage and change both humanity and the future, suggesting a universal boundary.

4.3 *The dimensions of the experience of design*

This section presents the dimensions of the experience of design. The dimensions were derived from a cross category meta analysis of the results reported in the previous section. Four dimensions were identified: communication; research; creativity; transformation. Each dimension is considered in turn.

4.3.1 *Dimension 1. Communication*

Table 4.2 shows that two forms of communication were described: verbal/interpersonal communication between the differing groups of people involved in the design undertaking; and visual communication, encompassing the role and ability of design to communicate messages to differing audiences. Each form of communication entails differing roles and foci across the categories, ranging from communication as a means of understanding the problem and educating clients, to communication as a means of engaging others as equals and changing humanity’s understanding of some aspect of their world.
Table 4.2 Focus and role of communication in the experience of design

<table>
<thead>
<tr>
<th>Dimension Communication</th>
<th>A: A problem solving, outcome generating activity</th>
<th>B: An affective agent</th>
<th>C: A strategic act resulting in benefit to humanity</th>
<th>D: An affective, socially embedded reciprocal domain</th>
</tr>
</thead>
<tbody>
<tr>
<td>Focus and role of verbal communication</td>
<td>To understand &amp; persuade client &amp; manufacturer. To educate them.</td>
<td>To understand client’s business; to persuade client. To understand user capacities</td>
<td>To direct design team &amp; sell concept to client. To understand user needs</td>
<td>To understand context of client’s business &amp; their requirements. To understand world of audience</td>
</tr>
<tr>
<td>How</td>
<td>Talk in designers’ language, &amp; listen</td>
<td>Interaction</td>
<td>Consult &amp; listen</td>
<td>Collaborative interactivity</td>
</tr>
<tr>
<td>Role of visual communication</td>
<td>Explain concepts to client and manufacturer Communicate</td>
<td>Explain concepts to client and manufacturer Provoke audience response</td>
<td>Not addressed</td>
<td>Clarify brief, explain concepts to client. Engage client’s audience, induce change</td>
</tr>
</tbody>
</table>

In **Category A**, verbal communication provides an understanding of clients’ wishes, “usually I will do a lot of talking with the clients to get a really good idea of what they want” (Philip). It is this understanding that enables design concepts to be devised, “it’s quite hard for clients to conceptualise what they want [and] I’ll put the [design] together based on what they’ve told me” (Philip). These concepts then provide the basis for further communication between designer and client, “they say... okay, that’s all good, or they’ll come back and say, well let’s just change these bits...” (Philip). Table 4.2 shows how verbal communication is conceived and how it is undertaken. For example, in this experience it is enabled by, “You’ve got to have good people skills, you’ve got to be able to listen [and] you’re getting a dialogue going with them in your language” (Ken) resulting in educating others, “you end up educating them... because you point to other possibilities that they’d never entertained” (Ken).

In **Category B**, verbal communication generates an understanding of client requirements (see Table 4.2), “you have to talk to the client a lot to be able to ensure that you’re getting the right thing” (Marg) and of the clients business, “so it’s... about...my understanding of the nature of the business” (Ian). Communication is also expected to enable designers to understand the client’s audience - those people for whom the design outcomes are intended. For example, Marg said, “I think designers should be able to interact with everybody so that they can understand all the problems that people have with everyday things.” This understanding results in the production of design concepts “I would then take some time to have a serious
discussion with the client about... my conclusions” (Ian). These visual concepts are used to persuade the client into producing them, “you’ve got to get these ideas that you think are great ...you’ve got to get someone to feel that good about them that they say ...yeah this is going to work ...we can do this [and] you’ve got to get somebody to make them” (Marg). Here, verbal communication is an interaction between the parties involved in the design undertaking, suggesting that it is a reciprocal activity, “hopefully, by then, I’m well into an interaction with the client” (Ian).

In Category C, verbal communication provides the means to enable a company and design team to work together to produce and sell a design concept. For example, Jim said, “I consult [with] the designers and the company...I’m there, helping them through the process of design [and] I help them to frame the idea, and sell the concept to the client.” In this experience too, communication enables an understanding of those for whom the design is intended, with Jim proposing, “listen to the user. And not only listening ...but observing them ...listening to their needs”. Table 4.2 shows that in this experience, communication, in the form of consultation, keeps the various groups of people involved in the design process connected with and understanding each other, whereas listening to and observing users enables an understanding of them.

In Category D, too, verbal communication provides an understanding of client wishes. Jen said, “So they had a brief [but] they didn’t have any [concept] in mind, and so ...it was garnering information from them [but it was] difficult to ...find out the information they have in their mind.” This understanding provides the basis for the generation of initial concepts, for example Alan said, “often, it’s hard to get a decent brief out of people who are not used to describing things... so, often the first showing of your visual concepts can lead to a better brief” suggesting a process whereby verbal communication results in the production of visual material which is used as a basis for clarification of client intentions. Table 4.2 shows that the client’s audience also forms part of the field of communication, “sometimes it’s difficult convincing the company who are your immediate audience... that their audience is almost more important than themselves” (Alan). Consequently, communication in this experience seeks to understand not only the client’s requirements, their business and its context, but also, as Alan implies, an understanding from the consumer’s perspective, “the big thing, for me is... to know enough about... your client’s audience... to be able to project into another person’s head” (Alan).
In this experience, verbal communication is a reciprocal activity between equal partners, for example Alan said, “it’s not a matter of dictating to these people. It’s a matter of discussing with them how this thing might appear and getting their feedback on it.” Furthermore, for Jen, the nature of the relationship between people has the power to affect the undertaking, “I am interested in this idea of... productive interactivity where your relationship with a person changes what you do, and it’s collaborative.” This suggests that in this experience communication is a reciprocal activity where people as equals may influence each other.

### 4.3.2 Dimension 2. Research

In Table 4.3, there is a dimension of research ranging from general information gathering, which provides the basis for concept generation, to academic research undertaken to answer self-set research questions. The quantity and scope of research also differs across the categories.

<table>
<thead>
<tr>
<th>Dimension Research</th>
<th>A: A problem solving, outcome generating activity</th>
<th>B: An affective agent</th>
<th>C: A strategic act resulting in benefit to humanity</th>
<th>D: An affective, socially embedded reciprocal domain</th>
</tr>
</thead>
<tbody>
<tr>
<td>Focus of research</td>
<td>Cursory, into clients wants, their existing information, and into production and marketing issues</td>
<td>Into the culture of the client's existing business; To understand relationship between design outcome &amp; users</td>
<td>Extensive, into the life-world of the consumer to enable an understanding of relationship between their needs and the market</td>
<td>Extensive, into clients wants/needs, existing business &amp; socio/cultural context of consumer. Theoretical research, resolves research question.</td>
</tr>
<tr>
<td>Scope</td>
<td>Bounded by clients business</td>
<td>Bounded by clients business and users</td>
<td>Bounded by consumer context</td>
<td>Bounded by socio-cultural context of problem</td>
</tr>
<tr>
<td>Type</td>
<td>Applied</td>
<td>Applied</td>
<td>Applied</td>
<td>Applied &amp; academic</td>
</tr>
</tbody>
</table>

In Category A, research is a cursory activity, with a focus on gathering information related to the immediate problem. For example, Philip said, “quite often, they [client] have to provide resources for me,” and, “I’ll look at the logo they have and their slogans and their bits and pieces ...and example photographs.” These comments suggest that in this category research is expected to provide a visual understanding of an existing business. Research is also undertaken to enable an understanding of an existing scene and of likely production and marketing issues: “you do your research
and figure out if there is anything in that arena” and, “checking for production methods, checking for marketability” (Rod).

In Category B, research is the first activity of the design process. Ian commented, “I’d start with serious research”:

I’m very fond of researching and reading around the topic so I could spend... days really coming to grips with what the client is about. So it’s... understanding ...the nature of the business ...what its character is, what the people are about and what their precedents have been, so the design is often a continuation of some culture that’s already established (Ian).

In this category, too, research is undertaken with the aim of understanding what exists (Table 4.3). However, here, research is also used to evaluate the degree of success of existing design outcomes. For example, Marg said, “Well I look at what the brief is... and then I go out and try and find out more about it. So I go straight into researching, looking into what currently exists, how it works, how it doesn’t work”. She goes on to say, “I then try and find out who uses it, how they use it, and what they want to use it for” suggesting that in this experience, research is also expected to provide an understanding of the relationship between the intended design outcome and the clients audience.

In Category C, also, research provides an understanding of what already exists. “So the first thing you do is research to understand reality. What is there? What exists?” (Jim). However, Jim continues, “the main thing is to understand the context, to understand the people...for whom you design... [so] I do research on the user [by] using video tape, to observe people, how they live, how they work.” Here, the primary focus of research is to understand the users of the intended design outcome in their contexts.

In Category D, the aim of research is to understand the problem and the context; an aim achieved by a number of activities. For example, “it was garnering information from them [client]” and “we went and looked and took in the environment [and] tried to work out what it was reflecting” (Jen). Alan, too, focuses on the context in which the design outcome will be located:

I started this one the same way I start everything which is to sketch down anything I can think of to do with the subject and then to go beyond that to reading up on it... talking to each of the board members and getting their thoughts on it... researching at libraries and then talking to their
people on the ground... getting existing data from that area ... So there’s previously existing information to do with that area... there’s cultural information to do with that area and ...local folklore in that area (Alan).

Here the focus of research is to understand the socio-cultural world of the target audience.

Academic research (see Table 4.3) featured in this category only. Here, research according to Alan, entails recognising that a question exists: “I thought ... that is just perverse. How can that happen?” and then determining how to provide an explanation, “So I’ve been struggling with various theories of my own because I couldn’t find anything on this anywhere in design.”

So the learning side of it... is then to look outside of design... who has done research into [this]... the first place to look is cognitive psychology... So what it’s done for me, it’s provided a huge breakthrough to be able say why... I was looking for an answer to this weird paradox and that seemed like a very good reason ...it explained..it (Alan).

So research is also supplying theoretical answers to theoretical problems.

4.3.3 Dimension 3. Creativity and Ideation
Creativity is a feature of design practice that enables ideation, that is, the creation of design concepts. It often follows on from research, the activity, which, together with verbal communication, provides the information base from which design concepts are derived. Table 4.4 suggests that it is variously experienced across the categories, ranging from an innate and spontaneous ability, to a strategic way of working, each form of creativity entailing either subconscious or conscious procedures, or both.

Although creativity in its different manifestations is expected to enable ideation, it is not the sole means of generating concepts as different activities, for example, particular ways of thinking, are also deliberately utilised to provoke ideation. Table 4.4 indicates that in category D, these ways of thinking are expected to enable the designer to transcend the known; a practice, which results in the generation of innovative concepts.
Table 4.4 Creativity in the experience of design

<table>
<thead>
<tr>
<th>Dimension</th>
<th>Creativity</th>
<th>A: A problem solving, outcome generating activity</th>
<th>B: An affective agent</th>
<th>C: A strategic act resulting in benefit to humanity</th>
<th>D: An affective, socially embedded reciprocal domain</th>
</tr>
</thead>
<tbody>
<tr>
<td>What is creativity?</td>
<td></td>
<td>An innate ability to spontaneously generate an idea Intuitive</td>
<td>An innate ability to innovate Intuitive</td>
<td>A deliberate &amp; strategic way of working Proactive &amp; Strategic</td>
<td>A deliberately adopted frame of mind enabling innovative perspectives Proactive &amp; strategic,</td>
</tr>
<tr>
<td>How is ideation achieved?</td>
<td></td>
<td>Deliberate activities enable subconscious to process information causing moments of inspiration. Questioning known to reveal alternative possibilities</td>
<td>Deliberate activities used to enable spontaneous ideation</td>
<td>A strategic process of research and analysis enables patterns of meaning which result in ideation</td>
<td>A strategic way of thinking intended to transcend the known resulting in innovative ideas Deliberate activity used to enable subconscious to process information</td>
</tr>
</tbody>
</table>

In Category A, creativity in an innate ability to spontaneously generate ideas using intuition and subconscious processes. Philip said, “creativity comes on a bit of a sliding scale...some people ...don’t have brains that can come up with things spontaneously.” Ken suggests that although it is an intuitive and ungovernable feature, “There is no process for creating [where] you can guarantee you are going to get the product you want... it’s about...tuning yourself to see intuitively, in a flash - that’s what it wants to be.” Nevertheless being consciously aware and in a prepared state to recognise the moment the subconscious generates an appropriate concept, provides as much of a measure of control as possible.

Although the statements above suggest that the ability to create is spontaneous and intuitive, activities intended to foster ideation are also knowingly utilised. For example, Philip said, “I guess I come up with ideas by scoping out the problem” and “mind mapping”. These conscious activities are followed by a deliberate non-focusing on the problem intended to enable the subconscious to process information, which, in this experience, results in spontaneous ideation. For example, “sometimes I’ll do a whole lot of process work and then I’ll just leave it for two or three days [and] kind of soak them up [and] I’ll come back to it and suddenly things just start popping into place” (Philip).

In Category B, Marg suggests that creativity is an innate ability to perceive the world in new ways and subsequently to use this insight. For example, Marg said, “creativity is... somebody who is not someone who thinks in black and white but
they have... a way of thinking... you can see things in a different way than they are presented to you... so that you can turn things around into something else.”  This comment implies that although creativity is innate, recognising how something has changed and then using that new perception to consciously generate concepts, implies a measure of control over the process. In contrast, ideation occurs as a result of conscious activities, “have kind of brainstorming sessions... brainstorm ideas” (Marg) and “when I’m researching things ...finding things out, I put these three dimensional images together” (Marg) suggesting that research provides the information base from which ideas emerge.

In Category C, creativity is “a process [and] you... can be creative in the research... You can be creative in whom you will talk to... how you collect information... creativity is a better way to do things” (Jim). In this category, a systematic process, starting with research, is utilised to enable ideation. Accordingly, Jim said, “you do research, to drive the conceptual development [and] you’ve got all this mass of information because a product is... condensed information”. The information is then analysed, which results in “[from] the analysis of this data, you can see patterns [and] you say, this data with this means something” (Jim). These patterns of meaning result in ideation “having... ideas... from the output of the analysis”.

In Category D, creativity is a frame of mind that is deliberately utilised to enable the designer to transcend the known. For example, Evan said, “[design’s] distinctiveness comes from how it approaches things... as a creative way of looking at things. This way of perceiving is, according to Evan, intended to generate ideas that result in new design outcomes “It’s about how you apply design thinking to the situation” and “I have strategies for how to come up with ideas.” He goes on to suggest, “if you want to come up with interesting perspectives, you get rid of labels and you focus on the doing and the experiences...if I look at a situation through those lenses...I... screen myself out from preconceived concepts.” Here, creativity is a deliberate cognitive strategy, which results in new perspectives, which, in turn, result in innovative design outcomes. In this experience, practices are also utilised to deliberately enable the subconscious to process information. For example, “looking and thinking ...the best thing... is just to sit down and read a book and not look at the problem ...by having a diversionary tactic, that’s when a myriad of possible solutions come about” (Jen).
4.3.4 Dimension 4. Transformation

This feature of design, similarly expressed in each category as the bringing into existence of a design outcome, is brought about by the participant’s various design processes. In *Category D*, broad based communication, in-depth research, and strategic cognitive practices result in concepts that become innovative design outcomes. Whereas in *Category A*, scoping out the problem, questioning, understanding client requirements and manufacturing issues result in concepts which become new design outcomes.

Table 4.5 shows that in addition to the form of transformation described above, further forms of transformation are described, which also vary across the categories. Here, too, transformation entails a change of some kind. In *Category A*, the ability to design improves as a result of practicing, whereas in other categories it is the design outcome that is expected to perform as a transformative agent. For example, in *Category B*, the domain of design changes as a result of the outcomes of design practice. And, in *Category D*, the design outcome acts as a transformative agent when humanity’s understanding of some aspect of their world is changed through engagement with it. Thus, Table 4.5 shows that what is transformed, how it is transformed, and the outcomes of the various transformational processes vary across the categories.
Table 4.5 Transformation in the experience of design

<table>
<thead>
<tr>
<th>Dimension Transformation</th>
<th>A: A problem solving, outcome generating activity</th>
<th>B: An affective agent</th>
<th>C: A strategic act resulting in benefit to humanity</th>
<th>D: An affective, socially embedded reciprocal domain</th>
</tr>
</thead>
<tbody>
<tr>
<td>What is transformed?</td>
<td>Information results in insights, which become artefacts</td>
<td>Research creates concepts, these become artefacts</td>
<td>Research becomes knowledge, which become concepts. Concepts become artefacts. Designer’s understanding improves. Humanity’s way of working improves</td>
<td>Research becomes concepts, which become artefacts. Personal knowledge changes. Practice develops. Humanity’s understanding changes</td>
</tr>
<tr>
<td>Ability to design</td>
<td>Body of design</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>How is it transformed?</td>
<td>By utilising personal problem solving process</td>
<td>By utilising personal design process Understanding user needs</td>
<td>Knowledge enables new patterns of meaning to be discerned. This enables user needs to be understood and concepts to be devised.</td>
<td>By utilising personal design process Applying strategic thinking to transcend known</td>
</tr>
<tr>
<td></td>
<td>Questioning existing norms</td>
<td>New artefacts form evolving body of design</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>By performing &amp; then reviewing practice</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Outcomes</td>
<td>Artefacts exist</td>
<td>Artefacts exist &amp; affect users</td>
<td>Artefacts exist and improve life for humanity</td>
<td>Artefacts exist, New perception &amp; knowledge created changing designers’ understandings</td>
</tr>
<tr>
<td></td>
<td>Designer able to perform better, practice develops</td>
<td>Designer’s understanding changes</td>
<td>New knowledge created changing designer’s understanding</td>
<td>Designer’s able to practice more effectively</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Body of design evolves</td>
<td>Humanity works better</td>
<td>Humanity understands the world differently</td>
</tr>
</tbody>
</table>

In Category A, two forms of transformation were evident. The first was the process of designing, “that process that people go through to get from a moment of inspiration... and where they took that and got to the final result” (Philip). The second form occurs when design practice changes. This form of transformation is discussed below.

In this experience, the transformational process of design focuses on understanding the issues that will enable the designer to achieve the moment of inspiration identified by Philip above, and by Matt in the following comment, “it was a flash of insight,” and subsequently transform this ‘insight’ into an artefact. Here, the transformational process, entails “getting the vision right... so you go from the
general to the particular and back to the general again to try and achieve that feeling that you started with” (Ken), implying a process of alignment between ‘insight’ and eventual outcome. In this experience, which focuses on problem solving and outcome production, the process of transformation is assisted by understanding the issues related to the problem. For example, “I come up with ideas by scoping out the problem and looking at the issues that are there” (Philip), by “checking for production methods” (Rod) and, “understand[ing] the anomalies ...that arise … and be[ing] able to talk to [those] who are making it” (Ken). Table 4.5 shows that in this category an additional form of transformation is expected to take place - specifically, a change in personal understanding and ability to practice. For instance Ken states, “every single design you do is just another step towards the next one... The stuff you learn ...and every design will feed on into your next one... designing is about knowing more about what you are doing... getting better at it.” This comment implies that a change in the designer’s understanding results in an ability to improve their practice. Thus, both designer and practice are transformed by means of a process of performing and reflecting on practice.

In Category B (see Table 4.5), three forms of transformation were described. As with Category A, the first was the process of designing. The second occurs when personal understanding is changed. The third occurs when the outcomes of the design process cause the body of design to metamorphose. In this experience, the process of design focuses on understanding both client and those for whom the design outcomes are intended. For example, Marg suggests, “designers should be able to interact with everybody so that they can understand the problems that... people have with everyday things” and “you have to talk to the client a lot to be able to ensure that you're getting the right thing.” This information then provides the basis for the creation of concepts as Marg’s comment implies, “you can picture things in your head... from words ...so when I’m researching things ...I put these three dimensional images together,” and, “That’s a very organic process and I go back and forth until I have a fairly clear idea about what the outcome is” (Ian). Here too, the production of an artefact forms part of the process of transformation: “you’ve got to get these ideas that you think are great ...you’ve got to get somebody to make them” (Marg). The second form of transformation in this experience, a change in personal understanding, is implied by Marg: “I realised that the ways I would think was because I didn’t know anybody who was [like that] [but] when I started hanging out with these friends, it was like wow... it’s made me open my eyes and... I’ve now changed my attitude.”
The third form of transformation occurs when the outcomes of the design process contribute to and form the body of design, which, as a result of this input, constantly evolves. Marg said, “design is always changing... there’s so many new things happening in [design] it’s just this amorphous thing that’s constantly... moving around and changing and developing in to something else.” Ian too suggests this metamorphosis, “there is no such thing as fixity in terms of design... it’s just a step in another direction and it constantly evolves [and] you’ve only got to look at your own work over the ...years”.

In Category C, the process of designing focusses on meaning making. For instance, by “collecting information and making sense of it ...you find and transform information, you take it from information to knowledge” (Jim). This transformation of information is then described “here is research... then analysis... you’ve got all this data and you start to make connections ...So on analysis of this data, they can see patterns [and] you see from a broad perspective, from different angles [and] so we start understanding needs ...understanding these problems”(Jim). Here, information itself is not a sufficient basis from which to devise concepts. The information must be processed so that new knowledge, in the form of patterns of meaning, enable concepts to be created, “you start to have ideas from the output of the analysis” (Jim). He then describes the process of transforming a concept into an artefact: “the next part is prototyping. It’s usability testing, and then you fix the problems [and] if the process is beautifully followed, the output will be good.” In this experience, the transformational process of designing enables a design outcome to be devised, and the designer’s understanding to change. It is also implied that the design outcomes themselves may have the capacity to change life for others: “We’re talking about [products] related to... how we can work better... in ...people’s environments” (Jim) by enabling humanity to change the way it works.

In Category D, the first form of transformation is the process of designing. In this category, although research provides information from which concepts are generated, the design process of this experience focuses on strategic cognitive practices. These are deliberately utilised with the intention of enabling designers to transcend the known. For example, Evan said “if you want to come up with interesting perspectives, you get rid of labels” (Evan). Here, the person deliberately transforms their way of perceiving with the intention of enabling the generation of innovative concepts. Then “it’s a matter of going back through all your sketches, and
thoughts and the brainstorming” (Alan) and “so if you’ve got a whole swirl going on, your mind, at some stage settles on something... then I’ll do some ...sketches and... then you create that and maybe do some modelling” (Evan).

In this experience, in addition to changing personal understanding by intentionally perceiving differently, understanding is also changed by means of academic research. For example, Alan said, “I’ve got a very strong research interest ...into ...psychological responses to images ...what ...you can do to elicit a response?” and “the result of [my] research... it’s provided a huge breakthrough to be able say why...” (Alan). The resulting knowledge is used to enable more effective practice, “finding out why that ...happened, then using that to make sure you get the right response” (Alan). Thus, both the person and their practice change. In this experience the process of designing results not only in the creation of a design outcome, but rather, in an outcome that is intended to change the understandings of those who experience it. For example, Evan said, “you need a way of drawing people in, so that as they come out they perceive the change that’s happened to them through that experience.” In this experience, not only does the transformational process of designing result in the creation of an artefact, but the designers deliberately change their own understanding by means of two different processes, reconceptualisation and academic research. The latter process also results in the designer’s ability to subsequently change their practice. Lastly, the design outcome itself is expected to transform the understanding of those who experience it.

4.4 **Summary of the categories and dimensions of the experience of design practice**

Four categories of the experience of design were described. These ranged from an experience where, in category A, design was devising and using a process to generate a design outcome; to category B, where design was using a process to produce design outcomes which beneficially affect others; to category C where design was using a strategic process to understand humanity and thus provide design outcomes which would be of benefit to humanity; to category D, where design was creating innovative experiences which had the capacity to change users’ understandings and ultimately the future, and to understand the relationships between design and society.

The participants’ descriptions of their experiences suggest that a relationship exists between the role of design and the boundary of the experience. For example, in
category A, where the role of design is to use a process to devise a design outcome, the experience boundary is circumscribed by the activities entailed in the production of an artefact. In category D, design is conceived of as a domain embedded in a social matrix where each has the ability to impact on the other. Here the role of the designer is to understand the interrelationship and use this to change humanity’s understanding. In this category the experience boundary incorporates all of society, including design. These descriptions imply that the role of design changes across the categories moving from a local focus on performing, to a universal focus on understanding affective social interrelationships.

The participants’ descriptions also suggested that the ways of practicing - the design processes, also change across the categories. These differences become apparent in the following descriptions of the dimensions of the experiences of design. The dimension communication comprised two forms of communication: verbal communication and visual communication. In both forms of communication, the functions and scope of communication changed across the categories. Similarly, in the dimension research, two forms of research were described, applied research and academic research, although the latter was only described in category D. Where the categories differed was in the scope of the applied research undertaken. In all categories the dimension creativity entailed differing ways of questioning the known, coupled with various activities, practices which, when used in tandem were expected to result in ideation. The categories differed according to the amount of control exerted by the designers over their design processes. In the dimension transformation, there was an increase across the categories of the number of forms and functions of transformation.
CHAPTER 5
THE VARIATIONS OF THE EXPERIENCE OF DESIGN TEACHING

5.1 Introduction
The aim of this chapter is to describe the ways in which the participants variously experience the teaching of design and to present the dimensions of the experience of design teaching. In Section 5.2 four categories of experiences of design teaching are described. The categories were derived from an analysis of the participants’ descriptions of their various teaching experiences. The category titles express the focus and meaning of each experience and these are: A. Design Teaching is providing a pattern of practice; B. Design Teaching is providing an environment enabling autonomous practice; C. Design Teaching is causing a change in understanding; D. Design Teaching is enabling relational meaning making. Each category of experience is explained in turn by the quotations characteristic to each experience. These convey the ways in which each category varies in its complexity and scope. Section 5.3 presents the dimensions of the experience of design teaching. The dimensions were derived from a cross category meta analysis of the results reported in Section 5.2. Four dimensions were identified, which are: Outcomes of the teaching learning process; Assessment practices in the experience of design teaching; The nature of taught knowledge; and Teachers’ perceptions of student teacher relationships and their roles. These dimensions are based on the features of the experience of design teaching expressed in each category, features which are variously experienced and therefore change across the categories.

5.2 Variations in the experience of design teaching
This section presents the four categories of the various experiences of design teaching, which are illustrated in Table 5.1.
<table>
<thead>
<tr>
<th>Design Teaching is</th>
<th>Focus of experience</th>
<th>A: Providing a pattern of practice</th>
<th>B: Providing an environment</th>
<th>C: Changing understanding</th>
<th>D: Enabling meaning making</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Provide a design vision &amp; pattern of practice and help students to adopt these</td>
<td>Provide an environment in which students develop expertise through autonomous learning</td>
<td>Provide a context linking domain with society. Cause change in student understanding</td>
<td>Provide context promoting exploration of affective relationship between domain &amp; society. Enables meaning making</td>
</tr>
</tbody>
</table>

**Teacher Role**

<table>
<thead>
<tr>
<th>Teacher Role</th>
<th>Role model</th>
<th>Architect</th>
<th>Mentor</th>
<th>Colleague</th>
</tr>
</thead>
</table>

### 5.2.1 Category A. Design teaching is providing a pattern of practice

In this experience of teaching, the participants believe that as their own way of designing is effective, and their vision of design beneficial, they focus on what they need to do to encourage students to adopt the teacher’s pattern of practice and design vision. Marg, the participant with the least teaching experience, suggests that, “I don’t know how to teach but I know how to design so I teach them that.” Accordingly she proposes, “What did I use when I went out and worked, and what worked and how it worked and that’s now what I try and teach the students.” Jim, too, suggests that students adopt his way of working, “I care about the process. I’m in love... [with] this ...great process. So this is the process I do and this is the process I’m teaching here” (Jim). These data suggest that teaching is providing a pattern of practice for students to follow.

Moreover, students are also expected to accept the teacher’s knowledge. For example, Marg says,

> teaching... is to... take the knowledge that I have and ...put it into a language that the students can understand [and] trying to find a balance between giving them the information they need, and making it entertaining so they will listen and take it onboard.

Jim proposes, “if I make them curious about the topic and I show the importance of the topic [then] they will do anything I ask... [if] I say read this big book, they will read it because they know the importance of that” (Jim). These comments imply that teaching is more than “giving” knowledge; here it is working with students to encourage them to engage with and accept the teacher’s knowledge by making it comprehensible and ensuring that they understand its importance. Students are also
expected to adopt the teachers design vision. For example, “to teach someone [students] how to understand what a user wants...” (Marg), and, “[so] one of the topics of research I force my students to do is on social... trends... so they start... understanding these problems” (Jim). In this experience, teaching is providing a pattern of practice for students to follow, and supplying knowledge and a vision of design for students to adopt. Teachers appear to perform as role models.

5.2.2 Category B. Design teaching is providing an environment in which students develop expertise through autonomous practice

In this experience, teaching is providing an appropriate environment or content, in, or with which, students can develop their own design processes: “I think teaching is...creating an environment where students can... start a process of...working out how they can evolve their own creative process” (Philip). Philip continues, “we need to provide a platform from which they can launch themselves and it will very much be up to the student how much they get from it” and, “they can launch from that and take an idea and run with it if they’re willing to teach themselves.”

Teaching is providing an environment in which students can perform as they wish: “you can’t teach design...” and, “So how do I teach it? I can explain it to somebody ...go that way. I can encourage them... But at the end of the day they’ve got to make it their own” (Rod). Philip, too, suggests that teaching is enabling the development of a personal way of working, “it’s important to impassion students in the area of design ...if you can do that, then... you’ve got people who are excited about going out and discovering something, then they’ll go and do the work” and, “then... actually own the creative process.” This suggests that teaching practices such as the encouraging and impassioning of students are expected to result in the autonomous development of an individualistic design process. However, in this experience the environment is also expected to enable students to produce design outcomes, “I get the students to... go out there and make something. In fact I keep telling them it is not design until you have made it” (Ken).

Encouraging students to question their work also has a role. For example Ken proposes “once you get them onto that questioning everything it can be a bit explosive for them, because they don’t feel they have any ground at all, but design is about... questioning your limits” because, “they can ...go where they’ve never been
before, and feel confident... that they will find a way. ” Thus, a questioning frame of mind is expected to enable students to learn to discover for themselves.

In this experience, the teachers perform as architects, providing an environment that students may occupy in the way they choose, making the space their own. In this space they learn to perform autonomously as designers by developing individualistic design processes by means of which they are expected to produce design outcomes.

5.2.3 Category C. Design teaching is causing a change in understanding

In this category design teaching is enabling students to develop their own way of working. So as with category B, the process of designing is believed to be unteachable. For example, Evan said, “their design process is their skill ...and that’s not something that you can teach” [and] “they need to understand that there isn’t a design process model that is universal.” Consequently, teaching is enabling students to develop their own way of working. This design process typically, is expected to involve experimentation, “So they need to engage with design... and experiment to see whether they can get the hang of it” (Evan). As a result of this engagement and experimentation, “they come out with the ability to say, what I can do is apply ...design strategies to a particular problem and come up [with] solutions” (Evan). Although students are expected to have developed their own design process with which to problem solve, in this experience teachers also expect that the process incorporates strategies. Thus, students are expected to identify goals and then devise the means of achieving them.

Moreover, students are not just expected to produce design solutions, but to produce solutions that show evidence of innovation and which transcend the brief. For example, Evan said, “solutions ...that aren’t necessarily in the definition of the context or the problem” and then suggested that this is achieved by, “Trying to get them to see something differently... trying to change their way of thinking. It’s about... a way of perceiving a situation that’s different to what they would see it as.” Similarly Ian proposes, “teaching’s... continually questioning existing ideas and notions and preconceptions.”

Not only does teaching enable students to perceive differently, and accordingly devise innovative design outcomes, but it is also expected to enable students to perceive design as part of a broader picture. Ian suggests this when he distinguishes
between design teachers as content or context providers, “a content provider would be somebody who is... putting the materials for the sausage ...in the sausage machine ...whereas a context person would be... the factory or the society that the machine existed within...” As a result, teaching practices use the individual student’s design processes as a means to generate an understanding of the relationship between design theories and design outcomes:

That’s my theory part... [in] the studio practice part... the students get to apply those ideas because they have to invent ...a story for themselves and that story then gives them some idea of the mythology of a particular product... and they get to develop their own ...product design using those principles (Ian).

Here, whilst students are expected to produce a design outcome, the focus of learning is not on the outcome itself, but rather on enabling the individual to develop an understanding of design theory and to perceive how theory and practice relate to each other. For example, Ian said, “the design project is not about doing beautiful design, but about using design as a vehicle for understanding. So they get to act and put their degree of understanding... into some real activity... they make their understanding physical” (Ian).

In this category of experience, teaching is providing a context in which teaching practices are expected to bring about a change in student understanding, enabling them to produce innovative design outcomes, and perceive the relationship between design practice, design outcomes and design theory. Here, teachers perform as mentors. For example, Evan said, “I feel that you learn design through being mentored... So I try and create a mentoring approach where ...if a student has a problem, you’re designing with them”.

5.2.4 Category D. Design teaching is enabling relational meaning making
In this experience, teaching is providing a context in which it is possible to see the relations between the parts. For example, Jen said, “you ... give them information about the broader culture because a thing always exists in a relationship with other things... so you’re teaching the relationship.” This is also implied by Alan, “so [teaching is] creating a context for the students to find their way amongst... a deep ...historical ...cultural context.” A context which, in this experience, also encompasses politics, “I’m a believer in there being politics behind absolutely everything and I think [students] need to question that” (Alan). This practice is
expected to enable students to, “find there’s this whole rich resonant web that these [artefacts] sit in” (Alan). Student appreciation of the complex interrelationships between design and society is achieved by a number of different teaching practices. For example, Jen said, “so we looked at what was the problem with high and low culture and tried to unpack that [and] you have to ...pull apart, to show them how a process works”. While the teachers demonstrate how to expose underlying meanings, students, too, are expected to learn how to discern these for themselves by being directed to interrogate design outcomes. For instance, Alan proposes, “they [students] need to ask...What was the agenda that made this chair?”

In this experience, students’ interests are used to provide the basis for research. This activity is expected to enable them to confront the status quo in order to expose underlying meanings and also promote future learning. Alan comments:

I try to get [students] to show me an example of the stuff they really like... [and then] for them to then go and look for the reasons why it might have happened... these things don’t happen in a vacuum, they’re a response to something [and] from then on, it’s just about getting them to run with their enthusiasm.

Here, teaching practices are intended to not only enable students to perceive and confront the social and political forces and structures that produce and constrain the domain of design, but also to understand the affective mechanisms between design and society. For example, Matt said, “it was an understanding thing... and I said look what is happening... and they were making new meanings...”.

Teaching, in this experience is also facilitating an understanding of the relationship between theory and practice. Jen proposes, “what I want to do is to weave theory and practice. So that theories aren’t just ideas that you have to spit out in an exam, but that they’re embedded and a part of the things we create”. Alan expressed a similar notion: “This [project] followed immediately from the lecture. So rather than have the lecture left hanging... let’s get them to engage with some of the things that I’ve explained in the lecture ...and people really got the idea of it and it made sense to them.” These data imply that students are expected to understand design theories when they engage with, and subsequently integrate them with their own practice, and that design outcomes, theories, and the society of which they are part, all form an interrelated entity. In this experience, teaching is creating a context in which individual students’ perceptions are changed through activities intended to foster critical thinking with the aim of exposing the affective relationships between design
and society, thus revealing new meanings. Here, the teachers work with students as collaborators. For example, Jen says, “it’s a collegial environment, teaching ...students and staff as people interested in similar topics” implying that students are perceived as equals.

### 5.3 The dimensions of the experience of design teaching

This section presents the dimensions of the experience of design teaching. The dimensions were derived from a cross category meta analysis of the results reported in the previous section. Four dimensions were identified: 1. Outcomes of the Teaching Learning Process; 2. Assessment practices in the experience of design teaching; 3. The nature of taught knowledge; 4. Teachers’ perceptions of student teacher relationships and their roles. Each dimension is considered in turn.

#### 5.3.1 Dimension 1. Outcomes of the teaching learning process

The outcomes of the teaching learning process reflect the various teaching aims described in section 5.2. Table 5.2 shows how this dimension varies across the categories; ranging from enabling students to devise an individual design process and use it to produce design outcomes, to enabling students to produce and critique design outcomes and societal structures. In category A the outcome of learning is an ability to understand user needs and address these. For example, Jim proposes, “one of the topics of research ...my students do is on social trends [on] users ...So on analysis of this data [they] start understanding needs.” Alternatively, in category B, the comments “they can identify a problem and ...find a solution for that” (Rod) and, “using their own process...to get to the final result” (Philip), suggest that in this category the outcome of the teaching learning process results in an ability to devise a design process with which to produce design outcomes.

In category C, using the design process to provide an outcome is more strategic. For example, Evan said, “they need to explore design processes ...and come out with the ability to apply design strategies and come up [with] solutions that aren’t necessarily in the definition of the context or the problem” implying a similar learning outcome to that of the previous category - the ability to use a design process to produce design outcomes. It differs in expecting students to develop a strategic process with which to produce innovative design outcomes.
Table 5.2 shows that in categories C and D, the teaching learning process is also expected to result in students producing designs that show their understanding of the principles and theories presented in lectures. For example, “students ...get to apply those because they develop their own design using... those principles. So, the project is about using designing as a vehicle for understanding theory” (Ian).

In category D, the teaching learning process is expected to enable students to understand the affective relationship between design outcomes and the theories, social forces and contexts that shaped them. For example, Jen said,

I ...weave theory and practice [as] theories [are] embedded and part of the things we are responsible for creating... So, [I] give them information about the broader culture because a thing always exists in a relationship with other things so you’re teaching the relationship.

And Alan proposes, “[students] need to question... to look at the reasons why it happened [and] so they find that a meaning exists within a deep historical ...cultural context.”

<table>
<thead>
<tr>
<th>Dimension Outcomes</th>
<th>A: Providing pattern of practice</th>
<th>B: Develop expertise</th>
<th>C: Changing understanding</th>
<th>D: Enabling meaning making</th>
</tr>
</thead>
<tbody>
<tr>
<td>Outcomes of the Teaching Learning Process</td>
<td>Become expert like teacher. Able to understand user needs and produce designs that address these</td>
<td>Become expert able to devise own process &amp; use to produce design outcomes Apply principles to practice</td>
<td>Become expert able to use strategies to produce innovative design outcomes Understand &amp; apply theory. Change understanding</td>
<td>Become expert able to produce &amp; critique design outcomes &amp; societal structures Enable meaning making. Change understanding to develop practice</td>
</tr>
</tbody>
</table>

A further outcome shown in Table 5.2, only apparent across categories B, C and D, is an intention to change student understanding. In category B, Ken expects students to question the known so that they can “go where they’ve never been before.” In category C questioning is used to challenge students’ existing understandings with the intention of changing them, “It’s... questioning their existing ideas and preconceptions” (Ian) and Evan suggests “Trying to get them to see something differently... to change their way of thinking.” However, in category D, teaching learning processes not only change student understanding but enable students to use their altered awareness to, for example, improve future practice. As Matt implies, “[what] happened was an acknowledgement of her conscious awareness that she knew... and I know that the next assignment she comes upon, she’ll use that same whatever it was that she got.”
5.3.2 Dimension 2. Assessment practices in the experience of design teaching

Although assessment was not something addressed by the teachers in category A, Table 5.3 reveals that a diversity of assessment practices were used across categories B, C and D, ranging from an evaluation of individual student’s workbooks to the use of public class critique sessions. These different assessment practices are expected to achieve a variety of outcomes. For example, in category B they are expected to reveal a student’s degree of proficiency to the teacher, whereas in category C they are expected to teach students how to evaluate their work.

Table 5.3 Assessment practices in the experience of design teaching

<table>
<thead>
<tr>
<th>Dimension Assessment</th>
<th>A: Providing pattern of practice</th>
<th>B: Developing expertise</th>
<th>C: Changing understanding</th>
<th>D: Enabling meaning making</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>What is being assessed?</strong></td>
<td>Assessment not addressed</td>
<td>Student’s ability to make effective decisions about their work</td>
<td>Student potential &amp; their ability to evaluate &amp; develop their work</td>
<td>Student potential, &amp; understanding of theories &amp; criteria on which critique is based &amp; ability to use these to evaluate &amp; change their work</td>
</tr>
<tr>
<td><strong>How is it assessed</strong></td>
<td>Assessment not addressed</td>
<td>Student’s final &amp; process work reviewed by teacher</td>
<td>Student to student discussion of workbooks and class critique. Formative</td>
<td>Teacher/student discussion in class critiques. Students evaluate progress of own work. Formative and summative</td>
</tr>
<tr>
<td><strong>Who is assessing</strong></td>
<td>Assessment not addressed</td>
<td>Teacher aware of student proficiency and ability to evaluate</td>
<td>Teacher &amp; students aware of student proficiency &amp; ability to evaluate</td>
<td>Teacher &amp; students aware of student proficiency, understanding &amp; ability to evaluate</td>
</tr>
</tbody>
</table>

The data also reveal differences across the categories concerning teacher awareness of student potential and understanding. Here, assessment practices undertaken at different stages of a course enable either, the teacher alone, or both student and teacher to recognise these. Ken, for whom teaching is providing an environment comments that:

Frequently in the process work ...we see much better ideas and drawings than we see in the final outcome. And you always wonder… They have made some really bad mistakes in their editing here... but you’re never quite sure if they can see it themselves.
Such a comment suggests that while the assessment practice enables the teacher to ascertain the degree of merit of a student’s work and their ability to make sound evaluative decisions, the teacher alone understands this. It also suggests that in saying “final outcome” that here, assessment is a practice undertaken on completion of a project.

These comments by Evan suggest that in category C, the assessment practices of both class critique and student workbooks enable students to learn how to evaluate their work:

You hold up a piece of work... so they’ll talk about [it]... so they’re assessing each other’s work, reflecting on it, commenting on it

and,

I get students to sit with the student beside them and ...go through their workbook and then ...write down what they think they should be doing next, and they’ll repeat the process on each other so that... they’ll get the skill to learn to do that themselves.

These comments imply that students are not only expected to learn how to critique, but how to use it to develop their work. Additionally in category C, Evan suggests that workbooks provide the means of enabling staff to evaluate student proficiency and understanding: “if a student has a problem ...I’ll always be drawing on their workbook and saying ...what about this?” This comment suggests that here, in contrast to category A, the teacher uses student work as a basis for discussion with them.

In category D, Alan’s comment that “they get involved, not only in making the thing but also in critiquing what’s working... this way, they get a sense of ...where they stand in the scheme of things and why they stand there” suggests that here too, critique enables students to learn how to critique. It also suggests that critique enables students to understand both the comparative merit of their work, and the reasons for determining its relative position in a cohort. Jen, too, implied that when critiquing, students are expected to develop an understanding of the criteria to be used, and how to apply them. She said, “[they need] that understanding of the culture of critique, the grounds on which critique is formed...”. These variations are shown in Table 5.3.
Moreover, in this category, students are also expected to understand the underlying theories on which critique is based. For instance, “designers ...have this capacity to make an object that can be critiqued... using particular theories and ideas, [and] theories... are part of the things ...that we are responsible for creating... so I hope people look at something and critique it as an idea” (Jen). Matt suggests that critique also enables students to understand what needs to change, and to make the necessary alterations. For example, “the student showed me the design in class, during a critique... and next day ... she did another design and it really worked ...she thought about it in a completely different way” and, “she has a better understanding now of what she is doing”. In category D, both the teacher and student are aware of the student’s proficiency and understanding, a shared awareness enabled by the assessment practice.

An additional form of assessment is described by Matt, which suggests a longitudinal evaluation. For example, “I made them keep every single rough draft ...[to] keep a record of that process... having ...the rough draft to the very end product, to see the transition from start to finish”. Table 5.3 shows that in this category alone, students are expected to reflect on and review the entire progress and development of their work, rather than evaluating only the current piece of work.

5.3.3 Dimension 3. The nature of taught knowledge

Table 5.4, shows a clear variation in the nature and focus of taught knowledge ranging from, knowledge as acquiring and using factual information and practical skills, to knowledge as a foundation for understanding and meaning making.
## Table 5.4 The nature of taught knowledge

<table>
<thead>
<tr>
<th>Dimension Knowledge</th>
<th>A: Providing pattern of practice</th>
<th>B: Develop expertise</th>
<th>C: Changing understanding</th>
<th>D: Enabling meaning making</th>
</tr>
</thead>
<tbody>
<tr>
<td>Knowledge types</td>
<td>Practice / General Factual / concrete</td>
<td>Practice / General Factual / concrete</td>
<td>Practice / General Theory / Abstract</td>
<td>Practice / General Theory / Abstract</td>
</tr>
<tr>
<td>Expected use of</td>
<td>Integrate understanding of human needs and practice knowledge to resolve design problems</td>
<td>Use practice knowledge to resolve design problems</td>
<td>Use practice knowledge to resolve design problems. Apply principles to practice to integrate. Develop practice</td>
<td>Integrate theory &amp; practice. Use theory &amp; research to expose affective relationship between design &amp; society. Develop practice</td>
</tr>
<tr>
<td>Knowledge scope</td>
<td>Bounded by human needs &amp; design problems</td>
<td>Bounded by problem &amp; ability to resolve it</td>
<td>Bounded by design theory &amp; practice</td>
<td>Bounded by design as part of socio/political matrix</td>
</tr>
</tbody>
</table>

In categories A and B the knowledge focus is on skills and factual information. For example, Marg says, “teach how to use... that drawing ability as a tool...” and Rod says “[to] know something about materials [and] technology” and, “if you are a problem solver you never know what product, or service you’re going to have to tackle, [so] they [students] have to know how to get to know something very fast.”

In category C the focus on practical skills is extended to encompass context and historical factors. For example, Ian comments, “they have an assembly of tools available to them that they have the ability to use to give form to things” and “[they should] have a sense of context [and] a consciousness of ...historical things... about everything that’s happened since... Lasceau.” His comments suggest a focus on both process and theoretical knowledge. However, Ian argues that: “[based on] a lecture I did ... students get to develop their own product design using... those principles”. Thus, knowledge also includes the ability to apply theory.

In category D, Jen says, “[I] give them information about the broader culture because a thing always exists in a relationship with other things so you’re teaching the relationship” and Matt proposes, “the [students] took the brief laterally, which is what the idea was, the underlying philosophy of deconstruction... which was the whole process of understanding what deconstruction is about.” These comments suggest that knowledge is an understanding of the relationships between design and society and an ability to integrate theory and practice.
5.3.4 Dimension 4. Teachers’ perceptions of student teacher relationships, and their roles

Table 5.5 shows that teachers’ perceptions of the relationship between teachers and students changes from teaching a group, category A, to teaching individuals with unique needs and experiences, category D.

<table>
<thead>
<tr>
<th>Dimension Teacher perception</th>
<th>A: Providing pattern of practice</th>
<th>B: Develop expertise</th>
<th>C: Changing understanding</th>
<th>D: Enabling meaning making</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teacher perception of students</td>
<td>A group</td>
<td>Both a group &amp; individuals</td>
<td>Group with needs, &amp; individuals with needs &amp; abilities</td>
<td>Individuals with unique needs, experiences &amp; understandings Partner/colleague</td>
</tr>
<tr>
<td>Student role</td>
<td>Follower</td>
<td>Explorer</td>
<td>Junior partner</td>
<td></td>
</tr>
<tr>
<td>Controlling role</td>
<td>Teacher’s role</td>
<td>Teacher’s role</td>
<td>Teacher &amp; student</td>
<td>Student’s role</td>
</tr>
</tbody>
</table>

For example, in category B, Rod’s comment: “I lectured them [and] I’ve never seen so many empty faces” suggests that students are recognised as an audience with a collective mind. However, Philip’s statement, “some students ...perform best under pressure, and other students need to take the pressure off themselves” and a similar statement by Evan, “if a student has a problem, you’re designing with them...” suggest that students are perceived as individuals with differing needs and abilities. Whereas in category D, Alan’s comment implies that students are seen as unique individuals whose singular experiences will impact on their views of design, “if somebody’s ...excited about a particular design, there’s … reasons behind that and it might be ...their upbringing ...their situation ...their experiences.”

Accordingly, teachers also perceive the role of the student differently across the categories as indicated in Table 5.5. For example, in category A, Jim’s comment, “I think this is a great process [so] I teach the process... that I believe [in]” and Marg’s, “What did I use when I... worked... and that’s now what I try and teach the students” suggest that as students are expected to adopt both the teacher’s way of working and their design vision, that students behave as followers. In contrast, in category B, the comments: “we need to provide a platform from which they can launch themselves and it will ...be up to the student how much they get from it” (Philip) and “they can go where they’ve never been before, and feel confident that they will find a way... You don’t know what it is going to be, but if Kupe had been too scared to lose sight of the shores of Hawaii he wouldn’t have discovered the shores of New Zealand. So
you’ve got to let go” (Ken) suggest that students are perceived as independent *explorers* discovering the environment provided by the teacher.

In category C, too, students are expected to perform autonomously. For example, Evan said, “they need to engage with design... experiment to see whether they can get the hang of it.” However, here rather than the distant stance between teacher and student implied in category B, the teachers suggest a more involved student/teacher relationship with Evan proposing, “I try and create a mentoring approach where ... if a student has a problem, you’re designing with them.” Although this suggests that students and teachers may work alongside each other, “mentoring” implies that it is the teacher who is the senior partner and advisor in the relationship, whilst the student is the junior partner. Whereas, in category D, a comment by Jen suggests that students are perceived as equal partners and colleagues: “a couple of [recent] designs I’ve worked on with students, it’s collaborative [and] it’s a collegial environment, teaching ...students and staff as people interested in similar topics”.

These differing perceptions also influence the control teachers exert over students, with Table 5.4 showing that teachers progressively cede more control to students and expect them to be more active in directing their own learning. For example, responsibility for motivation is perceived differently across the categories. In category A, Jim proposes, “I motivate them and ...then anything I ask ...say, read this big book, they will read it” thus implying that it is the teachers’ role to provide the prompt that will cause students to follow the teacher’s requests. However, in category B, Philip’s comment, “I need to be able to inspire the students in terms of the range of ideas that they can come up [with],” implies that it is the teachers’ role to provide the creative stimulus which will enable students to independently generate a diversity of concepts. In category C, although Evan said, “we, staff, should be running projects that interest us ...it’ll get [students] to engage in something their teacher’s engaged in,” he also proposes, “I ask students to divert their course according to their own learning direction.” This implies that both the teacher’s and students’ interests are expected to provide a prompt for student learning. In category D, it is the individual student’s interests that are expected to provide motivation. For example, Alan proposed, “if they latch onto some aspect of design ...from then on, it’s just about getting them to ...run with their enthusiasm [and] they can go on from there under their own steam.” Here, motivation is believed to be the student’s responsibility because, “people get into the stuff they’re interested in rather than the stuff they’re directed towards” (Alan).
5.4  Summary of the categories and dimensions of the experiences of design teaching

The focus of the experience and the teacher’s role for each category are summarised in Table 5.1. There is a clear progression from category A, where teachers focus on their own activities and their control of students, to category D, where the focus is on enabling a change in the individual student’s understanding and ability to make meaning. The teacher’s perception of students and their understanding also varies across the categories, ranging from students as a collective with a collective understanding, to students as individuals with individual understandings of which the teachers are cognizant.

Teachers in three categories, B, C and D, all implied that teaching entailed providing environments in which students could learn to perform as practitioners, although teaching aims and learning outcomes differed. The exception was category A, where the teachers provided a model of practice for students to follow. Despite these differences, the aim of teaching in every category was to enable students to become experts.

As the focus of the experience of teaching changes, so too does the teacher’s role. For example, teachers who provide a pattern of practice perform as role models; teachers who provide an environment for others to inhabit perform as architects; and teachers who expect to enable a change in student understanding do so by adopting a mentoring approach; whereas teachers who perceive students as individual and autonomous equals perform as colleagues (Table 5.1). There is a corollary to this, where the role of the teacher suggests students will have a complementary role. For example, teachers who perform as role models expect students to perform as followers. This feature is discussed in the next section under teachers’ perceptions of student teacher relationships and their roles.

A summary of the four dimensions of the experience of design teaching follows.

In the Outcomes of the Teaching learning Process dimension, a learning outcome identified in each category was the ability to devise and use a design process to change ideas into some concrete form of design outcome. However, in categories A, C and D the design outcomes themselves were expected to enable further
understanding of some aspect of design, understandings which varied across the categories. Furthermore, the teaching/learning process is also expected to bring about a change in student understanding in categories C and D, and in category D, it also enables students to make meaning and develop their work.

In the dimension Assessment practices in the experience of design teaching, final examinations as a means of assessing student proficiency were not identified in any category, although a variety of alternative forms of assessment were described all of which related to studio practice. Although assessment was not addressed in category A, it was expected to achieve a variety of different outcomes across categories B, C and D. In category B, teachers review final submissions and this enables them to evaluate each student’s proficiency and their ability to critique their work. In category C, class critique sessions teach students how to critique their work, while peer review of workbooks is used to teach students how to use evaluative practices to progress. These practices enable both teacher and student to become aware of the student’s degree of proficiency. In category D, class critique sessions enable students to learn the theories underlying the practice of critique, to understand and use the criteria on which critique is based, and also provide a discussion forum enabling students to perceive how to improve their work and make the necessary changes. Here, both teacher and student are aware of the nature of the change in the student’s understanding. An additional assessment practice also enables students to review the progression of their work over its duration.

In the dimension The nature of taught knowledge, in categories A, B & C, whose focus is the production of a design concept, the knowledge focus is directed towards knowledge that will effect this aim, that is, on practice knowledge. For example, it is concerned with skills, design specific information, the ability to determine what needs to be known to enable the solving of a design problem, and the ability to research. Additionally in categories C and D, theoretical knowledge is also identified. In category C, this is an understanding of design principles and the ability to apply those. However, in category D, theory encompasses an understanding of the philosophies and socio/political influences on design, and an appreciation of the affective relationship between them.

In Teachers’ perceptions of student teacher relationships and their roles, the teacher’s awareness of students changes across the categories. In category A, students are perceived as a group, and therefore have a collective understanding. In categories C
and D, students are perceived as individuals with unique understandings and interests, and in category D, this uniqueness is used to encourage learning specific to the individual. The respective roles of teacher and student also differ across the categories and influence the nature of the interactions between them and the degree of control exerted by the teacher. In category A, where teachers perform as role models and expect students to follow their lead, students are closely controlled and therefore have little autonomy. In category B, teachers “withdraw” and expect students to autonomously develop their own way of working. In category C, where students are expected to develop their own strategies, teachers act as mentors, working alongside students and only intervening when necessary. In category D, where students are perceived as colleagues and autonomous individuals, teaching is a discussion between equals and students direct their own learning.
CHAPTER 6
DISCUSSION

6.1 Introduction
The aim of this research was to identify design academics’ qualitatively different experiences of design practice, and the relation between these experiences and their design teaching. In this chapter design and its teaching are discussed as follows:

- The differences between the categories of conceptions of design, and the dimensions of the phenomenon are compared with past research.
- The differences between categories of conceptions of design teaching and the dimensions of the phenomenon of teaching in general are compared with past research.
- The relationships between design practice and its teaching are explored, and the impact of design upon design teaching is discussed.
- The structure of experience and the implications of this for the development of teaching are discussed.

6.2 Categories of conceptions of design.
Four categories of conceptions of design emerged from the analysis of the participants’ descriptions. These are distinguished by: the meanings of the various experiences; the focus of the designer; their approach to the design process; and the intended aim of the design outcome. In the least complex category the designers focused on the performance/production aspects of design, while in more complex categories the focus gradually broadens to encompass those for whom design outcomes are intended, and social contexts. In category A, design was experienced as a problem-solving, outcome generating activity, where the focus of the experience is to use a process to resolve a problem and create design outcomes. In category B, design was experienced as an affective agent, and the focus of the experience is on using a process to devise design outcomes that beneficially affect others. In category C, design was experienced as a strategic process that enables an understanding of the way others live, an understanding that provides the basis for the generation of
innovative design outcomes that will enable change to occur. In category D, design was experienced as an affective socially embedded and reciprocal domain, and the focus of the experience is on the creation of innovative design experiences by means of a strategic process. In this category the design outcomes of the process are expected to engage and change society. Moreover, society is expected to impact on design as one is embedded in the other.

Table 6.1 indicates the design aims of participants in each category, and the means utilised to achieve these aims. Although the use of a design process is evident in every category, these processes vary across the categories according to the way the various activities comprising the process are conceived, and their differing aims, for example, to create a design outcome or understand some aspect of the world.

<table>
<thead>
<tr>
<th>What</th>
<th>How</th>
</tr>
</thead>
<tbody>
<tr>
<td>Category A</td>
<td>Use process to produce design outcomes that may communicate</td>
</tr>
<tr>
<td>A problem solving, outcome generating activity</td>
<td></td>
</tr>
<tr>
<td>Category B</td>
<td>Use process to understand users and produce design outcomes that affect them</td>
</tr>
<tr>
<td>An affective agent</td>
<td></td>
</tr>
<tr>
<td>Category C</td>
<td>Use strategic process to understand society and produce innovative design outcomes which change society</td>
</tr>
<tr>
<td>A strategic act resulting in benefit to humanity</td>
<td></td>
</tr>
<tr>
<td>Category D</td>
<td>Understand affective relationship between design and society and use strategic process to produce innovative design experiences which change human understanding of our world.</td>
</tr>
<tr>
<td>An affective, socially embedded, reciprocal domain</td>
<td></td>
</tr>
</tbody>
</table>

6.2.1 Design as a domain of interconnected parts

The category descriptions also revealed that design was experienced as a domain comprised of interconnected parts, with the parts not only increasing in number across the categories, but also transforming the part with which they connect. For example, the design process is a ‘part’, and the design outcome that is derived as a result of designing is another part, which, as it is derived from the design process is connected to it. The domain of design, which is partially formed by new design outcomes, is another part. Thus the various parts of design are interconnected, with each contributing to and changing the next. This feature of design is revisited later when discussing the dimension of transformation.
6.2.2 Experience boundaries
The category descriptions also imply ever increasing focal parameters of the phenomenon. In less complex categories, design is circumscribed by the practice and domain of design, whereas in the more complex categories the parameters extend to encompass the socio/political world. Here, the various conceptions of design, in tandem with the intended aims of the design outcomes dictate the boundaries, implying an internal relation between the designer’s conception of design and the intention of the designer. For example, in category A, design is a problem solving activity whose aim is to produce design outcomes. Here the focus encompasses the problem and the process utilised to resolve it and produce an outcome. However, the focal boundary of this category appears to fade just beyond the production of the design outcome. Although the outcomes are expected to communicate, who the recipients might be, and how the outcomes communicate, are factors that do not form part of the focal field and the expectation remains as a vague intention. In contrast, in both categories B and C, design outcomes were expected to affect people in some way and therefore the designers incorporated their audiences in their focal field. Design in category B focusses on understanding user capabilities, while design in category C, where the aim is to improve life for others, focusses on understanding the relationship between the user and their society. Thus, the parameter of category B is circumscribed by the users of the design outcome, whereas the parameter of Category C is circumscribed by the social world of users.

6.2.3 Social intervention and relationships
The argument above, suggesting that design outcomes are intended to achieve an aim that relates to and affects other members of society, implied that the practice of design entails a form of social intervention. This is implied when designers believe design outcomes should benefit others in some way, or when designers aim to educate others, for example, when designers aim to use design outcomes to change an audience’s understandings. This suggests that designers put themselves in a powerful position in relation to other members of society, and that it is the designer who has the dominant role in the relationship. In categories A to C, although audiences may respond to design outcomes, it is the designer who has directed the response, and influenced society in some way, thus suggesting a passive/receptive role for the audience and an active/controlling role for the designer. Category D, although similar to the other categories in aiming to influence others, also differs from them in expecting members of society to engage with design outcomes and use
them for their own ends, thus implying that design and society may have an equally controlling and reciprocal relationship with each able to influence the other. It is possible that designers who perceive design and society to have equal but differing participatory roles in design undertakings may be more likely to consult with users on design issues impacting on society as they and their capacity to influence design form part of the designer’s awareness.

6.2.4 Comparison with other research on the topic

Only one study was located that explored design academics’ experiences of the practice of design. Using a phenomenographic approach, Reid and Davies (2003) interviewed 17 full and part-time design academics with the intention of enabling the participants to fully explore their understanding of the design world and how this world related to their understanding of teaching and learning. The focus of the study was not to understand design per se, but rather to understand it in relation to student learning. Consequently the researchers focussed on the participants as teachers rather than as designers. Reid and Davies presented seven categories of description of conceptions of design (see Table 2.6.). These ranged from a focus on the production of an outcome, to categories which focussed on problem solving and the relationship with the client, to categories whose focus was the design process, which, in the more complex categories incorporated designerly ways of thinking. A concept described in the current study that is also apparent in Reid and Davies (2003) study, is the idea of roles and relations between designer and client (see Table 6.2.). However, it is only in the most complex category in their study that the focus moves beyond the designer/client/process boundary to locate the practice of design in a social context which includes those for whom the designer is designing, and an understanding of the impact of design on them. All other categories in their study are circumscribed by variations on a client/designer/process experience. In comparison, in this current study the designers focus less on the design process and clients and more on: the effects of design outcomes on society; their communicative capacity to instigate change; and understanding the affective relationships between design and society. Moreover, Reid and Davies (2003) do not report an experience of design that incorporates the concept of reciprocity. The two studies concur that the focus in most categories suggests that professional design practice depends to a considerable extent on the ability to utilise a design process to achieve a range of objectives.
Table 6.2 Comparison of categories of the experience of design between this study and Reid and Davies (2003)

<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Category A. Use a process to resolve a problem and produce a design outcome which communicates</td>
<td>Category A. Design is ‘end-product oriented’</td>
</tr>
<tr>
<td>Category B. Use a process to devise design outcomes which beneficially affect others</td>
<td>Category B. Solve clients design problems, and satisfy their wants.</td>
</tr>
<tr>
<td>Category C. Designer as the coordinator of a strategic act to understand others, resulting in visionary outcomes enabling change and benefit to humanity</td>
<td>Category C. Success is a having a good design process and re-educating client.</td>
</tr>
<tr>
<td>Category D. Design as an affective, socially embedded and reciprocal domain that enables a change in societies understanding of itself and the future</td>
<td>Category D. Perform as orchestra conductor to ensure all elements of the design process work in harmony</td>
</tr>
<tr>
<td>Category E. Design is being ‘open to possibility, a questioning condition’</td>
<td>Category E. Design relates to alternative ways of perceiving the world</td>
</tr>
<tr>
<td>Category F. Design relates to alternative ways of perceiving the world</td>
<td>Category F. Design relates to alternative ways of perceiving the world</td>
</tr>
<tr>
<td>Category G. Understanding people and the impact of your design on others - communication</td>
<td>Category G. Understanding people and the impact of your design on others - communication</td>
</tr>
</tbody>
</table>

Category C in this study approximates to category G, the most complex category in Reid & Davies study. In both categories, design is located within a social context, which is similarly based upon ‘an anthropologically informed perspective’, an understanding of how others live. Category C in this current study also shows similarities with Category D in the Reid and Davies study as in both categories there is a focus on the planned use of the design process. The designerly ways of thinking identified by Reid and Davies, are also reported in this study but form part of the dimension of creativity and ideation, which are discussed in the next section.

The differences between the findings of these two studies may be due to differences between the focus of the institutions from which the participants were drawn. Participants in Reid and Davies study may have been drawn from a university with a technological base, where the teachers may focus on skills and processes. This may be in contrast to academics drawn from a traditional theoretical and research based university, who may focus more on theory and contextual/relational understandings than on skills. Differences may also be due to the background of the sample. For example, the current study comprised a number of architects in addition to product and graphic designers. The possible influences of different types of design on conceptions of teaching provides an area for future exploration.
6.2.5 Design process differences
As argued above, the results of the current study and those of the Reid and Davies (2003) studies suggest that the design process was a key focus in all the categories. The literature on design has, so far, either not focussed on the different ways in which the design process is experienced, or it has provided descriptions of the design process which suggest that it is experienced in the same way (e.g., Lawson, 1990). However, an in-depth exploration of the design process descriptions in this current study revealed considerable differences across the categories. This study revealed that design processes are individualistic and that it is the focus of the designer and their differing beliefs concerning both the meaning of design and the skills and attributes required to create design concepts which result in designers undertaking the activity of designing in different ways. The categories show variations in participants’ approaches to the design process, where, although the designers described similar features, they differed in the amount of control they exerted over these various features. The design processes of participants in more complex and sophisticated categories utilised increasingly strategic procedures, whereas participants in the less complex categories relied more on intuitive attributes. The design process was also conceptualised in two different ways. In categories A, B and D, the design process was believed to be an individualistic one, with each designer devising their own way of working. However, in category C, the designer’s process was believed to be the most effective one, and therefore the one that ought to be adopted by all designers. However, as all the design processes were created by the individual designers, including that of category C, it might be argued that therefore all processes are individualistic. These two differing perspectives impact on design teaching practices and are discussed in the next section on design teaching.

6.3 The dimensions of design
In chapter 2 it was argued that dimensions enabled an understanding of the parts, whole and the internal relationships between them, of a phenomenon. Thus, the various ways in which a phenomenon may be experienced are revealed by the dimensions of the phenomenon. Unlike any other research located so far, this study identified and described dimensions of design. These are: Communication; Research; Creativity and ideation; and Transformation. These dimensions not only enabled detailed descriptions of the different ways in which the practice of design, and in particular the ways in which design processes are experienced, but also revealed that
the differing design processes were directed by the participants’ conceptions of design.

6.3.1 Communication
Two different forms of communication were evident in the participants’ descriptions: verbal communication, and visual communication, with both forms of communication contributing significantly to the practice of design. In every category verbal communication was emphasised by all participants to a considerable degree where it appeared to permeate all phases of practice performing a number of important roles, suggesting that design is a dialogic practice.

In all categories, visual communication in the form of drawings, models or prototypes, performed a similar function in providing explanatory visual representations of the design concept for all those immediately involved in the concept generation and production of a design outcome. However, in addition to this form of visual communication, participants also suggested that design outcomes, once out in society, have the capacity to communicate with an audience, and it was here that differences between the categories emerged with the communicative capacity of design gradually assuming ever more significance. This finding is in contrast with those of Reid and Davies (2003), where communication is only identified in their most complex category, G, where it is described as “the impact of your design on others” (p.5).

6.3.2 Research
Two forms of research emerged from the participants’ descriptions of practice: applied research, undertaken to facilitate design problem solving, and academic research. While participants in every category described the first type of research, only participants in category D described the second. Designers in all categories agreed that problem-solving research formed part of the design process and entailed analysing a problem and subsequently locating information to facilitate an understanding of the particular problem. Moreover, they stated that when designing, any area of knowledge might prove to be of use and therefore a critical design skill was the ability to know how to research. Where they differed across the categories depended on the designer’s conception of design, which directed their increasingly expansive research scopes. Such beliefs and practices suggested that designers are
not constrained by domain knowledge, but will incorporate any knowledge into their practice if it enables them to solve a problem. Similarly, the answer to an academic research question was generated by a participant looking for answers in an unfamiliar knowledge domain when he was unable to locate any relevant information in design research. These practices imply that designers are non-territorial knowers who expect to take responsibility for and direct their own learning.

6.3.3 Creativity and ideation
Creativity was variously experienced across the categories as a means to ideate, that is, to devise design concepts. Although designers in all categories described utilising the subconscious in conjunction with differing strategic procedures to facilitate ideation, designers in the less complex categories depended more on innate ability, and designers in more complex categories on strategic procedures. Designers in every category also suggested that a particular way of thinking facilitated ideation, adventurous and transformational thinking, that is, thinking differently about the known, a way of thinking variously achieved across the categories. For example, designers in the least complex category utilised a questioning approach intended to result in being able to conceive alternative possibilities, whereas in the two more complex categories designers utilised deliberately devised cognitive strategies intended to facilitate a re-conceptualisation of the known and provoke new perspectives, thus enabling the creation of innovative concepts. These transformational cognitive strategies resulted in category D, in the creation of concepts so innovative that according to Evan, they “fracture the expectations” of users, who then perceive the world differently. Although two of these designerly ways of thinking are also identified by Reid and Davies (2003), in contrast to this current study they are only reported in their more complex categories.

6.3.4 Transformation
This dimension describes a feature of design without which design could not be design: the bringing into existence, as if from thin air, an original design outcome by means of a transformational process, where information was transformed into a design concept and subsequently, into a design outcome. Expressions of experience in three categories of conceptions of design described a further form of transformation, the ability of a design outcome to bring about change. In category B,
it was suggested that the outcomes would cause change in the form of improvement, implying a change from one state to another and better one. In categories C and D, where there was a focus on innovation, radically different design outcomes were intended to provide experiences expected to change others’ understandings of our world and the future. In contrast, Reid and Davies (2003) only identified this capacity in their most complex category, G, as an awareness on the part of the designer that their design outcome might impact on others, a concept more in keeping with those of categories B and C in the current study (see Table 6.1).

The idea of the creation of design outcomes coming into being and then forming part of something beyond themselves implies a temporal ‘before and after’ state, which differs across the categories (Figure 6.1). For example, in category A, temporality is implied by the existence of a new artefact where before, there was nothing. In category B, new design outcomes are said to contribute to and thus change the domain of design over time. In category D, design outcomes form part of, and change, the future. Thus in category A, transformation stops with the production of a design outcome, whereas in the more complex categories the production of design outcomes results in the continuous transformation of something of which they form part. Such descriptions imply that in every category design entails an expectation of some form of change. These range from the production of a new artefact, to a change to the domain of design, to a change in society. Social change occurs when engagement with novel designs changes human understanding, a change that has the capacity to alter the future. It is possible that designers who believe that design has the capacity to affect the future may be more likely to evaluate that impact, whereas designers who focus on the production of an outcome cannot consider its social impact as the affective relationship between design and society does not form part of their experiences.

<table>
<thead>
<tr>
<th>Category A</th>
<th>design process -------&gt; design outcomes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Category B</td>
<td>design process -------&gt; design outcomes -------&gt; domain of design -------&gt; benefit = change</td>
</tr>
<tr>
<td>Category C</td>
<td>design process -------&gt; design outcomes -------&gt; domain of design -------&gt; society</td>
</tr>
<tr>
<td>Category D</td>
<td>design process -------&gt; design outcomes -------&gt; domain of design -------&gt; society &amp; future</td>
</tr>
</tbody>
</table>

Figure 6.1 Transformational boundaries of design practice
6.4 Conceptions of design teaching compared to those of other studies

Table 6.3 compares two phenomenographic studies, which explored teachers’ conceptions of teaching, based on information supplied by academics from a wide range of different disciplines (e.g., education, psychology, nursing, chemistry, and engineering), with two conceptions of teaching studies all of whose participants were design academics. The two general studies are Kember’s (1997) synthesis of thirteen studies exploring teachers’ conceptions, from which five categories were posited, and Samuelowicz and Bain’s (2001) review of Kember’s (1997) study, in which seven categories are presented. The two conceptions of design teaching studies are Drew’s (2000) phenomenographic exploration of the various ways of experiencing design teaching, and the current study.

Drew reviewed the learning journals of seven academics from a UK technologically based university who were undertaking a teaching development course. The method, context and sample of this study have been reported in section 6.2.4, and although the two studies differ in a number of ways, the Drew (2000) study has been utilised as it provides the only study to report categories of conceptions of design teaching. The two studies also focussed on design teaching from slightly different perspectives. Drew focussed on teachers’ conceptions of professional practice, while this study focussed on designers’ conceptions of design teaching. In order to compare like with like, Table 6.3 does not include any ‘Approaches to Teaching’ studies, despite some of those studies including design academics amongst their participants. This is because the research aims and methods were not considered sufficiently equivalent to the current study, whereas Kember (1997), Samuelowicz and Bain (2001), and Drew (2000) studies are comparable.

6.4.1 Similarities and differences

An analysis of the two sets of studies considered in this chapter – Kember (1997) and Samuelowicz and Bain (2001), and Drew (2000) and my study, Shanks (2013) – reveals a series of similarities and differences between them. What is noteworthy is that the studies in the two opposing sets display both commonalities and contrasts at the same time, as Table 6.3 reveals. However, all four studies report similar findings in the more complex, student-centred categories of teaching where the focus is either on helping students to become experts, or developing or changing student understanding. Two studies which report a similar conception of teaching in their most complex category, Samuelowicz and Bain (2001) and my study, both describe
categories in which students have a similar degree of autonomy over their own learning, are perceived as equals in a collaborative learning environment and contribute to the formation of new knowledge. Where the two studies differ is that in the former study the students are postgraduates while in my study they are undergraduates.

Similarities in findings are found in the Kember (1997) and Samuelowicz and Bain (2001) studies, as indicated in Table 6.3. Both involve a range of comparable conceptions of teaching, from teacher-centred, knowledge-conveying categories to more complex and sophisticated student-centred, facilitation of learning categories. However, as Table 6.3 reveals, the findings of Kember (1997) and Samuelowicz and Bain (2001) contrast with those of the two studies involving design academics only (Drew 2000; Shanks, 2013). In the design-based studies the various categories of teaching are almost all located in the student-centred, learning facilitation categories. This result supports similar findings reported by Drew & Trigwell (2003), Kember & Gow (1994), and Trigwell (2002).
### Table 6.3 Comparison of conceptions of teaching studies with conceptions of design teaching only studies

<table>
<thead>
<tr>
<th>General Studies</th>
<th>Knowledge conveying categories</th>
<th>Intermediate categories</th>
<th>Facilitation of learning categories</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kember (1997)</td>
<td>Imparting information</td>
<td>Transmitting structured knowledge</td>
<td>Student-teacher interaction</td>
</tr>
<tr>
<td>Samuelowicz &amp; Bain (2001)</td>
<td>Imparting information</td>
<td>Transmitting structured knowledge</td>
<td>Providing and facilitating understanding</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Design only studies</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Drew (2000)</td>
<td>Offering students a range of practical and technical skills</td>
<td>Developing students’ practical and technical skills</td>
<td>Developing students’ critical, practical and technical skills through interaction with students</td>
<td>Developing students’ skills and conceptions in the context of professional practice</td>
<td>Helping students change conceptions</td>
<td></td>
</tr>
<tr>
<td>Shanks (2013)</td>
<td>Provide a design vision &amp; pattern of practice and help students to adopt these</td>
<td>Provide an environment in which students develop expertise through autonomous practice</td>
<td>Provide context linking domain &amp; society. Enable change in student understanding</td>
<td>Provide context exploring affective relationship between domain &amp; society. Enable meaning making</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
The studies that focus only on design academics (Drew, 2000; Shanks, 2013) report that design teachers tend to focus on enabling students to learn to practice as experts. This finding is in keeping with Reid and Davis’ (2003) study, and I too propose that the focus in most categories of design practice suggests that professional practice depends to a considerable extent on the ability to utilise a design process to achieve a range of objectives. It would appear that the objectives of practice are therefore carried through to, and impact on, teaching aims.

Where the two design teaching-only studies (Drew, 2000; Shanks, 2013) differ is that in the current study there is a greater emphasis on understanding the users of design outcomes and their needs, and on understanding the relationship between design and society. In contrast, in Drew’s (2000) study, there is a greater emphasis on the skills and technical processes required when designing. This variation may be due to differences in the sample, the focus of the programme from which the sample was drawn, or the orientation of the researcher.

A further contrast between the two sets of studies is displayed in the conceptions of design teaching. In addition to developing or changing student understanding, there is a focus on professional practice – on enabling students to learn to perform as designers and recognise that a relationship exists between design and society. Such a focus is absent from the two general conceptions of teaching studies. Although other studies report categories where teaching enables students to become experts (e.g., Dall’Alba, 1991; Prosser & Trigwell, 1999; Samuelowicz & Bain, 2001), each study contains only one category that does so, and none suggest that becoming an expert entails understanding that relationships may exist between professional practice and society, implying a relational world view.

### 6.5 The dimensions of teaching

Although numerous other conceptions of teaching studies have described dimensions of teaching, no other research so far, has described dimensions of design teaching.

This section summarises and discusses the similarities and differences between the current study, and other conceptions of teaching studies that identified the same or similar dimensions. Table 6.4 provides a comparison of the dimensions identified in
the current study with the same, or similar, dimension identified in other conceptions of teaching research. These are: Outcomes of the teaching learning process; Assessment practices in the experience of design teaching; The nature of taught knowledge; and Teachers’ perceptions of student teacher relationships, and their roles.

Table 6.4 shows that although the current study reported many similar findings to the other studies, in each of the dimensions identified above, the current study also consistently differed in two ways:

- In every category there was a focus on professional development, facilitated either by providing a pattern of practice for students to follow, or contexts in which students learn autonomously;
- The least complex conceptions were absent from every dimension of design teaching, although concepts similar to the more complex student-centred ones were described.

For example, in Outcomes of the teaching learning process, in the current study, only the purposeful use of knowledge, and changed ways of thinking are represented. This may be due to the expectation that the outcome of the design teaching/learning process in every category was the ability of students to purposefully use knowledge to devise a design process and then use it to resolve problems. Moreover, in all categories in the current study, there was a focus on the need for students to seek knowledge from outside the domain in order to solve the variety of problems encountered by designers, suggesting that designers are non-territorial knowers. Subsequently, students integrated this knowledge into their practices implying that in design, knowledge is gained by means of an integrative personalising process, which is a form of knowledge reported only in the most complex categories of The nature of taught knowledge dimension.
<table>
<thead>
<tr>
<th>Dimension</th>
<th>Shanks 2013</th>
<th>Other studies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Outcomes of the teaching learning process</td>
<td>Ranging from; use process to produce designs addressing user needs, to, apply principles &amp; use strategies to produce innovative designs, to, understand affective relationship between design &amp; society, &amp; change understanding of world</td>
<td>(i) from reproduction of knowledge, to purposeful use of knowledge (Dall’Alba, 1991; Martin &amp; Balla, 1991; Pratt, 1992) (ii) from retention of atomised information to reproductive understanding, to changed way of thinking (Samelowicz &amp; Bain, 2001)</td>
</tr>
<tr>
<td>The nature of taught knowledge</td>
<td>Ranging from; structured by teacher to, personalised and constructed by students, to, collaboratively and socially constructed, and personalised.</td>
<td>(i) taken for granted, to structured by teachers, to discovered by students, to socially constructed (Martin &amp; Ramsden, 1992) (ii) “what there is to be revealed” to socially constructed (Bain et al., 1998) (iii) possessed by lecturer, to discovered by student within lecturer’s framework, to constructed by students, to socially constructed (Kember, 1997) (iv) from externally constructed, to personalised (Samelowicz &amp; Bain, 2001)</td>
</tr>
<tr>
<td>Assessment practices enable teacher to evaluate</td>
<td>Ranging from; not addressed, to, summative; student’s effective decision making ability, to, formative; student potential &amp; ability to evaluate &amp; develop own work, to, student potential, understanding, &amp; ability to evaluate and change own work</td>
<td>Not identified in any other studies</td>
</tr>
<tr>
<td>Teacher / student interaction</td>
<td>Ranging from; one-way to engage students, to, two-way to challenge student’s understanding, to, two-way to check/change understanding, to two-way to negotiate meaning.</td>
<td>(i) one-way, teachers to students, to two-way to maintain students attention, to two-way to check/clarify students’ understanding, to two-way to negotiate meaning (Samelowicz &amp; Bain, 2001)</td>
</tr>
</tbody>
</table>
What other studies have not focused on is the particular processes utilised to create personal knowledge. This process is apparent in all categories of design teaching, where personalised knowledge was acquired by a process of performing as a designer in conjunction with critical reflection, suggesting that in design, the onus for learning is the responsibility of the knower/learner. This performance/reflection manner of learning may be particular to design, and is identified by Cross (2001, p. 54):

...Some of it is knowledge inherent in the activity of designing, gained through engaging in and reflecting on that activity. Some of it is knowledge inherent in the artifacts of the artificial world ...gained through using and reflecting upon the use of those artifacts.

No other conceptions of teaching studies included assessment as a dimension. It was identified as one in the current study where it provided one of the discipline’s most effective learning practices. In a domain where answers to design problems cannot be categorised as either correct or incorrect, but instead are said to be more or less effective or successful, students have to learn to evaluate what constitutes an effective solution, and how to develop their work to achieve this. A variety of formative assessment practices were described, either between teacher and student,
or peer assessment. The practices most commonly identified were the public critique and the review of individual students’ workbooks. The descriptions of these practices revealed that in design, critique not only provided an interactive forum that enabled teachers to evaluate student proficiency, but, through individual or public dialogue, to work with individual students to check or change their understanding.

My study combined a number of dimensions that have been treated separately in other studies. For example, the respective roles of teacher and student, and the responsibility for motivation of students, have been combined into one dimension as it was believed that these aspects of teaching are interdependent (see Table 6.4). The separate dimensions of Teachers’ and students’ roles; Teacher /student interaction; and Motivation, when viewed together imply that as categories of teaching become more complex, the teachers focus less on themselves and more on students, gradually ceding control to students and expecting them to become more responsible for their own learning and self motivation. The corollary to this is that students’ roles change too. As the teachers devolve responsibility to students, the students become more active in their own learning.

6.6 The relationship between conceptions of design and its teaching
This study not only confirms the premises of Shulman (1987), Jenkins (1996), and Murray and MacDonald (1997) that discipline beliefs influence teaching practices, but moreover reveals how discipline beliefs impact on teaching practices. For example, in chapter 5, participants who experienced design as a problem solving process whose aim was to produce a design outcome, provided teaching contexts and practices whose intention was to enable students to devise a design process and use it to produce design outcomes. Similar associations were revealed in each of the categories of teaching.

6.6.1 Interrogatory practices and experience boundaries
In section 6.2.2 it was proposed that as the experiences of design practice became more complex, the focal boundaries of each category expanded. These same experience boundaries also emerged in design teaching practices, and one dialogic teaching practice in particular revealed this. In all categories, teachers utilised an interrogatory teaching practice directed by the aspects of design that they as designers believed to be of significance. For example, where the designers focussed
on problem solving and devising a design outcome, the questions put to students may implicitly direct them to focus on their design outcome and possible alternatives, “asking, what else could this be? ...every mark you make is a decision you’ve made, and it could have been a whole lot of other things, but you’ve decided it’s that. Why?” (Ken). Where designers focus on understanding the affective relationship between design and society, the questions they put to students may implicitly direct students to focus on understanding that such a relationship exists. For instance, “I think they [students] need to question that. What was the agenda that made this chair?” (Alan).

### 6.7 Signature pedagogies

The signature pedagogies of design identified by Davies and Reid (2001) and Swann (2002) were: *studio-based teaching; project based learning; public critique; and the final show.*

Although the first three pedagogies were described by design teachers in the current study, none of them described ‘the final show’. This may be because in the traditional university context in which they worked, final examinations may have substituted for a show of work. Although Swann’s descriptions suggest that signature pedagogies are uniform practices, Davies and Reid imply that pedagogies may be utilised differently when they say, “the actual environment established for learning will depend on the appropriateness of the context” (p.183). The current study supports this view and shows how differently design pedagogies are utilised. For example, the practices of reviewing student workbooks with them during studio session and public critique, may enable both staff and students to evaluate the student’s understanding by means of discussion. In contrast, the practice of reviewing students’ summative work enables only the teacher to evaluate student understanding.

Shreeve (2011) suggests that dialogue might be included as a signature pedagogy of design, and the number of the teaching activities described in the current study that utilise dialogue (the interrogatory practice described in section 6.6, and formative critique practices) would support this suggestion.
6.8  **Explanatory relationships**

As previously reported, several conceptions of teaching studies reported that when design academics were included among the participants, that in contrast to academics from other domains, the design academics tended to cluster in the more complex student-centred categories. Although no explanation for this had been sought by the researchers who reported it, it is possible that such uniformity might be due to some of the inherent features and the signature pedagogies of the domain, for example: the design process; the nature of design knowledge; assessment practices; and design as a transformational practice. Each of these will be discussed in turn.

6.8.1  **The design process**

According to an either overtly stated or implied belief expressed in all categories of the current study, design entails a personal process developed by the individual in their own way. As a result of this belief, design teachers in categories B, C and D provided a variety of teaching contexts intended to enable students to develop and learn to use, an individualistic design process in their own way. Such practices make it likely that design teachers may therefore feature in the more complex and sophisticated ‘facilitation of learning’ categories of conceptions of teaching (see Table 2.1).

6.8.2  **The nature of design knowledge**

In section 6.5 it was argued that design knowledge is both holistic and personalised, because designers, whether novice or professionals, create their own design processes, decide what needs to be known to solve a problem, and then the various forms of knowledge required to create a design outcome are integrated and purposefully used to produce a design outcome. These practices imply that in design, the responsibility for transforming knowledge is the individual learner/practitioner’s. Moreover, in three categories of the experiences of design and design teaching (categories B, C and D), the participants imply that design knowledge entails an interpretation of reality as they aim to perceive and understand societal forms and interrelationships in new ways. These ways of experiencing and conceiving of knowledge are dimensions identified by Kember (1997), Pratt (1992), and Samuelowicz and Bain (2001), exclusively in the more complex categories of teaching (see Table 6.4).
6.8.3 Assessment practices
In conceptions of teaching studies, teacher awareness of students and their existing understandings, and the interactions between teacher and student have provided the criteria used to categorise expressions of experience of teaching to more or less effective and complex categories of teaching. Samuelowicz and Bain (2001) propose that in the more complex categories, teachers are aware of students and interact with them to either maintain their attention, to check/clarify their understanding, or to negotiate meaning (see Table 6.4). The formative assessment practices described by teachers in my study, particularly the practices of personal or public critique of student work, suggest that these practices not only provided an interactive forum that enabled teachers to evaluate student proficiency, but, through either individual or public dialogue, to work with individual students to check or change their understanding. Consequently, design teachers describing the practices of critique are likely to be allocated to the more sophisticated student-centred, facilitation of learning categories (see Table 2.1).

6.8.4 A transformational practice
Two factors together suggest why design teachers might be likely to be categorised in the more sophisticated and complex student-centred, facilitation of learning categories of teaching. The first of these is the bringing into existence of an original design outcome by means of a transformational process. A process that suggests that a change in understanding will have occurred as the designer/student will have had to resolve how to accomplish the transformation from abstract idea to concrete artefact.

The second factor concerns the implicit teaching intention of the design teachers in every category in the current study, to enable students, in different ways, to become expert designers. This, in conjunction with the inherently transformational nature of design practice, makes it more likely that design teachers will feature in the more sophisticated categories of conceptions of teaching (see Table 2.1) where the aims of teachers in those categories are to enable learners to become experts and to develop/change their understandings.
6.8.5 Signature pedagogies as a reflection of the practice of design
In my study, the participants’ description of design practice and teaching suggest that the signature pedagogies of the discipline reflect the practice of design. For example, the various contexts/environments provided by teachers may replicate the studios in which professional designers practice, contexts that may provide the opportunity for students to develop a personal design process. In all categories of teaching students were expected to then use their design processes to resolve realistic design problems, as professional designers do. Moreover, the various forms of critique may enable students to develop the judgmental skills required when practicing, to evaluate their own work and determine when an appropriate solution has been achieved.

6.9 The structure and development of experience
This section discusses the issues related to the ways in which categories of conceptions are thought to be structured and the implications of this for developing the ways in which phenomena may be experienced.

6.9.1 Hierarchy and demarcation
The descriptions of the various conceptions of design described in chapter 4 and above, reflect the kind of inclusive hierarchy proposed by Åkerlind (2004), where more complex categories include the concepts of the previous category and add to them suggesting an expansion of experience. For an example of this, refer to figure 6.1. However, the methods of phenomenographic analysis blur individual differences between participants’ experiences to facilitate categorisation, so that while categories express gross similarities, detailed descriptions show that categories may also incorporate individualistic concepts particular to one category. Kember (1997) posits that phenomenographic research has issues in determining how many categories exist, and in establishing the demarcations between the categories, with a difficulty in providing definitive boundaries. He surmises that categories may not be discrete entities but shades of adjoining categories, a hypothesis which is supported by the findings of this study. For example, in design teaching category C, although both participants expressed similar teaching beliefs, they also shared beliefs with participants in adjoining categories: one participant expressed an experience that had more in common with category D, whereas the other expressed an experience that had more in common with category B. This blurring of category boundaries
supports the concept that categories are inclusive and hierarchical rather than exclusive and independent of each other.

Figure 6.2 shows the relationship between the categories of conceptions of the experience of design, and the dimensions of the phenomenon. The boundaries of each category are dictated by the differing conceptions of design including the various ways in which the dimensions of the phenomenon are experienced, and the totality of all categories and dimensions is deemed to be the phenomenal field (Bond, 2000). In the current study, the participants’ descriptions suggested that dimensions are not discrete features, but instead interlink with each other and moreover, that there may be return loops between the dimensions. Here, it is the range and number of connections between each dimension that reveal a more or less complex experience of a phenomenon.
Figure 6.2 The structure of the phenomenal field of design practice showing the relationships between the categories of description and the dimensions of the phenomenon.
6.9.2 Conceptual change or development?
Åkerlind (2008) proposes that there is a difference between phenomenographic and cognitivist perspectives, and that the two perspectives will impact on the means utilised to bring about a change in understanding phenomena. Cognitivists, according to Åkerlind, suggest that as beliefs are different and change across the categories, that categories of conceptions are independent of each other, although ordered in a hierarchy of more or less complex experiences. In this model, to bring about a change in understanding beliefs must be rejected and replaced. In contrast, in phenomenography, less complex conceptions are thought to be incomplete rather than wrong, and differences between the categories reflect an increase in breadth of awareness. These two perspectives suggest that from a cognitivist perspective, the beliefs of individuals must be changed, whereas in phenomenography, Åkerlind (2008) posits, concepts will be developed by expanding awareness of the phenomenon “to include discernment of additional aspects of the phenomenon not currently discerned” (p. 637). Therefore, attempts to enable conceptual development should “focus on optimizing opportunities for individuals to experience variation in aspects, or features, of the phenomenon that they currently take for granted” (p. 637). She goes on to suggest that developmental strategies which emphasise the part-whole relationships of an experience, where discernment of the whole from its context, and comparison of wholes, “one way of seeing a phenomenon” (p. 638) with other wholes, comparing the parts and the part-whole structure, facilitates an expansion of awareness. An expanded awareness of the domain of design practice suggests possible benefits to society. For example, designers who currently do not express an awareness of the possible influence and impact of design on society may come to recognise and address the ways in which their design outcomes may be impacting on society; an expanded awareness that may in turn influence students’ experience boundaries.

6.10 Limitations of the study
Although the participants in the study practiced in a range of different areas of design, (e.g., architecture, product design, communication design) and originally came from different countries (e.g., both North and South America, Australia, Europe and New Zealand) suggesting that participants might have evinced a range of perspectives, the number of participants was small, only ten, and the majority were males. Moreover, all were drawn from the same tertiary institution, a traditional research-intensive and theory-based University. Such a close-knit group
of participants, although providing descriptions enabling four categories of
descriptions of design teaching to be identified, may also have reflected experiences
influenced by the institution.

The methods of phenomenography provide a moment in time snapshot of an
individual’s experience, so that another time and/or slightly different questions
might elicit different responses resulting in the depiction of a different experience.
Thus the categories and dimensions presented in this study are not definitive, and
future studies may well identify more or different categories and dimensions of both
design and its teaching.

6.11 Summary
The arguments of this chapter not only support the findings of other studies which
reported that design academics tended to cluster in the more complex student-
centred and learning-focussed categories of teaching (e.g., Drew & Trigwell, 2003;
Kember & Gow, 1994; Trigwell, 2002), but also confirm the premises of studies which
suggested that it is discipline beliefs that influence teaching practices (e.g., Shulman,
1987; Jenkins, 1996; Murray & MacDonald, 1997).

In this chapter I proposed that the clustering of design academics in more student-
centred categories may be explained by both the particular characteristics of the
domain of design and the signature pedagogies of the discipline. Moreover, it was
proposed that the participants’ descriptions of design and teaching practices
indicated that the signature pedagogies of the discipline closely reflected the
requisite knowledge and practices of the profession.

In section 6.6 it was argued not only that differing discipline beliefs variously impact
on teaching practices, but moreover, it was revealed how they variously impact on
teaching practices. An example was provided in section 6.6.1 where it was argued
that the questions put to students were directed by the teachers’ conceptions of
design. This link between domain beliefs and teaching practices has implications for
the conceptual development of teachers. It was proposed in section 6.9.2 that
expanding the awareness of academics of aspects of phenomena of which they are
currently unaware or take for granted may facilitate practitioner/teacher
development.
Unlike any other research located so far, this study identified and described dimensions of design. These are: Communication; Research; Creativity and ideation; and Transformation. These dimensions not only enabled detailed descriptions of the different ways in which the practice of design, and in particular the ways in which design processes are experienced, but also revealed that the differing design processes were directed by the participants’ conceptions of design. These dimensions may be of use to future studies in enabling categories of design to be defined and compared across and within studies.
CHAPTER 7
CONCLUSIONS

7.1 So what?
‘So what?’ was a question put to me toward the culmination of the study. After all this work, what has been accomplished? To answer the question this chapter summarises the key findings and how they may be of use.

7.2 Key findings
The aim of this study was to explore design academics’ qualitatively different experiences of design practice and teaching, and to understand the relationships between them. The study has provided a detailed portrayal of the phenomena of design and design teaching, and revealed that both may be variously experienced.

Four categories of conceptions of both design practice and design teaching were derived from the participants’ descriptions. These are:

Categories of Design
A. Design as a problem-solving, outcome generating activity;
B. Design as an affective agent;
C. Design as a strategic act resulting in benefit to humanity;
D. Design as an affective, socially embedded and reciprocal domain.

Categories of design teaching
Design teaching is:
A. Providing a pattern of practice;
B. Providing an environment enabling autonomous practice;
C. Causing a change in understanding;
D. Enabling relational meaning making.

Four dimensions of each phenomena emerged from the participants’ descriptions of design practice and its teaching. These are:
Dimensions of Design

1. Communication;
2. Research;
3. Creativity;

Dimensions of Design teaching

1. Outcomes of the Teaching Learning Process;
2. Assessment practices in the experience of design teaching;
3. The nature of taught knowledge;
4. Teachers’ perceptions of student/teacher relationships and their roles.

Although the design processes described by the participants varied, the descriptions universally suggested that design is a transformative practice, where, in every category, what was transformed was information into a novel idea, into an artefact. However, the conceptions also differed in that in the more complex categories, participants thought that the domain of design itself, individuals and society were in turn transformed by the artefacts produced by designers. This study has been able to reveal that the various forms of transformation are circumscribed by the differing focal boundaries of the experiences of design.

The study has found that the signature pedagogies identified in other studies were also utilised by this study’s participants, and that like design practice, the signature pedagogies, too, were variously experienced. For example, in chapter 6 I describe how critique and studio practice were variously conceived of and utilised to provide more or less autonomy for students to develop in their own ways, and also provide richer and more sophisticated experiences of design.

In chapter 1, I proposed that domain beliefs influence teachers’ teaching practices as these are formed prior to practitioners commencing teaching and that it is only by gaining an understanding of domain beliefs that practitioner teachers will be able to perceive how these beliefs affect their teaching practices. This study has been able to provide numerous examples supporting this argument, demonstrating that a relationship exists and that it is domain beliefs that influence teaching practices.
Marton, Watkins and Tang (1997) argue that phenomenographic conceptions do not reveal individual academics’ ways of thinking, or their inclination to practice in a particular way. However, the results of the current study suggest that by linking teachers’ domain beliefs with their conceptions of teaching, that inclinations to teach in a particular way become manifest. The interview methods of this study sought information about specific examples of both design and its teaching practices, and in so doing facilitated an understanding of the explanatory relationship between the two.

7.3 Implications

Prosser and Trigwell (1999) propose that a central role of academic development is to expand teachers’ awareness of their learning and teaching situations. This statement could perhaps be applied to any phenomenon, where an expanded awareness of something might therefore result in development of practice. It is hoped that this study will be of benefit to both design practitioners and design teachers, and by providing a basis for dialogue, result in enabling designers and design teachers to understand/perceive the phenomena in a new way, and thus perhaps, enjoy richer and more sophisticated experiences.

By providing the basis for dialogue amongst designers, this study may serve to raise awareness of the various meanings of design and of the different ways in which the domain may be experienced. The results of the study indicate that the designers’ processes varied across the categories in complexity and breadth, directed by their intentions, activities, abilities and strategies. For example, in less complex categories designers depended more on innate abilities to promote ideation, whereas in more complex categories they deliberately devised and utilised cognitive strategies to achieve the same end. Therefore, a discussion of the individualistic ways in which designers design may enable, for instance, the strategies used to achieve a reconceptualisation of the known to become more familiar, and thus provide a measure of control over aspects of practice that, to some designers, appear less amenable to governance. Moreover, if this research enables all designers to become more aware of users and to adopt communicative practices intended to enable an understanding of how users live and their needs and capabilities from the users’ perspectives, it may result in design outcomes that are able to accurately and sensitively address these issues and thus benefit users.
The study also hopes to raise awareness in designer teachers, of the affective relationship between design and teaching beliefs, and of the ways in which design beliefs may impact on teaching practices, where, for example, they may either facilitate or inhibit, autonomous learning, the ability of students to evaluate and develop their work, and their awareness of the domain’s experience parameters. As the study has reported that there is an affective relationship between designers’ conceptions of design and their teaching practices, if designers’ awarenesses are expanded and enriched, then this new understanding may flow through into their teaching to influence students’ experiences.

7.4 Future research

Although the aim of this study was not to explore whether designers from differing fields of design practice experienced design differently, nevertheless, some differences were hinted at, although, as explained in the previous chapter, the sample was too small to enable this to be explored further. Future research might determine whether conceptual differences between designers from differing fields impact on conceptions of teaching practices. For instance, studies which incorporated both engineering academics and design academics (e.g., Samuelowicz and Bain, 2001) reported that in common with other disciplines, engineers expressed conceptions of teaching that spanned all categories. In contrast, designers were invariably located in the more complex categories, a difference that suggests that engineers and designers may experience design in different ways, and that these differences may impact on their teaching of design.

A number of studies have explored designers’ and design teachers’ experiences of design; however only one study has examined students’ experiences of design. Reid and Davies (2003) focussed on discerning the variations in the way teachers and students experience their subject and its relation to the professional design world. Further research into the extent to which students’ perceptions and experiences of teaching-learning and assessment activities either support or constrain their engagement with the conventions and characteristic ways of thinking and practicing of the subject may enhance understanding of high-quality learning in the various disciplines. McCune and Hounsell (2005), who have undertaken such research in Biology, propose that it is, “by building up a richer picture of the kinds of learning sought in each setting, we will be better placed to consider the strengths and weaknesses of each teaching-learning environment” (p. 258).
7.5 The objective researcher?

Finally, a brief word about my perception of the objective place of the researcher in research, and whether I believe researcher objectivity to be a realistic premise. Towards the end of this study I began to perceive that for me, research and design entailed very similar ways of thinking and working. This affinity is perhaps due to the creative roles both designer and researcher play in producing new knowledge in all its various forms. Consequently, during the undertaking of this study, myself as researcher and designer merged, as I recognised that the way I worked as a designer was similar to the way I worked as a researcher, in that both required a deliberate intention to perform a creative and transformative act. Both entailed a similar intellectual form of analysis and synthesis, with each new insight emerging from this iterative process being structurally integrated into the developing whole, thus enabling further understandings to develop. As when producing a design solution, I realised that an integral part of producing a research solution also lies in the act of designing/creating the way to achieve a solution, and this way is as much a part of the solution as the thing itself. In research, as in design, we cannot take ourselves out of the equation; we provide the constructive conduit between intention, strategy and end result, a result that will reflect who we are as a researcher, just as surely as a design solution reflects its designer.
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