Curriculum Decision Making in a Research University:

An Interplay between Ideologies and Influences

Pamela Judith Roberts

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Declaration of Originality

This thesis is my original work and I am responsible for the collection, analysis and interpretation of all material contained in the body of this thesis. To the best of my knowledge and belief, this thesis contains no material previously published or written by any other person, except where due reference is given in the text.

Pamela Roberts.

Acknowledgments

Abstract

This empirical study addresses the need to better understand how academics design undergraduate curricula and the influences that shape their decisions. The study draws on literatures from the perspectives of curriculum and the teaching-research nexus to identify a framework for investigating curriculum decisions that comprises all potential influences in the higher education context, including research.

Interviews were held with 20 academics from a range of disciplines who were working at a research university and were both research active and committed to teaching. These participants were selected to represent a group who experienced the dynamics between research and teaching in their curriculum practice.

The process of higher education curriculum decision making was found to be an iterative web, with multiple starting points and pathways. The common starting points, in order of frequency, were course content, learning outcomes, and teaching and learning activities. The findings suggest that there is no one best pathway for curriculum design, because the iterative process means that decisions are progressively revisited and refined. Beginning from learning outcomes is helpful for providing a framework for thinking about other curriculum decisions; however a focus on teaching and learning experiences leads to more innovative curriculum approaches. There is widespread awareness that students need to be engaged, and that active learning approaches enhance student learning. Good practices that were less common were using marking criteria to guide students in assessment tasks, and evaluating learning effectiveness.

Participants' beliefs about educational purposes were found to the most important influence shaping their curriculum decisions. Five curriculum orientations were identified that aligned with the following beliefs about educational purposes: (1) inducting students into a discipline, (2) preparing students' for professional and academic pathways, (3) making learning personally relevant to students, (4) engaging students with social issues and reform, and (5) designing a system for learning.

The explicit inclusion of research in this study enabled the identification of the 'professional and academic curriculum orientation', which is distinctive from other curriculum studies. In this orientation, research provided a bridge between professional

and academic educational purposes for preparing students for professional practice, for future research and for academic learning.

Patterns of beliefs suggest that curriculum orientations are informed by participants' disciplinary knowledge practices, however they also express agency informed by educational ideologies. Engagement with educational professional development was found to develop pedagogical expertise that could lead to transformative curriculum change.

Most participants did not explicitly identify influences from the socio-political context as having an impact on their curricula decisions. However they demonstrated that they were responding to changing expectations for including employability skills in curricula, and about teaching and learning. Participants' curriculum orientations were found to shape their responses to change.

This study suggests implications for educational change initiatives and for educational professional development. Academics were found to be responsive to changing their curriculum and teaching practices when they perceive the change to enhance the achievement of their educational purposes, to be aligned with their disciplinary knowledge practices, and to provide benefits that include institutional recognition and reward.

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Chapter 1
Project Description and Rationale

1.1 Focus of the Study

This study began from considering the growing body of literature advocating the desirability of reforming undergraduate education by explicitly developing links between research and teaching (Brew, 2003b, 2006; Healey, 2005b; Jenkins, Healey, & Zetter, 2007). Brew (2003b) identifies a range of motivations and drivers for integrating teaching and research. For example, the negative impacts of initiatives that encourage their separation on institutional structures, policies and funding arrangements, and performance measures that privilege research. Institutional motivations include research universities identifying a competitive advantage from linking teaching and research, and other universities seeking to maintain their status as teaching and research institutions. As an academic developer working in a research-intensive university I have engaged in a number of initiatives to enhance the integration of research and teaching. These initiatives were inspired by the 1998 Boyer Commission Report, which challenged research universities to reform undergraduate education by making inquiry and research central to the student experience.

Historically there has been much debate about the purpose of universities and the importance of research to their role, with many of the arguments summarised by Barnett (1992) and Hattie and Marsh (1996). Research is now assumed to be central to the role of universities and used to differentiate universities from other education providers (Brew, 2001b; MCEETYA, 2000, 2007). However, in a policy climate of contested funding, increasing accountability, and competition from non-traditional higher education providers (DEST, 2005), the question of the necessity of both teaching and research being undertaken by all universities and all academics has recently been revisited by governments in a number of countries, including UK, Australia, and New Zealand. The introduction of research assessment and quality evaluations in the UK, New Zealand and subsequently Australia, has raised concerns that the separation between research and teaching will be further entrenched (Jenkins, 2004; Robertson & Blackler, 2006).

Although many academics regard teaching and research as core activities of universities and academic work, research has been largely invisible to undergraduate students and often seen to conflict with undergraduate teaching for time and resources (Barnett, 1992; Pocklington & Tupper, 2002). Brew (2006) and The Boyer Commission (1998) argue that the purpose of a university should be to induct students into a community of scholars by engaging them with research alongside academics. Engaging undergraduate students in research is also proposed as an effective way to develop graduates with the critical inquiry and lifelong learning skills required for dealing with 'supercomplexity' and problem solving in an unknown future (Barnett, 2000; Brew, 2003b).

Academics have been found to hold a range of beliefs about how research can be incorporated in their teaching. Some see little or no connection at the undergraduate level, while others believe that a link is essential to learning at university (Robertson & Bond, 2001, 2005). Academics' beliefs and conceptions of the links between teaching and research appear to be contingent on their views of knowledge, which are informed by disciplinary knowledge practices (Healey, 2005a; Robertson & Bond, 2001, 2005). Robertson & Bond (2005) find that academics' experiences of research-teaching relationships can be understood as an 'experiential field' that has a logical coherence, which suggests it is difficult to influence one component of the experience in isolation from others. Therefore encouraging academics to link their research and teaching may have the undesired effect of entrenching existing transmission teaching approaches that are associated with surface approaches to learning. Hence, I believe that we need to better understand how linking research and teaching can be used to enhance the quality of teaching and of student learning.

Curriculum is a field of educational research that provides a framework for understanding teachers' decisions about the design and enactment of educational experiences (Lattuca & Stark, 2009; Stark, 2000). However 'curriculum' is a framework that has not been commonly used in higher education, where the focus of research has been on academics' and students' conceptions of teaching and learning (Barnett & Coate, 2005; Hicks, 2007; Prosser & Trigwell, 1999). The term curriculum is used to encompass educational purposes and the planning and reflecting stages of course design, in contrast with teaching and learning which focuses on the instructional act (Barnett & Coate 2005; Knight 2001; Stark 2000). Barnett and Coate (2005) and Hicks

(2007) believe that curriculum has the potential to provide a framework for addressing new challenges in higher education. Blackmore and Kandiko (2012) also identify the curriculum as a critical site for higher education institutions to address current challenges and achieve their goals in relation to increasing student numbers and diversity, internationalisation and globalisation, competition and specialisation. Developing research-based teaching is one example of an institutional curriculum initiative to develop specialisation and distinctiveness in educational programs.

The curriculum literature provides models for guiding teachers' practices as they design courses and learning experiences (Brady & Kennedy, 2010; Print, 1993), and also explores the values and beliefs that underpin different curriculum approaches (Eisner & Vallance, 1974; Grundy, 1987; Kemmis, Cole, & Suggett, 1983). Distinctive curriculum approaches have been found to be influenced by teachers' beliefs about a range of educational and contextual factors that include educational purposes, their discipline, teaching, learning and students, and the institutional context and culture. However, because curriculum models have been typically developed in relation to school education, research is usually not usually included as one of the influences. Therefore I believe that bringing together the curriculum and research-teaching literatures will provide a framework for investigating higher education curriculum decisions in context that explores all potential influences, and that can be used to better understand how research can be inform teaching and student learning.

1.2 Research Questions

The research questions that guided the design of the study were:

1) How do academics in a research-intensive university make undergraduate curriculum decisions?

2) How do academics perceive the influences that shape undergraduate curriculum decisions?

3) How do academics perceive the influence of research, in particular, on their curriculum decisions? What approaches to research-led teaching are being adopted?

4) What are academics' perceptions of the influences that support or constrain change to improve the quality of curriculum and teaching?

5) What are the implications for improving higher education curriculum practices and for institutional curriculum change initiatives?

1.3 Research Design

The purpose of this research is to better understand how academics make decisions about undergraduate curricula, and the key educational and contextual factors that they perceive as influencing their decisions, including the influence of research. The nature of the study leads to the selection of a social constructivist perspective, in which the researcher seeks to capture an understanding of the phenomena being studied from the perspectives of the participants (Denzin & Lincoln, 2000). The aim of research using this perspective is to identify underlying patterns or mechanisms to explain how people interpret and make sense of their experiences and the actions that they take to manage their day-to-day situations (Miles & Huberman, 1994; Schwandt, 2000).

The study took place in a research university where most academics designing and teaching curricula were also actively engaged in research and their work was influenced by the institutional research culture. This context was selected in order to highlight the complexities and interactions between research, curriculum and teaching in how academics make sense of their decisions and practices. An email invitation was distributed inviting academics, who had recently designed or reviewed the curriculum for a course they were teaching, to participate in the study. The email invitation was sent to an academic community of practice at the University, which had been formed to share practices about improving teaching and student learning. Membership of this community of practice was considered to indicate that these academics had a demonstrated interest in improving the quality of their teaching and student learning.

Research participants were selected from those who responded to the invitation to include a range of disciplines and demographic characteristics. Academic disciplines are believed to be a major influence on teachers' curriculum and teaching practices, because they are both the primary way of organising academic work and a source of academic identity (Lattuca & Stark, 2009; Stark, 2000; Toohey, 1999). This study used Biglan's typologies as adapted by Becher (Becher & Trowler, 2001) to select a range of disciplines based on the dimensions of hard vs. soft and pure vs. applied. Another group of participants was specifically selected because they were developing innovative curricula that included educational technologies and research-led teaching approaches.

This last group of participants came from a range of disciplines. Within each of the groups included in the study, participants were selected to ensure a range of demographic characteristics that included different sexes, levels of experience in teaching, engagement with formal educational professional development and public recognition for their teaching through awards. Participants were also selected to explore a range of course characteristics that included factors such as year levels, elective and compulsory courses, student numbers, and delivery modes such as semester based and intensive courses. Most participants were selected from those who responded to the email invitation, however a few participants were also approached to ensure a diversity of academic and course characteristics to the extent that was possible.

A review of the curriculum and research-teaching nexus literatures was undertaken to identify an initial framework for investigating curriculum as a field of decisions and influences. This initial framework was used to develop questions for a semi-structured interview. Semi-structured interviews in the form of a conversation with research participants were used to allow them to describe their curriculum decisions in their own words and to focus on the issues of significance to them. Research participants were asked to reflect on a specific course for which they had responsibility for curriculum design and teaching. The interview questions explored (1) how participants go about the design of the course selected, with the aim to identify the key elements and process of making curriculum decisions; and (2) their beliefs about the key factors that influenced their decisions. The field of influences identified from the literature was used to provide probes for exploring participants' beliefs about the full range of potential influences, with a specific focus on the influence of research. Participants were allowed to interpret what was meant by research in their own way, and then were asked to describe their understandings of research in the context of curricula.

This study explores academics' curriculum decision making at the course planning and design stage, and does not examine the enactment stage of teaching and student learning. McAlpine, Weston, Berthiaume, Fairbank-Roch, and Owen (2004) report that teacher thinking becomes progressively focused on strategic and tactical issues as teaching conceptions are translated into specific teaching contexts. Research participants were asked to elucidate their curriculum decisions by providing examples how they were enacted in their teaching and by referring to curriculum documents and

materials, such as course guides and assessment tasks. Assessment was explored as a critical decision point, because Ramsden (2003) and Toohey (1999) believe that assessment may be the best indicator of academics' values and beliefs about teaching and learning.

Data consisted of interview transcripts and the curriculum documents provided by participants, which were mainly the formal course outlines communicated to students. Participants were provided with summaries of their interviews to ensure that they agreed that it provided a recognisable account of their views, and to add further details if they wished. This represented one of the processes used to ensure the trustworthiness of the data and findings generated.

The data analysis began by reviewing interview transcripts and documents several times to gain a sense of the data and the themes for coding (Creswell, 2002). The NVivo qualitative software package was used for managing and analysing the data. NVivo is designed to model the processes involved in developing theory that is grounded in the data. It allows the researcher to make notes, to search the text, to explore connections between themes and coding categories, and to refine coding categories as relationships between categories emerge. The data were analysed initially using deductive categories identified from the literature to describe the curriculum elements and influences defined in the conceptual framework that guided the design of the interview questions. Inductive categories were then developed to describe the themes and patterns that emerged from the analysis using the 'constant comparative method' described by Maykut and Morehouse (1994).

Findings are reported in separate chapters related to curriculum decisions and curriculum influences and identify the variations found in each of the deductive categories. The interview data forms the main source of data reported and quotes are provided using participants' words to help capture their intended meaning. The data is reported in this way to allow readers to form their own interpretations, and to compare the researcher's insights with their own.

1.4 Thesis Outline

Chapter 2 presents a review of the literatures on curriculum and research-teaching relationships which were used to construct the conceptual framework for investigating

higher education curriculum decision making. The curriculum literature was reviewed to capture two different foci that are represented. One focus has been the development of curriculum models, which are used to guide teachers' practices by identifying curriculum elements, relationships between them, and principles and processes for making decisions. Another focus for understanding curriculum practices explores teachers' beliefs and ideologies that underpin their decisions. The literature on research-teaching relationships provides insight into how research influences curriculum and teaching. These literatures are used to develop an exploratory model of the field of curriculum decision making that characterises the curriculum elements and each of the influences that were investigated in this study.

Chapter 3 details the selection and design of research methods, which involves a social constructivist methodology and qualitative research approach for exploring how participants make curriculum decisions and interpret their context of practice through their beliefs about curriculum influences. Details are provided of the process of data collection, data analysis and interpretation using grounded research methods and the NVivo software package for managing the data.

Chapter 4 presents the findings about curriculum decisions as a holistic model of the decision making process. This model shows that participants begin their curriculum decisions from different curriculum elements, and follow different decision making pathways. Next, detailed accounts are provided of the variation and range of decisions made about each of the individual curriculum elements identified in the model. The findings suggest that the variations in curriculum decisions are informed by disciplinary differences; however there are also individual differences that cross disciplinary boundaries.

Chapter 5 explores participants' beliefs about the influences that shape their curricula decisions. Participants' perceived the most important influences to be their beliefs about educational purposes, discipline, research, teaching and learning, and students. Each of these influences is analysed in detail to show the variations in participants' beliefs and how these correspond with different patterns of curriculum decisions. Participants reported that contextual influences were less significant in shaping their curriculum decisions, which included their beliefs about the institutional context and culture of the

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research university, and external influences from the socio-political context. Although participants viewed these influences as being less important, their beliefs provide insight into how the educational context enhances and constrains curriculum decisions and curriculum change.

Chapter 6 explores participants' patterns of beliefs about key curriculum influences, which align to represent coherent philosophical orientations to curriculum. Five distinctive curriculum orientations are identified and presented in a model. Each of the curriculum orientations is analysed to identify the critical features, and illustrated with case studies from the data. The discussion then explores participants' perceptions and responses to contextual forces that are identified drivers for change in the higher education literature. The findings show that participants responses to external influences and drivers for change in higher education both shape and are shaped by their curriculum orientations.

Finally, Chapter 7 revisits the research questions and explores the implications of the findings for designing strategic institutional curriculum change initiatives and educational professional development programs.

Chapter 2
Conceptualising Higher Education Curriculum Decision Making

This chapter reviews the literature on curriculum and research-teaching relationships in order to develop a conceptual framework for investigating higher education curriculum decision making. Section 2.1 examines the development of curriculum as a field of study, exploring changing definitions and understandings of curriculum and the related models for explaining and guiding curriculum practice. Section 2.2 explores theoretical frameworks for understanding different approaches to curriculum and teaching practices in context. This literature suggests that curriculum is shaped by teachers' beliefs about educational purposes and processes, to create coherent and distinctive philosophical orientations. A range of educational and contextual factors that inform teachers' beliefs are identified. A summary of the curriculum models and explanatory frameworks found in the literature is presented in Table 2.1. In Section 2.3, research is identified as a neglected influence in curriculum models and theories. This section reviews the separate literature exploring research-teaching relationships, in order to provide further insight into potential influences on higher education curriculum decisions. Section 2.4 draws on all of these literatures to identify a conceptual framework for this study that defines the full range of potential influences and how they are understood and investigated in relation to curriculum practice. Section 2.5 presents a model of the field of curriculum decision making that identifies each of the influences that will be investigated in this study.

2.1 Changing Definitions and Models of Curriculum

This literature review draws on curriculum research from both the school and higher education sectors to explore the development of understandings, theories and models about curriculum. However it is useful to note some differences that impact on curriculum practices in these sectors. One of the main differences identified is that higher education academics typically have more control over curriculum than school teachers, where curriculum may be prescribed at national levels. For example, Toohey (1999) describes control over curriculum as a key advantage of university teaching, providing opportunities for creativity of which university teachers seem largely unaware. However, this differentiation is diminishing as curriculum is increasingly governed by departmental committees and institutional objectives and policies, which

include graduate attributes and internationalisation of the curriculum (Barrie, 2004, 2012; Reid & Loxton, 2004).

In choosing to focus on curriculum as a way of conceptualising educational practice, I also note that understandings of the term 'curriculum' have changed over the years. Barnett and Coate (2005, p. 5) describe a 'fuzziness' between the concepts of curriculum, pedagogy, and teaching and learning. Curriculum, as a term, has a long history in education, where it was initially used to define the major fields of study in an academic program. As a consequence the term curriculum is still often associated with the syllabus. Modern definitions of curriculum describe a holistic process of making decisions about what is important for students to learn, and how best to facilitate their learning (Prawat, 1992; Toohey, 1999). For example, Smith and Lovat (2003) describe curriculum development comprehensively as involving decisions and judgements about the knowledge that is considered worth learning, the most appropriate processes and conditions for learning, the practical outcomes of learning, and the means of assessing them. In contrast, in higher education, the major focus of academic discourse has been the terms 'teaching' and 'learning', and curriculum has been described as a 'missing term' (Barnett & Coate, 2005, p. 14), and as one that has little currency (Hicks, 2007). Yates (2008) also identifies shifts in meanings and emphasis in the use of the terms curriculum and pedagogy in framing academic and policy debates about school education over the last few decades. However she notes that typically the term 'curriculum' is used to convey the choices made about educational values and purposes, while references to 'pedagogy' are used to place emphasis on the interpersonal instructional act. The recent higher education curriculum literature also makes similar distinctions, using curriculum to encompass educational purposes and the planning and reflecting stages of course design, in contrast with research on teaching and learning, which focuses on instructional interactions (Barnett & Coate, 2005; Knight, 2001; Stark, 2000). In this thesis, I adopt a holistic definition of curriculum, focusing on curriculum as a way of conceptualising educational practice. This focus reflects my belief that curriculum has the potential to provide a unifying framework for addressing new challenges in higher education, as expressed by Barnett and Coate (2005), Hicks (2007) and Blackmore and Kandiko (2012).

These changing definitions and understandings of curriculum are reflected in the development of different theories and models of curriculum practice (du Toit, 2011; Kelly, 2009). The development of curriculum models is often presented as a chronological progression beginning from a view of curriculum as content, to the development of the product, then process models of curriculum design (Kelly, 2009). 'Curriculum as content' describes standard practice before the development of theories and models, where curriculum is understood as the subjects or topics that students study, and the processes of selecting and teaching content are assumed to be unproblematic. Curriculum theory is often presented as beginning with the 'product model' devised by Ralph Tyler (1949 as reported in Kelly 2009), which was intended to provide a logical basis for curriculum design. Tyler believed the purpose of the curriculum is to achieve desirable outcomes in students. Hence the product model begins by defining educational objectives, which then provide the basis for subsequent decisions about selecting and organising educational experiences. Evaluation is the final step to determine if the educational objectives were achieved. Kelly (2009) reports that the next major stage of curriculum theory was the 'process' model, which was developed to address weaknesses in the product model. These weaknesses included the tendency to focus on narrow behavioural learning outcomes that are specified prior to teaching, and so are not responsive to students' learning needs and the teaching context (Kelly, 2009). The process model is associated with Lawrence Stenhouse (1975) and focusses on the process of learning, rather than the products. The process model begins from broad learning goals that provide a set of guiding principles for teachers, and curriculum is understood as the interaction between teachers, students and knowledge in the classroom (Kelly, 2009). In her review of curriculum models and theories, du Toit (2011) presents the contributions of curriculum theorists as a continuum with Tyler and Stenhouse represented towards each end, which she labels as functionalist and progressive views of education. She also includes Bobbitt, Taba, Dewey and Freire on the continuum, and describes their contributions that include bottom up approaches and action research, experiential learning, and emancipatory education developed through dialogue and inquiry learning.

Despite critiques and new models, the product model of curriculum has continued to be developed and used because of its utility in providing a rational process for curriculum design. New versions are also known as rational or objectives models (Brady &

Kennedy, 2010; Knight, 2001; Print, 1993) and as outcomes based education (Prideaux, 2003). Print (1993) describes the evolution of objectives models into cyclical models, which also begin by defining educational objectives and identify a logical sequence for making decisions about curriculum elements. However, cyclical models represent curriculum development as a continuing, cyclical process, where objectives are revisited before beginning a new cycle. Most of these curriculum models define a similar set of processes and elements, which are: formulating learning objectives or outcomes, selecting and organising course content, selecting and organising teaching and learning activities or experiences, assessment, and evaluation. However the ordering and relationship between elements varies across models. Further developments examined what teachers actually do in practice, which were developed into descriptive curriculum models to distinguish them from the prescriptive models that are designed to *guide* teachers' curriculum practice (Print, 1993). Descriptive models found that curriculum development does not follow a linear, sequential pattern and that teachers may begin from any curriculum element and proceed in any order (Print, 1993).

Prideaux (2003) and du Toit (2011) describe outcomes based education or OBE as the dominant curriculum model in higher education since the 1990's. OBE is a prescriptive model that provides a rational framework for making curriculum decisions by defining what students are expected to achieve as learning outcomes. Prideaux (2003) argues that OBE provides the benefits of focussing curriculum designers on students and what they will do, rather than on teachers and their intentions. The dominance of OBE also reflects its alignment with political concerns for quality assurance, as it provides a framework for demonstrating that the intended learning outcomes have been achieved. Prideaux (2003) and Knight (2001) restate many of the concerns about OBE previously reported about Tyler's product model, and that led to the development of process models for school education. Prideaux (2003) cautions that learning outcomes need to be significant and enduring, and to focus on higher order thinking, rather than behavioural objectives. Biggs' (1999) model of constructive alignment represents an OBE model that now underpins many higher education professional development programs and educational policies. Biggs' (1999) model addresses Prideaux's concerns, because it encourages teachers to express learning objectives as levels of cognitive performances, underpinned by a constructivist learning philosophy. However in Biggs' model, learning objectives are determined prior to teachers interacting with students and the

teaching and learning context, and hence may lack the responsiveness intended in process models of curriculum. Knight (2001) argues for the process curriculum model because he believes that complex learning objectives are not achieved by tight specification, but by focusing on the complexity of learning as a process, which is also supported by Kandiko and Blackmore (2012b).

Barnett and Coate (2005) identify a different kind of curriculum model to capture emerging trends and provide principles for change in higher education. Curriculum is represented as three domains for forming student identities, which are described as 'knowing', 'acting' and 'being'. Barnett's & Coate's domains attempt to capture curriculum as dynamic interactions between students, content and context. The 'knowing' domain represents acquiring specialist knowledge, and includes both knowing a subject and how students come to know. The 'acting' domain involves both developing skills and the action contexts in which skills are developed. Whilst the 'knowing' and 'acting' domains are commonly evident in curricula, Barnett and Coate (2005) describe the 'being' domain as emerging and under-developed. Their examples of embryonic forms of 'being' in curricula suggest that it involves developing as a person, and taking an intellectual stance towards knowledge. Barnett & Coate (2005) also acknowledge the essential inter-relatedness of the curriculum domains.

> … in developing the skills embedded in a form of knowing (computational, argumentative, analytical etc.) the student is also learning how to engage within that form of knowing, and to take on the identity of what it is to be mathematician, philosopher etc. …She is acquiring the deep grammar of a discipline and comes not just to think in such terms but to be such a person (Barnett & Coate 2005, p. 61-62).

This thesis develops a descriptive model of curriculum design in higher education, by exploring how a group of academics in a research-intensive university make curriculum decisions in practice. The academics are interviewed about their process of curriculum design to identify the curriculum elements and sequences of decision making, and their beliefs about what influences their curriculum decisions.

2.2 The Role of Influences and Ideologies in Shaping Curriculum and Teaching Practices

2.2.1 The influence of teachers' beliefs on curriculum and teaching approaches

Another stream of the curriculum literature distinguishes between the process of curriculum design and the influences that shape curriculum decisions, including the role of teachers' beliefs and educational ideologies in constituting distinctive approaches to curricula (Eisner & Vallance, 1974; Grundy, 1987; Stark, 2000; Toohey, 1999). As noted in the introduction to this chapter, there is considerable overlap in the literature between the meanings given to the terms curriculum, pedagogy, and approaches to teaching and learning. Some studies of pedagogical or teaching practices are framed in similar ways to studies of curriculum, and include planning, educational purposes, subject matter, and teachers' beliefs and values. Hence this section also examines these studies of teaching practices for their relevance to understanding higher education curriculum decision making.

The role of influences in curriculum decision making is highlighted by Stark (2000), who undertook an extensive descriptive study of how and why US college teachers plan introductory courses. In line with the findings of descriptive studies of school education reported in Section 2.1, she reported that academics may begin their planning from any curriculum element and follow any sequence of decisions. However, almost half of the academics began with selection of course content, followed by course objectives as the next most common starting point. Stark also explored key influences on curriculum planning, using the term 'contextual filters'. She found that academic discipline was the strongest influence on course planning, because disciplinary influences were strongly rooted in teachers' scholarly background and their preparation as a scholar and teacher. Students' characteristics were the next most important influence and included academics' beliefs about student ability, preparation, interest and anticipated effort. Other influences, which were of lesser importance, were classified as pragmatic factors, such as textbooks, which are influential in some disciplines. Stark (2000) found that pedagogical resources and professional development had very little influence, and where they did, the influence was often negative. Jenkins (1998) also visualised the curriculum as shaped by a field of forces, over which academics may have little control. Jenkins' curriculum field presents a range of forces that include academics' conceptions and theories about the discipline, research, teaching, learning, assessment and students;

and forces arising from the context of practice, including institutional structures and external quality requirements.

Fanghanel (2007) identified filters that shape academics' 'pedagogical constructs', using a socio-cultural approach that investigated teaching practices in context. Fanghanel found that filters operate at three levels: (1) the macro level of institution and external factors, (2) the meso level of the department and discipline, and (3) the individual level of pedagogical beliefs. While Jenkins (1998) suggests that academics have little control over many of the forces shaping curricula, Fanghanel (2007) is interested in where academics can demonstrate agency. Her findings show that academics' teaching practices are shaped by both individual ideologies, based on those identified by Trowler (1998), and disciplinary knowledge practices and cultures, such as those associated with Biglan's hard-soft and pure-applied disciplinary typologies (Becher & Trowler, 2001). Trowler's (1998) educational ideologies are explored later in this section along with similar frameworks that identify coherent patterns of educational beliefs that underpin teachers' curriculum and teaching practices.

Other studies have explored the relationship between teachers' beliefs and pedagogical practices. Neumann, Parry, and Becher (2002) found that disciplines and their knowledge practices provide an important organising framework for understanding different dimensions of teaching and learning. Their study distinguished between dimensions that they classified as (1) knowledge related—curriculum, assessment and main cognitive purpose—and (2) socially related—the group characteristics of teachers, the types of teaching method involved and the learning requirements of students. The framing of this study reflects the 'fuzziness' in the literature between concepts of curriculum and pedagogy, where the term teaching and learning is used to represent the overall educational experience, and curriculum is understood as a subset representing the syllabus. Gunstone and White (1998) investigated physics teachers' pedagogical goals and practices across school and higher education sectors. They found that their pedagogical practices were informed by their beliefs in three key areas: teaching and learning, the nature of science, and the purpose of education. First year university physics teachers' pedagogical practices were found to be dominated by their beliefs about the nature of science. Their focus was on teaching students the structure of physics as a discipline and preparing them for research. In contrast, high school physics

teachers' views of learning were central to their practices, and they stressed the relevance of knowledge and real world applications. These differences suggest the different priorities and training of high school teachers and university academics and their respective focus on pedagogical or disciplinary knowledge when making curricula and teaching decisions. Barnes (1992) analysed the influences on secondary teachers' pedagogical practices. He presents a framework of five interrelated beliefs about the following factors: knowledge and subject matter; teaching and learning; students; priorities and constraints in the professional context; and teachers' personal commitment to teaching.

Stakeholders are identified as another important contextual influence shaping curriculum practice. Klein (1991) focuses on who makes curricula decisions and presents a framework that involves seven levels of decision making involving competing interests in what he describes as 'a maze of influence and power' (p. 25). Barnett, Parry, and Coate (2001) and Toohey (1999) describe the changing context of higher education, and identify a number of stakeholders and trends shaping beliefs about the purposes and processes of higher education. They identify a shift to 'performativity' or vocational outcomes as a major trend being driven by government agendas, which is reflected in initiatives such as the inclusion of graduate attributes in institutional policies.

These studies suggest that higher education curriculum and teaching practices are strongly influenced by academics' beliefs about their discipline and what constitutes important knowledge and skills, whereas in schools, teachers' practices are more informed by pedagogical knowledge. Fanghanel (2007) found that disciplinary knowledge practices are mediated by individual ideologies that cross disciplinary boundaries, and the institutional and departmental contexts of their work. Academic work involves both teaching and research, which may compete for their time and resources, and hence academics' teaching practices are likely to be also influenced by their commitment to teaching and their beliefs about institutional priorities, including reward systems (Fanghanel, 2007; Trowler, 1998).

2.2.2 Making sense of patterns of curriculum decisions as ideologies

Curriculum researchers have sought to make sense of different approaches to curricula by examining *patterns* of values and beliefs that underpin curriculum decisions and

practices. For example, Grundy (1987) uses Habermas' three 'cognitive-interests' or ways of knowing to explain the different forms of knowledge and action that underpin the two major curriculum design models identified in the previous section as the product and process models. Habermas' cognitive interests are classified as (1) technical, (2) practical and (3) critical, and each is associated with the different values and processes underpinning knowledge production in the physical sciences, social sciences, and critical sciences respectively. Grundy (1987) argues that 'technical' ways of knowing underpin the product model, and are congruent with the design principles that begin from identifying educational objectives, which then determine other curriculum decisions. In contrast, the process model is underpinned by 'practical' ways of knowing, where curriculum is informed by interpretive knowledge that guides teachers as they interact with students in the teaching context. Grundy proposes a third 'praxis' curriculum model, which is informed by 'critical' ways of knowing, and is similar to the process model; however, it emphasises ethical actions and educational outcomes, such as student autonomy and equity.

Other researchers have identified coherent sets of beliefs about educational purposes and processes that constitute philosophical orientations to curricula or educational ideologies (Eisner & Vallance, 1974; Kemmis et al., 1983; Toohey, 1999; Trowler, 1998). Trowler (1998, p. 65) defines ideology as the 'framework of values and beliefs about social arrangements and the distribution and ordering of resources which provide a guide and justification for behaviour'. Trowler (1998) identified four educational ideologies that revolved around three axes defining features of higher education: (1) the **aim**, which was characterised as being Newmanite or vocational; (2) the important **content,** which emphasised either discipline based propositional knowledge or skills, and (3) the important **functions** taking place within it, characterised as research or teaching. Eisner and Vallance (1974) and Toohey (1999 identified five similar curriculum ideologies, and Kemmis et al. (1983) identified three categories.

A total of six overlapping educational or curriculum ideologies can be identified from the literature, as follows:

1) Traditional or discipline based orientation (Eisner & Valance, 1974; Toohey, 1999; Trowler 1998) where the purpose of education is the transmission of an

established disciplinary or cultural canon. Different perspectives on this orientation are associated with both a love of learning (Fanghanel, 2007; Trowler, 1998), and with instrumental purposes, similar to the vocational orientation described below (Kemmis et al., 1983).

2) The vocational or enterprise orientation (Trowler, 1998) which views the main role of higher education as equipping students with transferable and vocationally relevant skills necessary for a successful career. Kemmis et al. (1983) include vocational purposes with the traditional orientation above and its emphasis on transmission of established knowledge and values.

3) The cognitive orientation (Eisner & Vallance, 1974; Toohey, 1999), which views the purpose of education as developing students' intellectual capacities and abilities to learn how to learn.

4) The personal relevance (Toohey, 1999) or self-actualisation orientation (Eisner & Valance) which focus on the relevance of learning for students and for fostering their autonomy and personal growth. Trowler (1998) and Kemmis et al. (1983) describe a progressive orientation which suggests a combination of the educational purposes of the personal relevance orientation and educational processes similar to the cognitive orientation.

5) The socially critical – relevance orientation (Eisner & Vallance, 1974; Kemmis et al., 1983; Toohey, 1999; Trowler, 1998), which seeks to develop in students a critical consciousness about society, its institutions and cultural products.

6) The systems based orientation (Eisner & Vallance, 1974; Toohey, 1999), which views curriculum as a technical question of how best to deliver education to students, and does not have a corresponding view about the nature and purpose of education.

These studies show that similar categories of educational and curriculum ideologies have been identified over many years, which suggests that teachers hold enduring beliefs about educational purposes and processes. The ideologies also reflect changing trends in teaching and learning, in the context of education, and societal expectations. For example, Toohey (1999) suggests that in practice most higher education curricula are based on the structure of knowledge in a discipline, while Eisner and Vallance (1974) describe the increasing influence of the cognitive orientation in schools, informed by findings from educational psychology about the processes of thinking and

learning. Trowler's framework includes academics' beliefs about teaching- research relations as one of the influences on educational ideologies; however research is not explicitly a constituent of the other curriculum orientations. All of the authors above note that teachers hold a mix of orientations, which may create tensions during curriculum development at the system or program level. Hence, raising awareness about these different ideologies and orientations is considered to be beneficial for helping teachers to understand that they may be invoking different philosophical orientations during curriculum debates and collaborative curriculum developments.

2.2.3 The importance of knowledge and discipline in the design and differentiation of curriculum practices

The higher education curriculum literature reviewed in the previous section highlights the important role of knowledge in the curriculum and the influence of disciplines in defining important knowledge and skills. This is a feature of recent curriculum research that uses Bernstein's concept of the 'pedagogic device' to analyse how disciplinary knowledge and knowledge practices are constituted in curriculum (Ashwin, 2009; Ashwin, Abbas, & McLean, 2012; Luckett, 2009; Shay, 2013). Luckett (2009, p. 443) explains that Bernstein's theories distinguish 'three fields of activity: the field of production (research), and the field of recontextualisation (curriculum development), and the field of reproduction (teaching practice).' Bernstein's pedagogic device suggests that disciplinary knowledge doesn't directly translate into curriculum from the field of knowledge production, but is recontextualised based on rules and principles that are informed by social interests and relations. Luckett (2009) describes Bernstein's 'discursive gap' that always occurs when knowledge is relocated from the field of production to the field of recontextualisation. The 'discursive gap' provides 'a space for ideology to play that is usually filled by the curriculum developers around the purpose of education, the ideal moral and social order, staged notions of the ideal learner or graduate, and notions of how learning occurs' (Luckett 2009, p. 443).

Ashwin (2009) argues that Bernstein's pedagogic device is more useful for understanding how disciplinary knowledge is transformed into teachable materials in the curriculum than disciplinary knowledge practices. Ashwin (2009) explores the implications of Bernstein's theories for the recontextualisation of disciplinary knowledge in teaching-learning interactions. One implication is the strength of the disciplinary voice based on Bernstein's three broad classification categories of

singulars, regions and generics, which represent a progression from stronger to weaker disciplinary voices, as follows. In singulars, disciplines maintain their unique voice through strong classification and the problems defined are generated within the disciplinary discourse. Regions involve the recontextualisation of singulars in relation to each other and the focus is on dealing with problems generated in the world outside of the discipline. Generic modes involve weak disciplinary voices, where the emphasis is on the trainability of students, as in generic skills and learning to learn programs. The strength of the disciplinary voice suggests more elite positioning of access to knowledge, and is related to the position of the university and the discipline, which are in tension with social influences, such as making knowledge relevant for graduate employability (Ashwin, 2009).

Research based on Bernstein's theories has explored changes in the legitimation and organisation of knowledge in curriculum for different disciplines over time (Luckett, 2009 in sociology; Shay, 2010 in history), and identify influences of forces intrinsic to the discipline, such as post-modernism and interdisciplinarity, and extrinsic influences from policy shifts to include generic and employability skills. Luckett (2011) and Shay (2013) also use Bernstein's theory to explore inequality in student outcomes in higher education in South Africa, and the challenges of student progression, retention and articulation between different educational pathways.

This stream of curriculum research suggests implications for this study in better understanding how academics make curriculum decisions and the interplay of influences from research and discipline, where knowledge produced from research is recontextualised in curriculum and teaching practices based on rules, principles, ideologies and social relations

2.2.4 Summary of curriculum models

Table 2.1 provides a summary of the literature reviewed exploring models of curriculum and teaching practices. The table distinguishes between studies of curriculum that provide prescriptive or descriptive models comprised of curriculum elements and those that identify curriculum ideologies or explore patterns of beliefs and influences to explain variations in curriculum practice. Studies of teaching practices in context are defined in similar ways to curriculum and found to be shaped by a similar range of influences. The table highlights a difference in the theorising about curriculum and

teaching practices, where teaching practices are typically not described as a model for identifying and sequencing the associated elements. The influences which are found to shape curriculum and teaching practices include academics' beliefs about: educational goals and purposes, knowledge, disciplines and subject matter; teaching, learning and students; disciplinary knowledge practices; stakeholders, and the context of practice. This thesis adds to the research on the role played in curriculum design by teachers' beliefs and ideologies by investigating their relationship to curriculum design in higher education. The next section explores the literature on research-teaching relationships to further develop the field of curriculum influences.

Table 2.1: Summary of Models and Frameworks for Curriculum and Teaching Practices

Author	Context	Curriculum models and elements	Curriculum ideologies/ orientations	Key influences/ theoretical perspectives
Shay (2010, 2013) Luckett (2009, 2011) Ashwin (2009) Ashwin et al. (2012)	Higher education curriculum			Bernstein's pedagogic device How disciplinary knowledge is constituted in curriculum.
Fanghanel (2007, 2009)	Higher education pedagogies			Socio-cultural theories Filters that operate at institutional, departmental and individual levels
Barnett & Coate (2005)	Higher education curriculum	Descriptive: Domains of Knowing, Acting & Being		Discipline Contextual influences – performativity
Stark (2000) Lattuca & Stark (2009)	Higher education curriculum	Descriptive: Goals and objectives Content & structure Teaching strategies Assessment		Contextual filters model Discipline Student characteristics Institutional influences External influences
Toohey (1999)	Higher education curriculum	Goals and objectives Content & structure Teaching strategies Assessment Resources and infrastructure	Traditional or discipline based Performance or systems based Cognitive Experiential or personal relevance Socially critical	Teachers' beliefs about: Educational purposes Knowledge Teaching and learning
Biggs (1999)	Higher education curriculum	Prescriptive- Constructive alignment between Learning objectives Teaching and learning activities Assessment		

Trowler (1998)	Higher education ideologies		Traditionalism Progressivism Enterprise Social reconstructionism	Academics' beliefs about higher education aims, content and function
Gunstone & White (1998)	Secondary & higher education pedagogical practices		Discipline vs Relevance	Teachers' beliefs about: Educational purposes Teaching & learning Disciplinary & pedagogical knowledge
Barnes (1992)	Secondary education pedagogical practices			Teachers' preconceptions about: What is being taught Learning and how it takes place Students Contextual priorities and constraints Commitment to teaching
Kemmis, Cole & Suggett (1988)	Secondary education curriculum		Vocational Liberal/ humanist Socially critical	Teachers' views of educational purpose and knowledge.
Grundy (1987)	Secondary education curriculum		Product Process Praxis	Teachers' views of knowledge based on Habermas' cognitive interests: (1) Technical, (2) Practical or (3) Emancipatory
Eisner & Vallance (1974)	School curriculum ideologies	Content Goals Organisation of curriculum	The development of cognitive processes Curriculum as technology Self-actualisation Academic rationalism Social reconstruction-relevance	Teachers' assumptions about educational purposes and processes

2.3 The Influence of Research on Teaching and Curriculum

The previous section shows that most of the curriculum literature does not include academic research as an influence on decisions and practices, which may reflect its origins in the school sector. Trowler's (1998) educational ideologies, which were developed in a higher education context, include a dimension that represents academics' beliefs about the 'function' of education, and whether they prioritise research or teaching as a function of their work. However, Trowler's ideologies position research and teaching as conflicting priorities of academic work. Brew (2006) describes this as the traditional relationship between teaching and research, where they are seen as inhabiting separate domains, in which research generates knowledge and teaching transmits it. There is a growing body of literature advocating the desirability of explicitly developing links between research and teaching in undergraduate education (Brew, 2003b, 2006; Jenkins et al., 2007; The Boyer Commission, 1998). For example, Brew (2006) and The Boyer Commission (1998) argue that the purpose of a university should be to induct students into a community of scholars by engaging them with research alongside academics. Engaging undergraduate students in doing research is also proposed as an effective way to develop graduates with the critical inquiry and lifelong learning skills required for dealing with 'supercomplexity' and an unknown future (Barnett, 2000; Brew, 2003b). However, the nature and existence of the relationship between research and teaching has been the subject of on-going debate and research in higher education. Most of this literature explores the relationships between research and teaching, rather than research and curriculum, which reflects that academic work is typically conceptualised with teaching and research as the key components, and also because of the fairly recent emphasis on explicit studies of curriculum in higher education. Healey's (2005a) much cited study uses curriculum as a framework for exploring the range of possible ways for integrating teaching and research, and is presented in section 2.3.5.

Below, I categorise the literature examining teaching-research relationships in terms of the central questions asked and related research methods. This categorisation aims to indicate the progressive development of understandings and methods exploring the complexity of the relationship between teaching and research, and how this might inform understandings about curriculum for this study.

- Is there a relationship between teaching and research, and can it be demonstrated? Correlational studies of research and teaching (Hattie & Marsh, 1996; Marsh & Hattie, 2002).

- What do teaching and research have in common? Conceptual analyses of the relationship between teaching and research (Brew & Boud, 1995).

- What are academics' beliefs about, and experiences of the relationship between teaching and research? Qualitative studies involving interviews with academics (Neumann, 1992; Robertson & Bond, 2001, 2005).

- How do academics integrate research and teaching in their day-to-day work? Quantitative and qualitative studies of academic work (Colbeck, 1998).

- How can the relationship between research & teaching be strengthened? Documenting case- studies and examples of research-led teaching (Healey, 2005b; Jenkins et al., 2007; Zubrick, Reid, & Rossiter, 2001).

- How do students' experience academic research and learning through research? Qualitative and quantitative studies of students' learning outcomes and experiences (Healey, 2005a; Zamorski, 2002).

A brief analysis of the findings of these studies and what they mean for investigating the influence of research on curriculum is presented below.

2.3.1 Is there a relationship between teaching and research and can it be demonstrated?

Hattie and Marsh (1996) undertook a meta-analysis of studies that used ratings to quantify research and teaching and found little evidence that research productivity provided any benefit to teaching, although [it] 'does not seem to detract from being a good teacher' (p. 529). Time spent on research was found to be negatively related to time on teaching, but the effect of time is complex due to factors such as the organisational abilities of the academic and teaching load. They note that their analysis does not distinguish between different conceptions of teaching, learning and research, which may influence the degree to which teaching and research have similar objectives and strategies. Marsh and Hattie (2002) repeated their analysis in 2002 with similar findings of little evidence for a direct correlation between teaching and research productivity.

The Hattie and Marsh studies (1996, 2002) have been quoted extensively to justify the potential separation of teaching and research in academic roles and institutional funding. Their studies have also been vigorously challenged by many higher education researchers, for example Jenkins (1998), and Robertson and Bond (2001), because of the use of simplistic performance outcome measures for rating teaching and research in order to quantify the relationship. However, Hattie & Marsh (see Jenkins, 2004, p. 15) emphasise that their work has been misinterpreted and advocate the need for enhancing the relationship. They also emphasise that their findings relate to the individual academic and department level, not to the institutional level.

2.3.2 What do teaching and research have in common? Conceptual analyses of the relationship

The weak evidence for a direct relationship between teaching and research, combined with the continuing belief in both as important elements of academic work, has led a number of higher education researchers to explore the relationship in a conceptual rather than quantitative way that seeks to find commonalities and to value all elements of academic work. Boyer (1990) initiated a framework for redefining both teaching and research as scholarship, and challenged universities to 'break out of the tired old teaching versus research debate' (p. xii). Brew and Boud (1995) argue that the link between teaching and research is learning, where research is conceptualised as a process of inquiry: 'the ways in which knowledge is generated and communicated'; and not just the knowledge and understandings that are generated. The Boyer Commission (1998, p. 5) also identified the shared core concerns of research and teaching, 'inquiry, investigation and discovery', as the way forward for research universities to represent their values in undergraduate teaching.

These understandings of teaching and research have been influential in the evolution of studies of the relationship from simple dichotomies of 'is there or isn't there a relationship', to research questions and methods that explore the complexity of the relationship. Subsequent research has investigated variations in academics' beliefs and practices linking teaching and research, underlying conceptual differences, and conditions that strengthen or diminish the relationships.

2.3.3 What are academics' beliefs about, and experiences of the relationship between teaching and research?

Many academics report strongly held beliefs about the beneficial qualities that being an active researcher brings to their teaching, although Elton (2001) notes that studies of academics' beliefs may reinforce mythologies about the nexus, rather than actual practices.

The widely influential 1998 Boyer Commission report espouses the importance of the teacher being an active researcher.

> The non-researcher is too often limited to transmitting knowledge generated by others, but the scholar-teacher moves from a base of original inquiry. In a research university, students should be taught by those who discover, create, and apply, as well as transmit, insights about subjects in which the teacher is expert. (p. 16)

Neumann (1992) found that senior academic managers describe three levels of relationship between teaching and research: 'tangible' benefits, 'intangible' benefits and a global connection. The 'tangible' benefits are that researchers are able to provide students with the most advanced and up-to-date knowledge, while the 'intangible' benefits involve students developing a critical and inquiring approach towards knowledge. At the departmental level, these academic managers report a 'global' connection that involves a two-way, mutually beneficial relationship between teaching and research, where research benefits from teaching because it helps researchers to see their work in the wider context of the discipline, and teaching benefits from research by gaining direction from the departmental research focus. Research is defined in very broad terms as 'inquiry', which involves academics actively pursuing answers to questions.

More recent qualitative research has explored variations in academics' beliefs and practices linking teaching and research, reinforcing that not all academics perceive the potential for a relationship at the undergraduate level. Robertson & Bond (2001; 2005) found that academics hold a range of views about the nature and importance of the teaching-research nexus. The data revealed a split between those who thought engagement in research impaired teaching performance and those who believe that there is a symbiotic relationship that is fundamental to higher learning. These different conceptions and their implications for teaching and learning appear to be contingent on

academics' views of knowledge (Brew, 2001a; Neumann, 1992; Robertson & Bond, 2005). Robertson and Bond (2005) report that teaching-research links appear less likely to be enacted in undergraduate teaching in the hard (science) disciplines than soft (arts) disciplines. In hard disciplines, where knowledge tends to be viewed as hierarchical and cumulative, many academics do not believe that students can make sense of their latest research findings, or do their own research. In the soft sciences, interpretive understandings of knowledge make it more common for students to be engaged in the construction of knowledge through discussion and inquiry. However in the sciences it is more common for students to be involved in an academic's research as members of research teams, whereas it is less common in the humanities to work alongside an academic on their research (Colbeck, 1998; Healey, 2005a).

2.3.4 How do academics integrate research and teaching in their day-to-day work?

Investigations into academic work usually conceptualise teaching and research as separate activities that compete for an academic's time and resources (eg Brew, 2001a; Hattie & Marsh, 1996). Ramsden (1998) also notes the separation of teaching and research in terms of academic priorities and reward structures, particularly in research universities.

Colbeck (1998) investigated what academics actually do, to identify activities where teaching and research are integrated, and the contexts that enhance or constrain integration. Academics were surveyed across two universities (defined as research and comprehensive universities) and two disciplines (English and Physics). Colbeck (1998) found that the nature and opportunities for research-teaching integration differ according to the purpose of the teaching, degree of disciplinary paradigm consensus, disciplinary norms for training students to conduct research, university evaluation and reward policies, and faculty involvement in decision-making.

> Integration of classroom-oriented teaching and research appeared to be facilitated by low levels of disciplinary paradigm consensus, horizontal and expansory knowledge structures, a broad university definition of research, and faculty participation in decisions about assigning course. Integration of research training and research appeared to be facilitated by disciplinary norms for collaborative work (Colbeck, 1998, p. 666).

At the institutional level, Colbeck (1998) found that integration between teaching and research was assisted by broad definitions of research that included the full range of Boyer's scholarships, which are discovery, application, integration and teaching (Boyer, 1990). Zubrick et al. (2001) also found distinct differences in goals and priorities for strengthening the nexus in different types of universities. An elite research university appeared to have no articulated goals in relation to enhancing the teaching-research nexus, but saw it as integral to its activities. In contrast, in a developing university, inquiry learning and student–community based research were identified as strategic priorities.

Other studies of academic work identify the connection between research and teaching as learning. Kreber (2000) found that academics link learning about one's discipline and learning about teaching. She explained this as a connection between the processes, rather than the products, underlying research and teaching. Quinlan (2003) found that medical academics' research gained from their engagement in teaching using a problem-based learning (PBL) approach. The active and interdisciplinary learning processes used in the PBL context created dialogue and interaction between students and staff that enabled staff to learn more about their discipline. These staff also demonstrated an increase in research activity. From this, Quinlan (2003) theorised a two way relationship between teaching and research in which pedagogical content knowledge contributes to academic learning about their discipline and to their research productivity. Pedagogical-content knowledge describes the relationship between knowledge about subject matter and how to teach that subject matter identified by Shulman (1986).

2.3.5 How can the relationship between research & teaching be strengthened?

The focus of the debate about the teaching-research nexus has evolved from the question of whether there is a relationship between teaching and research, to how can it be strengthened? One theme in this literature is providing examples and case-studies that show how academics are using research to inform their teaching (Jenkins et al., 2007; Zubrick et al., 2001). These studies have led to an appreciation of the potential range of approaches to research-led teaching and the need for conceptual frameworks for describing and categorising approaches. These frameworks are also useful for analysing research-led teaching approaches in relation to contemporary understandings about good teaching.

Jenkins and Zetter (2003) present three categories of research-led teaching framed in terms of the role and type of research, as follows:

- Presenting your research to students

- Engaging students in research processes

- Engaging in research/ scholarship about teaching in your discipline

Jenkins, Breen, Lindsay, and Brew (2003) identify the following four curriculum strategies for integrating research and teaching in terms of student learning outcomes and experiences:

- Develop students' understanding of research

- Develop students' abilities to carry out research

- Progressively develop student understanding

- Manage students experience of (academic's) research

Healey (2005a) presents a curriculum model for research-led teaching that is constructed around two dimensions representing variations in the emphasis on (1) the input of research, as content or as problems and processes, and (2) the approach to teaching, from teacher centred to student focused. The categories for approaches to teaching as teacher-centred or student focussed are adopted from phenomenological studies, such as Prosser and Trigwell (1999). The model identifies four different approaches to research-led teaching, constituted from the four possible combinations of the two dimensions. The approaches are labelled as (1) 'research-led', which is a teacher centred approach structured around staff presenting their research as content, (2) 'research-oriented', a teacher centred approach where students are instructed about research processes, (3) 'research-based', a student focused approach where students learn by doing research, and (4) 'research-tutored', a student focused approach where learning is structured around research content that students generate, such as papers and essays. Healey (2005b) argues that students are likely to gain most, in terms of depth of learning and understanding, from research-based teaching, i.e. doing research.

The Boyer Commission (1998) and Brew (2003a; 2006) go beyond an exploration of research-informed teaching approaches to reconceptualise higher education as an academic learning community that includes students and academics. Brew's vision challenges the traditional teaching–research divide and associated hierarchical

relationships between academics and students, proposing instead a 'scholarly knowledge building community in which students are equal partners with academics' Brew (2006, p. 35). Brew (2006) further argues that reflexivity provides the possibility for transforming practices of research communities by 'examining the unconscious social and intellectual processes within practice' and by academics and students being engaged in developing the scholarship of teaching and learning.

2.3.6 How do students' experience academic research and learning through research?

A central justification for integrating research with undergraduate teaching is to develop graduates with capabilities for higher order thinking and lifelong learning. However, until recently, students' experiences of the research-teaching relationship have been neglected in the literature (Jenkins, 2004). The experiences of students now form the focus of a growing body of research, with two key foci that are described below.

1) Studies examining students' experiences of learning in a research-intensive environment, including students' understandings of research, of university learning, and their experiences and perceptions of their lecturers' research.

Breen and Lindsay (2002) found that students had mixed reactions to the research orientation of their lecturers. Student views of staff research depended on their perceptions of its relevance to students' own goals for curriculum. Studies of students suggest that staff research is often invisible to them or that they feel excluded (Robertson & Blackler, 2006; Zamorski, 2002). Zamorski (2002, p. 426) undertook a study of students experiences of learning in a research university and concluded that 'while students clearly value being close to research and the idea of the University as a research community in which they were included, there were many ways in which, in practice, they felt excluded. Much of their frustration lay in their sense of lack of understanding of what was happening by way of research in the University and their lack of access to it.'

2) Investigations of the learning and other outcomes that students gain from research-based learning and from doing research.

Seymour, Hunter, Laursen, and DeAntoni (2004) reviewed the literature reporting evaluation studies of US undergraduate research programs. Although these studies

expressed a range of motivations and claims for undergraduate research experiences, Seymour et al. (2004) found that they were poorly evaluated and fell short of demonstrating improvements in students' higher order thinking and research skills. There was a tendency for authors to write descriptive, highly positive accounts, and to omit details of their evaluation methods and approaches to data gathering, often combined with small sample sizes. However, Seymour et al. (2004) then undertook a study of undergraduate science research experiences at four US liberal arts colleges, and found that students identified a number of personal and professional gains. These gains included 'thinking and working like a scientist', development of critical thinking and problem solving skills, and enhanced career and graduate school preparation (p. 493). A significant finding of the Seymour et al. (2004) study was that 'students valued the opportunity to work one-on-one with faculty' and to develop collegial working relationships (p. 509). The literature on student persistence and retention indicates the importance of informal faculty contact on student retention, particularly for first year students (Pascarella & Terenzini, 1980; Tinto, 1997).

2.3.7 Summary of literature on relationships between teaching and research

The literature investigating the relationships between teaching and research highlights the complexity of understandings and practices for integrating teaching and research, and the related diversity of student learning experiences and outcomes. Academics' perceptions of the opportunities for developing research-teaching relationships are influenced by their disciplinary knowledge practices and cultures, and their motivations are influenced by their perceptions of rewards and priorities in their institutional context (Colbeck, 1998; Healey, 2005a; Robertson & Bond, 2005). Frameworks for categorising and understanding teaching-research relationships highlight differences between conceptions of research as content that can be presented to students, or as a process for learning how to do research and for learning to learn (Healey, 2005a). Brew (2006) and Robertson and Bond (2001; 2005) identify the interrelatedness of academics' conceptions of knowledge, research, and teaching and learning that inform their conceptions and approaches to research-led teaching. Robertson and Bond (2005) introduce the notion of an 'experiential field' to express the inter-relatedness between academics' experiences of research, teaching, learning and knowledge and their research-led teaching practices. They describe the 'experiential field' as having a logical coherence that suggests it is difficult to influence one component of the experience in isolation from others. However, academics' aims and approaches to integrating research

and teaching tend to mirror their existing pedagogical understandings and practices, including the potential for entrenching teacher-centred and content transmission teaching approaches (Robertson & Bond, 2005). Many of the claims made for enhancing student learning through research-led teaching and undergraduate research experiences are not well evaluated and do not demonstrate that students develop the intended higher order thinking skills (Seymour et al., 2004). Therefore there is a need to better understand the factors which shape how research is in curriculum in ways that enhance the quality of teaching and student learning.

Both the teaching and learning literature and the curriculum literature propose that curriculum and teaching decisions and practices are influenced by teachers' beliefs about educational and contextual factors. However, research is not included as an influence in most models and explanatory frameworks for making sense of curriculum design. The research-teaching nexus literature proposes, but does not systematically investigate the field of inter-related beliefs that influence different approaches to research-led teaching and curricula. Bringing together these two literatures allows me to build a more complete model of the field of influences that shape curriculum decision making. It also provides a framework to explore how research interacts with other influences within the field, and the conditions under which research enhances the quality of curriculum, teaching and learning. My aim is to explore all of the possible influences on curriculum design, in order to provide a rich description of the context in which academics make curriculum decisions, and to better understand the inter-relationship between influences as academics interpret and respond to them. I conclude this literature review below, with a summary and justification of each of the key influences on curriculum decision making that will be investigated in this study.

2.4 Conceptualising Curriculum Decision Making as a Field of Teachers' Beliefs about Influences

My literature review shows that teachers' decisions about curriculum and teaching are often conceptualised as being shaped by their beliefs about educational and contextual influences. This literature is representative of a substantial body of educational research that explores how teachers' beliefs influence their behaviours, based on the assumption that beliefs are the best indicators of the decisions that individuals make throughout their lives (Pajares, 1992). However Pajares notes that beliefs are a 'messy construct' where the literature uses beliefs interchangeably with a range of other terms that include

attitudes, values, judgments, axioms, opinions, ideology, perceptions, conceptions, and implicit and explicit theories. Pajares (1992) defines beliefs as the ways in which individuals make sense of the world, and draws a critical distinction between beliefs and knowledge. Beliefs are characterised as being based on experiences, and are often episodic involving guiding images from past events; whereas knowledge is characterised as based on 'facts' (sic). Beliefs are regarded as not being open to evaluation and critical examination in the way that knowledge is. However, beliefs are considered to be far more influential than knowledge in determining how individuals organize and define tasks and problems, and as stronger predictors of behavior (Nespor, 1987).

The next sections explore how each of the influences identified above are conceptualised and investigated in the literature to develop a conceptual framework for undertaking this study.

2.4.1 Beliefs about educational purposes, knowledge and discipline

Teachers' beliefs about educational purposes and knowledge have been identified as central to their curriculum decisions and ideologies (Stark, 2000; Toohey, 1999; Trowler, 1998). Disciplines are identified as a related influence because academics' beliefs about knowledge are shaped by their scholarly backgrounds and their socialisation in disciplinary knowledge cultures during their preparation as researchers and teachers (Becher & Trowler, 2001; Lattuca & Stark, 2009; Stark, 2000). Lattuca and Stark (2009) note that it is difficult to separate the influences arising from academics' backgrounds and scholarly and pedagogical training, their views of their academic fields, and their beliefs about the purposes of education.

Academics' beliefs about knowledge are often characterised in terms of disciplinary knowledge practices, using Becher's adaption of Biglan's typology of disciplines in four domains, as hard or soft and pure or applied (Becher & Trowler, 2001). Becher and Trowler (2001, p. 36) describe the disciplinary groupings and corresponding views of knowledge as follows. Hard-pure disciplines are associated with views of knowledge that are cumulative, atomistic, concerned with universals, show consensus over significant questions to be addressed, and research that results in discovery and explanation. These disciplines are represented by the physical sciences, such as physics and chemistry. Soft-pure disciplines are characterised by views of knowledge that are

reiterative, holistic, concerned with particulars, personal, value-laden, show lack of consensus over significant questions, and research that results in understanding and interpretation. These disciplines are represented by the humanities, such as history and pure social sciences, like anthropology. Hard- applied disciplines reflect many of the characteristics of hard-pure knowledge practices, but are concerned with pragmatic and functional approaches for applying knowledge that result in products and techniques. These disciplines are represented by engineering and clinical medicine. Like soft-pure disciplines, soft-applied disciplines are also characterised by knowledge for the purposes of understanding and interpretation, but with a focus on providing case studies and know-how for the enhancement of professional practice. These disciplines are represented by applied social sciences, such as education and law.

Neumann et al. (2002) also use disciplinary knowledge practices as a framework for understanding observed variations in teaching and learning methods and the main cognitive purposes of the curriculum. Hard-pure disciplines are associated with cognitive purposes that emphasise knowledge acquisition and intellectual skills that are specific and subject related. Soft-pure disciplines tend to identify with cognitive purposes related to personal growth, creativity and generalisable skills, such as critical thinking. Applied disciplines share a similar emphasis with their pure counterparts, combined with a focus on practical experiences and vocational outcomes. Hard-applied disciplines emphasise problem solving, and integration and application of existing knowledge. Soft applied disciplines emphasise personal growth, along with a practical focus on reflective practice and lifelong learning.

These studies suggest a strong relationship between academics' beliefs about educational or cognitive purposes and their disciplinary knowledge practices. However Trowler (1998) and Fanghanel (2009) argue from a socio-cultural perspective that disciplines are also shaped by local context and that individuals have educational ideologies that affect the way in which they understand and position themselves in relation to their disciplines. Therefore this study will investigate academics' beliefs about educational purposes within and across disciplines and how these influence their curriculum decisions.

2.4.2 Beliefs about teaching and learning, the teaching environment and students

Teaching and learning methods and approaches are an important element of curriculum. Teachers' beliefs about teaching and learning are reported to have a close relationship with their teaching and learning decisions and behaviours (Pajares, 1992). In higher education, a dominant approach to researching teaching and learning has been investigating teachers' conceptions of teaching and how they approach their teaching (Akerlind, 2003; Kember, 1997; Prosser & Trigwell, 1999). Kember's (1997) review of the literature notes that 'conceptions' of teaching is used more commonly than 'beliefs', but their meaning seems to be synonymous. Beliefs and conceptions are also used interchangeably by Devlin (2006), Quinlan (2003) and Pajares (1992).

Prosser and Trigwell (1999) identify close relationships between teachers' conceptions of teaching, conceptions of learning, how they approach their teaching and their students' learning, and the quality of their students' learning outcomes. Teachers' conceptions of teaching were found to range from a focus on transmitting concepts or knowledge, to developing or changing students' conceptions. Teachers hold corresponding conceptions of learning that range from accumulating knowledge, to conceptual development and change. Prosser and Trigwell (1999) then identify five different approaches to teaching which are constituted in terms of teachers' intentions and strategies. These approaches range from a teacher focussed strategy, with the intention of transmitting information or acquiring concepts, to a student focussed strategy, with intention of developing or changing students' conceptions. They show there is a close relationship between conceptions of teaching and of learning, and approaches to teaching and learning. Prosser and Trigwell (1999) argue that there is also a close relationship with student learning outcomes. This research informs contemporary understandings of good teaching as approaches that are student centred and conceptual change focussed, because they are associated with students adopting deep approaches to learning. A similar range conceptions of, and approaches to teaching have been found in many studies, which are reported in literature reviews by Akerlind (2003) and Kember (1997).

Academics' conceptions of and approaches to teaching also have been found to inform their approaches to integrating research in their teaching and curricula. Those who hold

a transmission model of teaching have been found to view research as providing advanced and up-to-date content knowledge to be transmitted to students; while those with conceptual change models of teaching are more likely to position students as co-constructers of knowledge or as active participants in the research process (Jenkins et al., 2007; Robertson & Bond, 2001, 2005; Zubrick et al., 2001).

Teachers' perceptions of students' abilities to cope with subject matter are an influence on their teaching approaches (Prosser & Trigwell, 1999). Fanghanel (2007) also finds that academics pedagogical beliefs are informed by dominant themes in education that include deep and surface approaches to learning and the effects of widening participation; and by folk beliefs about students' laziness, instrumentalism, and good and bad students. She found that a common theme was divergence between students and staff expectations. Students were often perceived as only wanting to get a good degree, which led staff to deploy strategies to encourage them to achieve more academic outcomes.

Teaching and learning environments are also identified as important influences on teaching approaches (Prosser & Trigwell, 1999). Teaching and learning environments are shaped by institutional context and policies, and will be explored in section 2.4.4.

2.4.3 Academic identity

Stark (2000) describes the origin of teacher's goals and their beliefs about the purposes of education in their disciplinary backgrounds and scholarly training. Studies of academic identity show that they are shaped and reinforced in disciplinary communities and social processes (Henkel, 2005). Disciplinary knowledge practices have been used to explain differences in curriculum and pedagogical practices (Becher & Trowler, 2001; Neumann et al., 2002). The Gunstone and White (1998) study of physics teachers, suggests that pedagogical purposes and practices are influenced by whether teachers identify more strongly with their disciplinary expertise, or with their pedagogical expertise. Barnes (1992) also identifies teacher's personal commitment to teaching as an influence on their pedagogical practices.

These studies suggest that curriculum decision making will be influenced by academics' beliefs about their identities as discipline experts or teachers; their pedagogical training, and personal commitment to teaching. Preparation for academic careers focusses more

on academics' development as researchers, than teachers. Hence participation in educational professional development programs is an important area for investigating how academics develop curriculum and pedagogical knowledge, as well as an indication of their commitment to teaching.

2.4.4 Institutional context

The institutional context is another important factor that influences teachers' approaches to teaching, and their motivations for adopting new practices through their perceptions of what is valued and rewarded (Colbeck, 1998; Prosser & Trigwell, 1999; Ramsden, 2003). Prosser and Trigwell (1999) show that teaching approaches are shaped by teachers' perceptions of the teaching and learning environment, such as class sizes and workloads. Fanghanel (2007) also identified academic labour as an important structural filter in the institutional context that hindered effective teaching practices. Themes included under-staffing, class sizes and teaching loads; reliance on part-time staff and their needs for training and mentoring; and academics being employed on short-term contracts. Institutional regulations were also perceived as a source of constraints on teaching practices, and many academics believed that they did not take account of pedagogical principles (Fanghanel, 2007).

As reported in section 2.3.4, different types of university were found to prioritise different missions and strategic priorities in relation to teaching and research (Colbeck, 1998; Zubrick et al., 2001). University cultures and missions influenced academics' understandings of what counted as research, which influenced their perceptions of opportunities for integrating research and teaching, and their motivations. Fanghanel (2007) also describes the institutional 'stance' on research and teaching as the most important influence for academics identifying with the institutional mission.

2.4.5 Socio-political context

Government reviews and books examining curriculum and teaching often begin by exploring the changing social and political contexts in which educational goals and priorities are shaped (Barnett & Coate, 2005; Becher & Trowler, 2001; Bradley, Noonan, Nugent, & Scales, 2008; Toohey, 1999). The following themes are regularly identified as important influences on curriculum and teaching, and underpin the most recent review of Australian higher education (Bradley et al., 2008):

- government agendas for developing workplace skills and meeting the needs of the economy (Barnett & Coate, 2005; Rowland, 2006; Trowler, 1998),

- increasing reliance on international students for funding of universities and goals for internationalisation of curricula (Reid & Loxton, 2004),

- assuring high-quality provision of higher education (Lattuca & Stark, 2009),

- increasing participation in higher education and the consequent increase in student diversity and preparedness for higher education ((Biggs & Tang, 2007; Toohey, 1999)

- innovative use of technology in learning and teaching (Australian Government Office for Learning and Teaching strategic priorities, 2014)

Stakeholders other than government also influence curriculum decisions (Klein, 1991; Lattuca & Stark, 2009; Toohey, 1999), which include employers and professional bodies and accrediting agencies, particularly in professional disciplines.

2.5 A Model of the Field of Curriculum Decision Making in Higher Education

This literature review in this chapter is used to develop the model presented below in Figure 2.1 as an exploratory framework for investigating the Field of Curriculum Decision Making in Higher Education, which guides the design of this descriptive study. The inner part of the model represents curriculum decision-making, and identifies a set of common elements found in the literature for investigating the nature and sequence of curriculum decisions. The outer part of the model represents the field of curriculum influences, which were also identified from the literature. This model will be used to inform interview questions and deductive categories for data analysis as described in the next chapter, Research Methodology and Design.

Figure 2.1: An Exploratory Framework for Investigating Field of Curriculum Decision Making in Higher Education
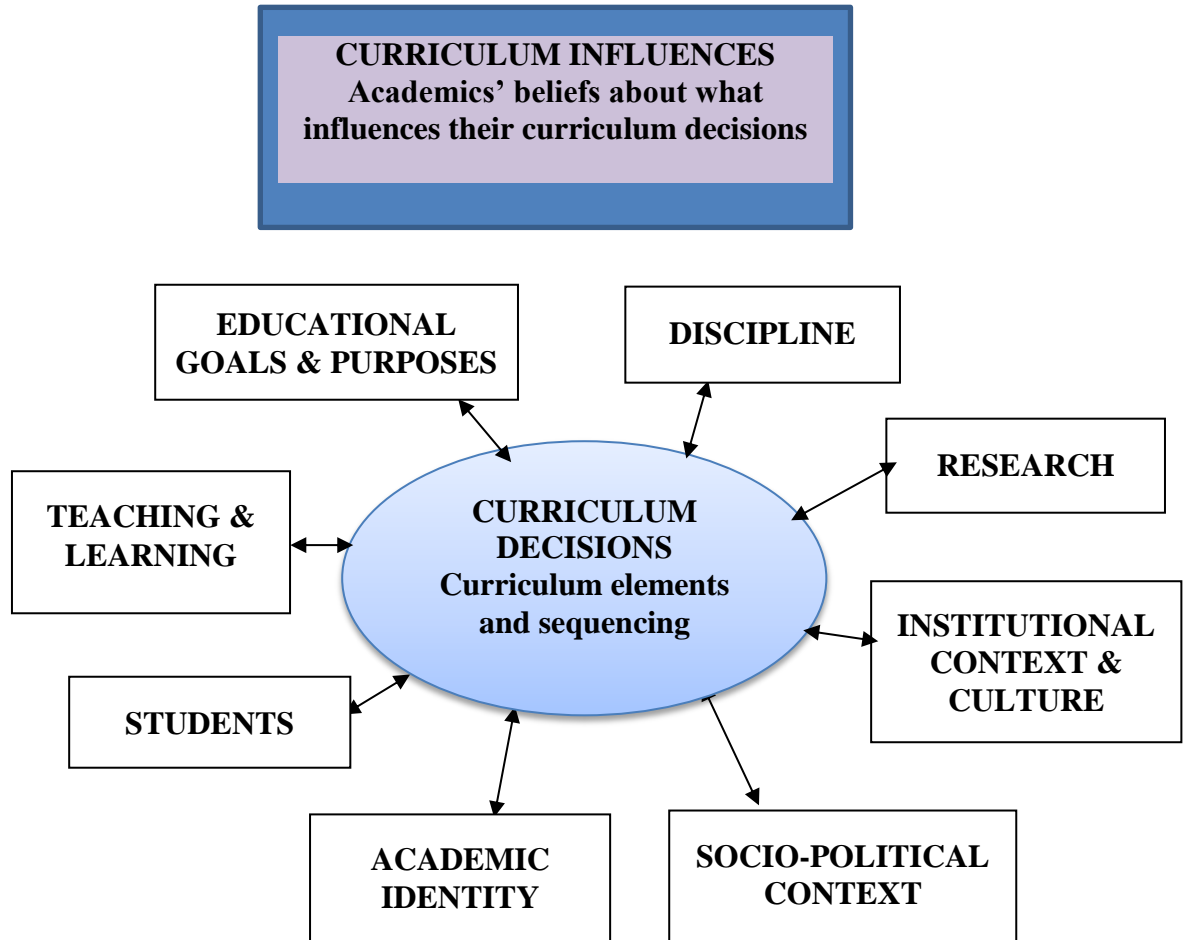
Chapter 3
Research Methodology and Design

This chapter outlines the research methodology and its appropriateness for this study, the research design, selection of participants, the procedures for data collection and analysis, and for ensuring the trustworthiness of the findings. Section 3.1 presents the aims of the research and the focus questions that guided the study. Section 3.2 describes the selection of a social constructivist theoretical perspective, and the ontological and epistemological assumptions that inform the design of the study. Section 3.3 explains the qualitative research design and grounded theory methods that guided the selection of participants in the study and the collection of data. Section 3.4 presents the systematic grounded theory methods for analysing and interpreting data using the NVivo software package for data management and coding. Section 3.5 identifies the processes for ensuring the trustworthiness of the data and the findings; and section 3.6 outlines the ethical issues and how these were addressed in the study. Section 3.7 explores the limitations of the methodology.

3.1 Aims of the Research and Focus Questions

This study aims to investigate how academics make curriculum decisions, and their perceptions of what influences their decisions, with a focus on the influence of research.

The research questions that guided the design of the study were:

1) How do academics in a research-intensive university make undergraduate curriculum decisions?

2) How do academics perceive the influences that shape their undergraduate curriculum decisions?

3) How do academics perceive research as a specific influence on their curriculum decisions? What approaches to research-based curricula and teaching are being adopted?

4) What are academics' perceptions of the influences that support or constrain change to improve the quality of curriculum and teaching?

5) What are the implications for improving higher education curriculum practices?

3.2 The social constructivist theoretical perspective

The purpose of this research is to better understand how academics make decisions about undergraduate curricula, and the key educational and contextual factors that they perceive as being influences on their decisions. This study positions academics as purposeful social actors who are making decisions about curriculum as they plan courses as individuals, and as members of curriculum teams within an academic school or department, and university context. Hence academics make decisions and take actions informed by their own values, beliefs and experiences about curriculum and their interpretations of their social context. The nature of the research leads me to select a social constructivist perspective in which my aim is to capture an understanding of the phenomenon being studied from the perspectives of the participants (Denzin & Lincoln, 2000). The aim of research using this perspective is to identify underlying patterns or mechanisms to explain how people interpret and make sense of their experiences and the actions that they take to manage their day-to-day situations (Miles & Huberman, 1994; Schwandt, 2000).

This section explores the ontological and epistemological issues involved in constructing a study from this theoretical perspective. Constructivist research is included amongst a range of naturalistic, qualitative and interpretive approaches (Cohen, Manion, & Morrison, 2000), which are based on the following assumptions:

- people act intentionally and make meanings in and through their actions,
- people interpret events and act on the bases of events,
- events and individuals are unique and constantly changing, hence they are not generalisable,
- situations should be examined from the viewpoints of the participants.

In addition to the understanding that individuals construct their own meanings from their experiences of the world, social constructivists 'recognize that influences on individual construction are derived from and preceded by social relationships' (Young & Collin, 2004, p. 376). Young and Collin (2004) describe social constructivism as an emerging perspective that exists on a continuum with social constructionism, depending on whether the focus is respectively on the individual or the social. Schwandt (2000) notes that social constructionist epistemologies draw on constructivism and hence they share beliefs that the mind is active in the construction of knowledge, and that it has an

historical and socio-cultural dimension. Constructionism argues that meanings arise in an intentional interplay between the mind and the object being studied, and are both objective and subjective (Crotty, 1998). Individuals are constructing meanings about the social world, which Ashwin (2009) describes as being complex, in that it is made up of a larger numbers of elements, uncertain and unpredictable, and emergent. The complexity of the social world means that it cannot be known directly and must be mediated through theory, which involves simplifying its complexity (Ashwin, 2009). Hence, explanations developed will be incomplete, approximate and contestable, and will focus on certain aspects and not others.

This view of the social world is adopted in my study, which reflects my beliefs that academics' curriculum decisions can't be known directly but require interpretation of their representations in dialogue and in curriculum documents. I selected qualitative research methods, involving interviews and analysis of curriculum documents, to gain insight into participants' ways of understanding and representing their decisions. An exploratory framework for investigating the field of curriculum decision making (Figure 2.1 in Chapter 2) was developed from the literature to provide categories for investigating and interpreting participants' curriculum decisions and beliefs about influences. Participants were free to express their decisions and beliefs in their own language; however the framework provided a structure for probing participants' understandings, and for developing initial deductive categories for interpreting meaning. This use of theory for the initial framework of the study is intended to capture the interplay between individual and social construction of meaning, which recognises that theories are produced socially, and new ways of seeing the world depend on existing theories (Ashwin, 2009).

The findings are presented as detailed accounts to represent the range of different ways in which participants make curriculum decisions in their context, and as case studies identifying underlying patterns of decision making. The findings are not intended to represent a generalisable truth about curriculum decision making, but to provide a defensible reasoning of the processes and outcomes of interpretation, with sufficient detail so that readers can form their own interpretations. The findings are intended to increase our knowledge about curriculum decision making in ways that can assist

academics to develop greater awareness of their own practices and the underlying beliefs that shape them, and a range of possible alternatives for improving practice.

The social constructivist theoretical perspective informs decisions about the role of researcher and the criteria for validity, which are explored in more detail in section 3.5. My role is informed by Crotty's (1998) description of the researcher as *bricoleur*, who brings a sustained focus to the task of interpreting meaning, in order to create new meanings. Validity addresses questions about the authenticity and trustworthiness of the findings in the account provided of the social world of the participants, and in identifying implications for others to take action (Lincoln & Guba, 2000). Approaches to validity in constructivist research include applying rigour in the methods for data collection and analysis, and providing detailed accounts of the processes in ways that show defensible reasoning and plausibility (Lincoln & Guba, 2000). Reflexivity is another important process for establishing authenticity in qualitative research (Lincoln & Guba, 2000), where my aim as a researcher is to be as self-reflective as possible about any potential biases world views and theories that I may be imposing on the data (Charmaz, 2006).

3.3 Research Design and Methods

My study explores academics' experiences and beliefs about the process of curriculum decision making at one research-intensive university in Australia over a short period of time from 2008-2009. My research problem and the social constructivist theoretical framework lead me to select a qualitative research approach and grounded theory methods for analysing the data. Grounded theory aims to uncover insights and understandings about processes or phenomena that are grounded in the data, rather than developed independently of it (Charmaz, 2006; Strauss & Corbin, 1990). A strength of grounded theory research is that it identifies systematic procedures for collecting data, identifying categories or themes, and connecting categories to formulate a theory (Creswell, 2002). This study investigates participants' beliefs about the factors that influence their curriculum decision making with a view to identifying underlying patterns that help make sense of their decisions. Hence the development of theory is understood in the 'looser' sense described by Thomas and James (2006, p. 772), of identifying patterns, rather than meeting 'positivist and functionalist expectations about explanation'.

The study began with a review of the literature to provide an initial theoretical framework for investigating and understanding curriculum decision making, and the potential range of educational and contextual influences. The theoretical framework locates the study in the language and terminology of the existing literature; however the analysis and interpretation are grounded in participants' subjective understandings and meanings. The literature also helped to identify characteristics of academics and courses to define a study population that would encompass a broad range of approaches to curriculum decision making.

Creswell (2002) describes the steps in a qualitative data collection process as:

- obtaining permission to conduct the study,
- selecting participants and sites purposefully to best understand the phenomena,
- identifying data from various sources,
- administering and recording data using protocols, and
- administering the data collection in a manner sensitive to individuals and sites.

The study took place in a research university, where most academics are actively engaged with both teaching and research as significant components of their work. This research site was selected in order to provide a context in which research-teaching relationships are significant for the participants, and the synergies and tensions between research and other educational and contextual influences can be explored. Obtaining permission to conduct the study involved an application and approval from the University Human Research Ethics Committee.

My qualitative approach to the research problem led me to choose intensive semi-structured interviews as the most appropriate method for developing an in-depth understanding of participants' perspectives and meanings (Charmaz, 2006). Interviewing provides a way of generating empirical data about the social world by asking people to talk about their experiences, attitudes and meanings (Creswell, 2002; Holstein & Gubrium, 2004). The face-to-face interview provides an opportunity for exploring responses in detail, for observing reactions and non-verbal cues, and for interactions where respondents can extend and clarify questions and responses. Semi-structured interviews provide a balance between structure and flexibility with a framework of common questions to elicit responses to key themes. Questions are open-

ended and the unstructured format allows for the flexibility to follow-up with respondents about the themes they raise. Holstein and Gubrium (2004, p. 141) describe this as the 'active interview' in contrast with the highly structured technical approach to interviewing, which aims to collect accurate information by minimising interviewer biases and distortions. They argue that all interviews are interactional and respondents are always actively constructing and co-constructing their identity in relation to the interviewer and the questions. Hence, it is better to acknowledge that meanings will be constituted during the interview, rather than pretend that interactional contributions can be eliminated (Holstein & Gubrium, 2004).

Curriculum documents were selected as another data source in which participants represented their curriculum decisions and beliefs. Creswell (2002, p. 209) describes documents as being a good source of text for analysis, 'which have the advantage of being in the language and words of the participants, who have usually given thoughtful attention to them'. Academics are required to create curriculum documents as course outlines for communicating their curriculum decisions to official university committees and to students. Therefore curriculum documents represent a public record of curriculum decisions that are available for analysis. Other documents expressing curriculum decisions and beliefs were offered by some participants, such as applications for teaching awards and academic papers they had written.

Within the context of this study, I am an insider who works at the university, with an understanding of the culture and context in which participants are designing courses and teaching. This knowledge is useful for establishing rapport with participants, but may raise concerns about gaining trust in relation to the purposes of the research and how the data will be used. My insider knowledge also brings my preconceptions about the nature and influence of contextual factors in the setting. In my position as an educational developer I also have preconceptions about common curriculum and teaching practices in disciplinary communities that may influence my questions and interpretation of data. Reflexivity involves a conscious experiencing of our multiple identities within the processes of research, for example as enquirer, respondent, teacher and learner (Lincoln & Guba, 2000). Hence throughout the research process I maintained a research journal for recording and reflecting on my analytical processes, emerging insights and

reviewing of potential biases which may arise from my background and experiences as an enquirer and an educational developer.

The selection of research participants, the interview protocol and process, and curriculum documents are described in more detail in the sections below. Descriptions of grounded theory often focus on a set of principles and practices that guide the analysis and interpretation of data (Charmaz, 2006), and it is this aspect of grounded theory that most informs the design of this study.

3.3.1 Research participants

An invitation requesting participants for my research was sent to the email list of a virtual teaching community at the university that had formed for the purpose of sharing interesting and innovative practices. The email, shown in Appendix 1, invited academics who had recently developed a course to meet and talk with me about their course development process, and offered them the opportunity to reflect on and gain insight into their experience. The request was for academics who had recently engaged in designing a new course or reviewing an existing course, so that they had a recent experience of curriculum decision making on which to draw. Many of those who responded expressed their desire to tell their stories about their curriculum and teaching as a way of debriefing and making sense of their experiences.

Forty-three members of the teaching community responded to the e-mail invitation to have a conversation about a course they had recently designed. The study participants were primarily selected based on opportunistic and purposive sampling from this group of academics after further email and telephone contact to gain information about their backgrounds, the courses they had designed and their availability for interview. Participants were selected to represent a diversity of academic characteristics, discipline types, course types and curriculum practices, including courses designed by individuals and teams. The selection of participants began from considering the profile of people who responded to the invitation in order to obtain cohorts of participants from common disciplines, and which also represented disciplines with different characteristics informed by Becher's typology of dimensions as hard-soft and pure-applied (Becher & Trowler, 2001).

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Participants were selected to represent four broad academic disciplines of science/physics (hard-pure), arts/social sciences/humanities (soft-applied and soft-pure), law (soft-applied and a profession) and environmental sciences (soft-applied and a cross-disciplinary field involving both the social and physical sciences). A fifth group of participants were selected because they identified innovative curriculum practices of interest to this study, which included technology enhanced curriculum and research-led teaching. This fifth group were classified as Innovative and included academics from a range of different disciplines.

Table 3.1 shows the range of characteristics considered in the selection of the study population and the profile of the study participants, who are referred to by pseudonyms. The characteristics and their dimensions considered in selecting participants are:

- Sex: Male or female
- Discipline – Science/ physics (hard-pure); Arts/ humanities/ languages/ social sciences (soft- pure and applied); Law (soft-applied & professional); and Environmental sciences (soft-applied and inter-disciplinary)
- Academic level and experience: Research Fellow/ Lecturer (B), Senior Lecturer (C), Associate Professor (D); Teaching experience was broadly defined as novice or experienced.
- Academic appointment: Research-Teaching (R-T), or Research only (R).
- Commitment to teaching: Completion of formal educational development programs, primarily the Graduate Certificate in Higher Education (GCHE) and Masters of Higher Education (MHE), and teaching award winners at the university or national level.
- Course characteristics: Levels in the undergraduate program represented as $1 - 3$ and Honours. Course type which were classified as Introductory, Advanced, Elective, or Compulsory.
- Curriculum design classified as being related to the development of a new course or a review of an existing course, and that was individual or collaborative.

Table 3.1 also shows that I also included two courses in the study that were both co-convened and collaboratively developed by two research participants, Tony and Brendan; and Brian and George. Tony and Brendan were both interviewed twice about

two different courses for which they were responsible, one in their primary discipline area and a second in a cross disciplinary area. Their inclusion in the study allowed me to compare their curriculum decisions in different course contexts and the influence of teaching in their specialist discipline area and a non-specialist area, as well as to explore the influence of participants collaboratively developing a course. For my study population this resulted in a total of twenty research participants, and twenty-two interviews exploring decision making in a total of twenty courses, which were organised as five groups, each involving a total of four courses.

The selection of the study population was based primarily on the individuals who volunteered to the email invitation, and so it was not possible to create a balanced sample across all of the intended characteristics. In particular, a number of the academic disciplines are characterised as soft-applied, however, they represent characteristics beyond Biglan's typology, which were also of interest in the study. Law is soft-applied and professional discipline, and environmental sciences, also soft-applied, was included to capture the practices from an emerging academic field, which is multi- or inter-disciplinary. Most study participants were appointed to teaching and research positions, but some were on research-only appointments and chose to teach. Fourteen of the participants (70%) were appointed at Level C and D. In order to include more inexperienced participants in the study population, I included two PhD students who were teaching courses related to their research, and had volunteered to be participants. Interestingly, a significantly higher proportion of men responded to the invitation to participate than women, and ultimately the study population is 75% male. The academic profile of the research university has a higher proportion of male than female academics, however not to the extent represented in the study population. Some of the disciplines selected for the study had much higher proportions of male than female academics in their appointments, such as physics and environmental sciences. However this does not fully explain why more males volunteered to participate. Some of them mentioned that they had little opportunity to discuss their teaching and so jumped at the opportunity provided by this study.

Table 3.1: Matrix of Study Participants' Characteristics

Interviewee/ Name & Code	Academics' Discipline/ Course field (if different from discipline)	Discipline descriptor	Sex	Academic experience: Academic level Novice or experienced Formal education qualifications and teaching awards	Academic Appointment: Research-teaching (R-T) Research-only (R)	Course characteristics Level (L1-3, Hons) Introductory, Advanced, Elective, Compulsory. New course/ course review	Course design Individual (I) Collaborative (C)
Brendan ARTS1/L2	Arts/Sociology	Soft-applied	M	Senior Lecturer (C) Experienced	R-T	L2 - Introductory New course	I
Brendan ENVS4/L1	Arts/Environmental science	Soft-applied	M	University & national teaching awards	R-T	L1 - Introductory Review	C
Vanessa ARTS3/L1	Arts/Gender-cultural studies	Soft-pure	F	Senior Lecturer (C) Experienced University teaching award	R-T	L1 Introductory Course review	I
Thomas ARTS4/L3	Arts/Languages	Soft-pure	M	Senior Lecturer (C) Experienced MHE University teaching award	R-T	L3 - Advanced Course review	I
Phillip ARTS5/L2	Arts/History	Soft-pure	M	Senior Lecturer (C) Experienced	R	L2 - Advanced New course design	I
Adam PHYS1/Hons	Science/Physics	Hard-pure	M	Research Fellow (B) Novice GCHE (not completed)	R	Hons Advanced New course	I
Scott PHYS2/L1	Science/Physics	Hard-pure	M	PhD Candidate Experienced secondary teacher Education qualification	Casual teaching	L1- Introductory Course review	I
Rose PHYS3/L3	Science/Physics	Hard-pure	F	Senior Lecturer (C) Experienced GCHE/MHE University & national teaching awards	R-T	L3 - Advanced Course review	I
Brian PHYS4/L1	Science/Physics	Hard-pure	M	Ass Prof (D) Experienced University teaching award	R-T	L1 - Introductory Course review	C
Edward PHYS4/L1	Science/Physics	Hard-pure	M	Ass Prof (D) Experienced University teaching award	R-T	L1 – Introductory Course review	C

Sarah LAWS1/L1	Law	Soft-applied	F	Ass Prof (D) Experienced	R-T	L1 – Introductory Course review	I
Nigel LAWS2/L2	Law	Soft-applied	M	Ass Prof (D) Experienced clinical legal educator	R-T	L2 - Elective New course	I
Ian LAWS3/L2	Law	Soft-applied	M	Ass Prof (D) Experienced	R-T	L2 - Elective New course	I
Elaine LAWS4/L2	Law	Soft-applied	F	Senior Lecturer (C) Experienced University teaching award	R-T	L2 - Compulsory Course review	I
Paul ENVS1/L2	Environmental sciences	Soft-applied	M	Lecturer (B) Experienced	R-T	L2 - Introductory Course review	I
Ryan ENVS2/L3	Environmental sciences	Soft-applied	M	Research fellow (B) Novice	R	L3 - Advanced New course	I
Andrew ENVS3/L3	Environmental sciences	Soft-applied	M	Ass Prof (D) Experienced	R	L3 - Advanced Course review	I
Tony ENVS4/L1	Environmental sciences	Soft-applied	M	Ass Prof (D) Experienced University & national teaching awards	R-T	L1-Introductory Course review	C
Tony INNO4/L3	Environmental sciences/ Leadership Interdisciplinary & research-led	Soft-applied	M		R-T	L3 - Advanced New course	C
Sameer/ INNO1/L2	Arts/literature Innovative technology	Soft-pure	M	PhD student Novice Teaching & Learning Foundations University & ALTC teaching awards	Casual teaching	L2 - Advanced New course	C
Matthew INNO2/L2	Business/Internet marketing Innovative technology	Soft-applied	M	Senior Lecturer (C) Experienced GCHE/MHE	R-T	L2 - Elective Course review	I
Gloria INNO3/L3	Biology/medical sciences Research-led	Hard-applied	F	Research Fellow (B) Novice GCHE	R	L3 - Advanced Course review '	I

3.3.2 Data collection methods

The interview protocol and process.

The interview protocol was designed to explore participants' perceptions of their curriculum decision making process and beliefs about the educational and contextual factors that influenced their decisions. Interview questions were developed from the literature review reported in Chapter 2, to explore the curriculum elements and the educational and contextual influences that were identified as being important. The semi-structured interview format involved a series of open-ended questions to allow participants to use their own terminology and concepts and to focus on the issues of significance to them, as they described the nature and process of making curriculum decisions, and their beliefs about influences. Follow up questions explored the terminology and concepts used in the curriculum literature, which helped create a common framework for analysing and interpreting their meanings. The interview protocol is shown in Appendix 2, and included a series of general prompts, which I found were valuable for helping participants to summarise their views at the end of a long answer and to ensure that they had the opportunity to revisit issues that may have been unintentionally passed over.

I designed the interview questions by considering participants' familiarity with the language and concepts of the curriculum literature. Given that 'curriculum' is a contested term that often refers to the subject content or syllabus, and is not commonly used in higher education to describe the holistic process of course design, the questions use the term 'course design' instead. I reviewed my questions with my research supervisors and then tested them in two pilot interviews with colleagues to get their feedback and to check if their understanding of the questions was what I had intended. Minor changes were made to the questions as a result of feedback given in these pilot interviews.

The interview questions asked participants to describe how the educational and contextual factors identified from the literature review influenced their curriculum decisions. For example, 'How do you think that your discipline influenced your curriculum decisions?' The interviews are aiming to gain insight into teachers' beliefs or perceptions about the influences of different factors, because beliefs are considered to be a powerful influence on individual's decisions and actions (Fanghanel, 2007;

Northcote, 2009; Pajares, 1992; Quinlan, 1999). The term 'beliefs' is used in the literature as shorthand for a range of similar concepts that include attitudes, values, judgments, axioms, opinions, ideology, perceptions, conceptions, implicit and explicit theories (Pajares, 1992). Beliefs underlie knowledge structures and are considered to be more influential in determining how individuals organise and define tasks and problems, and to be stronger predictors of behavior than knowledge (Nespor, 1987 in Pajares, 1992). One explanation is that beliefs represent cause-effect propositions drawn from personal experiences, and have more emotional content than knowledge (Pajares, 1992). Hence, the interview questions are framed to capture participants' beliefs about influences, while allowing them to respond in a meaningful way that reflects Pajares' view that researchers must take into account 'how individuals give evidence of beliefs, such as belief statements, intentionality to behave in certain ways, and behavior related to the belief in question' (Pajares 1992, p. 315 from Rokeach, 1968).

Interviews were arranged by contacting the participants and asking them to nominate a time. The suggested setting for the interviews was their offices so that they could have ready access to curriculum or other documents for reference; however participants were also given the opportunity to nominate another place if they preferred. My main considerations for the interview setting were the comfort of participants and their access to documents; however being in their offices potentially allowed for interruptions like phone calls or visitors. Interviews were recorded using a digital voice recorder and during the interview I kept notes so that I could follow up later in the interview on issues that participants may have bypassed, without interrupting the flow of the interview (Cohen et al., 2000). Participants were asked to select a specific course for which they had responsibility for the curriculum design and teaching to form the focus of the interview.

The interview began by my explaining the purpose and focus of the research and asking participants to provide some biographical information about their academic background and to describe characteristics of course they had selected for the study. This was intended to put them at their ease by beginning with familiar information and leading into a focus on their course design. Participants were then asked to recall where they began the process of the design or review of a specific course, and to describe their subsequent decisions in order. Throughout the interview research participants were asked to provide concrete examples to illustrate their curriculum decisions. They were

also asked to provide curriculum documents, such as course guides/ outlines and assessment tasks. During the interview, participants were asked to refer to the course documents, where relevant to illustrate their decisions, and these documents also provided a prompt to help them reconstruct their decisions. In the second part of the interview, research participants were asked to reflect upon their reasons for making these decisions and what they considered to be the key factors that influenced their decisions. Probes were used to explore the influences that were identified from the literature as being relevant and important to curriculum decision making.

During the interviews, my aim was to allow participants to respond to questions in their own way and to minimise interruptions to their line of thought. General prompts were used to encourage participants to explore their views more deeply by asking questions such as 'why did you do it like that?' or 'can you tell me more?' Some participants were familiar with my role in the university as an educational developer and I was aware that they may give me answers that they thought I was looking for. An example from one of the participants showed his awareness of my educational development role, and his perceptions of the kinds of practices that I may consider to be innovative or good.

> A lot of teaching people such as yourself think, well it's at the forefront, but the students don't actually like it as much. Innovation doesn't always equate when it comes to students' appreciation.

My approach to address this concern was to ask participants to provide examples from their practice to illustrate their views, so that there is a rich picture of supporting evidence for their statements. This included them referring to curriculum documents to ground their decisions, which were collected as the second source of data as described below.

The interviews also allowed me to engage with participants in a process of self-reflection about their curriculum decision making. In particular, many participants reported that they hadn't previously considered the range of the potential influences on their curriculum decision making explored in the study, and that they found it challenging, but elucidating, to explore them.

Course documents.

Participants were asked to have course documents available for the interview, and to refer to them when relevant to illustrate their decisions. All participants provided course

outlines, which were the formal documents communicated to students as required by the University. During the running of the study a standard format was developed for course outlines, that required such information as learning outcomes, a weekly schedule of topics, assessment tasks showing alignment to learning outcomes, and required readings. Hence the curriculum documents reflected both the thoughtful decision making by participants described by Creswell (2002) and the terminology and concepts required by the University. The University requirements also reflected a particular understanding of good curriculum decision making that was based on alignment of learning outcomes and assessment tasks.

Most participants referred to the documents during the interviews to illustrate their decisions with concrete examples. In some cases participants provided other course documents, such as detailed assessment tasks, evaluation surveys, applications for teaching awards, academic papers, and referred me to course websites which provided examples of their curriculum rationales and decisions in action. Curriculum documents were used to complement and supplement the interview data, and provided additional elucidation of curriculum decisions. The curriculum documents also provided source of comparison with participants' interview data, however the interview data were considered to provide more insight into where they saw the focus of their decisions.

3.4 Analysing and Interpreting Data

3.4.1 Using NVivo as the data management and coding package

NVivo was selected as the software package for managing the data and facilitating the analytic process. I was familiar with the NUD-IST software package from previous research for my Masters of Education degree, and NVivo is a further development of this package. I was attracted to NVivo's enhanced features for uploading Microsoft Word and other document formats and for working with transcripts and documents holistically, without having to determine individual data units prior to uploading. This helps the researcher to be able to maintain a sense of the meaning of the whole text, while analysing and coding smaller chunks of data. NVivo has functions that allow the researcher to make notes, to search the text and to explore connections between categories or themes. The program provides a range of processes for identifying emergent themes in the data that include searching the text for specific words and phrases, and identifying the most frequently used words within and across cases.

NVivo is described as a software package that is designed to model the processes involved in developing a grounded theory (Hutchison, Johnston, & Breckon, 2010). Grounded theory defines a systematic and iterative process of analysing and interpreting data that exhibits rigour in the procedures, in order to help create confidence in the findings (Creswell, 2002). Charmaz (2006) describes two phases of coding as initial and focused coding, which are also known as open and axial coding in the grounded theory literature (Strauss & Corbin, 1990). The analytical process for this study using NVivo is described in detail below.

3.4.2 Open coding of interview transcripts

Interviews were fully transcribed and imported into NVivo as Microsoft Word documents. Each interview document was created as a 'case node', which represents an organisational unit of analysis in NVivo (Bazeley, 2009). In my study, each case represented an individual participant. The case node allows all documents related to the participant to be stored together, and to record demographic and other information as 'attributes' of the case. This function assists the analysis by being able to search the data and make comparisons within and across cases, and for different attributes, such as gender or discipline (Bazeley, 2009).

I began the analysis with the interview transcripts because these represented the primary data that were constructed with participants to explore the research questions. Five interview transcripts were selected for initial detailed coding to gain a feel for the emerging issues and themes represented and to work out a coding system for use across the whole of the data. These transcripts were selected from participants who were interviewed early in the data collection process and represented one participant from each of my five groups of disciplines. The coding began with a close reading of these transcripts as a whole several times, in order to gain a feel for the themes and issues reported by each participant. This involved some manual coding using different coloured highlighter pens, and recording ideas and insights about potential categories in my reflective journal. Saldana (2009, p. 3) defines: 'A code in qualitative inquiry is most often a word or short phrase that symbolically assigns a summative, salient, essence-capturing, and/or evocative attribute for a portion of language-based or visual data'.

I then began the NVivo coding process by creating two categories as nodes for 'Curriculum decisions' and 'Curriculum influences', which represented the two key foci of the study. NVivo provides a function for automatic coding of data by structuring the transcripts using headings, which I used for the interview questions. Creating categories as nodes with the relevant text coded to them allowed this text to be searched separately within and across interview transcripts. The next stage of coding involved inductively identifying themes that emerged from the data. This stage is called preliminary or open coding in grounded theory and my aim was to stick closely to the data and try to capture participants' meanings expressed as what they do or think (Charmaz, 2006). Maykut and Morehouse (1994) suggest reading through the data to identify themes using questions such as:

- What are the recurring words, phrases and topics in the data?
- What are the concepts that interviewees use to capture what they do or think?
- Can you identify emerging themes in the data expressed as phrase, proposition or question? Do you see any patterns?

As themes were identified, I gave them descriptive labels that were used to define 'free nodes' in NVivo for coding data. As the open coding proceeded and progressively more themes were identified, I began the process of refinement using the 'constant comparative method' described by Maykut and Morehouse (1994). Their method involved creating a definition for the theme represented by each node, which attempted to capture its distinguishing properties and identified a rule for inclusion. New data was then examined for whether it fitted with the meaning of the data in an existing node, or required a new one to be defined. Lincoln and Guba (1985, p. 347) describe this as a 'look alike/ feel alike' criteria that represents the emergent process of categorising qualitative data. Some units of data fitted within more than one category, and were coded as such.

3.4.3 Axial coding and creating a tree node structure in NVivo

Charmaz (2006) describes the second major phase in coding as focused coding, where the researcher moves beyond descriptive codes to develop conceptual categories. During the open coding process, to help facilitate my analytical thinking, I recorded ideas for conceptual categories in my reflective journal and used the NVivo memo function to link ideas to nodes and specific data. The memos helped me to organise emerging ideas and to identify larger categories for grouping free nodes as more general

concepts. My next phase of coding was similar to the axial coding process described by Strauss and Corbin (1990), where sub-themes are related to the larger categories so that relationships can be built around the 'axis' of the category. The process of axial coding is intended to bring the data, which has been fractured into smaller units and codes, back together as a coherent whole (Charmaz, 2006). NVivo supports the development of axial coding by enabling the building of tree node coding structures. I had started a tree structure with two major categories curriculum decision and curriculum influences, at the top of the tree and the deductive categories from the interview questions and emergent categories assigned to these categories at different levels.

A snapshot of the developing node structure for the major category of curriculum decisions for the first five interviews is shown below. The snapshot shows that the axial codes/nodes are developed around categories representing curriculum elements, and, in this view, the nodes are organised alphabetically. Key curriculum elements such as 'Assessment', 'Content & structure', and 'Learning outcomes' were deductive categories identified from the interview questions, and others such as 'Alignment', 'Design of each class' were emergent categories identified from the data. The sub-themes represented as free nodes, are connected to categories in a hierarchical structure that is shown with different levels of indents. The numbers show the number of cases coded at each node, and the number of text references in the far right column.

Curriculum decisions		5	213
	Alignment	5	11
	Assessment	5	52
	Consultation, feedback	1	2
	continuous	1	2
	diversity	1	1
	exam	1	1
	marking	2	2
	prescriptive	1	1
	Content & structure	5	65
	conceptual framework	3	25
	course content	5	22
	core knowledge	1	1
	interests, themes	3	6
	lecture topics	3	4
	course documents	1	4
	course structure	5	23
	Design of each class	1	1
	Evaluation	5	28
	Learning outcomes and objectives	5	67
	careers	2	4
	citizenship	1	5
	communication skills	3	7
	critical thinking, reflection	3	3
	disciplinary thinking	3	5
	generic skills	2	5
	learning to learn	1	1

The conceptual development expressed in the axial codes also involved an interplay with the theoretical literature. Many of the sub-themes identified for curriculum decisions reflected familiar curriculum and teaching concepts, such as feedback, exams, lectures, tutorials, and real world problems. Similarly, some themes identified for curriculum influences also described recognisable constructs from the educational literature. For example, participants described approaches to teaching and learning that expressed variations similar to those identified in the literature exploring teachers' conceptions of teaching (Prosser & Trigwell, 1999; Akerlind, 2003). This was not an unexpected result as there have been numerous studies into conceptions and beliefs about teaching and learning, and one might expect that my study would find similar patterns of beliefs.

A snapshot of the tree code structure for 'Curriculum Influences' is shown below. The sub-themes identified for 'Approaches to teaching and learning' were informed by the literature, where it was considered relevant and helped to elucidate participants' meanings. During the analysis, this interplay between the literature and the data allowed

me to better describe categories in ways that were theoretically meaningful. These sub-themes were refined as more data was analysed.

Curriculum Influences		5	239
Academic identity		4	25
Academic history		4	11
Experiences as a learner		4	14
Experiences of educational professional development		4	14
Approaches to teaching & learning		5	84
1a. content transmission- imparting information		2	8
1b. transmitting structured knowledge		3	8
2. acquiring concepts of the discipline		5	24
3. Teacher-student relations		3	6
4. Active learning- student engagement		4	32
5. Student learning		4	7

Once the tree node structure was developed from open codes to axial codes, I progressively coded all of the interview transcripts, which involved further development and refinement of coding categories and the tree structure. Curriculum documents were then coded within this structure, primarily as curriculum decisions because this is what the documents reported.

3.4.4 Exploring relationships in NVivo with coding stripes and queries

As the axial coding progressed, the sub-themes that formed the tree node coding structure were refined from descriptive codes to create conceptual categories. These categories aimed to capture the variations in how participants conceptualised the curriculum elements that were the focus of their decisions, and their beliefs about curriculum influences. These variations suggested different approaches to curriculum decision making and underlying patterns of beliefs that informed those decisions. NVivo has a function where the coding structure within each participant's interview transcripts and curriculum documents can be made visible with coding stripes. This function helps to explore patterns of codes holistically in the text of each document. NVivo also has functions for making 'queries' to investigate relationships between coding categories. These functions allow the researcher to explore tentative propositional statements for the theory development phase of the analysis. I used the matrix coding query function extensively to explore relationships between individual participant's curriculum decisions and their beliefs about curriculum influences. From this process, I developed tentative theoretical propositions that variations in participants' curriculum decisions and patterns of beliefs about influences were related

to their discipline, and to their beliefs about educational purposes. These tentative theoretical propositions were confirmed using the matrix coding query function, and informed the theoretical development of the study.

3.4.5 Reporting of findings

The conceptual and theoretical development continued during the writing up of the findings. I found that writing up the findings involved returning to the data to clarify categories and provide illustrative quotes to demonstrate my interpretations of data coded in the categories and sub-themes. This led to further refinement of the categories and new insights and questions for probing the data and exploring patterns. Charmaz (2006) defines the end of the grounded theory process as when theoretical saturation of the categories is achieved. Theoretical saturation involves more than just seeing the same patterns in the data repeated, and occurs when the properties of the conceptual patterns are well developed, and no new properties emerge (Charmaz, 2006). Charmaz (2006) identifies questions for assessing that categories have been saturated, which include examining the comparisons that have been made for data within and between categories; the sense made of the comparisons; and how the comparisons illuminate theoretical categories. My research problem was to develop an understanding of curriculum decision making in a particular context, and of participants' beliefs about what influenced their decisions. Hence, my interpretation and theoretical development explored variations found in participants' curriculum decisions and beliefs, and underlying patterns. My conceptual and theoretical development finished when I felt confident that the properties of my conceptual categories were well developed. In addition, that I had made sufficient comparisons between and within the categories to ensure that I had identified distinctive and coherent patterns of beliefs that helped make sense of different approaches to curriculum decision making.

The findings from the analysis and interpretation is presented in three parts: (1) Chapter 4 presents the findings about curriculum decision making, which includes an overview of the process of decision making and detailed analysis of variations found in participants' decisions about key curriculum elements; (2) Chapter 5 presents a detailed analysis of variations found in participants' beliefs about each of the curriculum influences, and (3) Chapter 6 presents the underlying patterns of beliefs about influences that shape coherent approaches to curriculum decision making, which I have identified as curriculum orientations.

3.5 Validity and Reliability

Merriam (2009, p. 209) states 'All research is concerned with producing valid and reliable knowledge in an ethical manner'. Validity and reliability are the traditional terms associated with positivist, quantitative research, where 'reliability' relates to the consistency and repeatability of the findings, and 'validity', is the extent to which an event corresponds to what is intended to be measured and the findings are transferable to other situations (Merriam, 2009). In a qualitative study the aim is to develop a rich and detailed understanding about the experiences of the participants in a particular setting, and the findings are unlikely to be repeatable or directly transferable to other contexts. The methods and criteria for demonstrating that the findings are reliable need to reflect the assumptions and forms of inquiry that are relevant to qualitative research. Cohen et al. (2000) discuss many of the terms used as alternatives to validity in qualitative research. These include 'authenticity' from Lincoln and Guba (1985), 'understanding' from Maxwell, and 'fidelity' from Blumenfeld-Jones, all of which involve being true to the meanings from the perspectives of participants. Maykut and Morehouse (1994, p. 64) also use the term 'trustworthiness' from Lincoln & Guba (1985), which they refer to as the 'believability of a researcher's findings.' Demonstrating the trustworthiness of the findings involves providing an account of the design and processes for carrying out the research and data analysis so that the reader can 'place confidence in the outcomes of the study' (Maykut & Morehouse, 1994, p. 145).

Cohen et al. (2000) explore criteria for validity or trustworthiness of the data analysis in great detail. They identify the following set of criteria from Maxwell (1992), which I found to be relevant to the processes used in this study:
- providing an account of the research which has factual accuracy, and is not made up, selective, or distorted;
- capturing the meaning, interpretations, terms and intentions that situations and events have for the participants themselves, in their terms;
- developing theoretical constructions to explain the phenomena under study;
- ensuring generalisability *within* specific groups or communities, situations or circumstances, and beyond, to specific outsider communities, situations or circumstances (external validity).

Grounded theory identifies principles and a systematic process for ensuring the trustworthiness of the analysis and interpretation of the findings, including theory development (Charmaz, 2006). The processes for managing, analysing, coding and interpreting the data in this study are reported in detail in the sections above to demonstrate rigour and build confidence that the analysis and findings are meaningful. Data are reported as the actual words used by participants to ensure that the reader is provided with a close account of the participant's perspective. Readers are able to form their own interpretations and to compare these with the researcher's to consider the plausibility and transferability to other contexts. This is referred to as 'reader generalisability' (Merriam, 2009).

Member checks involve sharing the research findings with the participants in the study so that they can comment on whether the findings present a true account of their experiences or a 'recognisable reality' (Maykut & Morehouse, 1994, p. 147). After an initial reading of all of the interview transcripts, I structured them with headings representing the interview questions, and used broad themes identified from the analysis to structure the text beneath headings. These semi-coded transcripts were then sent to participants. I offered to meet with participants to discuss the transcript and interpretive themes to ensure that they were happy that the transcript represented an accurate record of the interview and to ask if they would like add further information. Meeting with them to discuss the transcript also allowed me to follow up with questions where I wanted further information or clarification. Another of my aims in meeting was to ensure that the research was useful for the participants, and helped to contribute to their understanding of their practice. This process was undertaken with all of the participants who formed the initial group that were analysed. These participants responded positively to the transcripts and the interpretative themes, and offered useful feedback. I did not meet with all participants, as some of the participants whose interviews were analysed later in the study, were no longer available to meet, or were not interested in discussing the interview further for a range of reasons, including that some were no longer teaching these courses.

Charmaz (2006, p. 67) describes 'wrestling with preconceptions' as an important part of the grounded theory coding process 'to avoid forcing data into preconceived codes and categories'. Some of my preconceptions include my assumptions about terminology, curriculum concepts and the theoretical framework I developed from the literature.

Charmaz's (2006) suggestions for challenging preconceptions and assumptions include achieving familiarity with the phenomenon being studied. During the coding and analysis I maintained a sustained focus on the data over a lengthy period of time, and engaged in regular reading and re-reading of transcripts and documents. The initial coding phase and subsequent discussions with participants were also strategies used in this study for helping me 'to wrestle with my participants' frames of reference' (Charmaz, 2006; p. 68). Taking a reflexive and questioning stance to the data is another way that I used to challenge my assumptions and world view.

3.6 Ethical Issues

The study was approved through the University's Human Research Ethics Committee (ANU HREC 2008/024). The protocol developed for ethics approval identifies the key ethical principles that need to be addressed, which are gaining informed consent of participants and maintaining their confidentiality by protecting their identities in the raw research data and in published material.

Participation in the research was voluntary and participants were not in dependent relationships with me as the researcher and were not recruited as representatives of disadvantaged groups. The aims and nature of the research were explained to participants in a written invitation to participate, and their informed consent to participate was obtained at the start of the interview. The interview questions were not in a sensitive area that would be expected to involve discomfort, embarrassment, or risk to participants. Participants were provided with summaries of their interview data to ensure that they agreed that it provided a recognisable account of their views. No concerns were raised by participants, however if any had been raised, I intended to address them with the participant in the first instance, or to refer the participant to my research supervisor if that was their preference.

Hard copy data were secured in accordance with the university's procedures in a locked filing cabinet in the researcher's office, where it will be kept for the required period and then destroyed. Electronic data were password protected and stored on the researcher's computer. The outcomes section of the report provides a rich account of participants' curriculum decision making that relates to a specific course that they designed and taught, hence I considered how to minimise the possibility that participants may be identifiable in the findings. These concerns were addressed by using pseudonyms in the

reporting of findings and attribution of quotations to participants. The course names were also generalised in the reporting to reflect a broad academic field of study so that they were not specifically identifiable. Participants were also members of a community for sharing their teaching practices and were committed to public sharing of their curricula and teaching. In addition, no participants expressed concerns during the interviews and follow up meetings that they could be identified when the findings were reported.

3.7 Limitations of the Methodology

A limitation of the study is that the primary data for investigating curriculum design involves self-reporting by participants. However, every effort was made during the interviews to encourage participants to ground their reported decisions in examples from their practice. The use of documents also provided examples of participants' decisions in action plans, and helped to establish links between their self-reporting and their practices. Another challenge for the study was how to explore participants' beliefs about influences and if they would respond meaningfully to questions that asked them to identify beliefs about influences, such as knowledge. The open ended interview questions and approach allowed participants to negotiate meaning during the interview and to clarify questions if they were uncertain or had concerns. Participants sometimes asked me to provide examples of what I meant in relation to the influences, and while I was reluctant to do this, I sometimes provided an example of an answer which had been given by other study participants. Interestingly, I found that participants often responded in significantly more sophisticated ways than the example I gave, suggesting that they were interested in exploring the complexity of the influence.

Another limitation is the representativeness of my study population for exploring curriculum decision making as a field of practice across the university. While the study population was not intended to provide a representative sample of the University population, my aim was to capture a diversity of practices based on characteristics identified in the literature that included different discipline groups. The selection of the study population was primarily derived from the group of individuals who responded to my email invitation, with some invited participants to fill in gaps in the characteristics identified as being relevant for the study. These respondents did not include a group from a hard-applied discipline and included a number of groups classified as soft-applied disciplines, using Biglan's typology. My reasons for selecting this group

included honouring my offer to the academics who responded to my invitation to have a conversation with them about their course design, and because I was also interested in discipline characteristics beyond Biglan's typology. These characteristics included a profession, which was represented by law participants, and an emerging inter-disciplinary field, represented by environmental sciences. I also included a group of individuals using innovative approaches to curriculum who came from different disciplines, including one participant from a hard-applied discipline. However, I am aware that the composition of my study population may bias my conclusions about the field of curriculum decision making towards the practices and beliefs represented in soft-applied disciplines.

Chapter 4
Findings 1: Curriculum Decision Making

This chapter reports the findings from the first focus of the research, which investigates how participants make curriculum decisions, including the different elements that compose their curriculum decisions and their decision making sequences or pathways. Then Chapter 5 reports findings from the second focus of the research, which explores participants' perceptions of the factors that influence their curriculum decisions. One issue that I wish to clarify at the beginning of this chapter is that the primary focus of the study is to provide insight into curriculum decision making processes and practices, and not to comment on whether these are good practices or not. My reason for this stance is that the practices described are reported from the academic participants' perspectives only, and students' experiences of the curricula and learning outcomes are not examined, making it difficult to definitively make claims about good practices. However, the findings suggest implications for recommending good practices about curriculum and teaching, and the discussion and interpretation of the results in this chapter explore those practices which are considered to be better than others, based on current educational literature.

The findings in this chapter are based on two sources of data:

(1) interviews with participants, where they were asked to recall how they went about the design of a particular course and the decisions that they made. The interview data provides insight into participants thinking about the process of curriculum decision making and the sequences of their decisions. Participants' decisions are described using their own language and the frequency and detail with which they describe particular curriculum elements and decisions gives a sense of those elements that they considered to be most significant in the curriculum. Quotes from the interview data are used to exemplify particular kinds of curriculum decisions.

(2) curriculum documents provided by participants about the course discussed in the interview, and which informed the interview. All participants provided a course outline for analysis, which was required by the University for communicating assessment and other requirements to students. Some participants provided other course documents such as the assessment guidelines given to students, applications for teaching awards, or academic papers about their curriculum and teaching.

Section 4.1 presents a curriculum model that describes the findings about curriculum decision making processes and pathways. This model shows that curriculum decision making is an iterative web, with multiple starting points and pathways. Common starting points and relationships between curriculum elements are explored. Section 4.2 examines how participants select and structure course content and the different ways in which their decisions are shaped. Section 4.3 examines decisions about learning outcomes and identifies four main categories of outcomes that participants want students to attain. Section 4.4 finds that assessment involves a sequence of decisions that include the type of task and purpose, defining the task, setting criteria and standards, giving feedback, and marking and grading. Variations in decisions at each stage of the sequence suggested different degrees of control that range from teacher-defined to student-defined. Section 4.5 explores decisions about teaching and learning activities in specific settings, and the underlying intentions that guide them. Section 4.6 explores the range of evaluation methods used and the purpose and focus identified for evaluation. Section 4.7 summarises the findings about how participants in this study make curriculum decisions, the range and variation of their decisions, and explores patterns for making sense of curriculum decisions.

4.1 A Model of Curriculum Decision Making

Most participants described curriculum decisions that included the common elements of

- course content and structure;
- learning outcomes;
- assessment;
- teaching and learning activities; and
- course evaluation.

Participants were found to start their course design from different curriculum elements and follow different decision making sequences. However, there were three common starting points, which, in order of frequency, were: (1) course content and structure; (2) learning outcomes; or (3) teaching and learning activities.

Although the different starting points led to some differences in the sequence of curriculum decisions, a generic curriculum design model was still able to be identified because decisions about the curriculum starting points tended to be interconnected and formed the first stage of a progressive series of decisions.

A generic model of the curriculum decision making process is described below, showing the key common elements that were identified.

Figure 4.1 Generic model of curriculum decision making
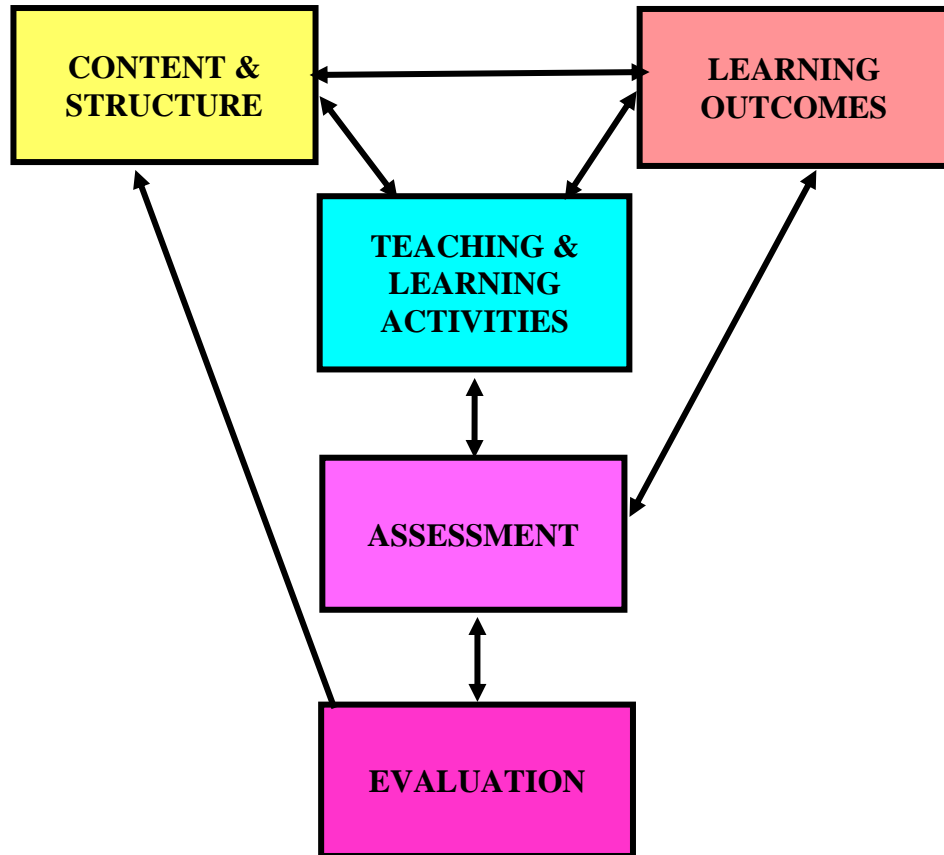
The model shows curriculum decision making as an iterative web with multiple possible starting points and pathways, where decisions about any element typically results in revisiting and refining decisions about preceding elements. The first stage is shown at the top of the diagram with 'content and structure', and 'learning outcomes'; because these are the most common starting points reported by the study participants. The majority of the participants (11/20) describe selecting course content as their starting point for designing a curriculum, and six participants report beginning from learning outcomes. The remaining three participants begin their curriculum decision making by describing the nature of the learning experience they wanted for students, which typically involved an inquiry or experiential learning approach.

These different starting points suggest participants have different foci for decision making with the majority beginning from *what they will teach* (course content); other participants began by considering *what they want students to learn* (learning outcomes); and lastly some participants began from *how they want students to learn* (teaching and learning activities). It is worth noting that these starting points were inter-related and that most participants were guided by broad learning goals or objectives when their curriculum decisions began with selecting course content or teaching and learning activities.

The model shows all of the possible decision making pathways, however some key relationships between curriculum elements were identified. Course content is linked with teaching and learning activities because decisions about selecting and structuring course content were closely connected to how it will be presented and organised as teaching and learning events. Most participants in this study used a conventional course structure based on a series of weekly lectures over a semester. There was also a close relationship between learning outcomes and assessment. Half of the participants explicitly described aligning or linking learning outcomes with assessment in order to achieve their goals for learning. This relationship suggests Biggs' (1999) model of constructive alignment, which has increasingly become the model of good practice that is taught in higher education professional development programs and embedded in university policies. At the University in the study, a policy requiring academics to write course outlines demonstrating that assessment was aligned with the learning outcomes was introduced during the time period in which the study was carried out. Some participants described greater degrees of alignment between curriculum elements than others. For example, some participants integrated assessment with teaching and learning activities to support students to develop the knowledge and skills required to do the assessment.

Evaluation was usually reported as the final stage of curriculum decision making. Evaluation methods included a range of formative approaches that were conducted during the teaching process, and the formal University student evaluation of teaching (SET) survey, which was used as a summative method for end of course evaluation. Most participants said that they used informal observations and reflections to evaluate 'what's working and not working' during the running of the course, for both immediate problem solving and longer term curriculum improvement. As shown in the model,

evaluation was often directed towards the course content, and how students engaged with particular topics or course materials. It was less common for participants to report that they evaluated and revised their learning outcomes and approach to teaching and learning once selected for a course. However, some participants reviewed and modified their assessment based on formal and informal evaluation of student performance and observations of unintended outcomes.

The next sections analyse the nature and range of decisions reported about each of the different curriculum elements in the model, followed by a discussion of the patterns and variations found across participants' decisions.

4.2 Selecting and Structuring Course Content

As noted in Section 4.1, more than half of the participants started their curriculum design by thinking about course content and what they were going to teach, and all participants included course content as a major curriculum decision. Selecting course content involved decisions about how it will be structured and presented to students, which included both the structure of knowledge and the structure of teaching and learning events. Most participants structured course content as a series of topics that were presented in a weekly schedule of lectures, or seminars for smaller groups. The structure of teaching and learning events as weekly lectures was typically not reported as a specific decision, but seemed to be taken for granted as the only approach. Only one participant described an alternative structure, which was a two week intensive course in environmental sciences, with a lecture format in the mornings and practical sessions in the afternoons.

Participants described a range of approaches for selecting and sequencing of topics, which are reported below, and which suggest some disciplinary differences.

4.2.1 Important topics and themes

Most participants teaching in arts, law and environmental sciences courses reported that they selected course content based on the topics that students need to know, guided by their expertise in the subject matter. For some, the decision was implicit, based on the most important topics.

> So, as far as content goes, we had 13 weeks so I basically thought well, each week is a topic. So, what are the 13 most important topics for these students to think

about that I know something about? So, that was really the basis of my selection. (Phillip, ARTS5/L2)

Other participants described their thoughtful seeking of a narrative or theme to link course topics and make them relevant and meaningful to students. Examples were given of decisions to make topics and learning activities relevant to students' lived experience as university students, to their roles as citizens, and to future professional roles.

> Values provide the philosophical framework for the course. We look at different law reform methods and their pros and cons, and looking for a satisfactory explanation about why it is a good thing for society. This includes examining questions such as 'Why are you lawyering?' (Nigel, LAWS2/L2)

4.2.2 The organisation of knowledge in the discipline

All science participants, from physics and biology, described the discipline as providing a conceptual framework for structuring course content.

> Basically, the field can be divided into two, quite simply. Well, the first part, which I took as first two thirds, is much simpler to understand concepts and then there's the last third, which is more research oriented. It's still foundational concepts but they are a bit more tricky. So, I took that very general approach that there is this natural distinction in the field and it's a distinction in terms of the hierarchical scheme of concepts, things that you build up. (Adam, PHYS1/Hons)

The organising principles reported for structuring content included from basic to advanced concepts, and different sub-fields of knowledge, such as mechanics and electromagnetism in physics, and anatomy and physiology in biology.

Textbooks.

Textbooks were also commonly used in physics courses, except where participants were unable to find anything suitable. Textbooks also reinforced the accepted disciplinary conceptual framework for organising knowledge.

> My approach to many things, including this, is don't reinvent the wheel. So although I had my own ideas about how to teach and what should be taught, I recognised that other people had similar thoughts. … So I did a systematic study of the literature, which is quite extensive in physics education, of the available texts, and there was a clear outlier in terms of effectiveness, and that was this one [that we are using]. (Brian, PHYS4/L1)

In addition, two participants from business and environmental sciences, who had written their own textbooks, used these to structure course content.

4.2.3 Inquiry and experiential learning structures

Five participants teaching courses in the arts, environmental sciences, and law used an inquiry-based or experiential learning approach, which provided a unifying structure for integrating course topics.

Elaine, who was teaching a level 2 compulsory course in law, used a role play scenario to provide the structure for students to encounter legal problems and experience applying knowledge and skills.

> I wanted to create an evidence course in context and it had to do with creating the materials to provide a context for the evidence rules. And the problem is that in Australia, there are no cameras in the courtrooms and there are very few TV dramas that deal with Australian legal issues. So I said, if I want to be able to put the students in the shoes of the lawyer and use this material, I've got to create it myself. … And what I wanted was short clips that I could play in class and that would raise questions or problems for students to then engage with and talk about so they could learn something of the context from the clip itself but then have to work with it to come up with resolutions to the issues raised by the clip. (Elaine, LAWS4/L2)

4.3 Defining Learning Outcomes

Learning outcomes or objectives were the next most common starting point for curriculum decision making, reported by six participants. When learning outcomes were the starting point for curricula, they were often used to determine other curriculum decisions and, in particular, were linked to the assessment.

> In designing a course, it's the learning outcomes that are critical and in [this course] it's … developing a solid foundational legal skill set coupled with hopefully an enthusiasm for studying law. … Students are so assessment driven, so the assessment has to be devised in such a way that students are going to develop those outcomes and then the teaching and the course outline design has to be congruent with that. (Sarah, LAWS1/L1)

4.3.1 Types of learning outcomes

Participants defined learning outcomes to express their intentions about what they wanted students to achieve in their courses. Four main categories of learning outcomes were identified, which were to develop (1) an understanding of the subject matter; (2) skills; (3) disciplinary ways of understanding; and (4) an overview and interest in the field. A few participants described other intended outcomes for their courses, which included to give students a sense of achievement, to develop their creativity and to improve student retention. Graduate Attributes were mentioned specifically by only three participants.

There were some differences in the learning outcomes reported by participants in interviews and in their course documents, with participants emphasising higher order skills in interviews rather than understanding course content, whereas course documents presented a balance between these types of learning outcomes.

Understanding subject matter.

All participants reported learning outcomes related to understanding disciplinary subject matter. These were expressed as understanding key ideas, concepts, theories and principles, and in some cases as knowing about particular processes, approaches, or stakeholders.

> So to introduce you to the sociological imagination through helping you reflect upon the way your everyday life is organised from work experience to leisure to your home life and your university. So use the sociological concepts to interpret the transition to university. This notion that they're taken for granted, that we act in a certain way because it's natural and everyone does that, so to pull that apart and to show there are different ways of doing it. So you've got to raise awareness of the different perspectives and theories that help us explain life and then because it is an introductory course I've got to think of my colleagues. (Brendan, ENVS4/L1)

Skills.

All participants identified learning outcomes related to developing students' skills. Common skills were reported that could be grouped as follows: disciplinary thinking and problem solving; critical thinking; research, communication, teamwork; and learning and reflecting skills. Skills were typically described in relation to discipline based knowledge domains, and so the focus was on students demonstrating that they

could use knowledge for thinking, solving problems, communicating, etc. as relevant to their discipline.

Physics courses emphasised skills for disciplinary problem solving. In professional courses, such as Elaine's law course, there was a focus on disciplinary skills, which were developed in real world contexts.

> [What was I] Trying to achieve? Trying to get them to be able to read a statute very closely and understand it. I'm trying to get them to be able to think strategically and to make an argument from a point of view. In other words, to advocate for a position. I'm also trying to get them to be able to think on their feet. And to be able to communicate about legal ideas, both orally and in writing. So all of those things are skills that I think this course should enhance. So, strategic thinking, it's also critical thinking, but really more strategic or advocacy thinking, than critical thinking in this course. (Elaine, LAWS4/L2)

Arts courses emphasised skills for critical thinking, reading and presenting arguments.

> One thing is for the students to realise that this kind of academic writing is not just presenting information, it's about presenting an argument, and this is what they had to do in their essays as well. ... I actually think that at the end of first semester if they've started thinking that things they think of as just ordinary and normal can actually be questioned, and if they can see that this kind of writing is a critical sort of sociological, anthropological, gender studies kind of writing, then I think that's a great thing. (Vanessa, ARTS3/L1)

Generic skills for communicating, writing and learning to learn were more common to arts, law and environmental sciences than physics, and were often the focus of introductory courses, while research skills were more common in final year courses.

Disciplinary ways of understanding.

Many participants also included learning outcomes that I categorised as developing disciplinary ways of understanding, which included how to approach problems and questions, understandings of professional and scholarly roles and attributes, and in some cases exploring their own values and behaviours.

In arts courses, these learning outcomes were expressed as ways of looking at the world and at knowledge, and included taking a critical stance towards knowledge, questioning and being reflexive.

> In a very broad sense what I want students to get is a sort of critical way of looking at the world, especially related to social structures like gender. … I just see it as developing skills and discussing key ideas in gender studies. But what that means for me is an ability to sort of step outside the social realm and look at it in a sort of critical and questioning way. And to do that you need certain skills in reading, like critical reading and you also need certain concepts. And so these are the concepts that I try and teach them. (Vanessa, ARTS3/L1)

Professional and applied courses, such as law and environmental sciences, also included attributes, values and roles as learning outcomes. Learning activities provided opportunities for exploring how values shape ways of framing problems.

> We've spent quite a lot of time working with people's world views and their values and we're trying to use a case example, which is where someone role plays a grazier and someone role plays a national parks and wildlife service, and someone role plays a back country hiker. We're just trying to get them to understand when they talk about 'the national park' they're actually talking about very different things, and want very different things out of it. (Paul, ENVS1/L2)

Developing an overview and interest in the discipline.

These learning outcomes were exclusive to physics and law participants, who identified a strong focus on inducting students into the discipline.

> I said that this is not going to be in the exam, this is to inspire you about going on to learn. This is the kind of stuff you can do if you go on to second or third year physics. I know none of you are intending to do that. But it was amazing how many people, after doing this course, actually decided to pick up some of the physics subjects. (Scott, PHYS2/L1)

4.4 Assessment Decisions for Achieving Educational Purposes

Although not one of the starting points for curriculum design, assessment was a major area of decision making that was emphasised by participants in their interviews. Nine participants, almost half of the study population, described using assessment to achieve their learning outcomes, because they perceived assessment as central to motivating or driving student learning.

Brendan, who was interviewed about two courses in sociology and environmental sciences, described both of them as 'assessment driven'. Course activities were aligned with assessment tasks to support students to do the task, including the theory presented in lectures, tutorial discussions, and 'just-in-time' workshops for research, writing and information literacy skills.

> I was constantly thinking of assessment. As you can see the reason why we bring in things like inequality is because we are going to be doing something on it here. Then the assessment is very much coordinated with the way that the actual lecture program is going. As you can see, we've got to put in lectures on essay writing. ... So it's not just 'this is sociology research methods' for the sake of it. I've brought that in at a time when their own experience requires them to think about that. They've got to think about how am I going to research for my essay and it's the same with the theory, bringing in theory, explaining the importance of theory when they're actually writing an essay. (Brendan, ENVS4/L1)

During the time period of this research, a standard course template was developed by the University, which required convenors to link assessment items with learning outcomes. Many of the participants, who had developed new courses, described the role of the template in their thinking about assessment.

> The Course Template is designed to ensure that course learning outcomes are linked with assessment. (Nigel, LAWS2/L2)

4.4.1 The assessment decision making sequence

Participants reported a range of decisions about assessment, which suggested a typical sequence of decisions described below, although not everyone included each step in the sequence.

- Selecting and structuring assessment tasks.
  The first stage of assessment decisions typically involved selecting individual assessment tasks and structuring and sequencing the tasks as a whole. Selection of tasks was purposeful and particular tasks were chosen to encourage and evaluate different kinds of learning processes and outcomes.
- Defining the task.
  The next set of decisions was concerned with defining the task, including topics and questions, guidelines for students, whether it was to be done as individuals or in groups, and in class or in students' own time. Differences in decisions

tended to reflect how prescriptive (teacher-defined) the task was, and how much choice was offered to students, mainly to define topics and questions.

- Communicating criteria and standards.
  For some participants only, the next step was communicating to students how their work would be appraised and marked.
- Giving formative feedback.
  Some participants designed processes for giving formative feedback as part of the assessment process. Their decisions typically focused on how feedback was given (e.g. written feedback vs individual consultations), rather than the process of appraisal.
- Marking and grading.
  Marking and grading were the final stage of the assessment process. Marking decisions emphasised how marks were allocated and the time and resources required. Grading decisions were about systems for distributing grades, and participants referred to criterion referencing, norm referencing and scaling of marks.

Participants were found to report different kinds of decisions in relation to each stage of the assessment decision making sequence. Their decisions suggested a continuum from teacher-defined to student-defined approaches, with a middle perspective involving teacher-student negotiation. Table 4.1 below shows the stages of assessment decision making and summarises the key approaches identified from the data along this continuum.

Table 4.1 The Assessment Decision Making Sequence

Assessment decision	Teacher-defined	Teacher-student negotiated		Student-defined
Selecting assessment tasks	Exams Tutorial participation	Essays/ Projects		Reflections
Structuring tasks	Summative Continuous	Formative/ Diagnostic		Aligned
Defining the task	Teacher-defined	Negotiated		Student choice
Communicating criteria & standards	No explicit criteria	Criteria/ marking rubrics		Negotiated criteria
Formative feedback	Model answers	Individual feedback & consultation		Peer feedback
Marking and grading	Norm referenced			Criterion referenced

The stages of decision making and nature of the different decisions at each stage are explored in detail below and examples are given to illustrate decisions, using participants' own words.

4.4.2 Selecting assessment tasks

Participants typically began assessment decisions by considering the type and range of tasks to achieve their intended learning outcomes. Most courses used a range of different kinds of assessment tasks. Only two courses used a singular form of assessment; with one using multiple regular short writing tasks and the other a major research project. Both of these courses had convenors who were comparatively inexperienced teachers, although experienced academics and researchers.

Some disciplinary differences in assessment practices emerged, with the main contrasts being the focus on writing and reflections in arts; projects, problem-solving and exams in sciences and some applied disciplines.

- Arts courses typically used essays, tutorial participation and reflections.
- Science courses used projects, tutorial participation, regular problem sheets, laboratory reports, and exams.
- Law, business and environmental sciences used research projects and/or essays, tutorial participation, and some courses in these disciplines used exams. Elaine included an exam in her compulsory law course, and in the business school an exam representing at least 50% of students' marks was an agreed assessment task for all courses.

The main types of assessment tasks and how participants express their intentions for selecting each are discussed below.

Exams.

Exams were used by eleven participants, mainly in the physical and environmental sciences, and in one course each in law, business, and arts/ languages. The main purposes expressed in both interviews and course documents for using exams were for students to demonstrate the sum of their learning achievements and for verifying students' individual performance.

Gloria's innovative biology course used an exam for students to demonstrate their individual learning. However, she believed that the design of the exam was critical for students to show their skills in applying and integrating knowledge, rather than memorisation.

> And I think the exam is an important part. That's where you can show me that you could put together what you learnt and not just bits and pieces that you can write at home, you can write with someone else. I don't know if it's your idea or someone else's. … I don't want to pressure them. But this is the real thing; this is where you can show. And it was fantastic. …. I feel it's important to set an exam where it might be really hard, but I can really see these skills, what level the student reached in these skills. I'm not interested in their memory, in a sense. I'm not really interested in putting an essay in and see how they could memorise the book. … Integrating knowledge, and that's why I like short answers because then I can really give them the real thing and see how they cope with it. So it has to be aligned, that's the main thing. (Gloria, INNO3/L3)

Tutorial participation.

Tutorial participation was an assessed component for almost every course, typically to encourage students' attendance, preparation and participation in discussion and learning activities. In some courses students were also nominated to facilitate tutorials, be discussion leaders or to make presentations of their essays and project reports, which served as both assessment and learning tasks.

> The second element is compulsory seminar participation and attendance and the seminar participation's worth 10 percent and it's in two components. The core of the learning takes place in the weekly two hour seminar class and at the beginning

of the semester; students are allocated a week in the first part of the semester and a week in the second part of the semester when they are a discussion leader in seminars. In each seminar class there are set problems and when you're a discussion leader, you can expect to be called upon by name, by your seminar convenor, to answer questions and lead discussion. So, there are a number of learning outcomes there we're seeking to encourage or develop, good oral communication skills, but we're also getting students to actively engage in their seminar work and we ensure that all seminars are lively because there are always students who know that they will have to talk and even when a student is not a discussion leader for a particular week, I think it's very useful for them to see their peers responding to questions. I think there's a lot of learning that takes in seeing other students participating in class in that way. (Sarah, LAWS1/L1)

In physics, tutorials typically involved problem solving based on problem sheets and sets that were intended to encourage engagement with the course, and were often homework activities for assessment.

I had problem sets each week which were assessable in a very broad way. So, if they basically did the problem set, then I would give them 100 percent, you know, and made a reasonable attempt. I just wanted them to keep them engaged with the material, see if they understood things and then we could discuss these in the tutorials. So, that was my motivation there. (Adam, PHYS1/Hons)

Essays and regular writing tasks.

Half of the participants used essays and writing tasks, primarily to develop students' skills in writing, analysing and constructing arguments, and research. Most arts courses included essays, where they were a traditional form of assessment. Participants identified the key goals of an arts degree as learning how to read and how to understand and construct an argument, which are skills that are demonstrated through writing.

Because I think that is the most important thing that they have to be able to do actually in an Arts Degree is to read, and to be able to identify and express an argument, and to write concisely. It's about being focused on the main argument and being able to identify that. So yes these are just skills that I think are important. (Vanessa, ARTS3/L1)

Essays performed similar purposes in law and environmental sciences to those described for arts courses. Students were intended to demonstrate their understanding of

course content, develop research and writing skills, and explore issues in their social and political contexts.

Rose and Scott also used research essays in physics to play a broadening role for students to explore their interests beyond the taught course content.

> The last thing was 20 percent of their assessment was based on a kind of literature research assignment, which I called a theme essay, but essay appears to have a very constrained meaning to a lot of students in this country, that they think an essay must be arguing something. My main idea with it was to give them the opportunity to find something that they then questioned in themselves, and so, you know, a lot of the students like astrophysics so there's lots and lots of nuclear astrophysics and particle astrophysics, which I wasn't going to cover. (Rose, PHYS3/L3)

Projects.

Fourteen participants teaching science, law and business described their assessment tasks as projects. Projects typically involved larger tasks than essays, where students were self-directed in choosing topics and doing their own research, and many required group work. Their intended learning outcomes were expressed as integrating knowledge and skills and solving real world problems, rather than developing an argument.

> For the assignment students have to design a monitoring program and consider other factors, and it was a problem that didn't have a neat solution. I gave them an impossible task that the amount of money that they were given as a budget. So, in this case, it was design a computer program to monitor different problems. I said you've got this much money, maybe three-quarters of what they really needed, so they had to compromise to come up with more innovative solutions to the particular problems. Real world problems. (Ryan, ENVS2/L3)

Thomas used a project assignment in his arts/languages course. Students worked in groups to develop a radio program, which provided a complex task for students to use and demonstrate language, research, team and production skills.

> They have to use all these [lectures] as exemplars and create a radio program and in that, they are planning, writing and performing in Spanish. And so they are using another part of the use of the language, which is to work in a group,

organise the work of the group to create collectively something that will be performed in front of the class. (Thomas, ARTS4/L3)

Reflections.

Reflections were used by four participants teaching arts, law and environmental sciences. The key intended learning outcomes were to develop students' abilities for critical thinking, for learning to learn by understanding more about their learning approaches, and for making connections about subject matter within and across courses.

In arts, Brendan and Vanessa both used a final reflective essay for students to review their learning, and to express it in their own words, rather than in the scholarly language of the literature required in a typical research essay.

> The last piece of assessment is another 2000-word essay, but rather than it being a research essay it's a synoptic essay. It's a way of looking back at the entire course. I give them a quote or a question and they have got to do the whole thing again. They don't have to do any research for this. Their universe of discourse is all of the course material, so they only need to use the course material, but it's their opportunity to take the feedback that we've given them in the research essay … and see if they can actually improve. So I think an important part of assessment has got to be reflection and redoing, or else what is the point; they just move on. (Brendan, ENVS4/L1)

Tony made reflection central to the curriculum in both his environmental sciences course in his specialist subject area, and his innovative cross-disciplinary course. His aim was to encourage students to integrate their learning and to develop their abilities for learning to learn. Tony also recognised the need to develop students' capacities to do reflections.

> The reflective learning portfolio is the key assessment item for the course. The portfolio encourages students to reflect on the interconnections between different parts of the course and on what they have learnt from their peers in the tutorial discussions and the briefing sessions. Because it is new for many students, I spend a lot of time modelling reflective practice in the course by summing up at the end of each panel discussion on what I might write in a learning portfolio about that panel. I also encourage students to read the examples on my webpage of learning portfolios from other courses that I teach. Students are also involved in creating the criteria for marking learning portfolios. (Tony, INNO4/L3)

4.4.3 Structuring assessment tasks

Some participants described their assessment as a sequence of tasks with different purposes for student learning. The following range of purposes were reported:

- summative assessment tasks for students to demonstrate achievement,
- a series of regular tasks to foster students' continuous engagement in learning,
- diagnostic or formative tasks to provide feedback to students on their performance, and guide them to undertake tasks, and
- tasks that were aligned with teaching and learning activities to develop students' knowledge and skills to do the assessment.

Decisions about the number of assessment tasks and using diagnostic and formative tasks for giving feedback also involved considerations about student numbers and staff resources available for marking.

The different approaches to structuring assessment are explored below.

Summative tasks for verifying performance.

Exams and some assignments were described in terms consistent with summative assessment, as final tasks at the end of teaching period for students to show what they had achieved. Most exams were described as one part of an overall linked assessment structure, where the exam was based on questions and tasks that students had previously encountered.

Mathew, who was teaching a business course defined as innovative because of his use of educational technologies, was required by his department to have an exam worth 50% of the overall marks. He described his philosophy for the exam as a showcase which allowed students to demonstrate their learning in familiar tasks.

> The motivation for the exam was complying with keeping my subject in line with everyone else. Once I had the exam in there, then I said well, what can I do with it? And it was a showcase. … The aim was to make certain that when they sat in the final exam, they knew what they were up against. The tone of the questions that were in there, which they had marked and received feedback on before they went to the exam, that style of question was the style of question on the paper. (Matthew, INNO2 L2)

Continuous assessment for engagement.

Regular, mostly weekly, tasks were intended to create continuous learning engagement and for students to practice writing and problem-solving skills. These assessment tasks were often repetitive, prescriptive tasks. Most physics courses used weekly problems sheets to familiarise students with physics problem-solving. In an arts course, Phillip used a weekly writing task to develop focused writing skills, which was one of his core learning outcomes.

> So, I said these students are going to write eight 500 word essays for me and they're going to develop their advanced literacy in two ways. … I would ask them to answer a question about a particular article that I'd set … and then write a good 500 word essay. One of the things that the students said was difficult for them was to learn to keep themselves within 500 words. I wanted to be strict about that. I said to them one of the aims of the course is to teach you how to write concisely because it's just a basic skill that you should have, and some of the students took a couple of weeks to realise I was very serious about that. … So, it was a very prescriptive exercise, but it had variety in it. (Phillip, ARTS5/L2)

Diagnostic and formative tasks for feedback on learning.

Some participants included diagnostic and formative tasks, because their experiences showed that students required guidance and support to do the task well. These tasks were common for essay assignments in first year courses, where participants recognised the need to build students' knowledge and skills for writing, developing arguments, and doing research. They were less common in the design of project assignments.

> And I have also decided to do an essay plan because I was constantly getting disappointed in their essays and realising that writing an essay is a hard thing it's not a basic thing, even if it's a short essay. … So they had to write the plan, the topic, the thesis, what the argument is, … and it was worth 15 per cent. And do you know what? It worked, like their essays were better. It was so gratifying, and I couldn't have done it if I hadn't had the tutors marking the essay plan really quickly, so that they had a lot of time between getting the essay plan back to do their essay. And yes, the essays were much better, partly because they were forced to start them earlier. (Vanessa, ARTS3/L1)

Tasks aligned with teaching and learning activities.

Some assessment schemes were designed to align tasks with teaching and learning activities, in order to better support students to do them.

A few participants described a continuum between learning and assessment activities. Reflective journals were one example, where students were encouraged to regularly review their changing understandings and their development of thinking and learning skills. Sameer's innovative course in literature involved a weekly package of activities that were both learning and assessment tasks. These tasks included both formative purposes, for keeping students engaged and providing feedback, and summative purposes of contributing to their marks.

> So the [course web] page was organised around the concept of weekly packages. … We're trying to integrate - like normally you split it into lectures and tutorials. I don't like all these ways of splitting things. I don't like to split the activity from the assessment, and I don't like to split formative from summative either. For me it's all one integrated thing. But when you try to do all these things, you've got to present it in a way that actually works. … So for us, the weekly package seemed the best way of organising it. … So I just think that the assessment that gives you the feedback should be the same as the assessment that you're judged on whether you've achieved a certain knowledge standard. (Sameer, INNO1/L2)

4.4.4 Defining the assessment task

All participants defined assessment tasks and provided students with descriptions of what was required in the course outline. The course outline was a University requirement for defining and communicating assessment requirements and weightings to students. The course webpage also was a place where participants communicated task requirements and provided resources, such as readings. The ways in which tasks were defined varied between courses and differences were identified in the extent to which they were teacher defined, negotiated, or student defined. Tasks that were teacher defined were often highly prescriptive and included exams, and Phillip's regular writing tasks described in section 4.4.3. For essays and projects, students were typically given choice and control over some elements of the tasks. A few participants developed assessment where students negotiated topics and assessment plans.

Student choice and negotiated tasks.

The most common approach was for participants to allow students' choice over the topic for essays and projects, either within the set topics or by negotiating their own topic, if they wished. The main aim was to enhance students' motivation by allowing them to explore their own interests.

> Well, my approach is to get the assessment to do two things. One is that the students have been reading and thinking and learning, but also that they get to apply those notions to something they find interesting or challenging or they think they need to know about, and to do it in a critical fashion. (Andrew, ENVS3/L3)

Some participants designed projects and essays for students to develop their own topic and provided supervision or mentoring to support them. Their aims included developing students' self-directed learning and research skills.

> So students had to come and see me with their topic. It was a bit like supervising Honours students. Come and see me with your proposed topic so we can work out whether it's doable or not. Sometimes it's too narrow, sometimes it's way too wide, sometimes it's really obvious, and all that kind of stuff. And then I scheduled appointments for students to come and talk to me, sometimes once, sometimes several times, about early drafts of their paper, and then about final drafts. (Ian, LAWS3/L2)

4.4.5 Communicating assessment criteria and standards

Five participants described setting and communicating assessment criteria to guide students to do the task and for appraising their performance, which included using marking rubrics. The other participants didn't identify this step in their assessment decision making, and provided no explicit criteria to students.

Marking criteria and rubrics.

Three participants described marking criteria that they communicated to students to make the requirements for assessment tasks clear. Vanessa developed a marking rubric to communicate marking criteria to students and to guide them to do the task. The rubric made marking easier, and was returned to students with feedback.

> The first paper is to write a reading report on one of the following texts. So in your report you should say what is the main argument, what are the main points or conclusions, what concepts and what's your opinion or the major accomplishment. And again that's about getting them to learn how to read. And I do actually give

them a hand. There's a proper rubric and everything, like I said I actually put separate stuff up on the web so I give them more details of how to do it and there's marking criteria. … I think they get a lot of useful feedback … they're usually hugely anxious around this assessment so I find it's good that it's something that's quite specific and quite directed. (Vanessa, ARTS3/L1)

Negotiated criteria.

In three courses students were able to negotiate the criteria and weighting of the marks for their project assessment. This approach was used in two of the innovative courses and a law course with a student defined project. Negotiating criteria was seen as an opportunity for students to understand the assessment process and standards.

The only thing that is a bit traditional is the project, which we assess it in the end. But really, you came up with your selection criteria and I think I'm teaching you something by doing that. That selection criteria are valuable. You realise that when you mark essays, everyone has different criteria, and we're teaching you that skill as well. You understand a bit about how it works and I think shattering some of the ideas that lecturers have all this knowledge we're giving you. (Sameer, INNO1/L2)

4.4.6 Giving formative feedback

Most participants reported that they gave students feedback on their assessments. Different approaches were identified along a continuum from teacher-centred approaches where the participant gave collective feedback in the form of their own model answers, to individualised feedback and consultations, and student-centred approaches, involving self and peer marking. Some assessment designs integrated diagnostic and formative feedback components.

Model answers.

Four participants described giving collective feedback, which included model answers and templates. Phillip gave students little individual feedback on his prescriptive writing tasks, but provided his own model answers to show them what he was looking for.

I'd mark all the assignments in one day and I wrote very minimal comments on each essay. I would just give them a mark, but what I would do would be to put a general comment on the way the assignments had been done on [the LMS] and some times that general comment took the form of me writing what I thought was my own good answer. So, I tried to make myself a model so sometimes I did that,

other times I just said, these are the points that I expected you to cover and these are the points that people covered well and these are the points that people ignored or didn't cover well. (Phillip, ARTS5/L2)

Individualised feedback and consultations.

Half the participants provided individual feedback on students' assessments. In the few courses that used marking criteria and rubrics, these were also were used to provide feedback to students.

Brendan included individual consultations in both his courses to create a personal relationship with students and to better understand their learning needs.

> It's an opportunity for them to chat about how it feels where they've gone during the course; I can let them know how I think they're going in tutes and all of that. They'll get their essay mark back, I can tell them how I think they're going in their tutes; find out more about what they're really interested in and so that's what it's all about. … Rather than just putting it in a box and getting the students to come if you know that you're actually going to have to justify your mark to students you actually have to think an awful lot more about their essays. So I'm always - as I'm marking essays - trying to think of three positive things which I can find in the essay that allowed them to reach the mark that they got, whether it's a pass or a high distinction. And then also three things which they could do to actually improve their essay writing. (Brendan, ARTS1/L2)

In physics, Brian and Edward used an automated online assessment program with multiple choice questions. Students were allowed multiple attempts at questions and the program gave them instant feedback on their answers. Their approach was based on mastery learning, and aimed to give students control over doing the assessment, and the opportunity to learn from their mistakes.

> I claim that that's actually the major advantage of online systems that the student knows where they're at while they're doing it. And the way that we do it is the students are allowed several attempts at the problem. So if they get it wrong the first time, then and there they know that it's wrong, and they have the option to resubmit. That is, hopefully while they're there and engaged and thinking about it they have the opportunity to have another go, and often we give them three to five goes. So we give them a set of problems often where the objective is simply for them to get it right. (Brian, PHYS4/L1)

Peer feedback.

Peer feedback was used in two innovative courses to develop students' understanding of the assessment criteria and their engagement with the learning tasks in online and face-to-face forums. Peer assessment and feedback helped to reduce marking loads for participants, and Sameer believed that the public nature of the process encouraged student motivation and self-regulation.

> One of the self-regulating mechanisms, I think, is that each person is forced to give feedback on three other people's things each week. So you find that when students post good stories, automatically people respond to them. And students are not shy, because we set up the environment that if you post a lousy story, or you don't do your work for that week, or you have a terrible mind map - there's a lot of peer pressure because people will say, 'This doesn't work, I don't understand what you're doing. Can you change it around this way? Can you do it that way?' People will self-regulate a little bit. (Sameer, INNO1/L2)

4.4.7 Marking and grading

Half of the participants described how they allocated and distributed marks to students along a grade distribution. However, five of these participants, from across disciplines, described their dislike of 'the bell curve' and standardising results. They preferred to use criterion referenced assessment, but believed that standardising results was a faculty requirement.

> There are also the institutional problems associated with all that. The idea of normalising is very strong in science, this came from the Dean initially; and the idea is that as a base assumption students can't do better or worse in one course than they do in another course, which to me sort of undermines the whole idea of innovation and pedagogy in education because if that's true, then why bother? I suppose a positive way of looking at it is that every course should be up at the same level. But that's just not true, for all sorts of reasons. One year a particular course might just go badly for any number of reasons. Maybe the particular lecturer in that course isn't concerned with teaching well, as that happens. Whereas in another course, like our one, you might have people who are enthusiastic and engaged and knowledgeable and so on, and yet there is no possibility of that actually being reflected in the marks. (Brian, PHYS4/L1)

Other issues reported in relation to marking were about the resources required for marking and feedback in courses with large student numbers. An important consideration in setting the number of assessments and formative assessments was the time and human resources required for marking.

> Of course, another factor is resources. In [this course], there is a lot of marking because it's a first year course, and we have always committed ourselves to an assessment scheme that has a number of small components in it. It's not a 100 percent exam subject. It couldn't be if we were to achieve our learning goals for the students. So, there are a number of assessment items, each designed for students to develop particular skills, and given the nature of the course, we want to provide students with fairly extensive feedback on that, more extensive than they would get in later year law courses. So, there's a big commitment in marking, and that's a human resource issue. (Sarah, LAWS1/L1)

In two courses, automated online systems reduced the human marking requirements. As described the previous section on feedback, Brian and Edward used a Mastery Learning approach in their physics course and an online system that provided automated marking and feedback. However, they recognised that this approach imposed limitations on the kinds of tasks and skills that would be assessed.

Sameer's innovative literature course used a different kind of automated marking scheme. Students were automatically allocated marks for completing weekly tasks, based on an honour system that was moderated by peer review.

> There are three general tracks, which is what I think of as the reflection every week that they did, the feedback that they offered other students each week and the overall project at the end. And then tying the whole thing together is the point system and the honour code system, which sets up very clear expectations right at the start. And the way we automated the points system and everything was such that we didn't have to go and tick and mark lots of stuff. It automatically did it every week. (Sameer, INNO1/L2)

4.5 Decisions about Teaching and Learning Activities

Decisions about teaching and learning activities began from considering the settings where teaching and learning interactions took place. Most participants used a combination of lecture and tutorial settings, except for some specialist courses where

student numbers were small and weekly seminars were held with sessions of up to three hours. These seminars combined the features of both lectures and tutorials, and so are not reported separately. Only Ryan used a different course structure, which involved an intensive teaching format over a two week block. His teaching and learning activities were structured on a daily basis as a combination of lectures in the mornings, and practical activities undertaken in the field and in class workshops in the afternoons. Ryan was in a research-only position, and felt he could not commit to teaching a course that ran over a semester. His course design showed that different approaches were possible, although most participants did not consider them.

The next stage of decision making was about the activities that participants undertook *within* each of the different settings for teaching and learning interactions. There is no agreed terminology in the literature for describing these different levels of decision making about teaching and learning, and teaching and learning activities and methods are used to describe both the generic settings for teaching and learning interactions, such as lectures and tutorials, as well as what teachers and students do within them. This is probably because traditionally a lecture described the setting and the activity, however this study found a diversity of activities within settings. Hence to distinguish between these different levels of decision making about teaching and learning, I have used the following terminology:

- *Teaching and learning settings* is used to describe the contexts for teaching and learning interactions, including virtual settings;
- *Teaching and learning activities* is used to describe what participants do *within* each of the teaching and learning settings.

Participants identified the following range of teaching and learning settings:

- Lectures or seminars;
- Tutorials;
- Discipline specific settings, such as laboratories and field trips, which may be regular or one-off;
- Educational technologies, which included platforms for disseminating course materials and for virtual teaching and learning; and
- Private study, with the focus on the activities that teachers set for students to undertake in preparation for their participation in other teaching and learning settings.

Participants' decisions about teaching and learning settings were largely predetermined, following the standard model used in each discipline or department, with the settings used taken for granted, and only the only decision by some participants was to consider the number of hours they allocated to each of the settings,.

Teaching and learning activities – Participants described a broad range of teaching and learning activities, including presenting information, narrative story-telling, demonstrations, case studies, role plays, problem solving, discussion and student self-directed learning. The teaching and learning activities were grouped into categories that reflect the intentions underlying participants' decisions, as follows:

- Presenting and structuring course content;
- Providing real world experiences;
- Facilitating active and interactive learning.

These categories represented an overlapping continuum of activities, where participants who used subsequent activities may also use previous ones. For example, active learning may include providing real world experiences, which may be accompanied by presenting course content.

This section explores participants' decisions about teaching and learning in terms of the activities they undertake *within* each of the different teaching and learning settings, and how they describe the nature and purpose of the activities. In Chapter 5, I will explore how participants' beliefs about teaching and learning shape their decisions *across* teaching and learning settings.

4.5.1 Lectures and seminars

Lectures and seminars are grouped together because participants reported a similar range of teaching activities in both settings including presenting course content, however, seminars typically involved smaller groups and more active learning experiences than did lectures. Participants reported using the full range of teaching and learning activities reported above, which are explored below in more detail.

Presenting and structuring course content.

Most participants used lectures and seminars as settings for presenting course content to students. Their decisions were described in terms of the topics they selected and the style and design of their presentation, for example use of PowerPoint slides.

Three participants described their teaching activities as primarily transmitting information, which was explained as both a preferred approach to teaching and learning, and as a pragmatic solution for dealing with students with diverse knowledge backgrounds.

> I tried to give them a dense injection of hard information on a core topic each week, and they could listen to it either live or on the learning management system (LMS), and they could also read the text on the LMS. (Phillip, ARTS5/L2)

Another four participants also used lectures to present content, however their aim was to provide students with a structure for understanding the course content and its broader disciplinary and contextual relationships. They expressed their intentions in the following ways:

- to identify core knowledge and concepts in the course;
- to provide students with a framework for understanding knowledge in the field; and
- to help student link and contextualise knowledge within the course and broader contexts.

> I think, particularly in this course, that I see the purpose of lectures as being to provide a framework and some direction for what's an enormous body of stuff. That if I was to say to the students, 'Okay, go away and learn about nuclear and particle physics,' they wouldn't know where to start.… I have got that experience and that body of knowledge and have spent a lot of time reading. (Rose, PHYS3/L3)

Providing real world experiences.

Seven participants used real world examples and demonstrations in their lectures to make them interesting, engaging and relevant for students. Their approaches ranged from content presentation to experiential learning, and included narrative story-telling, inviting guest lecturers to discuss their experiences of research and practice, making connections to students' everyday experiences, and practical demonstrations. In

Brendan's social sciences course, topics and concepts were explicitly linked to students' lived experiences.

> So I explained to them that time is not uniform; we don't experience time in a uniform manner, depending upon what we are doing and where we're doing it and who we are with. Time is actually socially constructed and psychologically constructed. And I also point out to them using some examples of how time has changed throughout history. Our concept of time and our use of watches are very different compared now to what it would have been in medieval times. So I begin to make them think that, okay, what I am really doing is, I am taking something which people think is natural, time, and actually showing they're socially constructed, and then showing them that they're going to have to deal with this in this new social environment of a university. They love that lecture. If there is one lecture I give that really makes students think and really takes their mind and puts it in another place, it's this lecture on time. (Brendan, ENVS4/L1)

Adam used real world problems and demonstrations in his physics lectures to make the course content relevant and interesting to students. Demonstrations were also intended to help students to visualise course concepts.

> So, my course design was to bring in real world problems. The specific problems, I would usually just come up with as I'm preparing the lecture… My goals when I was doing this were: one, is to actually show [concepts] in action, so they'd have something to pin their idea on. Two, to actually show that it's founded in reality, the very simple things, you know, this stuff is actually important. And thirdly, it just makes it interesting, it breaks up the lecture, allows them to have some fun. (Adam, PHYS1/Hons)

Facilitating active and interactive learning.

Nine participants reported that they designed activities to foster active and interactive learning in their lectures. Activities included students responding to and posing questions, problem solving, and using clickers for concept testing. Some participants described using an interactive lecture presentation where students were encouraged to ask and respond to questions; others used active learning more extensively. Vanessa introduced activities in her lectures that included surveys and questions to engage students and to encourage them to explore their preconceptions about topics. She described this as a major change from her former approach that focused on presenting concepts and theory.

So I really tried to make the lectures more interactive, have discussion things structured in there, and being a bit less anxious about giving them big slabs of theory and stuff. I do think that's just partly experience as a teacher and confidence. … Like in my first lecture I did this thing where I basically asked them to … write down, 'If I were the opposite gender I could…' 'If I were the opposite gender I couldn't…' And they write down their answer on these cards and then I collect the cards. And my tutor and I looked at them and … they really were quite interesting. We had like 20 minutes feeding back to class what they'd said, and there were actually a lot of really important themes… (Vanessa, ARTS3/L1)

Peer instruction was adopted as a novel approach in two physics courses, involving three of the participants. Scott adopted peer instruction in a limited way to make his lectures more interactive. Brian and Edward developed a full implementation of peer instruction, informed by their engagement with other physics educators using the approach and the educational literature. Students were asked to pre-read course materials prior to lectures, which then allowed a shift in the focus of the lectures to collaborative problem solving and conceptual testing, rather than content transmission. Students' conceptual understandings were regularly tested in lectures by asking them to respond to multiple choice questions using clickers, which were called 'clicker questions'.

Well the first lecture was explaining what we were going to do and why we're going to do it, which all worked pretty well, I think. I mean, I think the students understood, and it was actually quite a popular method. What we'd then do is have sort of 20 minutes of clicker questions, then 10 minutes in the middle as a break when us, or a guest speaker, would talk about something, then another bunch of clicker questions. So the idea was that the discussion between the students would be what would drive things, rather than us talking. (Edward, PHYS4/L1)

4.5.2 Tutorials

All participants described tutorials as a setting for small group learning, with activities that encouraged active and interactive learning, including peer teaching and real world experiences, such as role plays. Typically, participants' intentions for tutorials were to help students to discuss ideas and theories, make sense of knowledge, and practise skills. Four participants described tutorials as 'the place where learning happens'.

Small group tutorials are central to the course, because this is where learning happens. Tutorials are for students to engage deeply in the topic, and to teach your peers, and to learn from your peers. I believe that the best way to test what you learn is to teach others. (Tony, INNO4/L3)

Providing real world experiences.

Seven participants used tutorials for role plays and case studies in a small group environment. Role plays and case-studies provided real world and active learning experiences, where students applied knowledge, explored issues from alternative perspectives, and practised professional roles and skills. They were mainly used in law and environmental sciences courses, where the course goals were to prepare students for real world professional contexts and tasks.

We need an approach that puts the students in the shoes of a lawyer and into the courtroom so that you can understand when we talk about facts, what are we talking about? When we talk about evidence, and about testimony, what does that mean? And so I tried to give them a lot of context for understanding the rules and I also wanted to give them a lot of opportunities to practise using the rules. So if you look at the tutorials, you'll see that they say something like, 'Take the role of the prosecutor and introduce this piece of evidence.' And so in the tutorial, they've got to come up with the questions and try to introduce a piece of evidence. (Elaine, LAWS4/L2)

Facilitating active and interactive learning.

Most courses in arts, law and social sciences used a tutorial setting for class discussion based on set readings, and in some cases provided students with reading guides and discussion questions. This was described as the traditional discussion-based tutorial. In these disciplines, tutorials were intended to encourage students to articulate their views about topics, and collectively explore their understandings with each other and the tutor.

So this year … they were just your traditional small group tutorials with discussion questions. … I think there's a danger for me with tutorials, thinking that just sitting around talking, it's so old hat, and you should have the students giving presentations and Wikis and all this kind of stuff. But actually for topics like this, looking at the readings, focusing on questions, looking at what people don't understand, what they do understand, with a good tutor and a good group of students that you have built some rapport with, really I don't think you can beat it,

and the students like it. So yes, I'm a fan of the traditional discussion-based tutorial. (Vanessa, ARTS3/L1)

In sciences, tutorials typically involved students collaboratively working on problems, and sometimes project assessment tasks. Several physics participants described using this approach because it was familiar to students and how they expected to learn in physics.

> The tutorials were also group-based, and they still are because we strongly believe in that group perspective. They were a smaller group [than lectures] so we typically capped them at 15 students. Usually they're given a problem to solve, and the idea is that they work together on that problem, and that was probably the most continuous part of the course before Edward and I came in, because they were actually already doing that before. And there's sort of a lot of experience within the department of how to make that work. (Brian, PHYS4/L1)

4.5.3 Discipline specific teaching and learning settings

Laboratories or practicals were used in all physics and biology courses in the study, and field work was described as a distinguishing feature of many of the environmental sciences courses. These settings were also intended to provide authentic real world experiences, where students applied knowledge and skills, and experienced professional roles and tasks. Rose described a transformative experience while designing the curriculum, where she re-imagined laboratories as role plays where students could experience their future roles as scientists.

> One of the things I did with the labs was try and give them context. I had this moment of epiphany where I realised, 'All undergraduate lab is role play.' This is where the students come in and they role play what a scientist would do. ... A real scientist in their scientific daily life does not spend their time sitting, listening to somebody drone on. They do not spend their time doing textbook problems. But they may actually spend their time in the lab making measurements, trying to diagnose faults, all of these things. So the lab environment is possibly the only place in the undergraduate program where students are doing what they might do in the future. (Rose, PHYS3/L3)

4.5.4 Educational technologies

In this study, some participants used educational technologies combined with face-to-face teaching, but no courses were taught fully online. Seven participants described

using the University's Learning Management System (LMS), mainly for providing students with access to course guides and documents, readings, notes and PowerPoint presentations. Some also used the discussion forum tool on the LMS, both for communicating instructions to students and for engaging them in discussions.

Four courses used educational technologies more extensively, using online collaborative learning tools such as wikis and blogs to foster student discussion, peer review and reflections on learning. For his languages course, Thomas used a range of educational technologies to enhance students learning and provide flexible access to learning resources. He sought a grant to provide students with iPods, and uploaded the course materials to give them a mobile language database that they could access wherever they chose. He also used a range of online collaborative learning tools. Students kept blogs, where they interacted and posted peer reviews of each other's work. Students also used a range of technologies to produce a radio program in Spanish, which required them to work in groups and communicate in Spanish. Thomas used these technologies to create an immersion learning environment, which underpinned his approach to language teaching.

> Immersion means, when you go to a country you are immersed in the language; you cannot escape from using the language. The idea here is to immerse students in the language through technology, and the key element of that is the use of iPods … which are a database of radio programs. So they have to immerse in the language to get the content. … And the second issue was how they were going to present on their topic of choice. Initially it was simply a tutorial in which they would present to the class. This evolved into a blog, and the blog allows you to link video into it. They have to make a comment on the blog and they have to present at least two comments for assessment. So the interactivity of the blog allows you to require more from them, so they have to interact in this environment in writing. So they interact orally, but they also have to interact in writing. (Thomas, ARTS4/L3)

Matthew's business course also engaged students with a range of internet technologies, such as blogs & twitter, which were real world applications used by internet marketers. These technologies underpinned the experiential learning approach of the course, in which students used and critiqued the tools that they were learning about for their future practice.

I wasn't satisfied that I was making the best use of technology. The first year I taught this, I had a standard two hour lecture and one hour tutorial, and I admit that I got to the end of the semester and thought, why on earth did I have people sitting around talking to me in a tutorial room about internet marketing? What was I thinking? So, that design went out. The second year I thought, well what I'll do is, I'll push people to the technology and I'll make extensive use of the [LMS]. So, I was the sole tutor/lecturer for the subject. I removed the tutorial face to face component and replaced it with an online web based forum that became the tutorial. (Matthew, INNO2/L2)

4.5.5 Private study

The final teaching and learning setting reported is private study. Twelve participants reported that they set learning activities for students to undertake in their own time, and to prepare for tutorials and lectures. Course readings in preparation for tutorial discussions were an expectation in many courses. Problem sheets were used in most science courses and had a similar function to readings in arts, with students working on them prior to and during tutorials. Readings were usually provided as a printed resource and/or made available on the LMS. Reading the textbook prior to lectures was an essential element of the peer instruction approach used by Brian & Edward in physics.

The concept is that students study the material in the text before they come to lectures, and it's all pre-assigned so that they know what they have to do. Then in the classroom we ask them questions about it, and when we discover that there's something they don't understand, then we will stop and deal with that on an ad hoc basis. (Brian, PHYS4/L1)

However their experience was that not all students did the readings, which was a problem, and so lectures converted to a balance between presenting content and concept checking.

4.6 Evaluation for Quality Assurance or Continuous Improvement

As noted in section 4.1, evaluation was usually considered as the final stage of curriculum decision making. All participants used some form of evaluation in their courses, with the most common being the standardised University surveys for student evaluation of teaching (SET) at the end of the teaching period. However, many participants reported using a range of formal and informal evaluation methods, with the most common being:

- university SET surveys;

- informal student discussions;

- customised surveys, including minute papers;

- observations and reflections on teaching;

- feedback from class representatives;

- peer review; and

- student performance on assessment.

University SET surveys were frequently combined with informal student discussions, and participants' own observations and reflections on their teaching. Class representatives were a formal process in the Faculty of Science, which provided a point of contact for students to give their feedback in each course, and all class representatives met with the head of school at mid-semester. Other evaluation methods were reported by one or two participants only, and included an external evaluator, focus groups, regular feedback from tutors, investigating students' longer term outcomes, such as their subsequent subject and program choices, and their feedback ten years after graduating. Many participants described their purpose as being to find out 'what's working, and what's not working'. This encompassed problem solving about the curriculum by getting immediate feedback on students' responses to topics, readings, guest lecturers, teaching methods etc. Other purposes included continuous improvement of the curriculum by getting feedback on students' learning and on the quality of teaching and course design.

Brian, who described having an evidence-based approach to evaluating student learning in his physics course, reflected on the potential conflicts in evaluation between measuring student enjoyment vs their learning. He believed that learning that involved conceptual change was often challenging and unsettling for learners, so their experiences were not necessarily enjoyable.

> It's tough because it's nice to make students feel happy and think they've learnt something. And that's in my experience not too hard, and was certainly much easier than actually helping students to learn things. When students actually learn stuff it can be quite challenging or quite a negative experience. … It's relatively easy to learn how to keep people happy. It's much harder to figure out how to teach students to understand something deeply, and by doing that you might even

generate quite a negative feeling if we're struggling with concepts, and it's contradicting what you knew before and it's just really, really hard. I feel unhappy because we're struggling, and they feel unhappy because they're struggling, and we all go away and think oh my God, that's a disaster. But quite often in my experience, that was where the real learning happened. (Brian, PHYS4/L1)

How participants used different evaluation methods and expressed their intentions and purposes are explored further below.

4.6.1 SET surveys

Most participants reported that they used SET surveys as an end of course summative evaluation method. The focus of SET surveys is student satisfaction with their experiences of teaching. Phillip, who didn't teach courses regularly, used SET surveys and informal student discussion, and his comments suggest his intentions were primarily summative and to get feedback on his teaching, rather than student learning.

> I just used the standard [SET] questionnaire, and I was very keen to see the results and I was gratified by the results. I also devoted part of the last session to people telling me … what do you like about the course; what don't you like about the course? And again, the more talkative ones came up with answers to both questions and it was mostly about what they liked, and then after that discussion, I handed round the [SET] forms. (Phillip, ARTS5/L2)

Those who wanted information to improve their course design and teaching described the limitations of SET for this purpose, saying the most useful information was students' responses to open-ended questions.

4.6.2 Formative approaches

Eleven participants also used evaluation for formative and developmental purposes during the running of the course. The majority were informal methods, such as chats with students and their own teaching observations and reflections. More formal formative methods included mid-semester surveys in class or on-line, meetings with class representatives, and focus groups facilitated by an external evaluator. Their intentions for this type of evaluation was to identify 'what's working, what's not working', to respond to any immediate student concerns during the course, and for longer term planning and curriculum improvement.

> But I'm sort of always looking for what works, what doesn't work. And students that are not engaging, I sometimes approach them and say, 'Well this seems to be

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not engaging you, what's happening?' Usually there are simple explanations. Sometimes it's simply that they have reached the level of language in theory, … but they cannot cope with this or they are having another kind of problem somewhere. But usually I'm looking at what's happening and scanning for engagement. (Thomas, ARTS4/L3)

4.6.3 Integrated and evidence-based approaches

Four participants made evaluation integral to the course design and development, by regularly monitoring student satisfaction and learning effectiveness during the course. Student performance on assessment was seen as a key method for gauging students' understanding of course concepts and to guide teaching. Brian & Edward exemplified this approach during their implementation of peer instruction, and both described their approach as an evidence-based philosophy of teaching, learning and course design.

> In some lessons, we use assessment as evaluation. Are they learning the stuff? So it's not just driving learning, it's telling us what the issues are, so that you can follow it all in. Assessments, evaluations have been built into everything you're doing. I mean, in lectures they're using the clickers, that's instant feedback on how much the students know. (Edward, PHYS4/L1)

Tony reported that his environmental course focused on learning processes and a key learning outcome was for students to 'learn to learn'. For their final assessment task, students presented a structured reflection on what and how they had learned during the course. Hence, the final assessment task provided significant feedback from students on their perceptions of learning, which was also made visible in their presentations. This approach shows that assessment is a valuable resource for evaluating learning effectiveness.

> I guess [my approach] is fairly strongly student centred in that I'm interested in the impact it has on their learning. And I put in place a range of processes, like the ones I just described, to have a good feel for what impact it's having. So I guess, it's evaluation based, but through quite a broad suite of evaluation methods. And the most valuable I do find is just being part of the assessment process, particularly the one where the students have to give a five minute talk at the end of the course on what they've learnt. And I go to all those each year, so it's a fairly intense way to find out if the course has been effective. (Tony, ENVS4/L1)

4.6.4 Peer review

Five participants reported that they used peer review processes, which were mainly informal, for getting feedback on the quality of their teaching and aspects of course design such as the course website and resources.

> We did get some guest lecturers coming in to speak for our courses, and usually we give them all access to [course website] as well to have a look and see – to understand what the course structure is like before they come and guest lecture. So normally they turn up and they give us some feedback as well. (Sameer, INNO1/L2)

4.7 Exploring the Patterns and Variations in Curriculum Decision Making

The chapter examines curriculum decision making initially as a holistic process of selecting and sequencing curriculum elements, and then provides a detailed examination of the individual decisions made about each of the key curriculum elements.

Curriculum decision making was found to follow an iterative process of inter-related decisions as shown in the model developed in Figure 4.1. Participants described a predominantly common set of curriculum elements; however they began curriculum design from different starting points and followed different decision making pathways. Course content was the most common starting point for participants, learning outcomes was the next most common starting point, and lastly, teaching and learning activities. However, these decisions were inter-related and participants who began from course content and teaching and learning activities were typically guided by broad learning objectives about what they wanted students to achieve, rather than by explicit learning outcomes. Participants who explicitly defined learning outcomes described it as useful thinking process for clarifying their intentions for learning, for getting feedback from colleagues on their curriculum plans, and for deciding on assessment. Almost half of all participants stated that they aligned the curriculum elements, and hence just over half of the participants did not consciously align curriculum elements. Two common relationships were found between decisions about curriculum elements, which were that learning outcomes guided assessment design, and course content and teaching and learning activities were linked, because in most courses, content was organised around the weekly structure of lectures.

Describing the curriculum design process as an iterative web of decisions, distinguishes my model from the orderly linear and cyclical processes described for prescriptive curriculum models (Brady & Kennedy, 2010; Print, 1993). This study also identifies common starting points and common pathways defined by relationships between curriculum elements. This finding is also distinctive from many of the descriptive curriculum models, which suggest that teachers begin from any curriculum element and proceed in any order (Print, 1993). However, other descriptive curriculum studies have found that course content is a common starting point. For example, Stark (2000) found that almost 50% of teachers in her study began from course content, which she believed demonstrated their teaching focus on the discipline as a body of knowledge. Brady (1989, in Brady & Kennedy 2010) found that 87% of secondary school teachers began curriculum design from course content, however she notes that the study was undertaken before the emergence of OBE in Australia in the 1990's. My study also suggests that many higher education academics begin from course content because their priority concerns are about what they are teaching, however OBE models and constructive alignment appear to be encouraging a move towards beginning from learning outcomes. An interesting point is that this study suggests that there was not much difference in the final curricula developed from these different starting points. One suggested reason is that most participants are guided by broad learning objectives whatever their starting point, and the iterative design process means that these objectives are revisited to become progressively more specific learning outcomes that inform other decisions. Another reason is that the most common curriculum structure was based around the weekly schedule of lectures and tutorials, which encouraged participants to focus on course content and the topics required to fill the weekly schedule. More innovative approaches involved integrating topics using narrative themes that were relevant to students' lives, and inquiry or problem based structures relevant to professional and social problems. Differences in course structure are explored in more detail below.

This study provides a detailed picture of the range of decisions made about each of the curriculum elements, and explores patterns of variation in those decisions. Disciplinary differences were observed in how participants selected and structured course content. Arts participants selected topics based on their expertise, whereas for science participants, the structure of knowledge in the discipline provided the frameworks for organising course content. The more innovative course structures, described above,

based on narrative themes and inquiry or problem-based learning approach were developed by participants in social sciences and applied disciplines of law and environmental sciences. These findings suggest differences found between hard- soft and pure-applied disciplines (Neumann et al., 2002). Arts is associated with the horizontal and interpretive knowledge structures of a soft discipline, where teachers have some control over courses and the selection of subject matter to reflect their interests and expertise. In contrast, science represents a hard-pure discipline with hierarchical knowledge structures where courses and subject matter are sequenced to help students progressively develop and build on foundational knowledge. Applied disciplines are associated with knowledge that is contextualised, which in some cases led to problem- and inquiry-based course structures that favour application of knowledge and real world learning experiences. The use of these innovative approaches also suggested individual differences informed by participants' teaching philosophies.

Decisions about learning outcomes showed that most participants wanted students to demonstrate an understanding of course content and to develop higher order thinking skills. Thinking skills were found to be discipline related and courses in arts, sciences and law emphasised skills for critical thinking, problem solving and professional reasoning, respectively. Almost two-thirds of participants also reported learning outcomes that represented ways of understanding what it means to be an expert thinker or practitioner in their discipline. However as Ramsden (2003) notes many academics express learning goals that are not demonstrated in their teaching and assessment approaches, hence constructive alignment also provides principles for evaluating the quality of curriculum decisions in terms of whether they achieve the intended learning outcomes.

Assessment was a significant focus of participants' curriculum decisions, with most beginning from the selection of tasks based on their intended purposes for learning. The choice of assessment tasks suggests that participants were influenced by disciplinary norms and by their intended learning outcomes. Exams were common to disciplines other than the arts, and were used as one component of an assessment scheme. Participants typically emphasised knowledge focused learning outcomes for exams, and used them to verify student's individual learning. Essays or projects were used in courses across all disciplines and had similar goals for students to demonstrate their knowledge, and disciplinary thinking, problem solving and writing skills. Reflective

writing tasks were common to most arts courses and some of the applied disciplines, and were typically intended to develop students' self-understanding and skills for learning to learn. Hence, most courses in the study were using a range of assessment tasks that were appropriate for their intended learning outcomes, and demonstrated a balance between conceptual understanding, knowledge application and skills for reading, writing, presenting an argument, research, problem-solving, and learning.

Assessment schemes were often structured with formative components to support students to do the task, or as a series of tasks that progressively built on each other. A few participants described a continuum between learning and assessment tasks, which typically involved regular reflective tasks, such as learning journals. Assessment decisions also included defining and communicating the task requirements to students, setting performance criteria and standards, providing formative feedback, and marking and grading. These decisions were found to reflect a range of approaches that were categorised broadly as teacher-defined, teacher-student negotiated, or student defined; to capture who had control over decision making. The educational literature indicates that activities that encourage student ownership and participation in decision making enhance student motivation, are more effective for learning and for developing their understanding of the purposes and processes of assessment (Boud & Falchikov, 2006; Carless, 2007). The key area where students were given opportunities for input and control over assessment decisions was having choice over assessment topics in essays and projects. Only a small number of participants gave students more significant opportunities to engage with the assessment process and to have input, such as working with criteria and rubrics, defining and negotiating assessment criteria, consultations for individualised feedback, and peer marking and feedback activities. Only five participants or one-quarter of the study population used assessment criteria to help students to better understand academic expectations and how their work would be appraised. Three participants allowed students to negotiate criteria to help them better understand the assessment process. This study suggests that these practices were not common, and that students' understanding of criteria and standards was often assumed. Formative feedback is an important process for helping students to clarify what is good performance, and to gauge their own progress (Nicol & Macfarlane-Dick, 2006). Hence individualised feedback provides students with better quality information about their performance against criteria and how to improve, than the collective feedback used by some participants. Peer marking and feedback were used in two innovative courses to

develop students' skills in using and interpreting the assessment criteria and appraising others' work. Peer marking also develops students' capabilities to assess their own work, which is one of the principles of 'sustainable assessment' and is advocated as good practice for fostering life-long learning (Boud, 2000; Crisp, 2012).

Participants structured teaching and learning interactions in the settings and formats that were typical for their discipline at the University. Most participants expressed similar beliefs about the purposes of each teaching and learning setting, although they used different teaching and learning activities within them to achieve their purposes. Teaching and learning activities were grouped in categories to capture their conceptual differences as follows: (1) presenting and structuring information; (2) providing real world experiences, and (3) facilitating active and interactive learning. In general, lectures were seen as a setting where students acquired course content, and most participants used them for presenting content to some extent. All participants reported that teaching involved more than providing information, however presenting content was used as a pragmatic approach for ensuring that all students had exposure to common foundational knowledge. Almost half of the participants also used active learning strategies in lectures. Tutorials provided a small group setting, where all participants engaged students in active and interactive learning. Some participants described tutorials as the place where learning happens, because students interact in meaning making activities. Disciplinary differences were evident in the decisions participants made about learning activities in tutorials, and the skills they engaged. In arts and social sciences, students were typically engaged in discussion to help them make sense of lecture topics and course readings. The sciences and applied disciplines emphasised applying knowledge and problem solving, using mainly disciplinary problems in the former and real world problems in the latter.

The use of active learning approaches where students are developing the thinking, problem solving, and communication skills that define the intended learning outcomes demonstrates Biggs' (1999) principle of constructive alignment. Active learning approaches also have been found to encourage students to engage in deep approaches to learning, and to foster conceptual change (Prosser & Trigwell, 1999). The educational literature suggests that most academics have a teacher-centred content transmission approach to teaching (for example, Ramsden 2003, Prosser & Trigwell 1999), however, only three participants conceptualised their teaching predominantly in that way. Hence

the participants in this study appear to have better quality teaching and learning practices than is the norm, or they may represent a recent trend in higher education towards adopting active learning.

The University LMS was the most common educational technology used by participants, typically to allow students greater flexibility for accessing course materials. A small number of participants also used the LMS for students to interact and discuss, and for reflections and student peer review of assessment. These participants tended to be enthusiasts who embraced the potential for educational technologies to enhance teaching and learning, and described their battles with Information Technology (IT) departments and the technologies themselves to get them to work the way they wanted.

Course evaluation was typically reported as the final stage of curriculum decision making and considered separately to the core curriculum decisions. Most participants used a range of evaluation methods. Three common approaches were:

1) a summative standardised survey to evaluate students' experiences and satisfaction with the courses and teaching;

2) formative, with student discussions, surveys, and observations of teaching during the teaching period to explore what's working and not working in the course, with a view to immediate problem-solving and/or continuous curriculum improvement; and

3) evidence-based approaches, where the focus was on learning effectiveness and involved continual monitoring of student performance on assessment tasks.

Informal evaluation was often directed towards the course content, for example to review the lecture topics and readings that worked, or didn't work, in terms of gaining students' interest. Assessment was also subject to ongoing review and modification based on evaluation of student performance, and observations of undesirable outcomes. However it was less common for participants to report that they evaluated their learning outcomes or teaching and learning activities once these had been selected for a course.

In summary, this study provides more detail about the complexity of the curriculum design process and the range of decisions about each of the curriculum elements than have previously reported. Teaching and learning decisions have been studied

extensively in phenomenological and cognitive studies (Akerlind, 2003; Kember, 1997; Prosser & Trigwell, 1999), however these studies focus on academics' underlying conceptions and approaches to teaching and learning, and do not distinguish between the different intentions and decisions about teaching and learning activities in different teaching and learning settings. In particular, this study introduces a detailed examination of the nature and sequencing of assessment decisions and the different methods and purposes of evaluation. These detailed accounts help to identify areas where good practices are well developed and areas where there are gaps in good practices. Gaps are indicated in the use of assessment criteria and rubrics for communicating and guiding students about academic expectations and standards for assessment, and in evaluation methods that focus on students' learning achievements and that use feedback from assessment performance to develop curricula.

4.7.1 Continuity and variation in individual's curriculum decisions

This study population was also selected so that I could examine how individual participants approach curriculum decision making in different courses, and the situation where participants were co-convening courses. Brendan, from sociology, and Tony, from environmental sciences were interviewed twice with respect to different courses, which involved both their specialist and non-specialist knowledge areas, including one course that they co-convened to construct an inter-disciplinary approach to environmental studies.

Some aspects of their curriculum decision making were found to be consistent across these different course contexts. In his specialist course, Brendan described a structure based on the weekly lecture topics and a narrative theme linking topics that was relevant to students' lives. His co-convened course in his non-specialist area was also structured around topics, however these involved panel discussions, and an inquiry-based learning approach devised by Tony. Brendan reported that he adopted some aspects of the curriculum approach he developed with Tony in his specialist course and described both courses as assessment driven, where lectures and tutorials where scheduled to develop students' knowledge and skills to do the assessment.

Tony co-convened the same inter-disciplinary environmental sciences course as Brendan, which was in his specialist knowledge area, and another cross-disciplinary course in a non-specialist area. Tony also described a similar curriculum structure and

teaching approach in both courses. Both courses were structured as a series of topics that were presented by panel discussions with expert guest lecturers representing diverse perspectives. Tony's rationale was to show students that knowledge is contested, which he believed to be an important understanding about the nature of science. Both courses also reflected his teaching philosophy and beliefs based on collaborative peer learning, where students learn by teaching. In both courses, students were responsible for designing and facilitating a tutorial.

Brian and Edward jointly designed and convened a course in physics. They both described how they brought different concerns and approaches to the curriculum design. Brian was primarily concerned with the content and conceptual structure of the curriculum, and Edward with pedagogies, and was constantly evaluating and experimenting to enhance learning effectiveness. Brian and Edward both described their concerns as different but complementary, which allowed them to bring their different perspectives and priorities to the course design, and to inform each other's practice. The evidence based approach to researching and evaluating their teaching was common to both, and encouraged their continual collaborative course development.

These brief case studies suggest that participants see curriculum from different perspectives, which shape the focus of their decisions. Brendan and Tony highlight different elements of curriculum decision making that reflect consistent approaches across contexts. All of these participants found collaborative curriculum design positive and beneficial for learning from each other, however they emphasised that in their partnerships they each focused on different parts of the curriculum in complementary ways.

In conclusion, this chapter suggests that there are patterns in curriculum decision making that are informed by participants' disciplinary norms about structuring knowledge, desired learning outcomes, and how learning is best facilitated and assessed. However participants also approach curriculum decision making in their own distinctive ways, and many try out new ways of doing things. The next chapter examines participants' beliefs about influences on their curriculum decisions in order to better understand what shapes curriculum decisions and practices.

Chapter 5

Findings 2: Participants' Beliefs about the Nature and Impact of Influences on Curriculum Decision Making

This chapter reports findings from the second focus of the study, which investigated participants' beliefs about the factors that influence their curriculum decisions, which are called 'influences'. A set of educational and contextual influences were identified from the literature to provide the initial theoretical framework for the study, shown in Figure 2.1 as the Field of Curriculum Decision Making in Higher Education. This framework guided the interview questions. The subsequent data analysis showed that participants experienced the influences as having different levels of importance or impact on their decision making. Hence the chapter begins in section 5.1 by reframing the field of curriculum decision making as Figure 5.1, which shows the influences as a series of layers representing their different importance or impact levels. Participants identified the most important and direct influences on their curriculum decisions as being: educational goals and purposes, discipline, research, approaches to teaching and learning, and students. These influences are shown in Figure 5.1 as the inner layer, and each is analysed in detail in sections 5.2 – 5.6, respectively. These sections examine the range of beliefs that participants report with respect to each influence, and the related impacts on their curriculum decisions. Section 5.7 summarises the inner layer of influences and explores patterns and variations with respect to explanatory frameworks from the educational literature, including disciplinary knowledge practices, socio-cultural perspectives, phenomenography and cognitive studies. The second layer of influences represents participants' beliefs about their academic identity and formation, which are explored in Section 5.8. Section 5.9 explores the influence of the institutional context and in particular the culture of the research university, as the third layer, while section 5.10 explores factors external to the university as the fourth and outer layer. Section 5.11 provides an overall summary of the chapter findings, and sets the scene for identifying curriculum orientations in Chapter 6.

5.1 Reframing the Field of Curriculum Decision Making in Higher Education

Participants' perceptions of the factors that influence their curriculum decisions were investigated in the second part of the interview, beginning with an open-ended question asking participants about the most important influences on their curriculum. Then specific questions asked participants to describe the influence of each of the specific

factors identified in Figure 2.1. Finally, participants were asked to rank the influences in terms of their importance. In chapter 3, I drew on literature that argues that participants' decisions and actions are primarily shaped by their beliefs, which represent their informal theories and explanations drawn from personal experience (Pajares, 1992). Hence the analysis and interpretation of findings are discussed in terms of participants' beliefs about the influences, while noting that participants do not always express beliefs directly, but report a mixture of belief statements, examples of experiences, intentions and practices (Pajares 1992).

The analysis of the findings indicated that participants perceive some influences as having more direct influences, or being more important than others. This led me to reframe The Field of Curriculum Decisions Making in Figure 5.1 to show the different levels or layers of influences.

The following influences were identified as the inner layer, because participants described them as direct influences on their curriculum decisions, and ranked them as important.

- educational goals and purposes
- discipline
- research
- approaches to teaching and learning, and
- students.

The next layer of influences was participants' beliefs about their academic identity and formation of knowledge and expertise for making curriculum decisions. This was followed in importance by the institutional context and culture of the research university. External influences form the outer layer, and many participants reported little influence from external factors, because they had little direct contact with them.

The sections that follow examine the range of beliefs expressed by participants about the nature of each of the influences, and the associated impacts on their curriculum decisions.

Figure 5.1: The New Field of Curriculum Decision Making in Higher Education

EXTERNAL INFLUENCES

INSTITUTIONAL CONTEXT AND CULTURE

ACADEMIC IDENTITY & COMMITMENTS

EDUCATIONAL GOALS
& PURPOSES

RESEARCH

DISCIPLINE

CURRICULUM
DECISIONS
Learning outcomes
Teaching & learning activities
Assessment
Evaluation

APPROACHES TO
TEACHING &
LEARNING
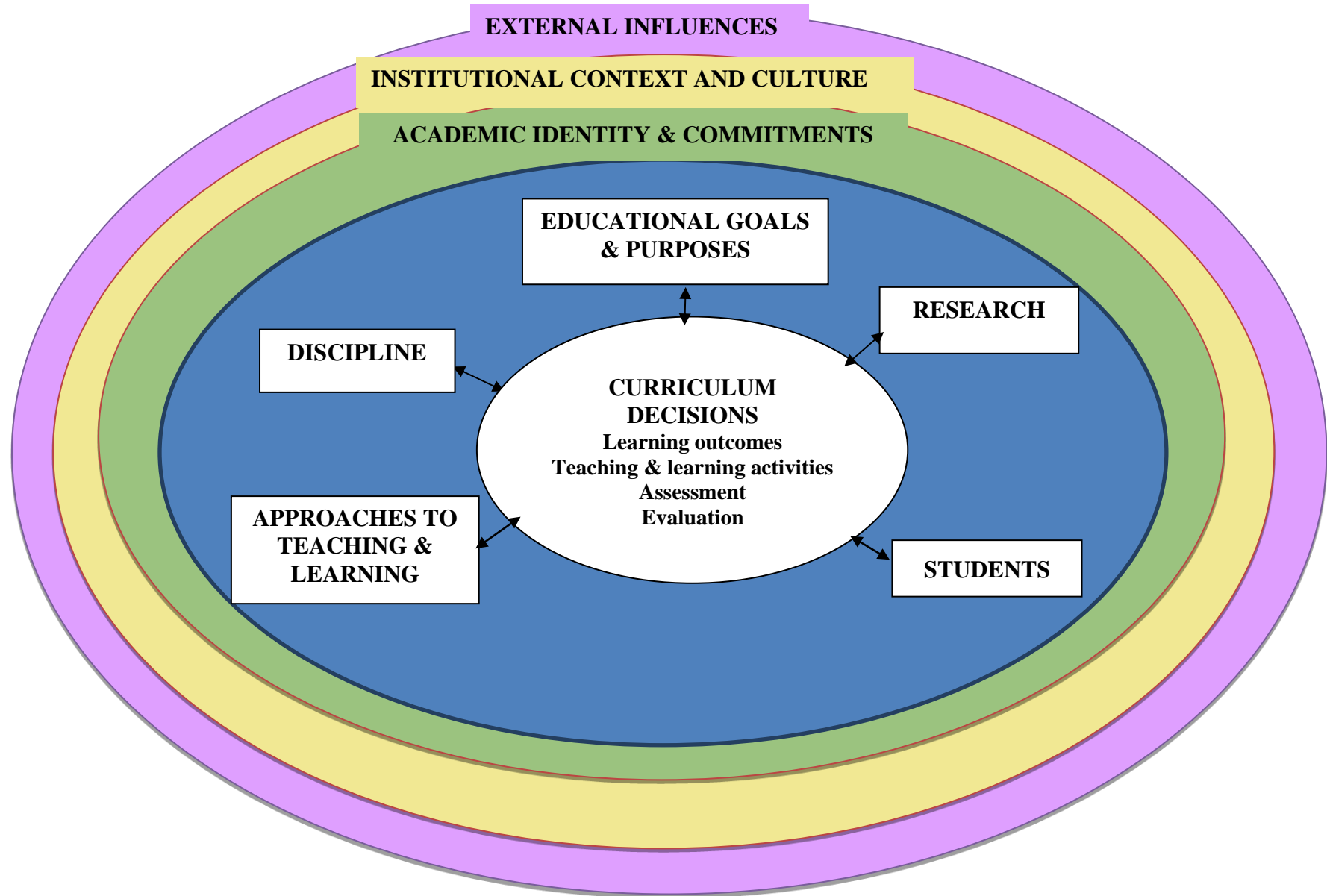
STUDENTS

5.2 Influence of Educational Goals and Purposes

When participants' were asked what they were trying to achieve for students in their curriculum they described higher order goals, which suggested their beliefs about the broader purposes of higher education, beyond the specific course learning outcomes.

Participants reported the following range of educational goals and purposes:
- to induct students into an academic discipline;
- to prepare students for future work and/or research;
- to develop students' generic cognitive skills;
- to make learning personally meaningful;
- to develop students' understanding of social issues and structures, with a view to social reform; and
- to design a system for learning[1].

The discussion below explores how participants expressed these different beliefs about educational goals and purposes, and how their beliefs influenced their curriculum decisions. Some participants identified multiple educational purposes, although one tended to be dominant in each case. The most common examples were that developing transferable cognitive skills and preparing students for work were reported alongside other educational purposes. Participants' beliefs about educational purpose were found to be influenced by their discipline and the course level, and these relationships are also explored in the sections that follow.

5.2.1 To induct students into an academic discipline

Six participants described their overarching educational goals as helping students to develop an understanding and interest in the discipline, and to think like members of the discipline. All physics participants expressed goals for students to learn to think and to approach problems like physicists. The discipline was seen as central to curriculum decisions and provided the structure for organising content within and between courses.

> I think they felt like they knew how to approach certain problems. They weren't scared of things, and to have a very, very general feel for physics. I mean, it

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[1] This last perception represents a different kind of educational purpose to the others, because it doesn't relate to students' learning outcomes, rather to an educational process, and is described further in section 5.5.6 as a philosophy of teaching and learning.

basically underpins just about all of physics, you'll encounter something which is non-linear, and that's really what I wanted to get across. I was not at all expecting any of them to continue working in this particular field, say in our department. I really saw it more as this is something which, as a physicist, you will encounter and it's good to not be scared of it and to be able to see that okay, I have my approach. (Adam, PHYS1/Hons)

This educational purpose was not limited to Physics participants. For example, Sarah's introductory first year law course also focused on discipline related goals for developing students' legal skills and their interest and enthusiasm for law.

In designing a course, it's the learning outcomes that are critical and in this foundations course, it's developing a solid foundational legal skill set, coupled with hopefully an enthusiasm for studying law. (Sarah, LAWS1/L1)

It should be noted that while many participants in the study included goals for developing students' understandings of their discipline in their educational purposes, in other categories disciplinary understandings were seen as informing other educational purposes, rather than being the primary purpose. In contrast, this category was distinguished by educational goals and purposes that were almost exclusively related to the discipline.

5.2.2 To prepare students for future work and/or research

Five participants described the key purposes of their curriculum as preparing students for their futures after graduation, both as researchers and as graduates entering the workplace. Like the previous category, these participants included aims for students to understand specific discipline knowledge and skills, however the focus of their curriculum decisions was to provide students with real experiences of professional and research tasks. These beliefs about educational purpose were more common in later year courses, and the professional and applied disciplines of business, law, and the environmental sciences. In law and business courses, participants focused on preparing students for professional practice. In the environmental sciences, participants described practice and research as being interconnected, which allowed them to select problems relevant to both pathways.

Andrew and Ryan, who were teaching third year courses in environmental sciences, both described their course development as beginning from their identifying an area of need in the workplace. The areas of need related to participants' own research expertise,

and their curricula focused on problems relevant to both research and practice. Andrew identified a need for scientists to understand public policy, which he described as a neglected area across science degrees.

> The course began with the identification of the need which was ... what is the best way of preparing people either to have to go into a research domain for their PhD or honours where they need to understand the public policy environment, and just know basic terms and concepts, so that they could go and land a job in a department in the policy section, or dealing with the policy section and have some idea of what's happening. (Andrew, ENVS3/L3)

His curriculum decisions focused on creating learning contexts and tasks that were relevant to students both for future work and for doing research.

> I actually thought, well, what these people are going to have to do is either go into a higher degree research or into a job where they are going to have to write in short version, in long version the briefing, the full report to the minister and in presentation, to be able to convey in that, proper analysis. ... So very much aiming at the sort of tasks they would be expected to do afterwards. (Andrew, ENVS3/L3)

5.2.3 To develop generic cognitive skills

Three participants described the primary purpose of the curriculum as developing students' broader cognitive skills, rather than specific content knowledge. These skills were conceptualised as generic or transferable skills that were useful for a range of purposes, including preparing students for future study and work. Hence this category overlaps with the previous category of preparing students for work. However these participants' curriculum decisions emphasised educational processes for developing cognitive skills, rather than providing real world learning contexts, as for the previous category. This belief about educational purpose was common to participants convening first year courses whose goals emphasised helping students to be successful as learners at university.

Brendan, who co-convened and taught the inter-disciplinary environmental sciences course, identified the focus of his goals and curriculum decisions as being the academic and learning skills students needed to reach their potential at university. Learning outcomes were aligned with teaching and assessment activities, and these skills were specifically taught and assessed in the course.

What we were trying to do, was to take them through right from the very beginning, assuming no knowledge, providing them with skills we thought were absolutely essential for them excelling, and for reaching their potential at university. Everything from research skills to just practical skills, like using a computer. One or two back then, even in 2001/2, some had never used a computer before. We almost did an informal skills audit with them, so we knew they had the basis for going out there.… It really was grounding them in those types of skills. ... We wouldn't have done this for second or third year probably, but because it was first year we thought this was really important. (Brendan, ENVS4/L1)

5.2.4 To make learning personally meaningful

In two arts courses, Brendan and Thomas described their key goals as being to help students understand their lived experiences and to explore their personal goals and interests. In Brendan's first year sociology course, he searched for a narrative to integrate topics and themes that was relevant to students. His narrative used sociology to help the first year students make sense of their transition to university.

So then I thought to myself why don't I actually give my course an experiential journey of first year showing how sociology can actually explain what they are going through, while giving them a bit of fun about how they can actually view the world through different lenses. So that's what the course is really all about, especially early on. ... Okay we've got these first year students, we've got a high dropout rate; what can we do to make their experience an easier transition from high school to university? What can we do to actually improve that and to make them feel as though they're actually part of this institution. So I thought that well if sociology can't actually explain that to them and you can't use sociology to explain that to them, then there's not much use in the discipline. (Brendan, ARTS1/L2)

These participants' curriculum decisions focused on making topics and learning tasks relevant to students' experiences and interests. Students were engaged in choosing lecture topics, and assessment tasks and learning outcomes included communication and writing skills, which were viewed as having personal relevance to students. Brendan described his teaching philosophy as experiential, however his approach was to make connections between topics and students' experiences, rather than encourage learning from direct experience. Thomas' philosophy and approach were more explicitly

experiential, and included students engaging in a substantial collaborative research project to produce a radio program in Spanish.

5.2.5 To understand social issues and structures

Five participants from arts, law and environmental sciences articulated goals that included students learning about important social issues, and developing their abilities to analyse and critique social issues and structures, with a view to social action and reform.

Most law participants contrasted a traditional view of law as a set of rules to be applied, with an understanding that law is developed and practiced in a social context. Nigel and Ian were concerned with law reform, and their aims included developing students' abilities to question the rules of law in practice, exploring their own values and purposes for practicing law, and seeing themselves as law reformers.

> All the law courses in the law curriculum are structured around an assumption that we can take a legal rules approach to a topic, … and that simply by looking at the legal rules, that one can thereby master the subject. This is absolute nonsense. You cannot practice law in a vacuum. A good example of this is if you take a problem, such as climate change, the laws that we pass to deal with climate change, whether it's a tax rebate on buying solar energy, or controlling the amount of water you can put through a sluice gate on irrigation, those laws only come about as the end product of a policy debate process. ... So that if you want to understand how we got the law we've got, and where you want to take the law from now, you've got to set it within its social environment. (Ian, LAWS3/L2)

Law and environmental sciences participants in this category used experiential approaches to teaching and learning, where students were engaged in direct experiences of analysing social issues and problems in context.

In gender studies, critiquing social structures was central to the goals and methods of the field, and expressed in curriculum decisions as developing the conceptual framework and skills to take a critical stance towards knowledge.

> In a very broad sense what I want students to get is a sort of critical way of looking at the world, especially related to social structures like gender. So what I'm trying to get them is a set of skills and the concepts sort of supporting those skills, which enable them to take things which are common-sense and natural,

which we might think of as common-sense and might take for granted as natural and be able to sort of look at them critically. (Vanessa, ARTS3/L1)

5.2.6 To design a system for learning

Sameer reported that his goals were to create a rich learning environment, which was designed as a system that supported students to learn. This belief expressed an educational purpose that focused on the *processes* of curriculum and teaching, which was different to the focus in other categories on learning outcomes. Sameer also describes his teaching philosophy as designing a learning system to create flexibility for students, which is explored further in section 5.5.

> Well, I think [we were trying to achieve] a really rich learning environment. Something that is really exciting, which is not a word that gets used a lot in university. … That's how I think of this teaching business anyway. You teach them some interesting things in an environment which allows people to actually interact and think. But the skill comes in actually designing it in such a way that the disparate components don't just crumble into chaos. That the foundations are there in such a way that it fits neatly. For the student, the system has feedback loops in a sense, or it has information front ended nicely so it's all seamless for everyone concerned. … So for me it's just designing the whole system in such a way that there's all these feedback loops going on. If something fails there's a backup support, something else you can do. So that's important I think. (Sameer, INNO1/L2)

5.3 Influence of Discipline

Participants described the influence of their discipline on their curriculum decision making in the following ways, as providing: (1) disciplinary knowledge for course content, including the structure for organising knowledge within and between courses; (2) skills for thinking and problem solving; (3) problems for applying knowledge; (4) scholarly and professional roles, attributes and values; and (5) pedagogies and norms for teaching. These different beliefs about discipline informed how participants selected and structured course content, their learning outcomes, teaching and learning activities, and assessment. Chapter 4 also identified disciplinary differences in decisions about these curriculum elements, including the kinds of thinking skills and problems that were relevant to different disciplines and educational purposes.

The discussion below examines how participants' beliefs about discipline are manifested within each of the discipline groups represented in the study, and the relationships between their beliefs about the influence of discipline, about educational purposes, and their curriculum decisions.

5.3.1 Physics –disciplinary knowledge and ways of knowing

Most physics participants described the influence of their discipline on the curriculum in terms of the disciplinary knowledge that constituted the course content, and learning goals for students to think like a physicist. The discipline also provided the structure for organising knowledge within and between courses as was reported in section 4.2.2, and which were defined by sub-fields of knowledge, such as nuclear physics or non-linear physics.

Participants reported that physics had an accepted canon of knowledge, and traditional ways of structuring knowledge and teaching, and so the discipline influenced expectations about what was taught, and how. Three participants reported they were challenging these traditions by exploring best practices in the educational literature, which included modern understandings of physics and active learning. Brian and Edward believed their evidence-based approach to adopting new teaching practices was influenced by being a physicist, leading to their taking a rigorous, scientific approach to evaluating their teaching and student learning.

> I'm talking quite personally now not generalising to how most physicists would be. I think it has made me approach learning in a rigorous research-based way and, by that I mean, that just because I think something is going to work, it doesn't mean it is. And that the only way to know that it's going to work is to evaluate it and find out whether it improves what I'm trying to improve, which is usually student learning. That's tremendously difficult to do as you would be aware. So I'm not claiming this is some magic formula, but that's the orientation that I have that just because I think something is a good idea doesn't mean that I'm going to believe that it is a good idea. I might try it because it's fun or interesting or something like that, but I won't make the claim that it's improved learning unless I have evidence. (Brian, PHYS4/L1)

5.3.2 Law –disciplinary knowledge, skills and attributes for professional practice

Most participants in law identified the influence of the discipline as defining the knowledge, skills and attributes that students require to practice as lawyers. However their educational purposes represented a range from inducting students into the discipline, preparing them for professional practice, and enabling them to critique the practice of law, with a view to social reform.

In a compulsory law course, Elaine described the law professional organisation as a significant influence on curricula, because it defined the specialist knowledge required to practice as a lawyer.

> Well the way the discipline is structured, there's certain requirements then that actually dictates a certain content and so the content is really dictated by the discipline of law - it's not driven by what are you particularly interested in or what are you researching this year or whatever. It's driven by what the statute is and what you have to know in order to be able to operate, to function, as a lawyer. (Elaine, LAWS4/L2)

Ian and Nigel perceived the discipline of law as having a culture of practice that they wanted students to be able to critique, and to explore their own values and roles as future lawyers. Their beliefs about the influence of discipline were shaped by their beliefs about educational purposes for social relevance and reform.

> Having been a law student and knowing the way in which they're taught to think. Well, the starting point is that law, as a discipline, is a casework discipline. That is the problem, it is confined to very well defined problem group. And then you look for these specific legal principles which you say go into that situation. And having confirmed that you believe you've got the right set of principles, you then look for the factual stuff around that. This is a closed system, it does not look outside anything else, right? So knowing that that's where the students were and knowing that my object in this course was to introduce them to the before and after and current effects, outside of the law, then the whole thinking of the thing says, 'Okay, here's where we are, would be lawyers, we're going out here this time, and you're actually going to find it's useful. Trust me.' And they did. (Ian, LAWS3/L2)

5.3.3 Arts - disciplinary knowledge and skills for understanding and critiquing the social world

Participants from arts described the influence of their discipline on curriculum decisions as defining the knowledge, concepts and theories for helping students to make sense of their experiences, and skills for critical thinking, reading and expressing arguments. In the social sciences there was a focus on students' understanding their everyday experiences, which suggests interpretive knowledge practices; and in the humanities, on analysing and critiquing discourses and social structures, which suggests critical knowledge practices.

Brendan described sociology as understanding how people shape and are shaped by their everyday experiences, which was a fundamental disciplinary understanding that he wanted students to attain. His first year sociology course was informed by a personal relevance educational purpose, where sociological topics and themes were selected and presented to help students make sense of their transition to university.

> Most of [my curriculum decision making] has been influenced by being a sociologist because of what we like to call the 'double hermeneutic', where we're trying to understand the world which we ourselves shape, which is something that sociologists have to do. I was conscious … about bringing out the sociology of the first year experience. As I say we're fortunate, unlike a lot of other courses, that we can actually use - actually it's a tragedy not to use sociology to do first year sociology. So it is absolutely essential to the design of the course, being a sociologist. (Brendan, ARTS1/L2)

In the environmental sciences course he co-convened, Brendan reported that initially he was concerned about what he could contribute to student learning, because he was not a subject expert. However he progressively gained confidence in what he brought to the course as a sociologist to help students make sense of the social dimensions of scientific problems.

Vanessa and Phillip, who were teaching arts/ humanities courses, described the discipline as being their most significant influence on their curricula, providing both the subject matter of the course, and skills for reading and interpreting texts, and for identifying and expressing arguments.

It's a reading practice. I mean, I think an Arts Degree is still a lot about learning how to read and not just for the information. So some of the activities I give them - it's about taking a reading and looking at how it presents its arguments. So recognising that the important thing about these articles is that they are synoptic, is that the right word? I don't know, but they're not presenting you with all the information on this topic. (Vanessa, ARTS3/L1)

5.3.4 Environmental sciences –multi-disciplinary knowledge and methods for solving complex social problems

Participants teaching environmental sciences described the field as multi- and inter-disciplinary, involving integrated understandings of concepts and methods from different disciplines to understand the social, technical and policy dimensions of problems. Participants expressed the applied and social dimensions of the discipline in their beliefs about educational purposes, which included preparing students for future practice and research; and for understanding and acting on social problems, such as sustainability and climate change.

My discipline is geography. So geography's field based, so a focus on field work. Geography integrates the social and the biophysical sciences, so it leads me to be thinking in terms of integration. And geography is very political and it's interested in the social allocation of scarce resources, and it leads to thinking about equity issues. So a focus on equity and the politics of resource allocation. So they're probably the three strongest things. And it crosses the arts/ science boundary, which is pretty rare. ... Well, the themes run through that course in every way ... so the topic selection, the involvement of people from different areas, the problem based tutorials and it's very applied, so that idea of giving students applied activities like getting them to develop a sustainability plan for [a local] region, which is where the first field trip is. (Tony, ENVS4/L1)

Curriculum decisions expressed different ways of addressing multi-disciplinarity. Paul's introductory environmental sciences course involved students enrolled from a range of disciplinary backgrounds. Paul described the tensions in choosing between teaching foundational knowledge, methodologies, providing examples and applications, exploring cultural issues and values, and learning to learn.

There are about 32 different degree profiles in any one year so there is this enormous disparity in what their background knowledge is and their motivations.

So that course tries to show where they fit … The problem is if I pick up more systems thinking into human ecology - into the core introductory course - then I have got some choices. I can either drop introductory ecological stuff, which then has to assume they can either pick that up somewhere else, because some will come in with it, … or I ditch more the examples and applications. Now there is forever a tension in doing the kind of course where you're introducing concepts and building conceptual frameworks, and building things like critical realistic possession perspectives and the idea of learning processes and reflections and stuff. (Paul, ENVS1/L2)

Brendan and Tony used another approach to address inter-disciplinarity in their co-convened environmental sciences course. The teaching philosophy was based on inquiry learning and panels of guest lecturers were invited to present different perspectives on environmental issues, with students posing questions to develop their understandings.

5.4 Influence of Research

Participants were asked how research influenced their curriculum decisions, which allowed them to interpret the meaning of research in their own way. They were then asked to define what they understood by research in the context of curriculum, and to explore if there were further ways in which research had influenced their curricula. Hence the data provides insight into the different ways in which participants' conceptualised research in relation to curricula, as well as their beliefs about how research influenced their curricula.

Most participants initially interpreted the question to mean how their own disciplinary research was related to the subject matter of the curriculum. So some participants initially responded that their research had no influence on their curricula because their curriculum content was not directly related to their research. This included participants teaching foundational courses that were not in their area of research expertise, law participants who reported that their experiences of legal practice were more relevant to students than their research, and physics participants who described their research as being too advanced or narrow for undergraduate students. However, when probed to explore broader ways of understanding research in the context of curricula, many of these participants were then able to identify ways in which research informed their curricula, including their stance towards knowledge.

Other participants were actively seeking to integrate research in their curricula, including their own research, current disciplinary research, and having students do their own research. Seven participants reported that being an active researcher was important for their teaching. Teaching their research gave them passion for the subject matter, depth of knowledge and access to resources, which enabled them to help students make sense of issues, sources and contexts.

> My research also allows me to present material in a context of not just it can be like this, but this is how you can think about it. And here's an example from the last 10 years of water policy because I happened to be active in that area. So it allows you to bring in, as a policy researcher, what I'm researching is something that's been in the newspapers and topical in the last few years or right now, so you can actually bring in substantive, much more detailed knowledge because you're an active researcher. And I think that enriches the teaching. (Andrew. ENVS3/L3)

The interview analysis found that disciplinary research was conceptualised in relation to curricula in the following ways, as providing (1) specialist knowledge and expertise in the subject matter, (2) research problems and projects for data, case studies and learning activities, (3) a process and skills for finding things out, and (4) a scholarly or critical approach to knowledge. Pedagogical research was contrasted with disciplinary research as an alternative influence on curricula.

These different beliefs about the influence of research on curricula informed five approaches to linking research and curricula, with the first four relating to disciplinary research and the final to pedagogical research, as follows:

1) research informs curriculum content;
2) research problems and projects provide real world learning experiences;
3) students undertake inquiry and research to experience research and learn methods and skills;
4) exposure to research develops a critical or scholarly approach to knowledge, and
5) pedagogical research is used to improve curricula and teaching.

Each of the approaches to linking research and curricula is explored below to identify the critical features that distinguish the beliefs about research in relation to curriculum, and the nature of the influence on curriculum.

5.4.1 Research informs curriculum content

All participants initially responded by describing whether their own research was relevant to the course content, or not. Some participants described a fortuitous connection, where the course content coincided with their research interests and expertise. Others reported intentional decisions to select and shape course content based on their research expertise.

> My research has influenced the shape of those lectures, so the way in which I frame that lecture program reflects my own research strengths. (Sarah, LAWS1/L1)

The course was not always informed by participant's current research, but based on their knowledge accumulated from doing research.

> The content of the course was directly related to my research. This is very much, in terms of content, a research led course, which is not to say that I was teaching a course based on my current research project. It was more that I was teaching a course that's based on all the research I've done …. so, all my knowledge comes out of that 25 year engagement with that theme in Australian history. (Phillip, ARTS5/L2)

In addition to their own research, eight participants described objectives for students to learn about current research in the discipline. This study took place in a research-intensive university, and six participants invited colleagues who were active researchers to be guest lecturers in their areas of expertise. This allowed participants to draw on research expertise beyond their own, and to showcase research from the University.

> Because it is a first year course and it must be broad because we can't teach everything, and we are specialists. What I think we do is we harness other people's research for the course, probably more research than others around campus. In our first two years we must have drawn on about 50 researchers. (Brendan, ENVS4/L1)

Participants also drew on published research as a source of up-to-date knowledge for the curriculum, which was more current than textbooks. This approach was more common in later year courses, where participants aimed to show students where research in the field was heading and to familiarise them with the research literature, in preparation for doing research in the future.

In this category, research is viewed as a source of specialist knowledge that informs curriculum content, typically by teachers who are active researchers presenting lectures on their research expertise. Participants believed that drawing on their research made teaching more engaging for students, and for themselves. Participants who were intentionally engaging students with current research in the discipline were more likely to engage them as active learners who were posing questions, analysing, discussing and reflecting. Guest lecturers, who were researchers, provided role models and mentors for students, and so students were also positioned as potential future researchers and members of the University research community.

5.4.2 Research projects and problems provide real world learning contexts

Six participants described the influence of research on their curricula as providing research projects and problems that could be drawn on for real world learning contexts. This was a common approach in the environmental sciences across all year levels, and in a later year course in biology, where participants' educational purposes were to prepare students for future research. These participants used their research projects and findings as case studies to illustrate topics in lectures, and to provide real data and contexts for students to learn about research, how it informed policy and practice, and to develop research skills.

> I wanted students to be able to walk away from the course with a very good and broad background, I suppose, in terms of water quality assessment and to a lesser extent environment flow stuff. I wanted them, if they were to take a job in a government department, or a consulting firm, or local government that they could commission research or investigation studies, that they could do that with confidence that they knew the process well; that they had some technical skills developed. They were never going to be really proficient, but they were going to have a base understanding about a lot of different skills. … The sorts of practical examples that we used came through my research. One thing that worked very nicely was this fictional river basin. It's a very complex river basin, for example, it's got deserts and high mountains and swamps and lowlands, … So it's got all these features and that enabled it to be used as a focus for the sample data that we have. (Ryan, ENVS2)

Gloria, who was teaching a third (final) year undergraduate biology course in the medical sciences, reported her key goal was to prepare students for future research. She used her own research problems to provide a context for students to learn how to do

research and develop research skills. She also believed that doing research developed generic cognitive skills that were relevant to students' potential futures in both biology research and clinical practice.

> So after the first year I started to think about what are the skills which are absolutely essential to do research. Many of the students are really interested in neuroscience so I assumed that many of them will try to go into Honours and do research. But also there are students who are in the medical science course and I again assume that they want to go on and do clinical work and medicine and become doctors. So since my background is in both of these I could basically set up a list of important skills. And one of the things, obviously is observation, being able to describe, and to make decisions based on picking up differences. To be able to communicate in writing or orally. Being able to criticise, you know, like reading a paper, and you should not take everything for granted. (Gloria, INNO3/L3)

In this category, participants conceptualised research as providing real world problems and projects and described their teaching and learning approaches as experiential and research-led. Students typically worked on problems drawn from the participants' research, rather than doing their own research.

5.4.3 Students undertake inquiry and research

Twelve participants described having students undertake research as one of the ways that research influenced their curricula. Student research essays and projects were common learning and assessment tasks across disciplines. In this category, participants conceptualised research broadly as a process and skills for finding something out. Like the second category, research involves students working on problems and projects, however in this category students undertake their own research. There were differences in the purpose and nature of student research activities across disciplines and year levels, with research essays being common to arts and law courses, and research projects to biology, physics and environmental sciences. In first year courses research typically involved a literature review, while in later year courses may include collecting data and writing academic papers.

Tony described the relationship between research and learning as a continuum from finding out something new to oneself, to something new to the world. Research was embedded in both his courses as a learning process, where students engaged in inquiry,

panels of invited researchers presented conflicting views on topics, and students did research projects.

> There's a really nice article written by two people from the University of Adelaide, who are talking about the nature of teaching and research links and how there is a continuum between the first year student finding something out for themselves that they didn't know to the Nobel prize winner finding out something that no-one on the planet knew. So all about uncovering new knowledge. So I think we tend to privilege that latter type of research over the former. But I think if you can get students excited about finding out things for themselves, even if it's already known by humanity, you know, that doesn't distract from the excitement that they could get from coming to some profound understandings themselves. (Tony, ENVS4/L1)

Andrew, who was teaching a final year course in environmental sciences, wanted students to have an authentic experience of doing research and to see themselves as researchers.

> Well, another is that the students will be doing some research. And I tell them that a really good mark in the course would be on par with a paper that could be considered for publication in a refereed journal, but aimed at a cross-disciplinary and policy audience. So what you're meant to be doing is a defensible bit of public policy research, and we've had a few that could easily have got published. [The aim] is to make them see themselves as researchers in doing that. (Andrew, ENVS3/L3)

In this category, research was defined as finding something out by investigating questions or problems, and included learning things new to yourself, as well as discovering new knowledge. This category is similar to the previous category, because research is conceptualised as a learning process and context. However, students do their own research, rather than working on problems drawn from their teacher's research.

5.4.4 Exposure to research develops a critical or expert approach to knowledge

Four participants reported that research developed critical or expert approaches to issues and problems. This belief suggested an intangible connection between research and curricula, where participants' own stance developed from their research was modelled in their curriculum and teaching decisions and actions, and available to students.

Vanessa initially described her research as not influencing her curricula, because the subject matter was not directly related to her research expertise. However, when probed, she reflected on the influence of her research as the scholarly and critical approach to knowledge that underpinned all of her curriculum and teaching. This was a quality that she aimed to model to students.

> This was a course that I was charged with doing so none of these topics are particularly close to what I research. … However, I do think that my approach to research is about the critical reading of text and it's about questioning the taken for granted and it's interdisciplinary. And in all those ways, I think, it influences my course design. Because my research in part gives me my perspective on the sort of enterprise of scholarship really and, in part, that's what you're trying to show the students or get the students working in those broad ways. The kind of critical aspect, the interdisciplinary aspects, so bringing things together that you might not necessarily bring together. (Vanessa, ARTS3/L1)

Other participants embedded research throughout their curricula, and students' immersion was intended to develop an expert or critical way of thinking about issues and problems.

> And the other key thing is this idea of 'research<u>ness</u>'. So getting students to start thinking like 'what does it mean to be a geographer?' So how does a geographer think, because I can't teach you everything a geographer knows, but hopefully I can start to get you thinking like a geographer, or thinking about, as a professional, how could you deal with sustainability issues. So that, to me, is more profound level of bringing research into the classroom. (Tony, ENVS4/L1)

This category describes an intangible link between research and curriculum, where students' learn from their exposure to, or immersion in research, which is embedded in curriculum and teaching decisions and modelled by the teacher as a researcher.

5.4.5 Pedagogical research for improving curricula and teaching

Pedagogical research was presented as an alternative form of research to disciplinary research. Some participants explicitly stated that they did not undertake pedagogical research, when they were asked to explore further ways in which research may have influenced their curricula. In contrast, nine participants made explicit connections with pedagogical research, reflecting different levels of engagement. Most of these participants reported that they had researched the literature for 'best practice' on how to

teach, and for implementing new educational technologies. Researching the educational literature often led participants to adopt teaching approaches that facilitated active student learning.

> So the key idea that was reinforced by my intensive study of the physics education literature, was that activeness on the part of students increased learning. … A big improvement comes just by having students work with each other in some way or other in a group basically. So what I mean by active is two things in practice. One is answering questions in class on an individual basis using the technology, the clickers. The other one is talking to class mates, usually the people who are next to them, about those issues that they're answering questions on. … It's a well-established technique and as far as I can tell it's the norm now in the US. (Brian, PHYS4/L1)

Four participants described researching their teaching to provide an evidence-based approach for improving their curricula and teaching.

> I'm interested in researching my teaching and applying that, and I would've thought that sophisticated evaluation methods are a form of self- research into your own teaching practice. So it's research into your own teaching practice and your own students learning and, again, that's a continuum from [someone] writing a PhD to me listening to students' presentations each year and making notes on what worked and what didn't work, you know. And some of that's quite structured and some it's probably totally subliminal, but having sat through 20 hours of that, it's given me an understanding that will inform how I teach it next year. (Tony, ENVS4/L1)

5.5 Influence of Approaches to Teaching and Learning

In Chapter 4, participants' decisions about teaching and learning were explored as the activities they adopted *within* different teaching and learning settings, such as lectures and tutorials. Decisions about teaching and learning activities were found to represent an overlapping continuum, which ranged from presenting and structuring course content, to facilitating active and interactive learning. Teaching and learning activities were influenced by the teaching and learning settings in which they were carried out, and by disciplinary norms, such as discussion or problem-solving in tutorials for arts and physics, respectively.

To complement the analysis in Chapter 4, this section explores how participants' beliefs about teaching and learning shape their decisions about teaching and learning *across* settings. In the interviews, participants were asked to explore their reasons for their teaching and learning decisions, including whether they had a philosophy or approach to teaching and learning. The phrase philosophy or approach to teaching was used to encourage participants to think in terms of a coherent set of beliefs that made sense of their decisions. Almost half of the participants reported having no formal teaching philosophy, however they described a range of beliefs about good teaching. Common beliefs were that good teaching involved being a clear communicator, showing your passion and enthusiasm for the subject, and engaging and motivating students. The remaining twelve participants either named teaching philosophies or approaches, or identified strategies congruent with theoretical approaches. These included: experiential learning; inquiry and research based learning; active learning and constructivism; and flexible delivery.

Six approaches to teaching and learning were identified, representing the patterns of teaching and learning beliefs and activities reported by participants *across* teaching and learning settings. The approaches are ordered below to represent an overlapping continuum beginning from informal beliefs that tend to be teacher and content centred, to theoretically informed philosophies that are active and student centred.

1) Teacher and content focused approaches, where teaching and learning activities were teacher directed and focused on presenting course content.

2) Teacher-student engagement approaches, which also involved teacher and content focused activities, however these participants were influenced by their beliefs that the teacher's role was to motivate and engage students in learning.

3) Experiential learning, which was described as both a teaching philosophy and a set of practices, where real world experiences provided the context for learning.

4) Inquiry-based and research-based learning, where participants' intentions were for students to learn about research and in research-like ways.

5) Active learning, where participants' intentions focused on providing activities for engaging students and for facilitating deep approaches to learning, constructing understandings and conceptual change.

6) Flexible learning, where educational technologies were used to provide students with flexibility and choice in how they engaged with course materials and learning activities.

Figure 5.2 shows the relationship between teaching and learning settings, activities and approaches. This diagram is intended to show how the teaching and learning activities used in different settings leads to the continuum of teaching and learning approaches defined above. The teaching and learning activities show a progressive development from being teacher focused involving presentation and modelling; to providing real world contexts which may be more directed towards presentation and showing, or towards more active learning as role plays, case studies, research and inquiry projects; and then active learning involving discussion, activities, problem solving and peer teaching. Educational technologies are shown as combining access to readings and resources, which were typically intended to inform discussion in tutorials or in some cases in online forums, with active learning to create a flexible learning approach.

The following discussion explores the key features of these approaches to teaching and learning, linking participants' decisions about teaching and learning activities as reported in Chapter 4, with their beliefs, intentions and philosophies described in this chapter.

Figure 5.2 Relationships between Teaching and Learning Settings, Activities and Approaches

Teaching & learning settings	Lectures & seminars	Tutorials/	Laboratories Field trips	Educational technologies

Readings/ learning resources

Teaching & learning activities	Presenting & structuring information	Modelling academic thinking	Real world contexts & experiences	Research projects /inquiry activities	Discussion, activities and collaborative learning

Teaching and learning approaches	Teacher-content focused	Teacher-student engagement	Experiential learning	Inquiry and research-based learning	Active learning	Flexible learning

5.5.1 Teacher and content focused approaches

Phillip expressed a predominantly teacher and content focused approach to his teaching, where his intentions were to give students 'a dense injection of hard information on a core topic each week.' He also believed that teaching involved more than providing information. However, his strategies were teacher-focussed and he described his role as modelling to students how to talk and write about the subject matter in lectures, tutorials and in the feedback he gave on assignments.

> [Lectures are necessary] because it's a chance to steer the course, just to identify the core knowledge of the course and also it's where you model for the students how to talk about it. I want to model talking and writing and I think that's important for a teacher to do, so it isn't just a matter of supplying information. (Phillip, ARTS5/L2)

Phillip responses showed apparent contradictions between his transmission approach to teaching and his belief that 'students learn by writing'. This belief about learning informed his design of assessment tasks as a series of short writing exercises. However his assessment design demonstrated his content focused approach, and was based on a set of additional readings to those discussed in tutorials, for the purpose of covering more content.

> Well, there were two sets of readings. There were the readings they had to write an assignment about, and there were the readings they had to do in order to engage in the tutorial discussion or the workshop. ... Well, I think it enabled me to cover more topics if I didn't tie them all together. There would be a good educational argument for having them more integrated, but there's an also an educational argument that this allows you just to cover more stuff and, I think, whichever of those options you go for, there's an opportunity cost. (Phillip, ARTS5/L2)

Although Phillip was the only participant in this study, who expressed this approach, it was included as a distinctive approach because it is reported as a common approach in the educational literature (i.e. Prosser & Trigwell 1999). The literature provides a point of comparison with the findings in this study that is explored in the discussion at the end of this chapter.

5.5.2 Teacher - student engagement approaches

Three participants from a range of disciplines described predominantly teacher and content focused teaching strategies, similar to those reported for the previous category, but they also expressed beliefs that good teaching involved engaging and motivating students. This belief informed their teaching strategies, which included showing their passion and enthusiasm for the subject, making topics relevant to students' experiences, and being available to help students.

Sarah, a law participant, described her beliefs that good teaching involved clear communication and well-structured materials, suggesting her focus was on presenting course content. However she also believed that it was important to engage students by showing her enthusiasm and passion for topics.

> I wouldn't say I have a fully developed philosophy of teaching. There are some things that are important to me. I think well-structured teaching and course materials are important, particularly for first year students to guide them through. I think clear communication is important. I think making yourself accessible to students is important and I try and avoid a hierarchical teaching relationship. ... I think it's important to express your enthusiasm for the subject you're teaching. I think if you don't do that you can't expect students to feel an enthusiasm for it. (Sarah, LAWS1/L1)

She also made a distinction between teaching in lectures, and student learning that happened in tutorials, where students were engaged in discussion and case analysis.

Brendan described an informal teaching philosophy where his intentions were to engage students by connecting with their everyday experiences. He also believed in being available for students and that making time for personal interactions was important to the university learning experience.

> So it's not just out of books and libraries, if you want information you can come to people to chat about these things, to personalise it. It's a romantic notion about what university is all about, that Oxbridge situation, and of course not all students can take advantage of that, given how busy they are these days. But students do want that availability where they can come and chat, … that's the university experience they'll never forget. … With the research essay, I actually cancel the

tutorials for a week after we've marked them - it's the essay consultation week - and all the students come in and meet me for 15 minutes. … It's an opportunity for them to chat about how it feels, where they've gone during the course; I can let them know how I think they're going in tutes and … and find out more about what they're really interested in. (Brendan, ARTS1/L2)

This category lies on a continuum between the previous category of teacher and content focused approaches and the next category of experiential learning. Brendan described his teaching approach as experiential, however he meant that he connected topics to students' experiences, rather than engaging them in learning from direct experience, as in the next category. Sarah's views also indicate that this category represents informal philosophies or theories of learning.

5.5.3 Experiential learning

Five participants from the applied disciplines of business, law and environmental sciences described their teaching philosophy as experiential, and/or used activities where students learned from concrete experiences of problem-solving, case studies, role plays, field trips and project work.

Paul was explicitly guided by an experiential teaching philosophy, based on the belief that experience provides the basis for learning.

The overall teaching philosophy is experiential, saying that genuine understanding flows from experience, hence the field trips. But that the students' everyday life is as much an object of worthy study as any material I might give them in a lab or in a lecture. We can lecture about Papua New Guinea Highlanders and how slash and burn agriculture operates, but the student could look in their own wastepaper bin and ask where did that tin of salmon come from? In the later courses we do an awful lot of exercises that involve students analysing some aspect of their own daily behaviour. T-shirts, what's the energy balance of a T-shirt, or a pint of beer or a mobile phone. (Paul, ENVS1/L2)

Other participants didn't specifically name their teaching philosophy, however they described their intentions and strategies in experiential terms. Role plays, case studies, fieldwork and projects were used to provide professional and policy contexts relevant to students' future professional roles, and to help them make sense of knowledge through their experience of applying it in context.

The learning goals for the course were to experience the internet, and basically I wanted people getting their hands on the keyboard, using the internet. I made that lab session so I was around the place if things went wrong. I could step in and help them out and guide them, but it was a lot more about actually physically you at a machine engaged with this technology. (Matthew, INNO2/L2)

5.5.4 Inquiry-based and research-based learning

Five participants made inquiry and research central to their curricula, using the full continuum of research-informed teaching approaches identified in section 5.4. Participants described presenting their research in lectures; using research projects and problems as experiential learning contexts; and engaging students in inquiry learning and doing research. This approach to teaching and learning was identified as being distinctive because it was also informed by participants' beliefs about the educational mission of a research university.

Tony and Brendan developed an inquiry-based learning approach in their introductory (first year) environmental sciences course. Lectures were designed as panel discussions, where researchers and experts were invited to present on a topic, and students generated questions as a core learning activity. Their approach was based on Tony's philosophy of teaching and learning, and was also a response to a strategic initiative of the University to develop inquiry-based learning.

> The motivation for the course was associated with the [University's] inquiry-learning initiative - bringing in researchers to talk about research, and wanting students to engage with contemporary research. ... The panel discussions were based on the idea that it wasn't just about feeding them information. It was bringing people in and them giving short talks, and then allowing students to contextualise what we've just done though asking questions. ... And giving students the confidence that their collective inquiry is just as important as us feeding them with information. (Brendan, ENVS4/L1)

Andrew and Gloria, who were teaching third year courses respectively in environmental sciences and biology, described their curricula as being research-intensive, which aligned with their goals to prepare students for future research and practice.

> I was practicing research-intensive teaching before it became a stated goal [of the University]. So as a research-only member of staff, I voluntarily engaged in

teaching in areas of my research interest. So that's certainly one philosophy: that the teaching be done in a way which develops skills, rather than just memorising things. Hence the interest in students actually exploring the material to do a substantive piece of research. …. I bring research in by getting students to read and reflect on research writing. So I use the current research literature, quite strongly, as a resource. Another is that the students will be doing some research, and I tell them that a really good mark in the course would be on par with a paper that could be considered for publication in a refereed journal, but aimed at a cross-disciplinary and policy audience. (Andrew, ENVS3/L3)

5.5.5 Active learning

Six participants described using active learning approaches across all of their teaching and learning settings, including interactive lectures and tutorials, problem-solving, student presentations and peer teaching. Some expressed informal beliefs that student activity was better for learning, and others expressed a more coherent constructivist philosophy that student learn by articulating their views, answering and posing questions, and building on their existing understandings. Constructivism and deep approaches to learning were also explicitly identified as teaching philosophies by a few participants.

Some physics participants, including Rose, described transforming traditional lecture approaches to active learning strategies, using peer instruction and other constructivist approaches.

I wanted them to actually explain what their internal mental picture was of what was happening … I wanted them to think about what's your physical model. And don't use high level discipline specific language about fields unless you can explain what you mean by that … So I was trying to get them to predict, explain stuff and then compare with what's really there and think about why they were right for some bits and what might be causing things to deviate from their expectations. (Rose, PHYS3/L3)

Vanessa also described a recent change from a transmission approach to using activities in lectures, case studies and field observations to build on students' interests, and encourage them to question their experiences.

It's getting them to actually do it, rather than just me telling them and this is about looking around at the world around you. You've always just taken it for granted, but why is it? And then what are the meanings of that? And they come up with a lot. I sent these three girls off … to look at clothes' shops. So I was really proud of them because they decided that looking at children's clothes in one store wasn't enough so they split up, … and they did this analysis of, not only the gender differences, but basically they didn't use the word 'class' because we hadn't started talking about it, but they were saying, 'There's this real difference between the expensive stores and the cheaper stores.' So it's through activities like that, so a combination of the readings, but also lots of case studies or images and things. Connecting things back to everyday life. (Vanessa, ARTS3/L2)

5.5.6 Flexible learning

Earlier in this Chapter, in section 5.2.6, I introduced Sameer, who described his educational purpose as to design a system for learning, which he also described as his approach to teaching. His design of the learning system was informed by a flexible learning philosophy, where educational technologies were used to give students choice and flexibility for accessing course materials and over their learning pathways. The learning system supported students to make choices that would help them achieve the intended learning outcomes, because the pathways and reward structures were made explicit.

We just wanted a lot of flexibility. Just the recognition that lots of students have lots of things going on in their lives. So we thought, can we get a system going where these people can not only do things at their own pace and their own time, but also get an interaction going amongst the different participants from really different faculties. … There are pathways available to them and the decision the student has to take is which pathways to go down, whether they do certain things in particular weeks, or whether they don't, or whether they want to change things or not. They can choose a pathway they go down, they can dig new pathways, offshoots in a sense. They can do whatever they want, but there's no ambiguity about what pathways are available and how to get onto them. Whereas a lot of courses, I think, there are lectures and tutorials, but students have no clue how these things match the assessment. (Sameer, INNO1/L2)

5.6 Influence of Students

Participants discussed students, their motivations and learning needs throughout the interviews and 'student' was the most frequently used word in the text of the interviews. When asked about how students influenced their curriculum decisions, participants reported the following key themes:

- students' prior knowledge and abilities;
- students' motivations and interests; and
- students' learning behaviours.

5.6.1 Students' prior knowledge and abilities

Seventeen participants reported that students' prior knowledge was an important influence for making decisions about what to include in the curriculum as content and learning experiences. Participants' beliefs about the influence of students' prior knowledge on their curriculum decisions were shaped by their assumptions about student diversity, which led to different responses, as follows:

- Students were assumed to be a uniform group with little or no prior knowledge in the subject, and participants responded by teaching them basics; or
- Students were assumed to have diverse prior knowledge and abilities, which informed three different kinds of responses in relation to curriculum decisions.

These different beliefs and responses are explored in the discussion below.

Students were assumed to have little or no prior knowledge.

Four participants said their experiences led them to believe that students had little prior knowledge in their subject area. Their responses assumed students to be a uniform group and that the curriculum needed to begin from basics to provide them with foundational knowledge and skills.

> The students' lack of background knowledge ... and that was sort of a bit of a shock for me. Because this was a third year course and I thought by now they have all the skills and they just build on that, and I realised that I can't. And I'm not sure how to address this, but the only way I could do it was trying to make sure that everyone finishes this course with the skills I think are important. (Gloria, INNO3/L3)

This belief suggests a deficit model of students, which is associated with content transmission views of teaching.

Students have diverse prior knowledge and abilities.

Thirteen participants described students as having diverse prior knowledge, experiences and abilities, which was an area of concern and challenge in their curriculum decisions. They described three different methods for responding to student diversity:

- learning and assessment tasks were designed to cater for student diversity,
- students' prior knowledge was investigated to inform curriculum decisions,
- students' diverse knowledge was utilised for peer learning.

These methods suggested progressively more sophisticated ways of understanding diversity and student centred strategies for addressing it. Some participants used multiple strategies to cater for diversity in a range of ways.

Learning and assessment tasks were designed to cater for diversity.

Almost half of the participants reported that their learning and assessment tasks were designed to recognise students' diverse backgrounds and interests. Vanessa's response was to design learning and assessment tasks that allowed students to perform at different levels.

> It's hard with a big course because, like I said, there's just a phenomenal screed of ability and preparedness. So I try to think of assessment tasks and even topics and readings that can be read on a couple of different levels so that students who are at a sort of foundational level, there's stuff that they can do and get a reasonable level of success at. But there's also scope there, there's always like a handful of incredibly able students that hopefully there's space there for them to be able to do more too. So there's their interests, there's their range of abilities and also there's the reality of their lives, which is that most of them are doing a hell of a lot of paid work. (Vanessa, ARTS3/L1)

Students' prior knowledge was investigated to inform curriculum decisions.

Six participants reported that they formally investigated students' prior knowledge, skills and interests to inform their curriculum decisions. Their curricula included surveys and diagnostic assessment tasks at the start of the course, and student feedback helped to shape the curriculum.

Normally I run surveys at start of semester asking people what they want out of their subject, even down to what type of exam question do you want. I've done various student surveys to say, what type of exam question, what's your background, what do you know, and do some base profiling. (Matthew, INNO2/L2)

Student diversity was utilised for peer learning.

Six participants responded to student diversity by designing collaborative learning and assessment tasks that encouraged students to work together and share knowledge as part of the learning process. This suggested they were enacting constructivist understandings of learning and engaging students in knowledge building communities.

I strongly believe in creating things together as a learning tool, because this allows different skills to be complemented. Some people will be better at speaking and they will have better Spanish, but some others will have better grammar because they are more analytical. Others will have more knowledge of the content. So the main idea is that they would have to come to a complementation. We try also to somehow engineer the rules in such a way that there will be different levels of ability and different things that different people will contribute. It does work very well in the sense that you have people with different levels working together. (Thomas, ARTS4/L3)

5.6.2 Students' motivations and interests

Fourteen participants reported that students influenced their curriculum decisions in the affective learning domain, because of the importance of engaging, motivating and challenging students. Curriculum decisions included selecting topics and learning activities that would be interesting and relevant to students, and giving students' choice over topics and assessment tasks. Brendan uses his experience of students' backgrounds and diversity in his thinking about how to keep all students interested.

When I think back to my earlier lecturing experience it must have been way above their heads. Nowadays it's about assuming that how can I actually grab their attention. Again it's that thinking about communication. I think about them in terms of how can I communicate my ideas to where they're at and how can I be aware that they're all at different stages and how do I manage to keep as many of them interested from the ones who are more advanced to the ones that are least

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advanced. How do you actually make sure that they're all getting something out of it? (Brendan, ARTS1/L2)

5.6.3 Student learning behaviours

Eleven participants described beliefs about students' learning behaviours that influenced their curriculum decisions. The majority expressed the belief that students are motivated by assessment, and hence assessment tasks were designed to ensure that students achieved the intended learning outcomes.

Others observed that students' familiar learning behaviours may create resistance when teaching innovations were introduced. For example in physics, students who were successful with mathematical problem-solving approaches were found to resist new approaches that were more conceptual and phenomenological.

> We also discovered the old problem of preconceived notions and student resistance. The students who had been successful in physics, often very successful, had been successful through a certain approach. Now we were not using that approach and so they were no longer successful in some cases and they were very upset. That was one problem. (Brian, PHYS4/L1)

5.7 Summary of the Inner Layer of Influences

Participants identified the most direct and important influences on their curriculum decisions as their beliefs about:

- educational goals and purposes
- discipline
- research
- approaches to teaching and learning, and
- students.

Each of these beliefs is summarised briefly below and discussed in relation to what is reported in the literature.

Participants expressed distinctive beliefs about the *goals and purposes of higher education*, however some participants reported multiple and inter-related beliefs which suggested they represented an overlapping continuum as follows: (1) to induct students into an academic discipline; (2) to prepare students for future work and/or research; (3)

to develop generic cognitive skills; (4) to make learning personally meaningful; (5) to explore social issues and structures, with a view to reform; and (6) to design a system for learning.

Government reviews of higher education, for example the 1997 UK Dearing Report, present a similar range of purposes as all being relevant to the provision of higher education (Barnett & Coate, 2005; Trowler, 1998). In contrast, studies of academics suggest these beliefs about educational purposes represent competing educational ideologies (Fanghanel, 2009; Kemmis et al., 1983; Trowler, 1998). These studies regard some beliefs as being incompatible, in particular, vocational or enterprise ideologies are seen to conflict with personal relevance and social reform ideologies. However this study found that many participants included vocational goals and skills alongside most other beliefs about educational purposes. For example, participants who saw the purpose of education as making learning personally meaningful for students, reasoned that cognitive skills had personal relevance to students for reaching their potential at university, in addition to preparing them for future careers. A focus on developing skills and graduate employability was central to the purposes of the most recent Australian Review of Higher Education (Bradley et al., 2008).

Common educational purposes were found within discipline groups, which suggested that purposes were influenced by disciplinary knowledge practices. However, some disciplines were associated with a range of educational purposes, informed by individual and contextual factors. Physics participants' educational purposes almost exclusively focused on acquiring disciplinary knowledge and ways of thinking, which is a characteristic of hard-pure disciplines (Becher & Trowler, 2001). Arts participants identified educational purposes focused on both personal relevance and social relevance and reform, which are consistent respectively with interpretive and critical knowledge practices associated with the social sciences and humanities (Neumann et al., 2002). Participants from law identified with more varied educational purposes: inducting students into the discipline; preparing students for professional practice; and social relevance and reform. Law participants also described two kinds of knowledge practices informing law curricula, a rules approach and a social context approach, which were associated with different beliefs about educational purposes. Similarly, environmental sciences participants identified with two educational purposes: preparing students for practice and research, and social relevance and reform. This result is not surprising, as

one would expect the applied disciplines of law and environmental sciences to identify with educational purposes that are both practice-oriented and value social relevance and reform.

Educational purposes were also adapted to course levels, reflecting participants' perceptions of students' needs at different levels. Developing cognitive skills was a common goal for first year courses, whereas preparing students for future professional practice and research careers was more common for final year courses. In some cases these were expressed as the dominant educational purpose or were incorporated alongside other educational purposes. Some participants also identified that their educational purposes were shaped by the mission of a research university, and included engaging students with research and preparing them to be future researchers.

Participants' beliefs about *the influence of their discipline* on curriculum decisions were categorised as providing: (1) specialist content knowledge and the structure for organising knowledge; (2) skills for thinking and problem solving; (3) problems for applying knowledge; (4) scholarly and professional roles, attributes and values; and (5) pedagogies and teaching norms.

Patterns of beliefs about the influence of discipline were found for different disciplines and beliefs about educational purposes. Physics participants perceived the discipline as central to their curricula decisions, which emphasised acquiring disciplinary content knowledge and ways of thinking relevant to inducting students into the discipline. Arts participants also perceived the discipline as an important influence, which defined content knowledge and thinking skills. However, in arts, disciplinary knowledge and skills were contextualised to demonstrate personal and social relevance to students. Participants in applied disciplines described the influence of discipline as the real world problems for applying disciplinary knowledge, developing problem solving and thinking skills, and experiencing professional roles and tasks.

The first four categories for discipline influences suggest Barnett's and Coate's (2005) curriculum domains of 'knowing', 'acting' and 'being', which were described in Chapter 2. The 'knowing' domain is represented by category (1) the disciplinary knowledge and ways of knowing that inform decisions about course content. The

'acting' domain is represented by categories (2) skills for thinking and problem solving, and (3) the problems, as action contexts, in which students develop skills. The 'being' domain is represented by (4) the roles and attributes that help shape students' personal, professional and scholarly identities. Different disciplines were found to prioritise different curriculum domains, with physics concerned primarily with knowing; and arts, with knowing and being, in terms of making sense of one's own experiences. The applied disciplines of law, business and environmental were primarily concerned with acting in terms of both professional problems and developing skills, and to a lesser extent with 'being' in terms of developing understandings of professional roles, attributes and values. Discipline was also found to influence curriculum decisions about pedagogies when these were intrinsic to educational purposes, such as a focus on experiential learning in applied disciplines, or when the participants were challenging disciplinary norms, such as the physics example above.

Participants' beliefs about the influence of discipline on curricula decisions also suggest the three broad ways of recontextualising disciplinary knowledge identified by Bernstein (2000), where (1) the discipline maintains its unique voice and also defines the problems of interest; (2) it is integrated with other disciplines and addresses problems from the real world; or (3) the disciplinary voice is weak and the focus is on generic skills and learning to learn. The findings suggest that most participants maintain a strong disciplinary voice in the knowledge and problems presented in their curricula, which Bernstein would predict for the elite context of a research-intensive university (Ashwin et al, 2012). However they are also responding to broader educational and social agendas for engaging students by making knowledge relevant to professional problems, to students' lives, and developing their generic skills for work and learning to learn. Courses where knowledge is recontexualised to address real world problems are more common in applied disciplines and later year courses, and generic cognitive and learning skills in first year courses.

Disciplinary research was conceptualised as an influence on curricula that provided (1) specialist disciplinary content knowledge, (2) real world problems and projects, (3) a process and skills for finding things out, and (4) a scholarly or critical approach to knowledge. These categories are similar to those identified for discipline in the previous section and also reflect the Barnett & Coate (2005) curriculum domains. These

similarities between beliefs about the influence of discipline and the influence of research would be expected, given the essential interconnectedness between research and the development of disciplinary knowledge and knowledge practices (Neumann et al., 2002).

Participants' beliefs about how research influenced their curriculum also suggested variations that were informed by both disciplinary knowledge practices and educational purposes. Physics participants perceived research in the curriculum as providing specialist knowledge, however their own research was considered to be too advanced for undergraduate students, and so they saw little opportunity for making connections. This belief is congruent with the hierarchical knowledge practices of a hard-pure discipline, where research and teaching are seen as occupying separate planes (Becher & Trowler, 2001; Brew, 2006). Law participants typically perceived their professional experiences as more relevant than their research for preparing students for practice, which is consistent with law as an applied discipline. However in both these disciplines, some participants included student research projects in the curriculum, to allow students to explore their own interests and to develop research skills. These goals reflect educational purposes beyond the discipline, for engaging and motivating students, and enacting the mission of a research university. Arts participants aligned research with their personal relevance educational purposes by using research essays to allow students to explore their own interests in topics. In the applied disciplines of business and environmental sciences, participants used problems and projects relevant to both research and practice to provide real world learning experiences. Some of these participants embedded research throughout their curricula because they believed it was central to the mission of a research university.

Almost half of the participants made explicit reference to pedagogical research, which they saw as distinctive from their disciplinary research. Engaging with pedagogical research led to evidence based approaches to teaching and ongoing curriculum improvement.

Participants' *philosophies and approaches to teaching and learning* represent a continuum of categories from teacher and content focused to facilitating active student learning. These philosophies reflect the range of conceptions of teaching identified in

phenomenographic and cognitive studies (Akerlind, 2003; Kember, 1997; Prosser & Trigwell, 1999). In this study, approaches for facilitating active learning were further differentiated as either experiential or inquiry and research-based. An additional approach was identified as flexible learning, which focused on giving students flexibility of access to resources and learning activities, along with an active learning approach.

Phenomenographic and cognitive studies are concerned with identifying the variations in conceptions and their consequences for teaching and learning approaches and learning outcomes, but do not develop explanatory frameworks for the observed variations. However, Neumann et al. (2002) explores disciplinary knowledge practices as an organising framework to understand similarities and differences in the teaching activities, conceptions and approaches observed within and across disciplines. Many of the teaching activities and approaches identified in this study were congruent with those identified by Neumann et al based on disciplinary knowledge practices, and were also congruent with participants' beliefs about educational purposes. For example, arts participants, who expressed educational purposes for making learning personally meaningful to students, emphasised student-teacher engagement approaches. Participants from professional and applied disciplines of law, business and environmental sciences identified experiential learning as a teaching philosophy informing their focus on real world problems and skills.

However many participants also described approaches that were not aligned with the expected disciplinary knowledge practices, indicating that they experienced agency in their decisions. For example, physics participants' disciplinary knowledge practices are associated with a knowledge transmission/ acquisition approach to teaching and learning. However, most physics participants were using active learning approaches, in particular peer instruction. They described peer instruction as an innovative approach that challenged traditional disciplinary practices, however it is an approach that was developed for physics and has progressively gained acceptance within the discipline (Mazur, 1997).

A more general trend towards active learning approaches was found across disciplines in the study, and participants reported that they were influenced by their experiences of

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educational professional development and changing norms for teaching and learning. However, as indicated in the section 5.5.5, participants' beliefs about active learning were often expressed at the level of 'folk beliefs' (Fanghanel, 2007), that being active enhanced student learning, rather than as a fully developed theory of learning.

The term, *students*, was the most frequently mentioned term by participants throughout their interviews, suggesting that students were a central consideration in their curriculum decisions. When specifically asked about the influence of students on curriculum they expressed three main concerns: (1) catering for students' prior knowledge and abilities, and diversity in student background, (2) the importance of motivating, engaging and challenging students, and (3) accounting for, or guiding, students' learning behaviours.

Beliefs about students' prior knowledge were a key concern that influenced decisions about the foundational knowledge required in the curriculum and how best to deal with a diversity of student backgrounds. The different ways in which participants responded to their beliefs about student diversity suggested a connection with their approaches to teaching and learning that were content focused, teacher-student engagement focused, or student focused. The literature also finds similar relationships between approaches to teaching and roles and assumptions about how students learn and their prior knowledge (Prosser & Trigwell, 1999; Toohey, 1999). This section identified some useful strategies that participants used to understand and capitalise on students' different levels of prior knowledge and abilities.

5.8 Academic Identity – the Second Layer of Influences

The literature review in Chapter 2 suggested that curriculum decision making is influenced by academics' beliefs about their identity, and in particular, their identification with disciplinary or pedagogical expertise. The interviews explored participants' perceptions of their academic history and how they came to be teaching the course investigated in the study, in order to capture the experiences and expertise they identified as relevant to their curriculum and teaching. The interview questions explicitly explored participants' experiences of educational professional development, as these experiences provided them with knowledge about curriculum and pedagogical practices, and were an expression of their commitment to learning about curriculum and teaching. The findings suggest this is a second, more indirect layer of influences on

curriculum decision making, but which informs the origins of participants' beliefs about the more direct influences examined in the sections above.

5.8.1 Academic formation

Most participants described their academic formation in terms of their experiences of learning about their disciplines from undergraduate studies to PhD, and then their experiences leading to their current academic appointment, including teaching experiences. Most described their development as teachers resulted from their experiences of teaching in their discipline, and rarely mentioned pedagogical training. However, this appears to be changing, as the PhD students and early career academics in the study had taken courses in teaching to enhance their chances of gaining a continuing academic position.

Participants' accounts of their academic formation often contained complexity in how they chose their research areas, and taking up different kinds of appointments involving research and/or teaching. Arts participants were more likely to identify multi-disciplinary backgrounds, where their discipline and research specialisms developed in different directions depending on the opportunities presented.

> My BA Honours subject was government or political science, my Masters was in a sociology program, and my PhD was in anthropology, and I did my PhD after I'd done seven years of being a lecturer at [another university]. I wanted a career change when I was in my mid-30s and the thread that runs through those three different disciplinary orientations is an interest in the historical formation of society and so it was a kind of, in a way, a natural progression for me to eventually align myself primarily with the discipline of history. One of the things I like about the discipline of history is that it's all encompassing and that it uses narrative and it can have a deep time perspective, all of which, I think, are very helpful in social analysis. (Phillip, ARTS5/L2)

Other academics also described complex backgrounds. For example, Rose identified a change in speciality from undergraduate to PhD studies. However, she saw it as leaving her more open to influences beyond the discipline.

> So I did my undergraduate degree in physics and philosophy and I actually did no nuclear physics as an undergraduate. I then went on to do a PhD in nuclear physics and … so I didn't actually have a sense of what people do in an

undergraduate nuclear physics course in a conventional or traditional course because I hadn't done it, and I guess that left me open to different ideas and different ways of doing things. (Rose, PHYS3/L3)

In the applied disciplines, professional experiences were also significant to identity formation, in addition to academic experiences. Nigel and Ian who taught courses in law reform described critical experiences as students and working in social justice that influenced their beliefs about educational purposes as social relevance and reform.

My interest in this kind of course is that pretty much everything I do is multidisciplinary. This probably reflects the fact that I find pure law to be a significantly overrated academic discipline. … However, given the importance that law plays in our life, I try to make any would-be lawyer appreciate that the little that they know is only important if it can be contextually integrated with other parts of society, and I think I've done something to redress the balance. This probably arises out of my own multidisciplinary background. I'm a qualified social worker with a degree in public administration and social work. And I've been an anticorruption authority and I've been a trade union official. So that's why this kind of course has always held an intrinsic interest to me. (Nigel, LAWS2/L2)

Environmental sciences participants also described professional experiences in their formation that clearly influenced their educational goals and purposes. Andrew's involvement in developing environmental policy led to him identifying this as a need within the science degree, and Tony's work with communities to enhance sustainability was expressed in his beliefs that education should engage students with social issues and reform.

This analysis indicates that participants have extensive periods of formation as academics through undergraduate studies, research training and work that primarily develops their disciplinary expertise. Their formation as teachers typically involves teaching in their disciplines, with very few undertaking pedagogical training. Therefore their academic identity formation is strongly embedded in their disciplinary communities of practice. Professional experiences were also important for law and environmental sciences participants, and were associated with beliefs about educational purposes that incorporated professional relevance, and social relevance and reform.

5.8.2 Educational professional development

All participants described some level of exposure or experiences with educational professional development, however, as noted in the previous section, most did not occur during their initial formation as academics. Participants reported a range of motivations related to different career stages and challenges that included solving practical teaching problems, exploring new ways of teaching, and taking on educational leadership roles. The analysis identified different levels of engagement, which were classified as:

- formal learning in courses for professional development;
- informal learning in workshops and from the educational literature; and
- experience-based approaches, such as trial and error.

These different forms of educational development were associated with different impacts on their curricula and teaching: (1) gaining theoretical frameworks and rationales from formal programs; (2) gaining practical methods for improving teaching and solving problems from informal learning, and (3) developing confidence as a teacher from experience.

Formal courses for professional development.

Half of the participants had undertaken sustained formal courses that included introductory Teaching and Learning Foundations courses, Graduate Certificates in Higher Education, and Masters of Higher Education. They described the influences on their curricula as gaining theoretical frameworks, rationales and teaching philosophies, as well as practical methods for improving their teaching.

> The whole process of doing the Graduate Certificate and going on and doing the Masters had a massive influence on how I thought about what I did, and the idea of constructive alignment seems so obvious. It really was a very powerful thing for me and I saw this as an opportunity to completely re-design a course and so to be able to put some of this into practice in a way that wasn't just tinkering or adding on, but really starting from the beginning and thinking about, 'Well, what is it that I want the students to be able to do at the end of the course and then - what knowledge and skills do I need to help them to get to that stage and how do I know whether they've got there and what kind of assessment should I do.' (Rose, PHYS3/L3)

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Other influences reported by participants who had undertaken formal courses included researching student learning to inform their practice, understanding educational change, and learning about alternative teaching and learning methods.

Informal approaches to professional development.

Seven participants, many of whom had also undertaken formal courses, described informal engagement in scholarly educational development. These approaches included attending regular or occasional workshops, talking with staff in the academic development unit, and researching the educational literature to learn about best practice. Their focus was typically on gaining new ideas and methods, practical strategies for improving their teaching, and having someone to talk to when things went wrong.

> Some of my most influential experiences have been people [from the education development unit] who were around at the right time, to just give me stuff to read. So it was very informal. You know, 'Just in time teaching'. So it was one to one, just in time. You know, I'm giving my first lecture next week, what on earth do I do? (Tony, ENVS4/L1)

Experience based professional development.

Five participants reported that their professional development resulted from their experiences of teaching, including informal reflective practice, responding to student evaluations, and trial and error. Other examples included talking with colleagues, and reviewing course proposals and documents as members of education committees. These activities typically introduced participants to alternative methods for teaching, and practical knowledge about how to do things, such as teamwork.

> I've gone to the odd seminar run by [the education development unit] over the years and that's been helpful, but in a more general sort of way. ... My professional development as a teacher, I think, has been more about me being reflective about my own practice, and reflective about other people's practice. (Sarah, LAWS1/L1)

5.8.3 Summary of the Second Layer of Influences

Participants' beliefs about academic identity and their formation of expertise represents the second layer of influences, informing their beliefs about more direct influences on curriculum decisions. Most participants identified the formation of their expertise from their experiences of learning, researching, working and teaching in their disciplines.

Therefore disciplinary knowledge practices arguably provide an explanatory framework for understanding the origins of their beliefs. However, participants from the applied disciplines of law and environmental sciences also identified critical professional experiences that shaped their beliefs about educational purposes.

Many of the participants in this study were in mid to advanced level academic positions and stages of their careers and had engaged with different forms of educational professional development. It appeared that participants' beliefs about teaching were gradually being informed by educational theories and examples of good practices. The impacts were evident in their approaches to teaching, which were predominantly experiential, research-based and active. This finding contrasts with the phenomenographic literature, which indicates that transmission approaches to teaching are the dominant mode across disciplines (Prosser & Trigwell, 1999; Ramsden, 2003). Taking on educational leadership positions also appears to change participants' perceptions of the expertise they require. Hence this suggests that academic identities are not fixed and can be shaped during and after their initial disciplinary formation.

5.9 Institutional Context of the Research University – the Third Layer of Influences

Participants were asked about the influences of the institutional context, including the specific influence of working at a research university. The institutional context represented the next layer of influences in terms of impact on decision making. In particular, the research university context influenced participants' perceptions of their priorities and rewards for putting effort into curriculum and teaching. Institutional policies related to curriculum and teaching had specific and localised impacts, however many of them were perceived as constraining good teaching practices. Departmental norms and departmental colleagues were also seen as influencing practice.

5.9.1 The research university and teaching-research relationships

Participants' beliefs about working at a research university had a distinctive influence on their curriculum decisions, in addition to the influence of the institutional context more generally.

Half of the participants identified positive influences on their curricula that were related to linking research and teaching, because the research university gave them access to researchers to give expert guest lectures, and to other research related resources.

> I guess the concentration of research expertise at the University affects [my curriculum decisions], because of the access to resource material and also things like guest lecturers. I don't believe anywhere else in Australia you'd get this ability to do that. Sometimes we bring our students to conferences or we encourage them to go to conferences or seminars that are on all over the place. (Sameer, INNO1/L2)

Three participants reported that their beliefs about educational purposes were specifically influenced by working at a research university to include engaging students with research and training future researchers. However, some also expressed concerns that research-related goals interfered with broader goals for catering for students with diverse interests, needs and potential careers.

> It's very tempting to think that we are training researchers of the future and I always have to remind myself that's not true for most of these people. (Edward, PHYS5/L1)

Negative influences were perceived as the University prioritising research over teaching, and the consequent time pressures and lack of reward for teaching. However more than half of the participants described their commitment to, and enjoyment of, teaching, despite these limitations. Hence they described the struggle to be both research and teaching active, usually by working long hours.

> So it's easy to put research on the lowest priority, because research doesn't come and knock on your door in the way that students do. But there's something weird about university career in that it's actually your research that you're judged by. To me that's a rather strange work environment where the work that you do on a day to day basis and that you get even more of, may I add, like I've got a hundred students this semester and I don't have any tutors. So that's six tutorials per week and the grading. I have to do all that grading; you can't not do it. Yet, on the other hand, if I want to be promoted I have to write a book. So there's something weird about it and I struggle with how to do it. (Vanessa, ARTS3/L1)

Some participants identified strategies for making time for research and making teaching more efficient. These strategies included linking their teaching and research,

mostly by researching their teaching; and teaching in one semester only, so they could give focused attention to each activity.

Vanessa problematised the common view that time can be created for research by neglecting teaching and students.

> Sometimes I think, well maybe one semester I should just say 'I'm just doing the bare minimum teaching, I don't care about the evaluations'. But, I'm not convinced that being a bad teacher takes less time because you still have to give a lecture, you still have to do tutorials, you still have to mark, so you might as well enjoy it. Whereas, if I was constantly feeling like all I want to do is get away from my students then I'd still probably be spending the majority of my time teaching, but I'd be hating it. (Vanessa, ARTS3/L1)

The research university culture was not seen as being supportive of time spent on educational development or mentoring colleagues. Tony identified a change in this culture as important for fostering educational change.

> So one thing I was pushing the DVC to change was the promotional criteria for Level E [Professor] to include mentoring and support of other people's teaching. … So if that was encouraged and supported, I could change the culture pretty quickly. ... I mean, people do it anyway, but they're not getting any credit for doing it. (Tony, ENVS4/L1)

5.9.2 Other institutional influences

One of the key ways in which institutions influenced curriculum practices was through the teaching spaces provided and timetabling that shaped norms for the structuring of teaching and learning events and decisions about teaching and learning activities. In Chapter 4, most participants were found to structure teaching and learning events as a weekly schedule of lectures and tutorials, which were associated with a common set of purposes and activities. These decisions about course structures and settings appeared to be largely invisible or taken for granted by participants, and they typically followed the standard approaches used in their faculty or department, seemingly without question. The institutional practices that were more visible to participants as being influences were specific teaching and learning policies, and initiatives for changing curriculum practice.

Institutional policies.

Institutional teaching and learning policies were reported as an influence on curriculum decisions, in particular, in the institution in question, recent assessment policies and the course approval process. Assessment policies had recently changed to set limits on amount and type of assessment, such as the marks that could be awarded for class participation.

> We have a limit of something like 3000 words for a course or a three hour exam, and if you take 1000 words for an essay, then you can only have a two hour exam and if you take - it becomes absurd and what we have is students who end up writing in a way that is to save words rather than to express themselves cause they're so cramped by these ridiculous word limits and they don't write about what they're interested in and they don't - they're not assessed on things they care about and the exam situation is demoralising and the whole thing undermines learning in general. (Elaine, LAWS4/L2)

These influences were typically perceived as constraints on good practices, and included both official university policies and participants' beliefs and experiences of practices at the department level. For example, participants often expressed beliefs that departmental requirements included norm-referenced assessment systems or 'grading to the curve', and limits on the number of High Distinction grades that could be awarded, even though these were not explicit institutional policies.

However a generally positive impact was associated with the institutional policy that all new courses were required to complete a course outline template that involved demonstrating alignment between assessment and learning outcomes. While this was perceived initially as a bureaucratic imposition, it was also found to be helpful.

> When I wrote the course proposal documents, there were twenty-seven different questions about exactly the same thing in quadruplicate as well. But asking things about learning outcomes and the like was really useful for framing the contents of the course and making it quite specific about what we wanted people to know at the end of it. I think that helped in the development of both the materials and the curriculum. (Ryan, ENVS2/L3)

Institutional projects for curriculum change.

Brendan mentioned two specific institutional change initiatives that had influenced his curriculum design. One was a project for developing inquiry and research based learning at the University. This project had provided funding and resources to support the development of inquiry and research based learning in a small number of pilot courses over one year, but had not become an ongoing initiative. Brendan & Tony's co-convened course had been initially funded by the inquiry learning approach and they had continued to develop the approach after the funding ceased. Brendan also mentioned an information literacy project that was another institutional change initiative, which aimed to embed generic skills across the curriculum to enhance student success and retention. Brendan described this initiative as having an impact on his first year sociology course design. Hence these institutional change initiatives appeared to have local, but enduring, impacts with the academics who engaged with them, however were not mentioned by any other participants.

5.9.3 Departmental culture and colleagues

Participants described the influence of the departmental culture and their colleagues on the norms and expectations about course content and teaching, learning and assessment practices.

> Absolutely, it's influenced by my colleagues in that we all talk about what this course covers because there's a 1001 [course] and then there's 1002. So we have to make sure that there's a sense of continuity and similarity of perspective, but not actual overlap or anything. (Vanessa, ARTS3/L1)

Colleagues also provided mentoring and support for new academics to develop curricula and for sharing ideas about teaching, learning and assessment methods.

Participants who introduced curriculum innovations that challenged the departmental or disciplinary norms often met with resistance from their colleagues. However, two participants reported that their academic credibility helped them to overcome resistance, which for Sameer was aided by gaining numerous teaching awards.

> It's not an easy thing to do because we got laughed at often by our colleagues at first. Now that we've won three different awards… that's muted all the criticisms. I remember the Dean at the time actually coming to us after the first time, he said, 'When I saw you all doing creative projects at first I thought what are you getting

them to do arts and crafts for.' We got nominated for a teaching award every year we taught it. The first time we walked in and said, 'We got nominated' and we asked him to be a nominee, and he wrote this letter for us that was really damning with faint praise. And that's because he doesn't believe in that creative thing, because I guess that he sees it as somehow less rigorous, but I don't think so. (Sameer, INNO1/L2)

5.9.4 Summary of the Third Layer of Influences

Influences from the institutional context and culture of a research university were perceived as being less central to curriculum decisions than those influences discussed previously. The context and culture of a research university was the most important of these influences, and informed some participants' educational purposes for engaging students with research. All participants perceived that research was prioritised over teaching, which constrained their available time for teaching. However most maintained a strong commitment to teaching and valued their interactions with students, as well as other benefits from teaching such as gaining a broader view of their discipline.

Institutional policies had some impact because they were mandatory requirements, however also led to resistance when they were perceived as educationally uninformed and constraining good practice. Only one participant described institutional curriculum change initiatives that were experienced as a positive and enduring influence on curricula, however their impact was local and limited to those directly involved.

5.10 Factors External to the University – the Fourth Layer of Influences

Participants were asked if they thought that factors external to the university had influenced their curriculum design, and were given examples as triggers: the government, employers, professional organisations, schools and parents. These external influences were intended to represent the socio-political context of higher education, with concrete examples of stakeholders from that context. Most participants perceived very little influence from external factors because they had little direct contact with external stakeholders, and three participants said explicitly that external factors had no influence on their curricula. However, professional associations and employers, government and schools were each described as influences by a small number of participants. For example, two physics participants described the international physics academic community as a significant influence on their curriculum and teaching, which

led to their adoption of peer instruction. Participants' perceptions of professional associations, employers and government influences are briefly explored below. However the relative invisibility of external factors from the socio-political context of higher education as an influence on curriculum practice needs further examination, and is discussed at the end of this section.

5.10.1 Professional associations and employers

In the professional disciplines of law, business and environmental sciences, four participants identified professional organisations and employers as influencing course content and graduate outcomes. In law, the professional organisation was perceived as having a strong influence on defining the required course content for accreditation.

> The content of the course is dictated by the Law Society. There's something in the law that's called the Priestly 11 - it's now Priestly 12, which includes this course content in its requirements. This course wouldn't be mandatory at all if not for the Priestly 12. (Elaine, LAWS4/L2)

In the environmental sciences and business, professional associations were experienced as having less influence and being less directive than in law, but participants did describe engaging in conversations with employers about graduate outcomes.

> Well through my research work, I've had a lot of interaction with state government and catchment management authorities and the like, and staff from those organisations. And I think understanding what their needs were also helped me to distinguish the needs for this course. (Ryan, ENVS2/L3)

Most other participants reported that employers had little or no influence, because they had no direct contact with them, although some would have liked to know more about their views of graduate outcomes.

5.10.2 Government as funder and employer

Four participants reported that government was an influence, while two participants specifically stated that it was not. The influence of government was perceived as the funding, or more specifically underfunding of universities, which affected the survival of particular disciplines, academic workloads, staff-student ratios, and other teaching decisions that involved resources. This influence was more apparent to participants in disciplines such as the languages, which had undergone substantial cuts, and to others managing increasing student numbers.

> I think effectively the government underfunds university education in Australia and we have too many students in these courses. So if I had 60 students, instead of 160, then I could teach the whole course and have it even more engaging. I can be engaging with 160 but it's much harder and it's a much bigger ask than it is to take 50. It's really a very different kind of process and student numbers change the way you have to deal with every aspect of it, from assessment to class time, to the way that you interact with students when they want help. (Elaine, LAWS4/L2)

Government was also identified as an employer of graduates by two participants, influencing their perceptions of graduate destinations and hence desired learning outcomes.

5.10.3 Summary of the Fourth Layer of Influences

Very few participants identified influences external to the university as having a significant impact on their curriculum practices, although a few did identify some specific impacts from professional organisations and government funding. The overall perceived lack of impact of potential external influences seemed to be because participants saw themselves as having little direct contact with external stakeholders. They also experienced little control over external influences, and so may not have seen such influences as within the scope of their decision making.

In contrast, the educational literature highlights many government agendas that are driving change in higher education, including quality assurance, graduate attributes, workplace skills and readiness, student equity and retention (Barrie, 2004, 2012; Bradley et al., 2008; Rowland, 2006). This study suggests that these agendas are often not visible to participants as influences. Nevertheless, their impacts were apparent in trends in the data. Examples are the common inclusion of generic and workplace skills across curricula, and institutional policies and quality assurance processes to standardise course outlines and assessment practices. This finding has implications for institutional managers and governments trying to achieve educational and curriculum change, and will be explored in Chapters 6 and 7.

5.11 Overall Chapter Summary

This chapter examined participants' beliefs about the educational and contextual factors that influence their curriculum decisions, and the nature of those influences. Figure 5.1

shows a resulting model of different layers of perceived importance and impact of influences on curriculum decisions.

Participants' identified the inner layer of most direct and important influences on their curriculum decisions as their beliefs about (1) educational goals and purposes, (2) their discipline, (3) research, (4) approaches to teaching and learning, and (5) students. The next layer of influences was participants' beliefs about their academic identity, through their formation and commitments to knowledge and expertise for making curriculum decisions. This was followed in importance by institutional context and the culture of a research university. External influences formed the outer layer, and many participants reported little influence from external factors, seemingly because they had little direct contact with them.

The chapter also explored the patterns and variations in beliefs about these influences, and compared them with explanatory frameworks from the literature. These explanatory frameworks included disciplinary knowledge practices based on Biglan's and Becher's typology of disciplines as hard or soft and pure or applied (Becher & Trowler, 2001); socio-cultural perspectives (Fanghanel, 2009; Trowler, 1998), Bernstein's pedagogic device (Ashwin, 2009; Bernstein, 2000), and phenomenographic and cognitive studies (Akerlind, 2003; Kember, 1997; Prosser & Trigwell, 1999). Patterns and alignments of beliefs were found around participants' beliefs about educational purpose, which shaped their beliefs about other influences and their curriculum decisions. Disciplinary knowledge practices helped explain many of the variations in participants' beliefs about influences. However, individual variations suggest participants' beliefs were shaped by an interplay between disciplinary knowledge practices and individual ideologies developed from their broader professional experiences and educational development. The institutional context was associated with enablers and constraints for change, however they were not always visible to participants, or led to resistance. External factors from the socio-political context were also largely invisible to participants. Hence, the findings suggest that participants identified the most important curriculum influences as those where they perceived having agency to shape them to their educational purposes.

Next, Chapter 6 explores the patterns of alignment between beliefs about educational purposes and other influences holistically to identify philosophical orientations to curriculum. These orientations provide a framework for examining how participants are responding to the changing context of higher education, and suggest implications for educational change initiatives and for professional development programs, which will be developed in Chapter 7.

Chapter 6

Making Sense of Curriculum Decisions as Philosophical Orientations to Curriculum

Chapter 6 explores how participants' beliefs about curriculum influences align to represent coherent philosophical orientations to curriculum. This was not an intended outcome of the study, but arose from analysis of the impact of the five key influences on curriculum decision making identified in Chapter 5. Section 6.1 reviews the findings from Chapter 5 that identify the range of beliefs about the five key influences that most directly shape curriculum decisions. These influences are educational purpose, discipline, research, approaches to teaching and learning, and students. Beliefs about educational purposes were found to create an alignment with beliefs about the other key influences. Table 6.1 presents this alignment for each educational purpose, which suggests that educational purpose serves an integrating function in decisions about curriculum design. Distinctive curriculum orientations are identified from the aligned sets of beliefs. A model is presented in Figure 6.1 to visually represent the defining features of each curriculum orientation in terms of beliefs about influences and curriculum decisions, drawing on the findings presented in Chapters 4 and 5 respectively. In section 6.2, each of the curriculum orientations is analysed to identify critical features, and illustrated with case studies from the data. Section 6.3 compares the findings in this study with educational and curriculum ideologies from the literature, and with explanations from disciplinary knowledge practices and socio-cultural perspectives. The curriculum orientations can be understood by drawing on both participants' disciplinary knowledge practices and their educational ideologies. Section 6.4, examines participants' beliefs and responses to contextual influences that are identified as drivers for change in the higher education literature. The findings show that participants' responses to these drivers for change both shape and are shaped by their curriculum orientations. The Chapter concludes by setting the scene for exploring the implications for institutional curriculum change and approaches to educational professional development in Chapter 7.

6.1 The Alignment between Beliefs about Influences and Curriculum Orientations

In Chapter 2, curriculum decision making in higher education was conceptualised in terms of a field of influences, where participants' beliefs about key educational and contextual factors influence their curriculum decisions and practices.

In Chapter 5, the following influences were identified as the most important for shaping participants' curriculum decisions:

- educational purposes;
- discipline;
- research;
- approaches to teaching and learning; and
- students.

Chapter 5 also found that participants' beliefs about educational purposes were a central influence that created an alignment between their beliefs about the other key influences listed above. Participants' beliefs about educational purposes were categorised as follows:

1) to induct students into an academic discipline;
2) to prepare students for future work and/or research;
3) to develop students' cognitive skills;
4) to make learning personally meaningful;
5) to develop students' understanding of social issues and structures, with a view to social reform; and
6) to design a system for learning.

Table 6.1 summarises each of the beliefs about educational purposes and the corresponding beliefs about the influences of discipline, research, approaches to teaching and learning, and students. The table illustrates that beliefs about educational purposes create an alignment with other beliefs that shape curriculum decisions. The table also illustrates that each of the educational purposes defines a focus in curriculum decisions, shown in bold, which relates to the influences of discipline, research and/or teaching and learning approaches. The key features and relationships between beliefs are explored below for each educational purpose. Beliefs about students are only touched upon in these snapshots because they are generally consistent with the teaching and learning approaches, and reflect varying degrees of emphasis on students' prior knowledge, motivating and engaging them, and directing their learning behaviours.

The first belief about educational purpose is ***to induct students into the discipline***, and hence discipline is the most important influence on curriculum decisions. Curriculum

decisions focus on students acquiring the disciplinary knowledge and ways of knowing that they require to become members of the discipline. Research was understood as providing disciplinary knowledge for curricula, however was also seen as too specialised for undergraduate students. The expected focus of teaching and learning approaches in this orientation is content transmission, however participants in this study reflected changing understandings of teaching and learning, and reported adopting active learning and teacher-student engagement approaches. Students' prior knowledge was seen as their most important influence on the curriculum.

The second category of beliefs about educational purpose is ***to prepare students for future work and/or research.*** The focus of these curricula are the real world problems and tasks that inform the design of learning and assessment tasks relevant to work and/or research. This category expressed a continuum of beliefs about educational purposes from preparing students for work to preparing them for research. This continuum was also reflected in the focus on discipline and on research as the source of real world problems and tasks for preparing students for work, and for research, respectively. This educational purpose also emphasises approaches to teaching and learning that are experiential and research-based, where students develop professional and/or research skills in the context of real world problems. Hence curriculum decisions focus on the teaching and learning context and approaches, rather than curriculum content as for the previous category.

The third category of beliefs about educational purpose is ***to develop students' cognitive skills,*** which also emphasises teaching and learning approaches, rather than curriculum content. Discipline is not emphasised, and research is an influence on teaching and learning approaches that are inquiry- and research-based for developing cognitive skills. This belief about educational purpose has much in common with the previous belief for preparing students for research.

Table 6.1: Relationships between Beliefs about Educational Purposes and Corresponding Beliefs about Curriculum Influences.

Beliefs about educational purpose Other Influences	To induct students into the discipline	To prepare students for future careers and/or research	To develop students' cognitive skills	To be personally relevant to students	To develop students' understanding of social issues and structures	To design a system for learning
Influence of Discipline	**Providing disciplinary knowledge and ways of knowing.**	**Providing real world professional problems.**		Providing disciplinary knowledge.	**Providing multi-disciplinary knowledge for investigating social issues and problems.**	
Influence of Research	Providing disciplinary knowledge.	**Providing research problems and projects.** **Developing research skills.**	Providing a process for developing cognitive skills.	**Providing real world disciplinary and research problems/ contexts for creating personal relevance.**	**Providing real world problems related to social issues.** Developing professional and scholarly roles and stances to knowledge.	Pedagogical research informs curriculum decisions.
Influence of Approaches to Teaching and Learning	Active learning and peer instruction. Teacher-student engagement.	Experiential and research-based learning.	**Active, inquiry and research-based approaches to learning.**	Teacher-student engagement.	Transmission and content centred. Experiential and active learning.	Flexible learning. Active learning.
Influence of Students	Students' prior knowledge.	Students' prior knowledge.	Students' learning behaviours.	Students' motivations and interests.	Students' prior knowledge. Students' motivations and interests.	**Students' learning behaviours.**

Curricula informed by the fourth category of educational purpose *to develop students' understanding of social issues and structures* emphasise both discipline and research as influences that inform (1) multi-disciplinary content knowledge, and (2) social problems and issues as teaching and learning activities, and (3) scholarly or professional roles and stances towards knowledge. Teaching and learning approaches were found to be *either* teacher and content focused, where the curriculum emphasised acquiring knowledge; *or* active and experiential, where the curriculum emphasised investigating social issues and problems.

The final category of educational purpose *to design a system for learning* views the curriculum as a tool for achieving the intended learning outcomes. The focus of curriculum decisions is the teaching and learning approaches that direct and support students' learning behaviours to achieve the intended learning outcomes, based on principles such as constructive alignment and mastery learning. Hence pedagogical knowledge and research is also a key influence.

Although each of the beliefs expressed about educational purposes have distinctive foci, there is considerable overlap between the focus on influences and curriculum decisions in the categories *to prepare students for future careers and/or research* and *to develop cognitive skills*. The rationales reported for developing students' cognitive skills included that cognitive skills were relevant for future work, as well as for academic learning. Hence these categories express an overlapping continuum of beliefs that the purpose of higher education is to prepare students for work, for research, and for academic learning. A continuum is also reflected in curriculum decisions with different degrees of emphasis on real world problems and experiential or research-based teaching and learning approaches for developing professional, research, and/or generic cognitive skills. So for the purposes of defining distinctive curriculum orientations, these two educational purposes are combined to represent a single orientation called professional and academic.

Hence five curriculum orientations were identified based on educational purposes as follows:

- Discipline based orientation, where the purpose of the curriculum is to induct students into the discipline by developing their understandings of specialist disciplinary knowledge.

- Professional and academic orientation, where the educational purpose is to prepare students for a range of future pathways that include professional practice, research and learning at university.

- Personal relevance orientation, where the educational purpose is to help students make sense of their everyday experiences and explore their interests to attain self-understanding and personal growth.

- Social relevance and reform orientation, where the educational purpose is to develop students' understanding of social issues and structures, with a view to social reform.

- Systems design orientation, where the purpose of the curriculum to design a system for learning, and hence the focus is on educational processes that guide students to achieve the intended learning outcomes, rather than course content.

Figure 6.1 presents a model to visually represent each curriculum orientation in terms of the alignment between beliefs about influences and curriculum decisions. This model highlights that each of the curriculum orientations prioritises particular beliefs about influences, which lead to a focus on different curriculum elements. The influences of discipline and research are strongly interconnected through their relationship in the production of disciplinary knowledge, and both are contextualised in curricula in similar ways as disciplinary knowledge (knowing), real world problems and skills (acting), and a professional or scholarly approach to knowledge (being). The model also shows the relationships between curriculum orientations, where there is an overlapping continuum as the focus in each orientation moves from the discipline and acquiring disciplinary knowledge; to real world problems and skills relevant to the discipline, research, and academic learning; to real world problems and issues that are relevant to students' personal lives or the social world. The systems design orientation is not shown on the diagram, because it acts in a different way to the other orientations by focussing on educational processes to construct relationships between curriculum elements that guide students' learning behaviours.

Figure 6.1 Curriculum orientations for making sense of curriculum decisions
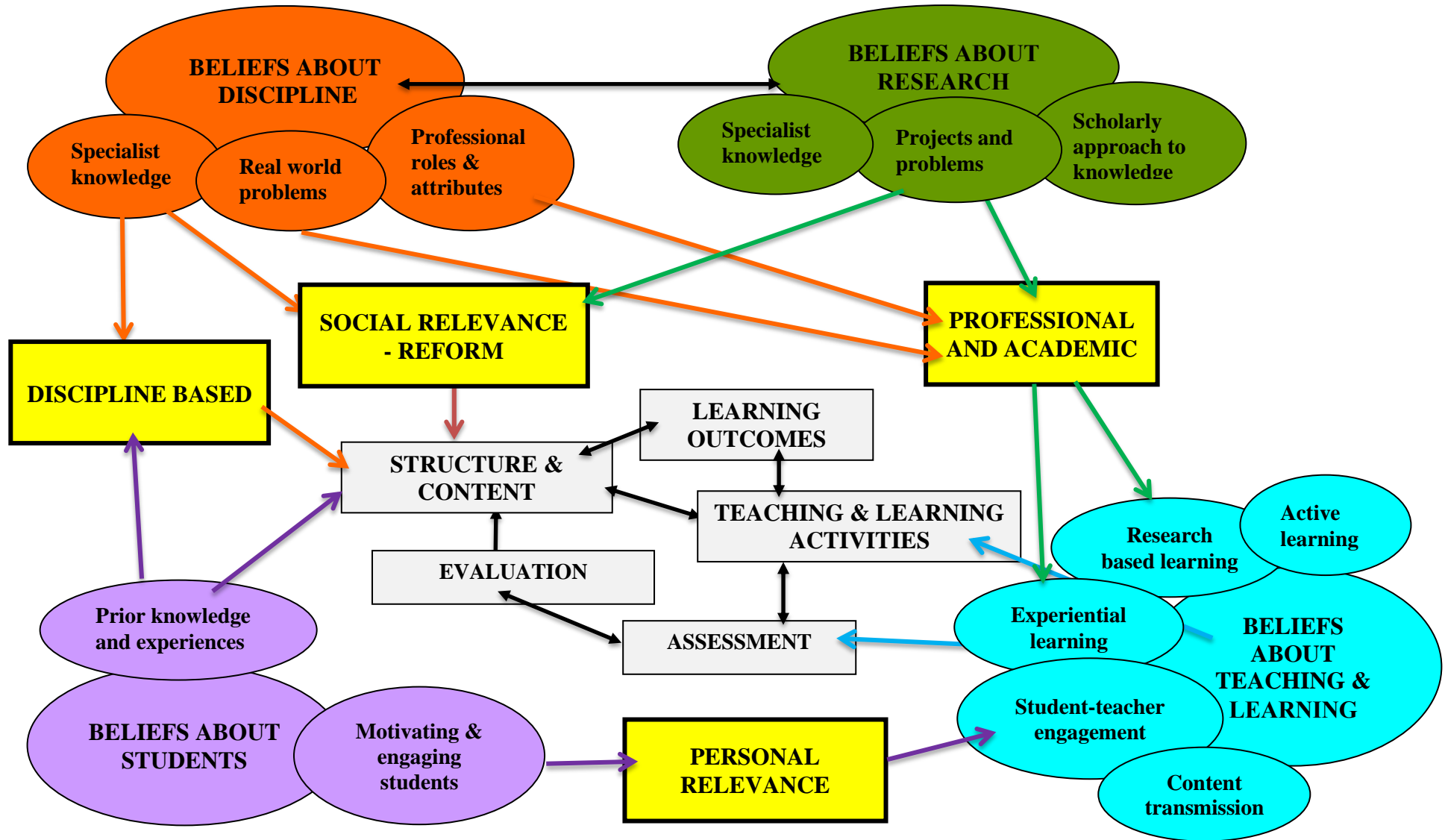
The following sections describe and analyse each of the curriculum orientations in turn, to identify their critical features in terms of beliefs about curriculum influences and curriculum decisions, and provide illustrative case studies. The views of many of the participants highlighted in the case studies will be familiar from Chapters 4 and 5, but in this Chapter they are presented in a more holistic and integrated way to illustrate the inter-relationships.

6.2 Critical Features of the Five Curriculum Orientations

6.2.1 The discipline based curriculum orientation

In this orientation, the purpose of the curriculum is to induct students into the discipline. The discipline was the most important influence and defines knowledge for course content, and disciplinary ways of thinking and problem solving. Learning goals also include developing expertise, interest and enthusiasm for the discipline, and understanding the social and historical contexts in which knowledge is developed.

Four physics participants were represented in this orientation and expressed common goals for students to acquire the knowledge and skills to approach problems like a physicist. The discipline also informed a canon of knowledge and traditional approaches to teaching and learning. However most physics participants in this study reported that they were challenging these traditions because the traditional way of organising and presenting knowledge did not reflect modern understandings of the discipline. A number of participants had adopted peer instruction, as an evidence based learning approach that was developed by a distinguished physics educator (Mazur, 1997), and hence was congruent with their disciplinary knowledge practices. One participant described how his beliefs about learning changed from a focus on students acquiring disciplinary knowledge, to facilitating conceptual change to achieve scientifically correct understandings.

Most law participants reported that law curricula traditionally focused on students acquiring legal knowledge using transmission focused teaching approaches. However, only one law participant was categorised as having a discipline based orientation in an introductory law course. She identified her educational purpose as being to develop students' foundational legal knowledge and skills while maintaining their interest in law as a discipline, and her decisions about course content, skills and problems were based

on their relevance to law as a discipline. She described a teacher-student engagement approach to teaching, where she highlighted the importance of clear communication and presentation of course materials, however she also aimed to engage students' interest and enjoyment.

In this orientation, research was conceptualised as providing specialist disciplinary knowledge for the curriculum, which was not always seen as appropriate or relevant to students. Physics participants' described their own research as being too advanced or narrow to be relevant for undergraduate students, even in advanced level courses. The law participant included research from colleagues in the lecture program to develop students' enthusiasm for studying law and because she believed that engaging students with research was important to the mission of the research university.

Two cases studies are presented below to illustrate this curriculum orientation.

A specialist level 3 course in physics.

In a specialist course on nuclear physics, Rose described goals that focused on students understanding the discipline, including the social and historical contexts that shaped its development as a knowledge field.

> I like the idea of students knowing some of the history and cultural context to some of the ideas that developed, and particle physics is quite a nice one for that because of the development of particle physics out of previous understandings of matter and interactions. ... Because I think that the most important thing that students can take away from an undergraduate degree is a sense of their own discipline, and not necessarily the specific knowledge of geometric optics, or particle physics, or whatever. It's more a sense of how things progress and how ideas fit together and how ideas change.

Her teaching and learning approaches were active and experiential to explicitly develop disciplinary ways of thinking and practising. One example was her development of traditional laboratory experiments as role plays so that students could envisage themselves as scientists, which was described in section 4.5.3. These approaches were different to physics students' familiar ways of learning based on mathematical problem solving and equations, and many found them challenging. The complexity of Rose's subject matter meant that there were no equations that students could use. However, she

recognised this as an opportunity to expand students' ways of understanding the discipline and to introduce them to constructing mental models as a conceptual tool.

> Nuclear particle physics is too hard to do theory at the third year level. So particle physics ends up having to be done quite phenomenologically. I knew from the students that they wanted more equations, they wanted more maths … because that's what they've been taught physics is, and then we hit them with nuclear physics and we don't have formulas and so I was trying to find ways of giving the students access into the theoretical side. … So I wanted them to think about what's your physical model of these interactions, what's going on?

Her disciplinary research did not influence her curricula, because she didn't think it was relevant for students, however she introduced a research project to allow students to explore their own interests in topics.

> So the research I do in physics is really, really specialised and so the main influence it had on the way I thought about the course was for me to think well it would be completely pointless for me to try and make this course be a lead up to my research and my specialisation because it just wouldn't be valuable for the students.

An introductory level 1 course in law.

Sarah's educational purpose was to develop students' knowledge, skills, and enthusiasm for the discipline. Her goals were influenced by the course context, which was a first year course intended to provide students with an introduction to law. She also included research in her curriculum, by inviting her colleagues to lecture on their current and topical research, and used a research essay for students to demonstrate research skills. These research experiences were intended to develop students' interests in the discipline and research done at the University, and were informed by her beliefs about the mission of the research university.

> I introduced a research essay ... so students are developing research skills that they can then use throughout their degree and that's important in any law degree, but particularly at this University. We're sending out a message about things that are important at the University and in the law generally, and interestingly, it's been a way in which, I think, students discover that we're also researchers.

'Precision' was the way she defined the influence of the discipline of law on her curriculum and was embodied in her teaching philosophy and approach. She believed

she modelled precision to students by ensuring her communications and course materials were well structured and clear. She also described being an ethical role model for students and modelling academic honesty, because of the importance of ethics to the discipline of law.

> Precision is one way in which I can see the discipline of law influencing the structure of my teaching materials and the way in which I present materials. I think the ethical modelling too is particularly important in law.

Her philosophy of teaching and learning suggested a teacher and content focus that was mediated by her beliefs that it was important to be approachable and available to students, and to engage with them as if they were future colleagues. She reported relaxing her approach to teaching as a result of her time as an educational leader in the faculty, when she was exposed to a range of different ways of teaching. Being more relaxed about the level of detail and structure in her classes and documents 'allowed more space for students to learn, paradoxically'.

Summary.

These case studies show that discipline was the dominant influence in this orientation, informing the selecting and structuring of course content, and learning outcomes that included students thinking like discipline experts and gaining an understanding and interest in the discipline. Research was conceptualised as a source of disciplinary knowledge and expertise, and was only included in curricula where it was considered appropriate to students' level of expertise. Teaching and learning approaches were found to be undergoing change from traditional teacher and content focused approaches, to student engagement and active learning. The physics case study shows that active teaching and learning approaches help to broaden goals for understanding the discipline from a focus on knowledge acquisition, to include discipline specific ways of thinking and practising, such as mental modelling, problem-solving, and role plays of scientific work.

6.2.2 Professional and academic orientation

This orientation represents a combination of two beliefs about educational purposes which are preparing students for future professional practice and research, and for developing cognitive skills. Seven participants expressed these educational purposes along a continuum involving professional, research and academic learning goals. At the professional end of the continuum, there was a focus on real world learning contexts

where students experience professional problems and tasks. At the academic end there was a focus on developing cognitive skills for thinking, learning and research. Applied disciplines of law, business, environmental sciences, and biology with a medical sciences context were represented in this orientation. The environmental sciences and biology/ medical sciences, were represented in the middle of the continuum where professional practice and research are connected through common real world problems and projects. Educational purposes are also shaped along the continuum by students' perceived needs in first year and final year courses. Final year courses focused on students' needs as graduates by preparing them for work and/or research, whereas in first year courses students' priority needs were defined as cognitive skills for thinking and learning to learn.

Two case studies are selected to show the continuum of purposes and their corresponding curriculum practices as exemplified in (i) a compulsory level 2 law course for preparing students for professional practice, and (ii) a level 1 environmental sciences course which focused on developing students' cognitive skills.

A compulsory level 2 course in law.

Elaine described the purpose of her compulsory level 2 law course as meeting professional requirements for the program to cover a specific area of discipline knowledge. However her goals were not just for students to acquire the relevant discipline knowledge, but to know how to apply and question the use of the knowledge in legal practice. Hence this curriculum maintains the strong influence of discipline in defining the knowledge and problems presented in the curriculum.

> I wanted the students to have a fairly comprehensive view of the Evidence Act. I wanted to teach them how the rules work in practice and give them an opportunity to practice with them, but I also wanted to raise the questions, 'Why is that right? Is that a good rule?'

Elaine described the most significant influences on her curriculum decisions as her experiences of being a lawyer and her beliefs about teaching and learning that were developed from undertaking a formal course in teaching and from her teaching experience. Her research was not directly related to the curriculum and so she saw it as having little direct influence on the curriculum.

This course doesn't line up with my research very well. It is more lined up with what I did in practice as a lawyer. So the things that I learned in practice as a lawyer, you know, affect the way I teach this course.

Her aims were for students to develop specific skills relevant to legal practice, such as thinking, advocacy, and communication, which also represent generic cognitive skills. An experiential learning approach was central to her curriculum design to achieve her educational purposes. The course was structured around video based scenarios and role plays where course topics were presented in a legal practice context and issues were raised for students to discuss and resolve.

We need an approach that puts the students in the shoes of a lawyer and into the courtroom so that they can understand when we talk about facts, what are we talking about? When we talk about evidence, we talk about testimony, what does that mean? ... What I wanted was short clips that I could play in class and that would raise questions or problems for students to then engage with and talk about so they could learn something of the context from the clip itself, but then have to work with it to come up with resolutions to the issues raised.

An introductory level 1 course in environmental science.

This first year course linking social and environmental sciences was collaboratively developed and convened by Brendan and Tony. Brendan described the primary purpose of the curriculum as developing students' foundational academic and learning skills to achieve their potential as learners at university.

What we wanted for students was to provide them with a firm foundation of generic skills. I think these days that has become almost compulsory across all first year courses. At that time 2001/ 2002, not many people were doing that, linking things like library tours into assessment, linking all those generic skills that we're looking for in first year students. At that time we were worried about things like wastage rates, and we were part of that early attempt to genuinely tackle that problem.

Brendan's focus was on the educational processes for developing students' generic cognitive skills, rather than course content. His focus on generic skills may also reflect that he was not teaching in his disciplinary speciality, and expressed concerns that he could not help students with disciplinary expertise.

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Research was an important influence expressed in the inquiry learning approach that ran throughout the curriculum. Expert researchers and practitioners were invited as panels of experts to introduce students to the latest research on environmental issues, and to provide different perspectives to demonstrate that knowledge is contested. The panels also included former students and graduates of the program to provide students with role models for possible future careers. The use of inquiry learning was also developed in response to a strategic initiative of the university to engage students with research.

> Because it is a first year course and it must be broad, because we can't teach everything and we are specialists. What I think we do is we harness other people's research for the course. … And so it's very much related to inquiry. ... The panel discussions were based on the idea that it wasn't just about feeding them information. It was bringing people in and them giving short talks and then allowing students to contextualise what we've just done though asking questions. … So having more time on the student questions than on experts on giving their talk, and giving students the confidence that their collective inquiry is just as important as us feeding them with information.

Assessment was also seen as central to the curriculum for supporting students to achieve the intended learning outcomes, and was aligned with teaching and learning activities.

> So a lot of the actual content and the structure of the content that we decided was assessment driven. … We were very conscious of the need for them to have content that was related to where the students were at in terms of the next assessment item. So very early on in the course, we had them going on library tours, making sure they all knew how to access the web, how to access journals. Because very early on we got them thinking about their essay question. It was a generic question about managing resources is about managing people. So we had to make sure that these early panels and early lectures were related to this issue, that resources were all about managing people.

Summary.

These case studies show that curriculum decisions from this orientation focused on real world learning contexts and teaching and learning approaches for developing skills, rather than course content. Discipline and research were identified as important influences providing knowledge and real world learning contexts for applying knowledge and developing skills to address a continuum of educational purposes for

preparing students for professional practice, for doing research, and for academic learning. Research also influenced the adoption of inquiry-based learning approaches for developing academic skills for thinking, inquiry and research. The inclusion of research in curricula helped to connect professional and academic purposes and broaden the intended learning outcomes from discipline specific professional skills to generic cognitive skills that are relevant for a range of graduate futures.

6.2.3 Personal relevance orientation

In this orientation, the purpose of the curriculum is to help students make sense of their lived experiences and to explore their own interests in order to achieve self-understanding and personal growth. This orientation was associated with arts rather than the physical sciences or professional disciplines. Discipline is seen as an important influence, providing the theoretical knowledge for helping students make sense of their experiences, however knowledge is contextualised by selecting topics and themes that are relevant to students' lives and interests. Hence, teaching and learning approaches reflect a teacher-student engagement philosophy. The personal relevance orientation is also evident in teaching and learning approaches, where participants provide personal interactions with students and students have some choice over topics for assessment tasks.

Research is conceptualised as an influence that informs the teachers' expertise in relation to knowledge for course content, and teaching, learning and assessment activities that engage students in doing research, such as research essays and projects, which are norms in arts courses. Research tasks are seen as allowing students to investigate topics related to their own interests, reflecting the personal relevance orientation.

Two arts participants were represented in this category and provide the case studies presented below.

An introductory level 1 course in sociology.

Brendan described his course development as evolving from trying to identify enough topics to fill the lecture spaces, to seeking a narrative which tied them together and made sense of them for students. Section 5.2.4 describes how he identified a narrative using sociological themes to help the first year students make sense of their transition to university. Hence his discipline of sociology was an important influence, however

disciplinary knowledge was recontextualised as topics and themes that were relevant to students' personal experiences.

> The narrative driving the structure was experiential. A lot of sociology - some people say it's about structure, but it's also about our personal experience of being members of a society. … I wanted to make it as relevant as possible to the everyday lives of the students and I wanted to make them question why they were doing what they were doing and to make them think about things they'd never actually thought about before as they went about their daily business. I wanted them to come on to campus and actually have their minds blown as much as possible by doing that, rather than coming in here and thinking I will just take a few more facts down here.

Brendan was also influenced by a university information literacy initiative for improving first year student retention and success, and his goals included developing students' learning and academic skills. He described his approach as 'assessment driven', where course activities were aligned with assessment tasks to support students to achieve the learning outcomes. He developed this approach to curriculum and teaching while working with Tony on the multi-disciplinary environmental sciences course described previously in section 6.2.2.

> I think just working with Tony gave me some sort of sense of the elements that you need in a first year course, from making sure that the assessment is linked to the actual content, which is also linked to a set of skills that we want the students to acquire or enhance.

Teaching was structured in a traditional lecture and tutorial format, with topics presented in weekly lectures. However his motivations were reflected in his personal relevance philosophy approach based on interacting with students and personalising learning, including providing individual consultations for feedback and guidance on assessment.

> It's such a pity that it's only a semester course because you get to know them so well. It's an opportunity for them to chat about how it feels where they've gone during the course. They get their essay mark back, I can tell them how I think they're going in their tutes; find out more about what they're really interested in and so that's what it's all about. And, really, at first my tutors who haven't done this before are scared of actually handing back essays, because it makes you mark

very differently. Rather than just putting it in a box and getting the students to come in, if you know that you're actually going to have to justify your mark to students, you actually have to think an awful lot more about their essays.

An advanced level 3 course in languages.

Thomas defined his educational purpose as providing students with a complex challenge that would help prepare them for work and travel in the Spanish speaking world.

> What I want the students to get out of the Spanish program is to meet a Spanish speaker and be able to communicate. Even if their grammar is not perfect, they will have plenty of opportunities to speak and communicate and if they travel they will be able to get whatever they want, eat whatever they want, and talk politics with the locals. The course had a very practical role, which was to provide students who are in our intermediate level with the challenge of discussing a lot of complex topics only in Spanish.

He identified how educational purposes change in language courses across year levels, from a discipline orientation focussing on vocabulary and grammar in first year, to a personal relevance orientation in later years.

> If I have to design a language course, what I do is look at the level of language, from the basic things, like what is the grammar that you would cover? So all the language courses have some balance. In the first year, we expect them to get as much language as possible. In the second year they have to consolidate it, but from the third year they have a lot of extra things in which they do things with language. So they are conceived mainly as you will do something that interests you with language. It will be complex, but you will be able to do it. You will have enough support and you will be able to do it.

Thomas' approaches to curriculum and teaching were eclectic and included drawing on a variety of activities for engaging students, immersion learning, educational technologies and students undertaking a collaborative research project. The course engaged students in learning by doing through listening and communicating in range of spoken and written modes. Online technologies were used to supplement face-to-face learning and provide students with spaces to present video and audio material, to interact, reflect and give peer feedback. Thomas gained funding to provide students with iPods that gave them flexibility and reliability in accessing a large language

database of resources and accents, which complemented his personal relevance orientation.

> When I began I wanted two things. I wanted to provide students with a big challenge that would be doable. … First, I give a lecture to give students the context, and then they have eight hours of radio interviews that will give them the access to the Bolivian accent and so on. The iPod allows you to create a language database, and instead of having a language lab that doesn't work, freezes and so on, they can do it when they arrive at the bar, when they are working, washing the dishes etcetera.

Thomas described the most important influences on his course design were his experiences of teaching, and of what works, supported by pedagogical research about how to implement the technology.

> Pedagogical research, like how does someone implement an innovative technology. I'm always looking for examples of how things were done, but also talking to people who did it.

Discipline was also an important influence because it defined the course content and the immersion pedagogy that underpinned his teaching approach.

Research was conceptualised as a process and methods for finding things out, which Thomas modelled for students in his lectures, but did not specifically teach. The assessment involved students undertaking a major research project, where they developed a radio program to communicate a topic in Spanish related to their own interests and presented their outcomes in both oral and written formats.

> Well for my research I have to understand a very complex history of the Spanish speaking community in Australia. So these research skills have been very, very useful in making complex topics available to students who are, after all, taking this course in a second language. So instead of giving them the facts, I give them the underlying patterns, so they will have the key to unlock all this information that's there. For their presentation, students have to go and explore the topic. They have to listen to the programs and get what are the issues. Go to the newspaper databases and explore them more, but they already have examples of how to unpack all this.

Summary.

The personal relevance orientation was found in two arts courses in sociology and languages. The case studies show that the personal relevance orientation informed the selection and presentation of discipline knowledge to show relevance to students' lived experiences and personal goals. Teaching and learning approaches aimed to engage students by selecting relevant topics and engaging learning activities, and to foster interpersonal interactions with teachers and peers. Research influenced curricula in the form of learning and assessment tasks, where students undertook research projects and essays based on their interests.

6.2.4 Social relevance – reform orientation

For this curriculum orientation the purpose of the curriculum is to develop students' understanding and skills to analyse and critique social issues and structures, including their own behaviours and assumptions. Five participants from arts, law and environmental sciences were identified with this orientation. The arts participants described themselves as multi-disciplinary scholars, which meant that they combined different fields from the humanities and social sciences. Research was described as a direct influence on curricula that informed their expertise about course content, and an indirect influence reflected in their scholarly and critical ways of engaging with issues. Law and environmental science participants shaped their curricula, respectively, around professional and multi-disciplinary problems with social contexts and dimensions. In this orientation, participants describe very varied approaches to teaching and learning, which reflect their different foci on students acquiring disciplinary or multi-disciplinary knowledge, or on examining and solving social problems. One arts participant used a teacher and content focused approach, which is congruent with a focus on students acquiring theoretical knowledge for analysing and critiquing social issues. Others described active and experiential learning approaches, where students were engaged in questioning their experiences and assumptions, undertaking field observations, and investigating and developing solutions for social issues and problems.

An introductory level 1 course in gender studies.

In her gender studies course, Vanessa aimed for students to develop a critical approach to knowledge and to question their familiar experiences and assumptions about social structures. Vanessa described the discipline as her most important curriculum influence

and the course had a strong focus on disciplinary knowledge, with weekly lectures and tutorials that explored theoretical themes, case studies and readings.

> For thinking critically, well I use a lot of case studies really. So in the early part of the course - I send them out to look at toys in toy shops and look at children's clothing stores and then report back, so how is gender constructed in these ways? … It's getting them to actually do it, rather than just me telling them. And this is about looking at the world around you. You've always just taken it for granted, but why is it?

Her goals were also influenced by her beliefs that the purpose of an arts degree was to develop critical reading and thinking skills.

> I do this reading report as the first paper. Write a reading report on one of the following texts. So in your report you should say what is the main argument, what are the main points of inclusions, what concepts and what's your opinion or the major accomplishment? And again that's about getting them to learn how to read.

Vanessa's approach to teaching and learning was active and inquiry oriented, where questions and surveys were used in lectures to engage students and to help them connect course concepts with their everyday experiences of gender, class and culture. Vanessa described this as a change from her former content focused approach in response to changing norms about teaching, which led her to research the educational literature to find better ways of engaging students. She was also driven by pragmatic workload reasons to reduce the time spent on preparing.

> There has been a shift around norms of teaching too. Well firstly I kept on reading stuff that said, 'Look, if you want to transmit information give them stuff to read, because reading is just a much more efficient way of transmitting information.' ... When I first started teaching there was a big thrill about giving a lecture and it was fun. But I was getting bored with it and also the time involved in preparing a two-hour lecture when you are basically delivering the whole lecture and having the kids as well, it was like, I can't teach like that anymore, I just don't have time. So it was a bit of self-interest as well. I thought I want to enjoy teaching. I don't want to be up until 4am writing stuff that I know they don't remember.

An introductory level 2 course in ecology.

Paul developed an introductory course in environmental sciences that aimed to build the multi-disciplinary foundational knowledge and skills that students need to explore environmental issues. Students doing the course come from a broad range of disciplinary backgrounds. Paul described his curriculum decision making as maintaining a balance between presenting foundational knowledge and methods from multiple disciplines, examples and applications, values and culture, and learning to learn.

> You're saying right up front in a big broad brush this is where we're going, this is what it's all about. This will reflect the fact that the course has an historical background and is different in different places and you talk about the rise of ecology and the rise of systems thinking and how it develops in different countries at different times. So then you say, well, have I got enough of the fundamental ecology in here, because we've got to go [on a field trip] and then things like [public holidays] get in the way. But if I front-end it all with biophysical or ecological stuff, when am I going to tell the guys who come in from arts that yes we're going to engage with culture, we're going to engage with social systems, we're going to engage with value sense and normative judgements.

His overall teaching philosophy was experiential, which included providing students with fieldwork, practical experiences and research projects, and also drawing on their own experiences. However, lectures were described as having a content transmission focus because students have a diversity of background knowledge and Paul saw this as an efficient way to ensure that they acquired the multi-disciplinary foundational knowledge.

> Maybe I'm just not thinking outside the box, but I really can't see how this course could not be to a certain extent a fairly traditional large lecture, me at the front and them in the stalls course. … There's no getting around the fact that I have to get some content in there, at the front end.

Research in the discipline was seen as strongly related to practice and understanding the technical, social and political dimensions of environmental problems. Hence research was integrated in the curricula as fieldwork, projects and learning activities where students researched their own values, assumptions and behaviours.

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So the idea of research-led teaching was both that students were practising research - developing research skills - as much as it's me showing the students what I got up to in research last week sort of thing. And that the students' own daily lives are the subject of research inquiry means that the students can research into themselves and learn from what they find, which is both a human ecological, if you like, principle and teaching practice as an example.

Summary.

These case studies show that discipline is an important influence for providing the disciplinary and multi-disciplinary knowledge, theories, methods and problem contexts for understanding and critiquing social issues and structures. Research is also seen as an important influence that informs theoretical knowledge, provides problems for learning experiences and also develops a critical stance towards knowledge. Research is integrated in learning and assessment tasks, where students investigate social issues and problems. The teaching and learning approaches presented in the case studies were experiential and inquiry oriented, however also showed that content transmission approaches were used to ensure that students from diverse disciplinary backgrounds acquired the desired foundational knowledge.

6.2.5 Systems design orientation

Two participants were identified with this orientation. One described an educational purpose and teaching philosophy that focused on the design of the learning environment as a system for directing students' learning behaviours to achieve the intended learning outcomes. Online educational technologies were a significant part of his design to provide students with flexible access to learning resources, and forums for discussion and interaction, student peer review and reflections. The other participant also described a curriculum design that focused on educational processes and systems for directing students' learning behaviours, and used educational technologies, such as clickers and computer-based assessment to monitor students learning, and provide feedback on performance for both teachers and students.

These case studies are presented below in more detail.

A specialist level 2 course on literature.

In his specialist literature course, Sameer's educational purpose focused on the design of the learning environment to create a highly flexible, interactive and engaging

learning system. His approach was informed by the principle of entrapping students, based on Biggs' (1999) concept of constructive alignment. He conceptualised the curriculum design as three streams, where students engage with content, theory and creativity. Technology enabled the systems approach, and the curriculum was presented to students as discrete weekly online learning packages. A key design principle was to create an unambiguous learning space, where students understood what they needed to do to be successful, and how their learning actions were valued and rewarded. Constructive alignment was used to influence students' learning behaviours, however students also had flexibility and choice over their learning pathways.

> There's pathways available to them and the decision the student has to take is which pathways to go down. Whether they do certain things in particular weeks, or whether they don't, or whether they want to change things or not. They can choose a pathway they go down, they can dig new pathways, offshoots in a sense. They can do whatever they want, but there's no ambiguity about what pathways are available and how to get onto them. Whereas a lot of courses, I think, there are lectures and tutorials, but students have no clue how these things match the assessment. … None of these questions ever crop up in our course because students know exactly what is important, and what we value, and what we don't. If we say that all you have to do is a mind map about this stuff, then they know that from the theory reading they can pick out a couple of concepts. There's no question that they're going to memorise particular quotes, we don't care about that, that's not our interest.

Sameer's innovative assessment and marking scheme was described in section 4.4.6, where it involved automatically allocating marks for completing weekly tasks, based on an honour system that was moderated by student peer review.

> Every component has an assessment because we wanted to make sure we tested everything. We didn't have a specific test so much as a generic test. So every week people post up their mind map. Every week people post up their creative piece. They also post a reflection of 100 words on that week of the course, right? And we said, 'Each week you have to look at three other people's work, any three from the course. It can be a mind map, it can be three mind maps, it doesn't matter, and you can use different people. But three pieces of work and make a comment of 50 to 100 words on each of those.' And that was our way of kind of self-regulating the assessment for the creative bit. And as well, we occasionally

looked at these different things just to make sure the people are keeping on track and on quality.

An introductory level 1 course in physics.

Edward described a systems design curriculum orientation that was demonstrated by his focus on educational processes for monitoring and evaluating students' performance, and iterative change directed at helping students to achieve the intended learning outcomes. Learning technologies were integral to the educational processes, which integrated learning, assessment and evaluation.

> Well it's been an iterative process of designing the course. My interest was in a lot of the pedagogical methods. I had some money from a [teaching award] which I used to buy clickers for the class and so I was keen to try and make the class very interactive. … I was so impressed by all the evidence about how good it was to be active in class and tried to get lectures to be entirely active. Students would do the reading ahead of time and they'd have a mini quiz before they came to class to test and make sure they'd done it. And then in class we would pose questions, and get them to discuss them in groups of three and then vote their answer with the clickers. … There was a really good buzz in class. We had a very high turn up of students, 70-80 percent of the class showing up all the way through semester. Generally, when we asked for feedback about how people liked the clickers in the groups that was actually very popular.

The curriculum design included ongoing monitoring and evaluation of students' experiences and learning performance using a range of formal and informal methods, such as surveys, discussion, and regular assessment.

> So three or four weeks in, the results of the first in-class exam came through and the grades were miserably low. So I guess the other part of what shaped the curriculum was very much a lot of real time re-jigging because we had a lot of assessment built into it – a lot of monitoring.

Changes were made during the teaching period to improve student performance, then the course was redesigned before each annual iteration to address problems which had been identified. Mastery Learning was introduced on the third iteration to ensure students developed competence in each section of the course before proceeding, by using regular computer-based testing. While Edward reported progressive

improvements with each design iteration, new problems were observed, and Mastery Learning showed that weaker students tended to adopt ineffective learning behaviours.

> So in the third year [of the course development], I was much more focused on why do students persist in bad ways of trying to learn. So I'm teaching them how to learn rather than actual content. So one of the big innovations in third year was pair clicker questions … based on the difficult conceptual issues. The students individually first commit themselves by voting, then discuss it with their neighbour and converge on an answer. So we're now following much more closely Eric Mazur's model, based on when he came to visit the University.

His teaching philosophy was also strongly influenced by his discipline and its methods for generating and validating knowledge.

> I'd say my philosophy is experimental and empirical. I guess being interactive ... so active learning, but the real focus is on measuring whether it works, so being very empirical, and not going on the basis of this seems like a good idea. Because a lot of ideas that seem like they ought to work, don't work in our context.

Research into teaching was reported as a strong and direct influence, but not research outside of teaching, including his own disciplinary research.

Summary.

These case studies show that participants with a systems design orientation are focused on the curriculum as a system for learning, with teaching and learning approaches that aim to direct students' learning behaviours. Participants also bring their disciplinary ways of knowing to their curriculum decisions and in Sameer's arts/ languages course there was a concern with making learning relevant to students and giving them choice over learning pathways and creativity. In Edward's physics course, disciplinary knowledge practices informed the course content, and his stance on empirical testing and validating learning outcomes. Both courses used active learning approaches, and were concerned with providing students with different levels and forms of control over their learning. Interestingly, the outcomes reported by participants for these different ways of enacting the systems design orientation suggest that in Sameer's literature course students self-monitor their learning and are empowered to achieve high results. However, in Edward's physics course where students learning choices are highly structured and controlled, weaker students act strategically and try to shortcut learning activities, leading to poorer learning outcomes.

6.3 Discussion of Curriculum Orientations

This chapter shows that participants' beliefs about educational purposes shape their curriculum decisions as an aligned sets of beliefs or philosophical orientation, and that participants perceive the most important influences as those where they have agency to shape them to their curriculum orientation. As discussed in Chapter 5, the beliefs expressed about educational purposes are recognisable as goals for higher education described in government reviews and as the educational ideologies found by Trowler (1998), Eisner and Vallance (1974), and Kemmis et al. (1983). The term curriculum orientations is used in this study to describe the framework of beliefs that guide and justify curriculum decisions. My use of the term 'orientations' suggests a softer stance than ideologies, positioning the boundaries between different sets of beliefs as less well defined and more open to change. This reflects my findings that participants' curriculum decisions were responsive to changing educational purposes and understandings of teaching and learning in the higher education sector as discussed in this section.

The literature on curriculum and educational ideologies (Eisner & Vallance, 1974; Kemmis et al., 1983; Trowler, 1998) presents them as being distinctive and contested sets of beliefs about educational purposes and processes held by academics. Each of these studies defines a similar range of educational ideologies, however they highlight different characteristics when defining distinctive categories, which reflect their overlapping concerns. All of these authors describe a traditional ideology which is concerned with transmitting cultural and/or disciplinary traditions, and is similar to the discipline based orientation found in this study. Trowler's (1998) enterprise ideology views the main purpose of higher education as equipping students with transferable and vocationally relevant skills necessary for a successful career. These concerns also inform the professional and academic orientation identified in this study. However, equipping students to participate in future research and academic learning were found along the same continuum that encompassed developing students' generic cognitive skills for academic success at university. Trowler (1998) and Kemmis et al. (1983) describe a progressive educational ideology, which focusses on students achieving self-understanding and personal growth. Trowler's progressivism includes progressive educational processes for developing students' minds and, hence, combines key elements of the personal relevance and cognitive ideologies reported by Eisner &

Vallance (1974). This study also finds a personal relevance orientation that focusses on helping students gain self-understanding and achieve their personal goals. However, teaching and learning approaches focus on engaging and motivating students by connecting with their lived experiences, rather than developing their minds. The social reform orientation is also identified by all of the authors, and is associated with the critical knowledge tradition in the arts and humanities. This study finds that this orientation encompasses broader educational purposes for engaging with problems that have social relevance, which is represented in some law and environmental sciences curricula. These curricula link educational purposes for social relevance to their respective disciplinary concerns of exploring issues of social justice and law reform, and addressing environmental problems that are relevant to society. They also adopt experiential learning approaches that are congruent with their disciplinary knowledge practices.

A distinctive aspect of this study is the explicit consideration of how research influences curriculum decisions, and how this influence takes different forms in each of the curriculum orientations. This enabled the identification of a professional and academic curriculum orientation that is distinctive from other studies, and was identified to express overlapping goals for preparing students for work, research and academic learning. Research provided a bridge between professional and academic educational purposes and was conceptualised variously as a graduate outcome, as providing real world problems, and as a process for developing generic cognitive skills. The professional and academic orientation integrates participants' beliefs about the educational purpose and mission of a research university, alongside other beliefs that focus on the contributions of higher education to employability.

This study also finds that there is an overlapping continuum of beliefs about educational purposes and practices across curriculum orientations, expressed through their different emphases on acquiring disciplinary knowledge, real world problems as learning contexts, and educational processes for developing cognitive skills. Trowler (1998) notes that educational ideologies reflect changing priorities and trends in the context of education and societal expectations. The shift in higher education to vocational purposes and developing transferable skills for employability has been identified by Rowland (2006), Barnett and Coate (2005), Toohey (1999) and Trowler (1998). All of the curriculum orientations in this study focus on students' acquiring disciplinary

knowledge to greater or lesser extents. In studies of higher education, most courses are found to be intrinsically discipline-oriented because disciplines provide the organising framework for developing and offering courses (Lattuca & Stark, 2009; Toohey, 1999). Some higher education researchers argue that the primary goal of higher education teachers is to induct students into their disciplinary community (Entwistle, 2005; Northedge & McArthur, 2009). However, Jenkins (2009) believes there are broader responsibilities for preparing students for transdisciplinary and supercomplex contexts that can be developed through discipline-based curricula.

Chapter 5 finds that disciplinary knowledge practices provide an explanatory framework for understanding participants' beliefs about educational purposes and many of the other influences. Their beliefs were shaped during their formation as academics, which focused on developing disciplinary expertise from learning, researching and teaching in the discipline. However differences within disciplinary groups indicate that curriculum beliefs and decisions are also shaped by individual ideologies where participants express their agency. Bernstein's (2000) theory of the pedagogic device is proposed by Ashwin (2009) as an alternative to disciplinary knowledge practices, and identifies three broad ways in which disciplinary knowledge is recontextualised in curricula that are similar to those found in this study. Bernstein's theory suggests that the strength of the disciplinary voice is shaped by power relationships and tensions with broader social agendas that are reflected in many of the arguments described in the preceding paragraph. This study is set in an elite research-intensive university, where Bernstein would predict curricula to maintain a strong disciplinary voice. However, the findings show that most participants are recontextualising disciplinary knowledge as real world problems and generic skills for a range purposes that include engaging students' interest, enhancing student success and retention; preparing them future work and research, and for engaging with real world social problems.

Chapter 5 suggests that participants' curriculum orientations shape their responses to institutional and socio-political agendas, and that their curriculum orientations are also responsive to change. The next section explores influences from the institutional and socio-political contexts of higher education which are intended to shape curriculum and social change.

6.4 Curriculum Orientations and the Changing Higher Education Context

Influences from the institutional and external socio-political context were perceived to have little direct impact on curriculum decisions, and none of the participants identified specific policy directions shaping the sector. Although they were largely invisible to participants, their curriculum decisions were found to be influenced by institutional and socio-political agendas intended to produce change in higher education curricula and teaching. The following influences, which have been identified as drivers for change in higher education (Barnett, 1990; Gallagher, 2010; Rowland, 2006) were evident in participants' accounts of their curriculum decision making.

- The skills agenda and graduate employability.
- Enhancing the research-teaching nexus.
- Changing understandings of teaching and learning.
- Educational technologies and flexible delivery.

The discussion examines how these influences from the higher education context both shape and shaped by participants' curriculum orientations and provide insight into the process and direction of educational and curriculum change.

6.4.1 The skills agenda and graduate employability

Many participants identified goals for developing transferable or generic cognitive skills and for preparing students for future work, alongside of their dominant educational purposes. Generic skills were evident in learning outcomes for developing skills for learning and learning to learn, research skills, and professional and workplace skills. Rowland (2006) raises concerns that the employability and skills agenda will diminish other priorities in higher education and promote instrumental values. However this study suggests that participants were responding to the skills agenda in ways that were congruent with their philosophical orientations to curricula and aligned with a broad range of educational purposes and values.

Each of the orientations is analysed below to discern the different ways in which skills and employability are understood and developed in curricula.

Discipline based curriculum orientation. In this orientation, physics participants were aware that most students taking physics courses would not become physicists, and so courses needed to equip them for a range of pathways. They addressed these concerns by representing problem-solving and thinking like a physicist as generic skills relevant

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to broader workplace contexts, and redesigning traditional laboratory exercises as role plays providing experiences of scientific work. Hence there was evidence that the skills agenda was being adopted in the discipline based orientation and leading to curricula with a broader range of intended learning outcomes and authentic learning experiences.

Professional and academic orientation. Developing generic skills for employability purposes and learning from real world problems and tasks related to the workplace were central to the goals of this orientation. The relevance of skills and learning for work was included as a secondary rationale for participants who were focused on preparing students for future research and academic learning.

Personal relevance orientation. In this orientation, generic skills were framed as being relevant to students for their academic success and achieving their potential at university. The core skills identified with arts degrees of reading, writing, thinking and communicating were also perceived as generic skills that are useful for work.

Social relevance and reform orientation. This orientation also aspired to develop a range of cognitive skills for critical thinking, communication and research. In the arts/ humanities courses these skills were framed as being relevant for students' social engagement and development as citizens through understanding social institutions and contributing to public debate. In the applied disciplines of law and environmental sciences, these skills included a practice orientation related to law reform and contributing to policies and solutions to environmental problems.

The rationales that participants gave for developing skills in their curricula suggest that there has been widespread adoption of the employability skills agenda and it is now a common goal across higher education. Participants were found to interpret the types of generic skills developed to be congruent with their curriculum orientations and disciplinary knowledge practices. This suggests that academics respond to change initiatives by adapting and accommodating change to align with their philosophical beliefs about curriculum. In particular, the inclusion of skills was an enhancement in discipline based curricula and encouraged participants to explore the broader relevance of their curricula for students' varied future pathways. Hence an implication for increasing the impact of change initiatives is to communicate change processes and practices in ways that are relevant to a range of educational purposes.

6.4.2 Enhancing the research-teaching nexus

The participants in this study were working at a research university and were research active, as well as committed to teaching. Most participants were able to identify different ways in which research influenced their curricula decisions and almost half of them were actively linking and embedding research in their curricula in multiple ways. Hence this study provides a picture of the range of beliefs and practices for linking research in curricula. Participants' ways of integrating research are explored below in relation to their different curriculum orientations.

Discipline based orientation. In this curriculum orientation, discipline was the most important influence on decisions and the focus was on students acquiring discipline knowledge and ways of knowing. Research was conceptualised as a source of specialist disciplinary knowledge. Physics participants were the main discipline group represented in this orientation, and they all described their own disciplinary research as too advanced or narrow for students. They did not perceive their research as contributing more broadly to their expertise and cumulative knowledge of the subject matter, as was common for arts participants. Their understandings of research were specific and focused on their current research and research as finding out something new. This belief contrasted with other perspectives, where research was understood as learning along a continuum that included students' constructing understandings that were new to themselves. These findings are consistent with those reported for hard-pure disciplines, where teaching and research are seen as occupying separate planes (Brew, 2006; Trowler, 1998). However there was evidence of some physics participants including research in their curricula. Research essays and projects were used for students to explore their own interests in the curriculum and to develop their research and writing skills. One physics participant described a transformative change in his course design from a content to a process focus, where he used his own approach to research as an integrating conceptual framework for the course. His approach to research became a generic understanding that he could teach and demonstrate to students to develop generalisable problem-solving skills. In physics, discipline based research into teaching and learning also was an important influence on curriculum decisions, which informed active and evidence-based approaches to teaching and learning. Hence these examples suggest that research may act as a transformative influence on curricula when participants explore broader understandings of research than teaching their disciplinary

research and identify the underlying features that are relevant and useful in a range of contexts.

Professional and academic orientation. Research was most integrated in curricula with this orientation, where research provided real world problems as learning contexts and an educational process for developing cognitive skills. Research was central to the design of many of the curricula towards the research and academic end of this orientation. Course content and topics were based on research, research provided authentic learning contexts for developing research and problem solving skills, and students undertook inquiry and research-based learning. Research skills were conceptualised as transferable generic skills that were relevant for preparing students for range of future pathways including academic learning, research, work, and for solving future unknown problems. The exception was a participant from law who adopted a professional orientation to curriculum and described her professional experiences as more relevant to the curriculum than her research. This participant believed she had limited choice over course content because of the requirements of the professional organisation for accreditation. However she also experienced a disconnection between her research and teaching in this course, because they involved different areas of expertise. The business and environmental sciences participants demonstrated that both research and professional practice outcomes can be achieved by using problems that are relevant to both. However, it is reasonable to expect that some courses may be more aligned with professional practice than research, and academics need to assess if and how introducing research brings value to their curricula and students.

Personal relevance orientation. In this orientation, research informed the curricula in the form of research essays and projects, where students primarily undertook literature research. Research was conceptualised as developing skills relevant for learning and work, and for engaging students' interest in topics. In arts courses, participants typically had more control over curricula to tailor course content to their research expertise and interests than in science disciplines with hierarchical knowledge practices. However, relevance to students' experiences and interests was the dominant motivation for selecting course content and learning experiences.

Social reform orientation. In this orientation, participants described their research influencing their knowledge about topics, arguments, and sources, and their ways of

thinking and approaching problems, in particular as adopting a critical stance to knowledge. Some participants adopted inquiry and research-based learning approaches to actively engage students in examining questions and issues, field research and observations of social phenomena, and undertaking research essays and projects.

The findings show that participants experienced strong motivations to integrate their research in their curricula to capitalise on their expertise, passion and enthusiasm for topics. Broad understandings of research provided more ways of integrating research in curricula beyond academics presenting their own research topics. Research informed curricula in the form of doing research essays and projects, inquiry learning, constructing understandings, and developing a scholarly or critical stance to knowledge. Some participants were responding to their beliefs about the mission of a research university, including one participant who engaged with a university strategic initiative to develop research-based curricula. Others were responding to changing understandings about good teaching and learning by adopting inquiry-based learning approaches. Hence integrating research in curricula provided opportunities for rethinking curricula through exploring new understandings about the connections between academic research and learning.

In the research university that formed the basis for this study, participants perceived research and teaching to be in conflict for their time and priorities. Research was seen to be more highly valued and rewarded than teaching, however teaching and students were experienced as more immediate demands. Hence, making time for research while managing teaching responsibilities was identified as a problem by most participants. Some participants described trying to capitalise on the synergies between research and teaching, and examples were given where inquiry-based learning reduced preparation time for lectures, and research capacity was enhanced by researching their own teaching. These findings suggest that many academics identify enhancements from strengthening research-teaching links that include better student engagement, better academic job satisfaction and workload. However workloads and the perceived prioritising and recognition of research in the University, were experienced as limiting academics' time for engaging with educational innovation, research and professional development to inform curriculum change.

6.4.3 Changing understandings about teaching and learning

Teaching and learning activities were influenced by participants' beliefs and philosophies about teaching and learning, and by disciplinary and institutional norms for timetabling and teaching settings. Lectures and tutorials were the standard settings for teaching in all disciplines and courses. Most participants used lectures to present and structure knowledge for students, however many also used a variety of approaches to engage students that included real world examples, inquiry-based and active learning. The study suggests there is a trend towards active teaching and learning approaches with participants using experiential, inquiry and research-based, and active approaches much more frequently than is usually reported in higher education studies (Prosser & Trigwell, 1999; Ramsden, 2003). Curriculum orientations also help to understand the factors which contribute to new approaches to teaching and learning being adopted. Physics participants, who were commonly identified as having a discipline based curriculum orientation, provide an example where teaching practices are changing from traditional content focused approaches to active learning and conceptual change approaches. However, the active teaching and learning approaches adopted remain aligned with the focus of this orientation on students being inducted into the discipline. Another participant who reported changing from a transmission focused approach in lectures to an active and inquiry-based approaches described a social relevance and reform orientation. She used an inquiry-based learning approach to engage students in exploring their own observations and experiences of gender and cultural issues, prior to introducing them to theoretical explanations, and found them to be much more interested and engaged with the theories than previously.

It was not clear from this study whether the participants were unusual in the degree to which they had adopted active teaching and learning approaches, as study participants were selected because they had expressed a commitment to teaching, in addition to research. Most participants had engaged with a range of educational professional development experiences and some had undertaken formal courses in higher education. Some further engaged in researching their teaching and their students' learning. Those who had undertaken formal educational development programs reported using educational concepts and theories to rethink and transform their curricula. Changes in beliefs and approaches to teaching and learning were also reported as a result of

colleagues influencing each other, in particular for the collaborative curriculum developments described in this study.

Academic identity formation was explored to understand the experiences that inform academics' beliefs about the expertise required for teaching and their development of pedagogical knowledge. Academics' identity and the development of their beliefs and expertise were found to be almost exclusively formed in disciplinary experiences of learning, research and teaching. However, as reported above, engaging with educational development and scholarship leads to more informed approaches to teaching and facilitating student learning. Hence, the trend for new academics to undertake foundational courses in teaching, seems positive for developing their awareness of alternative ways of conceptualising and approaching curricula and teaching during their formational experiences.

Teaching and learning approaches were also influenced by changing institutional policies in response to increasing external and internal quality assurance processes. For example, demonstrating the alignment between learning outcomes and assessment tasks became a policy of this university during the study and was embedded in the university course template required for new course approvals. It appeared to be an example of a successful policy that participants came to see as a useful thinking tool that they could engage with at different levels. University strategic initiatives were also reported as a positive influence for one participant, which included a funded project to adopt inquiry- and research-based learning and an information literacy project to improve student retention and academic skills. However other institutional policies and departmental norms were described as unproductive and constraining good practices. Many of these policies were designed to standardise assessment practices and assure a minimum quality, rather than enhance student learning informed by educational research. Hence the participants in this study described different responses to policy initiatives depending on whether they saw them as beneficial and whether they were good a fit with their educational beliefs and orientations.

6.4.5 Flexible learning and online educational technologies

During the progress of this study, using online educational technologies and in particular web based learning management systems became an expectation of the University, to provide students with flexible access to course materials. Most

participants used online technologies for this purpose, with a few also using online discussion forums to encourage communication and/or interaction between lecturers, tutors and students. A small number of participants further used educational technologies to foster collaborative peer learning in online forums and wikis, reflection in blogs, and one provided options for students to choose individualised learning pathways that encouraged their ownership and independent learning.

The broader use of online educational technologies for active and collaborative learning was adopted by a small number of enthusiasts, both as an educational ideology involving flexible delivery, and to solve practical problems. Practical problems included providing the means to give students access to a large database of language and accents in an arts/ languages course, and in another course to allow students to enrol from a range of degree programs, where they may have timetable clashes.

The *systems design curriculum orientation* represents the main example of curricula with extensive use of online educational technologies for providing students with flexible access to course materials, and to facilitate their learning. Eisner and Vallance (1974) describe a 'curriculum as technology' orientation, where the main concerns of the curriculum designer are the efficient means of communicating knowledge to achieve non-problematic learning outcomes. In this study the systems design approach was also concerned with using technologies to shape students' learning behaviours to achieve the intended learning outcomes. However online educational technologies appeared to expand the conceptualisation of the orientation to allow a student and learning centred approach, involving interaction, choice and control over learning pathways.

The other example of a systems design orientation reported by a physics participant, involved using computer-based assessment tools and a Mastery Learning approach. The Mastery Learning approach also involved a focus on students' learning behaviours to achieve the intended learning outcomes. However the educational technologies focused on repetitive problem solving to demonstrate mastery of course concepts. In this example of a systems design orientation, observations suggested that some students responded by adopting instrumental and surface learning behaviours that defeated the intentions of the approach.

The adoption of online educational technologies suggests a similar pattern to that found for integrating research and teaching, where participants initially conceptualise the innovation in terms of its relationship to course content. With respect to integrating research and teaching, participants initially conceptualised the connections between their own research and course content. However, when probed, participants were able to expand their conceptions and uncover further connections between their teaching and research that were aligned with their curriculum orientations. One would expect that expanding academics' awareness of different ways of using online educational technologies that are congruent with their curriculum orientations may also encourage changes in practice. However these technologies require academics to develop new skills, and they may have less incentive to engage with them than with research-led teaching, where they perceived a number of rewards.

In summary, the findings show that academics shape their curriculum decisions through a range of different philosophical orientations. The curriculum orientations provide a framework for understanding how academics prioritise influences and make curriculum decisions. These orientations were shaped by educational purposes, which are informed by disciplinary knowledge practices, educational ideologies, and institutional and social agendas. Understanding the different orientations that academics bring to curriculum design is helpful when academics engage in collaborative curriculum design within courses and across programs. Curriculum orientations are also found to shape how academics respond to change. Their responses to change initiatives suggest implications for university managers developing curriculum change initiatives and for educational professional development programs. The implications for educational and curriculum change will be explored in the next chapter.

Chapter 7

Conclusions and implications of the study for improving curriculum practice

The aim of this study was to better understand how academics in a research-intensive university make decisions about undergraduate curricula, and their beliefs about what influences their curriculum decisions. This study was also motivated by recent literature and initiatives at the case university advocating the desirability of enhancing research-teaching relationships in undergraduate education. Research is central to the mission of higher education, and research-based teaching enables students to participate more fully in academic communities of practice and develop important graduate learning outcomes. Research-teaching relationships have been investigated in their own specialist educational literature, but they haven't been studied to understand how research sits alongside other influences to shape the normal curriculum practices of academics.

A conceptual model of curriculum design was drawn from the literature as a starting point for examining the process and nature of academics' decisions as they design an undergraduate course. Research was added to the influences identified in the curriculum literature to construct a field of curriculum decision making that captures all of the influences relevant to the higher education context. The study participants were recruited from academic staff working at a research university, who were both research and teaching active. These participants were intended to represent a group who experienced the dynamics between research and teaching in their practice.

The findings provide insight into the process of curriculum decision making, the current quality of curricular practices, where they are in need of improvement, and the influences that support or constrain curriculum change. The findings also suggest implications for institutional managers wanting to implement educational change initiatives, and for the design of educational professional development activities to improve curriculum and teaching.

Section 7.1 summarises the findings on higher education curriculum decision making, which established a descriptive model of curriculum design as an iterative web with

multiple starting points and pathways. A detailed account of the range of decisions about curriculum elements identifies normal practices, good practices and gaps where practices need to be improved. Section 7.2 summarises the findings on academics' beliefs about the influences on their decision making, which led to the identification of five curriculum orientations that shape distinctive and coherent curriculum approaches. The patterns of beliefs suggest that curriculum orientations are informed by participants' disciplinary knowledge practices, and individual ideologies informed by other significant experiences that shape their beliefs about educational purposes and processes. In particular, educational professional development was found to develop pedagogical expertise that is important for changing beliefs and practices. Section 7.3 explores the influence of research on curricula, including how research-led teaching practices are shaped within curriculum orientations, and opportunities and constraints for using research to enhance curriculum practice. Section 7.4 examines the implications of the study for initiatives aiming to bring about educational and curricular change and for the design of educational professional development activities. Section 7.5 presents conclusions to the study.

7.1 Pathways and Patterns of Curriculum Decision Making

The first set of findings explored curriculum decision making as a process, the different elements that constituted curriculum, and decision making pathways. A common set of curriculum elements were identified that comprised: learning outcomes, course content, teaching and learning activities, and evaluation. Participants began their curriculum design from different curriculum elements and followed different pathways. The curriculum design process was found to constitute an iterative web of decisions, and this study indicates that there is no one best decision-making pathway across the curriculum elements. Course content was the most common starting point, which suggests that many academics are most concerned about what they teach. The next most common starting point was learning outcomes, which provided a framework for determining other curriculum decisions. Lastly, a few participants began their decision-making process with teaching and learning activities, which were typically informed by an experiential or inquiry based teaching philosophy.

Curriculum design pathways also defined common relationships between curriculum elements. Almost half of the participants described aligning learning outcomes with other curriculum elements, in particular with assessment. Other participants indicated

that they were also making decisions guided by broad objectives about what they wanted students to achieve, and considering the relevance and usefulness to students of course content and learning experiences. Participants who explicitly defined learning outcomes described it as a useful thinking process for clarifying their intentions for learning, for getting feedback from colleagues, and for making decisions about assessment. Biggs (1999) argues that students are more likely to achieve the intended learning outcomes when they are aligned with decisions about teaching and learning activities and assessment.

This study presents a detailed analysis of the range of decisions that participants made about each of the curriculum elements, and their reasoning for their decisions. Many of the practices reported indicate that participants follow typical disciplinary practices and norms, which appear to be unexamined as decisions and simply accepted as 'how things are done'. Patterns of disciplinary norms were found in decisions about how knowledge is selected and structured, learning outcomes, the settings and organisation of teaching and learning activities, and the selection of assessment tasks. The disciplinary norms were also reinforced by standard institutional practices, with the strongest drivers for uniformity being the standard settings for teaching and learning events in lectures and tutorials, and timetabling as a weekly schedule with standard hours allocated to each of the teaching events. Despite this, participants also described a diverse range of decisions within and across disciplines with respect to some curriculum practices, in particular about teaching and learning activities, which will be explored further below.

Decisions about selecting and structuring knowledge in the curriculum are important because the course structure is often the most visible feature of the curriculum to students (Toohey, 1999). Most participants structured their course around the weekly schedule of lectures, and the selection and organisation of topics to fill that schedule. More innovative approaches involved integrating topics using narrative themes that were relevant to students' lives, and inquiry or problem based structures relevant to professional and social problems. These innovative course structures were developed by participants from the social sciences and applied disciplines of law and environmental sciences, and also reflected their strongly held teaching philosophies.

Assessment decisions are considered to be important to achieve the intended course learning outcomes, and also because they express what teachers actually value with

respect to learning (Biggs, 1999; Ramsden, 2003). Assessment decisions in this study demonstrated both good practices and areas for improvement. The selection of assessment tasks typically followed disciplinary norms and expectations, with exams used in more quantitative disciplines, essays or projects in all disciplines, and reflections in arts. Good practices included that most participants were purposeful about selecting a range of different assessment tasks for students to demonstrate different kinds of learning outcomes. Tasks were often sequenced to provide support and formative feedback to students, or to progressively develop and build on skills.

Significant differences were found in processes used for defining the assessment tasks, communicating criteria and giving feedback. These differences suggested practices that were teacher-defined, negotiated or student-defined. The educational literature indicates that activities that encourage student ownership and participation in decision making enhance student motivation, and are more effective for learning and for developing understanding of the purposes and processes of assessment (Boud & Falchikov, 2006; Carless, 2007). Study participants typically defined assessment tasks themselves, but gave students some opportunities for choice and negotiating topics in essays and projects. Only one-quarter of participants reported that they were communicating standards and criteria to students, with some providing rubrics to students to guide them to do the assessment, as well as for giving them feedback. Even fewer participants gave students experience in developing criteria themselves or appraising their own and others' work. This is disappointing given that self and peer assessment and feedback practices are associated with 'sustainable assessment' and fostering skills for life-long learning (Boud, 2000; Crisp, 2012), and represents an area for improving practices.

As mentioned previously, most teaching and learning interactions were organised around a weekly schedule of lectures and tutorials. These settings were associated with different purposes and foci in corresponding decisions about teaching and learning activities. Teaching and learning activities represented a range from presenting course content, to providing real world learning experiences, to facilitating active learning. Lectures were usually seen as the place for students to acquire course content, and included presentation of content. Some participants also highlighted real world connections in lectures, using examples and demonstrations to engage students' interest and show them the relevance of the learning. In addition, almost half of the participants used active learning approaches in lectures, such as posing questions, using learning

activities and concept testing. All participants used active and interactive learning approaches in tutorials, and students were engaged in discussion, problem solving or role plays depending on their discipline.

Active learning approaches have been found to encourage students to adopt deep approaches to learning, which foster conceptual change (Prosser & Trigwell, 1999). Biggs (1999) also links the development of higher order thinking skills with constructivist learning approaches that involve active and interactive learning. The high proportion of participants using active learning approaches suggests a change from the dominant focus on content transmission in lectures that has been reported in many studies of teaching practices in higher education (Prosser & Trigwell, 1999; Ramsden, 2003). This finding will be further explored in section 7.2 which looks at influences on curriculum, including undertaking educational professional development.

Educational technologies were in an early stage of adoption during this study, and mostly used by participants for providing access to course materials and resources. However, some participants had adopted online educational technologies more extensively for teacher-student and student-peer discussions, reflections and peer reviews. Another example of use of educational technologies was an online assessment process used in physics, which gave students immediate feedback on problems and solutions, and was intended to give them control to identify and act on their learning needs. These participants were early adopters, who were enthusiasts and champions for educational technologies and were also informed by strongly held teaching philosophies about students having flexibility of access to curricula and control over learning and assessment tasks.

This study also explored decisions about course evaluation as part of the process of curriculum design. Evaluation was usually described as the final stage of participants' curriculum design, rather than as fully integrated in the process, however a positive finding was that a range of formative and summative approaches were used. All participants used the formal institutional surveys for determining student satisfaction with teaching at the end of the course, but typically reported that the information was not very helpful for curriculum improvement. Informal methods for gaining student feedback were seen as more useful, including participants' observations and informal reflective practice. These methods were used to solve immediate problems and for

reviewing the course content for the next course design iteration. Only four participants used research and evidence based methods for evaluating student learning, including students' performance on assessment tasks, which provided these participants with an informed basis for continuous curriculum improvement.

Although a wide range of evaluation methods were identified, the majority of participants did not report aims or methods for evaluating learning effectiveness, and did not use assessment outcomes as feedback on learning and teaching effectiveness. This suggests that these purposes and methods are not well known to participants, and constitute an area for improvement.

Unlike many prescriptive studies of curriculum design, this study suggests that the starting point and pathway for curriculum design are not critical to the quality of the curriculum developed, due to the iterative nature of the process. However, beginning from learning outcomes was believed to be helpful for providing a framework for thinking about other curriculum decisions. Prideaux (2003) and Knight (2001) raise concerns that focusing on writing highly specific learning outcomes is not helpful for supporting the complex learning goals desired in higher education. In particular, Knight (2001) believes it is better to focus on the design of teaching and learning experiences that support students to achieve the intended learning outcomes. This study also indicates that the most innovative curricula are designed by participants who structure the course around students' learning experiences, informed by an experiential, inquiry-based or constructivist teaching philosophy. Most other participants structure the course around course content based on the logic of ideas from the discipline or from their expertise.

A positive finding is that there is widespread awareness that students need to be engaged by teaching and learning activities, and that active and interactive learning approaches help students to make sense of course content and to develop higher order thinking skills. Active learning approaches in lectures were used by only half of the participants, indicating that these methods could be further disseminated.

Other practices that were less well developed and provide areas for enhancing teaching and curriculum design were the use of marking criteria to guide and provide feedback to students in their assessment tasks, and methods for evaluating learning effectiveness. A

significant constraint on developing more innovative curricula was found to be the standard institutional timetabling for organising teaching and learning as a weekly schedule of lectures and tutorials. While this constraint is largely invisible to participants in this study, it appeared to encourage participants to focus their decisions on selecting and organising course content rather than on students' learning experiences.

7.2 Curriculum Beliefs, Influences and Orientations

Curriculum decisions were found to be shaped by influences that operated at different levels of importance, with participants perceiving the most direct influences as those where they had greatest agency. The influences that participants perceived as most important were their beliefs about (1) educational purposes, (2) discipline, (3) research, (4) teaching and learning approaches, and (5) students.

Of these influences, *discipline* appeared to be the most significant in shaping curriculum decisions, and variously informed the structure for organising knowledge in the curriculum, learning outcomes for acquiring disciplinary knowledge, ways of knowing, thinking and problem solving skills. Discipline also provided real world problems for learning contexts and experiences, and defined professional roles and attributes. Participants' beliefs about *research* were aligned with their beliefs about discipline, however, the influence on curriculum decisions tended to be limited by participants' awareness of different options for research-teaching relationships. The most common understanding of the way in which research can influence curriculum was to have one's own research directly inform the content of the curriculum. The implications of participants' beliefs about the influence of research on curricula are explored further in section 7.3, representing the emphasis placed in this study on investigating the potential influence of research.

Participants' decisions about *teaching and learning approaches* were informed by a mix of informal beliefs about good teaching and theoretically informed teaching philosophies, which led to reasonably coherent teaching and learning approaches across teaching settings. This study identifies a trend towards active teaching and learning approaches, with participants identifying experiential, inquiry and research based approaches, plus active learning approaches much more commonly than is usually reported in higher education studies (Prosser & Trigwell, 1999; Ramsden, 2003).

Participants' beliefs about *students* primarily focused on their prior knowledge and abilities, which informed curriculum content, strategies for engaging and motivating students, and for directing their learning behaviours.

Patterns of beliefs about influences suggested an alignment with educational purposes that shaped different philosophical orientations to curriculum. Curriculum orientations were identified by their dominant educational purpose, as follows: (1) inducting students into a discipline, (2) preparing students' for professional and academic pathways, (3) making learning personally relevant to students, (4) engaging students with social issues and reform, and (5) designing a system for learning. Participants' beliefs about the most important and direct influences appeared to be those where they had most agency to shape their decisions to their curriculum orientations. Other influences from the institutional context and external factors were often seen as constraints on their agency. Structure and agency were only touched upon in interpreting the findings, and there would be value in future research exploring how structure and agency interact in shaping academics' educational purposes and practices.

Disciplinary knowledge practices, defined along the dimensions of hard-soft and pure-applied (Becher & Trowler, 2001; Neumann et al., 2002), were found to account for many of the variations in the beliefs and decisions represented in different curriculum orientations. Participants' accounts of their academic formation primarily involved learning, researching, working and teaching in their disciplines, and so link the origins of their beliefs in their development of expertise in their disciplines and disciplinary knowledge practices. Professional experiences were also significant for some participants in the applied disciplines of law and environmental sciences in shaping their educational purposes towards social relevance and reform.

Very few of the experienced participants had engaged with educational professional development during their academic formation, however all had engaged at different stages of their careers, and at different levels. Hence, participants had progressively developed pedagogical knowledge and expertise, which informed their curriculum decisions and teaching practices beyond disciplinary norms. The five participants who had undertaken the award programs of a Graduate Certificate or Masters in Higher Education described a transformation in teaching and learning beliefs and approaches based on the knowledge they had gained. For example, the concept of constructive alignment was described as helping them to rethink goals and learning outcomes, and

how they could be achieved. This included using active, inquiry and research based learning approaches. This finding is a contribution to the literature showing that formal educational professional development is an important factor in gaining coherent theoretical understandings for making informed curriculum and teaching decisions.

Some participants also reported changing their practices as a result of engaging in less extensive forms of professional development, such as attending workshops and researching the educational literature for best practice. Some of these participants described partial theories of teaching and learning, for example that student learning is enhanced by being active. The remaining participants described their professional development as experience based, and typically reported that they had developed new strategies for solving practical teaching and learning problems, and greater confidence in their teaching over time.

The institutional context and culture of the research university influenced academics' perceptions of priorities and rewards for dedicating time to teaching and to educational professional development. Participants described spending time on professional development as an opportunity cost for doing research that was often discouraged by their supervisors. However most participants identified significant personal benefits from teaching, which included enjoyment, gaining broad understandings of their own discipline, learning from students, and inspiring students to do postgraduate research. Most participants demonstrated a desire in their rationales for curriculum and teaching to provide value to students, but described the challenges of balancing their workload, with working long hours one of their few options for meeting workload demands.

Participants perceived external influences as having little direct influence on their curriculum decisions, however the impact of many changes in the higher education context and policy directions were apparent. Participants' accounts of their beliefs and practices suggest that they are responding to change in ways that were both shaping and shaped by their curriculum orientations. The findings indicate that many of these changes are adapted and accommodated within curriculum orientations, without always being visible to participants. This finding is explored more fully in section 7.4, as part of a discussion of the implications of the study for development of institutional projects to promote educational and curriculum change and improvement.

7.3 Putting Research into the Field of Curriculum Decision Making

Most of the participants in the study identified strong interests and motivations for linking their research and curricula. Participants identified benefits that arose from integrating their research into their curricula that included capitalising on their expertise, being more confident and enthusiastic about teaching, and using their knowledge and resources to provide students with richer learning experiences. Some participants also expressed beliefs about educational purposes that students in a research university should be engaged with research.

Research was conceptualised in ways that were consistent with participants' orientations to curricula, informed by their disciplinary knowledge practices, and their awareness of different understandings and approaches for linking research, teaching and curricula. Many participants with limited exposure to research-based teaching and curricula initially conceptualised the relationship solely in terms of presenting their own research to students. Not all participants perceived a connection between their research and curricula as being possible, because their course content did not relate directly to their area of research expertise. In addition, physics participants saw their own research as too advanced for undergraduate students, reflecting beliefs reported in the literature for academics from hard-pure disciplines. Law participants typically regarded their professional experiences as more relevant to students than their research.

During the interviews participants were probed to explore further possibilities for linking research and curricula, and some uncovered new understandings and connections. Broader understandings of research facilitated participants identifying more connections with their curricula, which included students doing research in the form of essays and projects, and research as a critical approach to knowledge that was modelled by academics in their ways of engaging with knowledge in the curriculum. Transformative understandings involved seeing research as a process for finding things out, and making connections between research and learning as a continuum from finding out something new to oneself, to discovering new knowledge.

The explicit exploration in this study of research as an influence on curriculum decisions enabled the identification of the 'professional and academic curriculum orientation', which is distinctive from other curriculum studies. In this orientation,

research was found to provide a bridge between professional and academic educational purposes that enabled participants to conceptualise discipline specific professional skills as broader generic skills relevant to research and academic learning. Some participants associated research-led curricula and student engagement in research with the purposes and mission of a research university. However the research university culture was seen as constraining their priorities and time for engaging with curriculum innovation and educational professional development.

Time and workload efficiencies were identified from integrating research and teaching. One participant found that changing to an inquiry based approach to teaching reduced the time required for preparing content focused lectures, and was more engaging for students. Another participant found efficiencies from making teaching the focus of his research. However, many academics would not regard this option to be beneficial because of their commitment to their disciplinary research speciality, and because teaching and educational research are not perceived to have high status and rewards by the University. Most participants struggled to balance teaching and research in their workloads, and consequently worked long hours.

7.4 Implications for Educational Change and Educational Professional Development

Many higher education institutions are exploring strategic curriculum change to address new challenges and achieve institutional goals. These institutional challenges include student diversity, access and mobility; globalisation and internationalisation; and fostering specialisation and distinctiveness in institutional offerings, of which research-led teaching is one example (Blackmore & Kandiko, 2012). The curriculum orientations identified in this study provide a way of understanding how participants' beliefs shape their curriculum decisions, and how they are responding to change in higher education. The findings from the study provide insight into the motivations and contextual factors that encourage individual academics to engage in improving their curriculum and teaching practice. They also have implications for institutional managers designing institutional change initiatives and other initiatives for improving curriculum and teaching, such as educational professional development programs.

This study shows that academics design curricula guided by a range of educational purposes that are expressed in their curriculum orientations and help to align all of their

decisions about curriculum elements. Using the study findings to develop academics' awareness of different curriculum orientations and their implications for curriculum design, for example in educational development programs, would have a range of benefits. Many academics teach and develop curriculum with colleagues across degree programs, and gaining awareness and understanding of the different perspectives from which their colleagues may be operating would help them to establish connections between their educational purposes and approaches, and identify gaps that need addressing.

Several of the participants in this study engaged in collaborative curriculum developments with colleagues within and across disciplines. They reported that they learned from each other and adopted new practices, some of which were reflected in their educational beliefs and transferred into their teaching and curriculum design in other courses. This highlights the potential value of encouraging academics to work in course teams, which will be facilitated by their having awareness of the significance and impacts of their curriculum orientations. The study provided an example of a successful collaboration to develop a multi-disciplinary environmental sciences course by Brendan and Tony. The success was facilitated by the participants having strong motivation to succeed and identifying a common educational purpose and approach that was led by Tony, because the course was in his specialist disciplinary area and he had a well-developed and articulated teaching philosophy. Brendan was happy to follow Tony's lead, but also described his struggle finding his role and purpose in teaching this curriculum, and gaining confidence when he identified a relevant disciplinary voice. Brendan also reported adopting the same teaching philosophy and approach in his other course investigated in this study.

Experiences of professional development were found to be important for fostering change in curriculum and teaching, and participation in formal programs developed theoretical understandings that transformed both educational beliefs and practices. Many academics do not engage with educational professional development until later in their careers, helping to entrench traditional disciplinary teaching practices and norms in the early stages. Hence, this study supports recent policy initiatives that encourage or require new academics to engage in formal educational professional development programs that provide them with expertise, conceptual frameworks and skills to develop quality curriculum and teaching approaches.

Trowler (1998) suggests that academics are more responsive to changes if they see them as providing benefits. He describes this as the 'profitability' of the change, with benefits that include 'security, prestige, peer approval, growth, efficiency and improvement in the quality of life' (p. 80). Most participants reported that they experienced significant conflicts in priorities between teaching and research, with research seen as having higher status, rewards and recognition. As reported in the previous section, participants identified a range of personal and educational benefits, in addition to student and learning benefits, from integrating research and teaching. These included enhancing teaching satisfaction, time and workload efficiencies from capitalising on expertise, reducing time in preparing lectures, and making teaching the focus of research. Hence there are many positive benefits that institutional managers can highlight to support change initiatives for developing research-based curricula and teaching.

One limitation in the introduction of research-based curricula was found to be participants' limited understanding of potential teaching-research relationships, with many thinking of the relationship as limited to presenting their own research to students. Participants with broader understandings of research-teaching relationships identified more potential connections between research and their teaching and curricula. This finding highlights the value of expanding academics' awareness and understandings of different research-led approaches to curricula and teaching. Professional development activities, such as workshops, where academics share their experiences and practices for linking teaching and research, including the challenges and efficiencies they have encountered, would be one approach for increasing awareness.

Significant conflicts were identified between time and priorities for teaching and research, and engaging in educational professional development. However, almost all of the study participants showed they were willing to engage with educational professional development at the level of attending a workshop and sharing practices with colleagues. Nevertheless, these participants had demonstrated a strong interest in learning about teaching, and their willingness to attend educational professional development workshops may not be representative of higher education academics more broadly. Hence institutional managers need to demonstrate that the time and effort for undertaking educational development will be recognised and rewarded, including in promotion policies and practices.

Teaching awards were another mechanism that provided recognition and enhanced academic credibility, which supported participants who introduced curriculum innovations that challenged the departmental or disciplinary norms. Hence this study supports the value of universities establishing teaching awards and other mechanisms for rewarding and valuing teaching.

University policies were also used for changing curriculum and teaching practices, often for the purpose of demonstrating quality assurance. Institutional policies were often described as stifling innovation and good practice, where academics believed that the policies were not pedagogically sound and not a good fit with their educational beliefs. Hence institutional policies will be more effective in achieving change when academics are involved in their development, feel ownership of the outcomes and believe that there are sound pedagogical reasons for the change. This study supports the view of Fullan (2003) that deeper educational change is achieved by engaging teachers' informed professional judgment than through prescription, even when prescriptive practices are educationally informed.

This study found that a significant constraint inhibiting innovative curriculum practices was the institutional practices for timetabling and organising teaching and learning activities. Kandiko and Blackmore (2012a) also note the power of embedded rules and practices for curriculum structures and organisation that create tensions for change. This study supports the need for institutional managers to address the administrative influences on change that constrain the structure and organisation of curriculum, and the teaching and learning spaces that shape teaching and learning interactions.

The study found that participants' beliefs about their discipline and disciplinary knowledge practices were a dominant influence on curriculum decision making. This may make some strategic curriculum change initiatives difficult, such as developing multi- and inter-disciplinary curricula. Kandiko and Blackmore (2012a) also report that many strategic institutional change initiatives create tensions with disciplinary goals and practices, and give as examples initiatives for broadening educational goals and general education, interdisciplinary courses, experiential learning, inclusive perspectives, and adopting distance and blended learning. They also note that disciplinary differences and views about the purposes of a degree influence the adoption of institutional initiatives. For example, initiatives such as the introduction of work experience and internships can

bring goals for vocational and professional training into conflict with the more liberal arts goals of 'learning to learn and think'.

This study suggests that many of the institutional and government agendas and initiatives for driving change in higher education are largely invisible to academics. Nevertheless, the impacts of some of these agendas were evident in participants' accounts of their curriculum decisions and practices. Many participants described and demonstrated that they were responding to changing expectations, including employability skills in curricula, and changing norms and expectations about teaching and learning. However, the beliefs underlying participants' curriculum orientations were evident in the way they shaped their responses to change. Hence change initiatives and educational professional development programs are more likely to be effective when presented in ways that support academics to enhance educational goals in alignment with their curriculum orientations and disciplinary knowledge practices, and allow them to adapt and accommodate the change to their educational purposes.

Many of the curriculum orientations identified in the study involved shaping disciplinary knowledge to achieve educational purposes for professional, personal and social relevance, which provide opportunities for accommodating change. The conflict identified between the liberal arts personal relevance educational orientation and the vocational and professional orientation was resolved to a large extent by the study participants through reframing thinking and learning skills as being generic and transferable to professional, research and academic learning. Hence curriculum orientations were found to have some degrees of openness and flexibility in accommodating and adapting to change, including the discipline based orientation, as is illustrated below for physics participants.

Discipline based curriculum orientations and ideologies, such as the orientation identified in this study for 'inducting students into a discipline', are usually associated with understandings of knowledge that lead to transmission focused approaches to teaching and learning. The transmission focused approach to teaching is reported to shape and limit academics' responses to curriculum change (Toohey, 1999; Trowler & Wareham, 2007). In contrast, this study shows that physics participants with a discipline based curriculum orientation adopted skills and employability agendas in student-focused ways. Examples were given where physics participants re-envisaged traditional

laboratory experiences as experiences for learning about being a scientist, and identified physics thinking and problem-solving skills as being relevant to broader work and learning contexts. Physics participants also adopted active approaches to teaching and learning that engaged students in conceptual change to achieve accepted disciplinary understandings. These participants adopted peer instruction as an evidence-based teaching approach for demonstrating learning effectiveness, in line with their disciplinary knowledge practices. Hence participants were willing to adopt changes that maintained their focus on inducting students into the discipline and were congruent with their disciplinary ways of knowing, while incorporating broader learning outcomes for students and active approaches to teaching and learning.

The literature provides examples where other disciplines have undergone significant changes in their teaching and curricula to take on new goals and approaches, such as problem based learning in medicine and engineering (Boud & Feletti, 1997). These changes have also involved initial resistance, followed by progressive acceptance over time, after significant research has established the educational benefits. However, I do not want to downplay the strength of disciplinary knowledge practices and norms in constraining curricula change, and this study supports the literature that suggests these changes require disciplinary champions, time and resources for establishing evidence of the educational benefits. The physics participants in the study also suggested that their academic credibility as researchers allowed them the privilege of introducing practices that challenged disciplinary teaching norms.

Participants also indicated that they were not influenced by external stakeholders because they had little direct contact with stakeholders. Some participants indicated they would like to have better understandings of graduate destinations and employers' needs. Universities could help to increase the visibility of stakeholders and engage academics more directly with them through a range of mechanisms, such as reference and advisory groups for degree programs that include diverse stakeholders.

Fullan (2001) argues that educational change is more likely to be successful when there is institutional support to provide the incentive and resources for teachers to develop new practices, and when the change is owned by teachers and addresses their priority needs. This study also indicates that academics are responsive to changing their curriculum and teaching practices when they perceive the change to enhance the

achievement of their educational goals and purposes, to be aligned with their disciplinary knowledge practices, and to provide personal benefits that include institutional recognition and rewards. Kandiko and Blackmore (2012b) also suggest that many institutional change initiatives are unsuccessful because they do not take account of local context and culture. The insights about curriculum orientations found in this study will help inform institutional managers about the educational beliefs and curriculum orientations which influence the local context and culture of curriculum decision making.

Another issue that can impact on the success of a change initiative is how students respond, as they may respond with resistance, which will impact academics' perceptions of the benefits and challenges of implementing change. This study investigated curriculum decisions and influences from the perspective of teachers, as is common to other studies of curriculum. Teachers often attribute particular beliefs about educational purposes to their students, which may or may not be accurate. For example, in my current position at a new university that emphasises professional and workplace experiences, I frequently hear academics say that what students really want are real workplace experiences. An area for future research would be to explore students' beliefs about educational purposes, and to compare these with academics' beliefs, and whether students also identify with institutional and disciplinary norms and expectations. In addition, academics can use the insights about curriculum orientations identified in the study to help students position themselves in relation to the different perspectives on knowledge reflected in the curriculum across a university department and program (Luckett, 2009; Weller, 2012).

7.5 Conclusions

In conclusion, this study found that curriculum was a useful framework for understanding the complexity of decisions and influences involved in designing an undergraduate course. The study identifies five coherent philosophical orientations to curriculum, where beliefs about educational purposes align with beliefs about discipline, research, teaching and learning, and students. Research was found to be a potentially important influence for curriculum change that enables academics to utilise their expertise, to share their enthusiasm with students, and to link professional and academic learning goals. The understandings gained from the study can assist academics to develop greater awareness of their own practices and the underlying

beliefs that inform them, and a range of possible alternatives for improving their practices. Raising awareness of different curriculum orientations can help to develop coherent curriculum at a program level by being able to better identify where there are common purposes and approaches. Curriculum orientations also provide a way for academics to help students to understand and position themselves in relation to the different knowledge practices represented across a department and degree program. Understandings of curriculum orientations can also provide insight into the design of institutional initiatives for curriculum change and educational professional development. Curriculum change and professional development are more likely to be accepted when presented in ways that are congruent with academics' beliefs about educational purposes that inform their curriculum orientations. This finding suggests that curriculum change initiatives may encounter problems if seeking uniform institutional responses to change, however providing opportunities for academics to develop ownership and explore ways of adapting to, and accommodating change to align with their educational purposes and curriculum orientations will be more successful. However, academics also need to perceive benefits and rewards for engaging in curriculum innovation and educational professional development, which requires institutional managers to increase recognition and rewards for teaching.

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Appendix 1

email Invitation to Participate in Research

Dear colleague

I am undertaking a PhD at the Australian National University. The purpose of my research is to investigate how and why higher education academics make decisions as they design undergraduate courses. Through this research I hope to better understand the influences on curriculum decision making and the factors that encourage academics to adopt teaching and curriculum practices that enhance the quality of student learning.

I am seeking academics who have recently designed a new course or reviewed an existing course to participate in an interview about your course design, and if possible to review any available curriculum documents in relation to your decisions. If this applies to you, I would appreciate you contacting me by phone or e-mail as described below. I am happy to discuss the project further if you would like more information.

I expect that the interview will take approximately two hours of your time. I hope that you would benefit from your participation in the research by reflecting on your decision making processes and gaining insight into your course design.

Your participation in this research is voluntary and you may decline to answer any questions during the interview, or to withdraw from the interview or project at any time. The information collected will not be intrusive or embarrassing to any participants. I would like your permission to tape record and transcribe the interviews, and am happy to provide you with a transcript of your interview. Interview transcripts will be coded and stored separately from your personal information, and would not be revealed to any third parties. All information that you provide will be confidential, to the extent that the law allows, during all stages of the collection, storage, processing and reporting of data. Pseudonyms will be used in the reporting of data so that individuals cannot be identified, and findings which could reveal the identity of any individual will not be published.

Your cooperation is greatly appreciated

Yours faithfully

Pamela Roberts
PhD students and Senior Lecturer CEDAM
Ph 61250060 or pam.roberts@anu.edu.au

Appendix 2

Semi-Structured Interview Protocol

1. Academic characteristics

Tell me about your history as an academic and how you came to be teaching this course?

Record details, such as

- Sex
- Academic level
- Continuing or fixed term position
- Your appointment: Research-teaching or research only
- Number of years as academic/
- Number of years teaching
- Do you have educational training/ qualifications and/ or experiences of educational professional development

2. Course characteristics.

- Course name/ code
- Degree program
- Year level
- Numbers of students
- Contact hours and course structure/ format of course (i.e. lectures/ tutorials/ laboratories etc.)
- New course design or review?
- When did you first teach it?

Curriculum planning/ decision making

Think about a specific course that you are currently designing or reviewing:

3. What was your motivation/ drivers for undertaking a new course design/ review?

4. When you designed this course, what did you do? Where did you begin?

Can you give me an examples of what you did?

Please give examples of your decisions in practice, for example how they were expressed in your curriculum documents.

5. Why did you do it like that?

Goals & purposes: What do were you trying to achieve for you and your students?

Content & structure: How do you select and organise the course content?

Did you have a particular philosophy or approach to teaching and learning? What methods did you use?

Did you have a particular philosophy or approach to assessment?

What evaluation methods did you use?

6. Important influences on course design

What do you believe are the most important influences on your thinking as you planned this course?

Probe beliefs about the nature and significance of the identified influences on course design?

7. Influence of research
How do you think that research influenced your course design? Please give examples.
When you talk about research in this context, what do you mean? Please give examples.
Do you think there are other ways that research has influenced your course design?
Please give examples.

8. Influence of discipline
How does your discipline influence your course design?
How do you think that your being a member of your discipline, (i.e. physicist, historian, etc.) has influenced your course design?

9. Influence of students
How do you take into account your students in your course design?

10. Influence of your experiences as a learner
How did your experiences as a learner influence your course design?

11. Influence of institutional context and research culture
How do you think the university has influenced your course design?
Do you think working at a research university has influenced your course design?

12. Influence of factors external to the university
How do you think factors external to the university influenced your course design? For example: the government, professional bodies, schools, parents, other..?

13. Your commitment to teaching and research
How would you describe your commitment to teaching? (For example: How much time/ proportion spent on teaching? What work activities do you do that are related to teaching?
How would you describe your commitment to research? (For example: How much time/ proportion spent on research? What work activities do you do that are related to research,

14. Ranking importance of influences
How would you rank the importance of the above influences on your course design?