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THE EDUCATIONAL BELIEFS OF A GROUP OF UNIVERSITY TEACHERS AND THEIR STUDENTS: IDENTIFICATION, EXPLORATION AND COMPARISON

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This thesis is presented in fulfilment of the requirements for the degree of Doctor of Philosophy, Edith Cowan University

Faculty of Community Services, Education and Social Sciences
Edith Cowan University

November 2005

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DEDICATION

I would like to dedicate this thesis to my parents, Margaret and Carew, who always believed in me, encouraged me to have my own beliefs and believed in the value of learning.

USE OF THESIS

The Use of Thesis statement is not included in this version of the thesis.

ABSTRACT

The quality of teaching and learning in tertiary education contexts is influenced by many factors including the educational beliefs of the university teachers and students who teach and learn in such contexts. Most belief research in the tertiary education sector has, to date, reported on the teaching or learning beliefs of just teachers or the teaching or learning beliefs of just students. Much less research has explored the connections between the educational beliefs of these two groups. This research has aimed to extend the parameters of previous research by investigating the point of intersection between the educational beliefs of a group of university teachers and their students. To attain this objective, the study adopted a mixed method approach which employed predominantly interpretivistic data gathering, data analysis and reporting methods. These methods incorporated elements of inductive and comparative analysis, and were augmented by other qualitative methods. Combined, these methods facilitated the identification, exploration and comparison of the educational beliefs of the participants in the study.

The findings that emerged from analysis of the data gathered throughout the study confirm, challenge and refute some of the previous understandings about educational beliefs. As well as revealing the remarkably parallel structure between the teachers' and students' beliefs about teaching and learning, these findings also suggest that the participants' beliefs were characterised by an awareness of the emotional and social elements of teaching and learning. Teachers' and students' beliefs also revealed consistent and embedded references to epistemology and, interestingly, to technology, and were based on perceptions of indistinct boundaries between such constructs as teaching, learning and knowledge.

As well as conveying revelations about the nature and structure of the participants' educational beliefs in general, the study also documents the similarities that were found between the nature and sophistication of the teachers' and students' beliefs. The differences between their beliefs,

though less extensive than the similarities, are also reported in this thesis in conjunction with some of the paradoxes which arose because the beliefs of both groups were considered concurrently within the same context. The discussion of the study's findings is aligned to, and evaluated against, central ideas cited in recent belief literature which reflect contributions from contemporary research and relevant educational theory. Implications for transference of these findings to other similar settings are also considered.

The study is reported from a reviewed framework that is based on the focus and structure of educational beliefs rather than an assumed hierarchical nature. Conclusions from this study challenge some of our perceptions about the overly cognitive nature of teaching and learning, and question the impact of academic context on teachers' and students' beliefs.

The study's research processes, and the findings reported in this thesis, some of which were quite unforeseen, will interest those involved in teaching, learning and course design at the tertiary level. The findings of the study will provide some evidence for the value of presenting teachers' and students' beliefs transparently, even if such beliefs expose some mismatches between the stakeholders in tertiary education. The thesis concludes with a call to educational researchers to continue the exploration of the links between the educational beliefs of university teachers and students.

DECLARATION

I certify that this thesis does not, to the best of my knowledge and belief:

    (i)   incorporate without acknowledgment any material previously submitted for a degree or diploma in any institution of higher education.

    (ii)   contain any material previously published or written by another person except where due reference is made in the text; or

    (iii)   contain any defamatory material.

I also grant permission for the Library at Edith Cowan University to make duplicate copies of my thesis as required.

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Date: ………………………….. ………………………

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ACKNOWLEDGEMENTS

I would like to offer my thanks and deep respect to my supervisor in this research, Dr Tony Fetherston, a true constructivist, who guided me and facilitated my learning throughout the process of this research with sensitivity and wisdom. I have especially appreciated his regular reminders to consider the big picture of this study when the details threatened to engulf me. His knowledge of education, his perceptive insights and his continuous support have assisted me no end. Thanks also to Professor Max Angus, my co-supervisor, who provided me with valuable advice and continues to be a model of a thoughtful educator.

My sincere thanks goes to the teachers and students who participated in this study for their incredibly generous, wide-ranging, honest and voluntary contribution to this research. Their invaluable time and effort was very much appreciated. I hope their voices are represented faithfully.

My family in Perth, Sydney and Melbourne have supported me along every stage of this work. I'd like to thank Jack Seddon, my husband, for his endless patience, understanding, support, superb cooking, good humour and love throughout the process of preparing and finalising this thesis. Thanks also goes to my mother, Margaret, for her belief in my abilities and her quietly consistent way of encouraging me. My late father, Carew, also had a huge influence on me in his biased fatherly way of focusing on my strengths above all else. My sister, Monique, and her family, Matthew, Elyce and Tia, have also encouraged me to get this thesis completed. They have been great support from afar. Thanks to George and Marli, my family in Perth, for their continued personal support and their professional suggestions, especially during the write-up process. Thanks to Isabel, also, for her interest and encouragement during this long project. All these family members have given me strong and loving support. Their considerate understanding of my obsession with this research has been ongoing and valuable. Without their encouragement, this thesis would still be unfinished.

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CHAPTER 1

INTRODUCTION

Background

Belief research has forged varied avenues of investigation, many of which have been specifically associated with educational issues. The collection of research studies that have explored individuals' beliefs is commonly referred to collectively as "the belief literature". This literature primarily reports on the general types of beliefs held by individuals and the specific educational beliefs held by teachers and students. This collection of research studies also incorporates references to a range of contexts, frequently espouses the value of studying the link between beliefs and practice, and reveals some directions for future research. These areas have been used as structural organisers in this chapter to explain the background of the study of beliefs in general and this study in particular.

Types of Beliefs

Everyone holds a range of personal, religious, political, epistemological and educational beliefs, and these beliefs influence how we think, act and feel. Inversely, our experiences of practical situations may influence our varied beliefs. Researchers have accounted for this connection between practice and belief by differentiating between espoused beliefs and beliefs in action, depending on whether such beliefs remain in an ideal, abstract state or are enacted in practice. In educational contexts, practical teaching and learning processes are directly influenced by the educational beliefs held by teachers and students, and these beliefs, in turn, are influenced by teachers' and students' practical experiences. This study focuses particularly on the educational beliefs about teaching and learning, with some references to the epistemological beliefs, held by a group of teachers and students who teach and learn together at a large Australian metropolitan university.

Educational Beliefs

Teachers and students hold beliefs about teaching and learning. Combined, such beliefs are often referred to as educational beliefs. Studies about educational beliefs have typically focused on either teachers and teaching (Åkerlind, 2004; Berliner, 1989; de Neve, 1991; Kember, Kwan, & Ledesma, 2001) or students and learning (Archer, Bourke, & Cantwell, 1996; Chapple, 1999; Dart et al., 2000; Forrester-Jones, 2003). In each case, beliefs about teaching have been explored from both teachers' (Kember, 1997; Samuelowicz & Bain, 1992, 2001, 2002) and students' (Kember & Wong, 2000; Young & Shaw, 1999) viewpoints. Similarly, beliefs about learning have been investigated from the perspective of teachers (Bruce & Gerber, 1995; Orton, 1996) as well as from the perspective of students (Eklund-Myrskog, 1997, 1998; Meyer & Boulton-Lewis, 1999). Compared to the majority of belief studies that have focused on either teaching beliefs or learning beliefs from either a teacher perspective or a student perspective, fewer studies have investigated the overlap between teaching and learning beliefs (Gill, Ashton, & Algina, 2004; McShane, 2002). Even fewer studies have explored the interconnection between teachers' and students' beliefs (Baker & Moroz, 1996; Rickards, Newby, & Fisher, 2001; Wing, 1989).

Regardless of the wide variety of views held by teachers and students about teaching and learning, there appear to be some commonalities between these concepts (Andrews, Garrison, & Magnusson, 1996; Bruce & Gerber, 1995; Johnston, 2001; McCombs, 2000, 2001). Subsequently, the value of exploring both teachers' and students' beliefs within the same context is becoming increasingly recognised as a vital area for future research (Forrester-Jones, 2003; Witcher, Sewall, Arnold, & Travers, 2001). Concepts such as teaching and learning should, therefore, be considered from teachers' and students' perspectives, as advised by Murphy (2001) "given there is no singular understanding or view relative to complex concepts, it becomes the role of teachers and learners to explore competing perspectives so that such shared understanding is more apt to emerge within a classroom community" (p. 226). For these reasons, this study has

investigated the links between university teachers' and university students' educational beliefs, the findings from which have also revealed and reinforced the connections between the perceptions of teaching and learning.

Focus on Teachers or Students

In the past few decades, the research into teachers' and students' educational beliefs has tended to investigate the beliefs held by one or the other of these two groups. The emphasis on teachers' beliefs that was prevalent in the 1970s and early 1980s began to change in the late 1980s. Approximately from this time until just recently, the literature indicates a concern by the academic community about students' beliefs. The emphasis on students, their learning and study requirements and patterns, over the past two decades, has resulted in an excess of such studies when compared to those based on teaching. Kember and Kwan (2000), Prosser and Trigwell (1997) and Trigwell, Prosser and Waterhouse (1999) all note that, compared to the research on students' beliefs, there is a lack of research in later years about teaching in higher education. Prosser and Trigwell (1997) especially noted that:

> There has been little research, however, into university teachers' perceptions of the teaching context, approaches to teaching and quality of teaching outcomes … As was the case with the early research on student learning, subsequent research is likely to identify further variation in the way teachers in higher education perceive their teaching environment, and to systematically relate it to approaches to teaching. (pp. 26, 34)

This former lack of emphasis on teachers' beliefs is beginning to be rebalanced by a number of authors (Kember et al., 2001; Samuelowicz & Bain, 2001, 2002; Tavares, Brzezinski, & Silva, 2000; Trigwell et al., 1999). However, despite the combined knowledge about teachers' beliefs represented by the belief literature to date, Åkerlind found new dimensions of university teachers' understanding of teachers' roles as recently as 2004 and, subsequently, suggests that "my findings indicate that we may still have much to learn about the various facets of university teaching" (p. 373). Her recommendation coincides with the advent of a barrage of new

technology and financial restraints that have recently beset the higher education sector both in Australia and worldwide. The renewed interest in teachers' beliefs has specifically focused on how such beliefs can be addressed in order to manage change, to improve teaching and to create a learning environment that is more technologically flexible from both an administrative and a learning preference perspective. So, rather than addressing either students' or teachers' educational beliefs, this study focuses on how teachers' beliefs relate to the beliefs of learners.

Range of Contexts

Research about teachers' and students' beliefs about teaching and learning has been conducted across a range of contexts and within varied levels of educational institutions. Some of these studies have been conducted within single academic domains, such as mathematics (Carter & Norwood, 1997), economics (Johnston, 2001), science (Hancock & Gallard, 2004) or music (Barrett & Rasmussen, 1996). Conversely, other research has been conducted within either a limited number of disciplines (Hativa, Barak, & Simhi, 1999) or across a wide range of disciplines (Evans, Ellett, Culross & Loup, 1993). Additionally, other research has been set within specific cultural contexts (Purdie, Hattie & Douglas, 1996). Research about teachers' and students' beliefs has also been placed within varied levels of education including preschools (Wing, 1989), primary schools (Steketee, 1997), secondary schools (Parr, 1999), vocational colleges (Chalmers & Fuller, 1999) and universities (Dunkin & Precians, 1992).

Relevance of Educational Beliefs to the Tertiary Sector

The teaching and learning processes adopted in tertiary educational contexts worldwide are in a constant state of flux, as various new strategies and theories are trialled and tested, and as the sector undergoes widespread pedagogical, administrative and financial transformation. The traditional approach of teaching in an instructivist manner is gradually being superseded by an approach which advocates constructivist pedagogy (Fetherston, 1997; Herrington & Standen, 1999). This paradigm change has infiltrated the pedagogy of much tertiary education and has subsequently

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had an impact on the educational beliefs of university teachers and students and the quality of learning experienced by many university students. For these reasons, the study of educational beliefs is particularly significant to the modern tertiary education sector.

Educational Beliefs and Practice

The combined work of educational researchers has revealed a concern with how students' and teachers' educational beliefs influence their learning and teaching practices (Archer et al., 1996; Berliner, 1989; Chapple, 1999; Dart et al., 2000; Marton & Säljö, 1976; Nasr, Booth, & Gillett, 1996; Oberg, 1989; Prosser & Trigwell, 1997; Rainer, 1999; Taylor, 1996). In the case of university teachers' and students' beliefs, the link is most evident in teachers' teaching practices (such as teaching strategies, preparation methods, course design considerations, face-to-face interactions and assessment techniques) and students' learning practices (such as study strategies, motivational issues, assignment completion, research techniques and contributions to learning activities).

Recent literature and current educational theory suggests that teachers' beliefs about education, learning and teaching are fundamental to the way they teach. Moreover, these beliefs are indicative of the way teachers interact with students and the way courses are designed. Pajares (1992) claims that the study of teachers' beliefs is central to the process of teaching. Nespor (1987) echoes this view about the close correlation of teachers' beliefs with their practical work, stating that: "… to understand teaching from teachers' perspectives we have to understand the beliefs with which they define their work" (p. 323). Such a view is also supported by Cannon (1983): "There is evidence that strong relationships exist between the field of teaching and attitudes to teaching and learning" (p. 24). Furthermore, Prosser and Trigwell (1997) found that the variations in university teachers' approaches to their teaching were directly related to the variations in their perceptions about the teaching context, thus illustrating the interrelationship between teaching beliefs and teaching practice.

The research into teachers' beliefs also shows how teachers' practical approaches to teaching are affected by their beliefs about learning. For example, the research by Ballone and Czerniak (2001) found that teachers' beliefs about learning significantly influence their choice of instructional strategies in science classrooms. Similarly, findings from Kippen's study (2003) suggest that higher education teachers who were able to explain their beliefs in relation to relevant educational theories about teaching were able to implement instructional strategies that supported deep student learning (Biggs, 1993). Such learning is motivated by an intention to understand, analyse and build upon existing knowledge, rather than just gain new information. The manner in which teachers' beliefs about teaching and learning affect their teaching practices has also been a central focus in the research into effective teacher education processes. Cronin-Jones (1991) suggests that teacher education programs will not be successful if they only address skill development without reflection on beliefs. This view is confirmed by Kember et al.'s findings (2001):

> The findings add to the growing body of knowledge that suggests the way in which people teach is shaped by their conception of teaching. Attempts to influence the quality of teaching and student learning outcomes, therefore, needs to be at least cognisant of the teachers' conceptions of teaching. (p. 403)

Although educators tend to think in terms of how beliefs affect practice, findings from recent studies inversely provide evidence that teachers' practical experiences can influence their beliefs (Greene & Zimmerman, 2000; McKenzie, 1996; Schuh, Walker, Kizzie, & Mohammed, 2001). However, whether or not teachers' beliefs affect their practice, or whether their practice affects their beliefs, is an area of research that Archer (1999) describes as being difficult to pinpoint: "The causal link between beliefs and practices is not clear cut" (p. 2). Despite this controversy between the direct influence between beliefs and practice, most research confirms that the belief-practice link is strong.

Just as university teachers' practices can be traced back to their abstract thoughts and theoretical conceptions, so too students' ideas about

learning and teaching are major determinants in their learning practices. The study by Dart et al. (2000) specifically explored the relationship between students' conceptions of learning, their perceptions of the learning environment and their practical learning approaches. Findings from this study indicate that students with qualitative and experiential conceptions of learning were likely to use deep approaches to learning whereas students with quantitative conceptions of learning were more likely to use surface approaches. This study has important ramifications for any research proposing to focus on the educational beliefs of teachers and students and was especially significant in the design of this study for the further link it revealed between the students' beliefs and practices, and that of teaching practices (Dart et al., 2000, p. 266). This complex network, based on the influences of teachers' and students' beliefs on their practices, is described by Kember and Kwan (2000) as follows:

> There is then evidence that the study approaches adopted by students are a function of the student's predisposition, the form of the teaching and the nature of the teaching and learning environment, or the curriculum in the broadest sense. The approach to study adopted by the student in turn affects the quality of the learning outcomes. (p. 470)

In general, the researchers that have explored the relationship between teachers' and students' beliefs and practice typically confirm the existence of this belief-practice link and it is this link that has motivated many investigations into the educational beliefs held by teachers and students.

Unexplored Areas in the Belief Literature

This consideration of the main areas of concern reflected in the belief literature to date has revealed a call for further research into the point of intersection between teachers' and students' beliefs, as well as the interdependency between the concepts of teaching and learning: "The teaching/learning partners in the classroom need to be more aware of each others' differing perspectives of the teaching/learning environment they experience" (Baker & Moroz, 1996, p. 9). Such recommendations suggest

that future research should investigate educational beliefs by taking into account both of the two main groups of stakeholders in education (the teachers *and* the learners) and both types of beliefs (beliefs about teaching *and* learning). This acknowledgement that these two groups and these two types of beliefs have frequently been treated separately coincides with the increased tendency of researchers to recognise the similarities in the conceptual structures of the nature of teaching and learning (Andrews et al., 1996; Bruce and Gerber, 1995; Johnston, 2001; McCoombs, 2000).

Conclusion to Background

Research about teachers' and students' educational beliefs is represented by investigations into teachers' beliefs, students' beliefs, the types of beliefs held by each group, beliefs held within different contexts and how such beliefs affect teaching and learning practices. Despite the apparent wealth of literature based on teachers' and students' beliefs, the relationship between their beliefs remains an under researched area. Researchers such as Hativa (2000b), McShane (2002) and Quinlan (1999) recommend that, in order to gain a fuller understanding of the educational beliefs of university teachers and students, additional research is required into the beliefs about teaching and learning held by those involved in higher education contexts. For these reasons, the study documented in this thesis has specifically focused on this important juncture of the overlap between each group's educational beliefs. Such an overlap may be an important indicator of, influence on, or predictor of the quality of student learning.

Rationale and Significance

Findings from the background information presented above have provided the rationale and significance of the study documented in this thesis. The rationale behind this study can be described in terms of four areas of significance: scope, process, participants and researcher. Firstly, the study is significant as it aims to focus on the overlap between university teachers' and students' beliefs by investigating the similarity between each group's beliefs. Although the educational beliefs of students and teachers have been previously researched in isolation, very few studies have

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addressed how the beliefs of these two groups are related. This relationship has been investigated in this study in order to acknowledge the voice of both groups (Forrester-Jones, 2003; Hanrahan & Tate, 2001; Lincoln, 1995) and to contribute to the existing literature which reflects a lack of research into the relationship between teachers' and students' educational beliefs.

The second area of this study's significance is related to the research processes that have been adopted to gather, analyse and interpret the study's qualitative and quantitative data. Some of these processes were markedly different from previously conducted belief studies and offer some further options to guide prospective researchers in this field. One of these processes incorporated the provision of video samples (King & Tuckwell, 1983; Smith, 2000) in interview situations in order to ground this data gathering process within a common practical context and to counteract some of the claimed inadequacies associated with the sole use of self-reporting methods. The method of collecting quantitative data has also contributed to the internal validity of this study. In addition to qualitative data gathering methods, data about teachers' and students' beliefs were also collected via an Educational Belief Inventory (EBI) which was created specifically for this study. The use of this inventory is significant since it was not designed for the exclusive use of either teachers or students, and it did not concentrate solely on the constructs of teaching or learning as other belief measuring instruments have tended to do. Instead, the EBI was designed for both teacher and student use, and provided these two groups with opportunities to demonstrate their beliefs about teaching and learning, and teachers and students, within the confines of the same instrument.

The data analysis processes adopted in this study to compare the educational beliefs of university teachers and university students represent another significant area of this study. Since previous research has rarely compared the educational beliefs held by particular groups, such research does not appear to have produced any consistent methodology for comparing the beliefs of two or more groups. This study has generated two methods of comparing teachers' and students' educational beliefs, one which is based on

an analysis of the qualitative data and one which is based on an analysis of the quantitative data. These data analysis methods were designed purposely for the comparison of teachers' and students' beliefs and may be further utilised in future research studies which aim to compare or contrast the beliefs of other groups, such as varied groups of students, varied groups of teachers, or groups of teachers and administrators.

Thirdly, the study is significant for the participants as they will be encouraged to reflect upon and, thus, become more sensitised to their personal educational beliefs. Although some previous belief studies have also been characterised by this aim in relation to one group or the other, this research further encourages the teacher-participants to become more aware of their fellow teachers' beliefs, as well as the beliefs of their students. Likewise, the study has also encouraged the student-participants to become more aware of their fellow students' beliefs, as well as the beliefs of their teachers. From this extended level of consciousness about their own and each others' educational beliefs, it is anticipated that both the teachers and the students who participated in the study may increase their ability to be more reflective about their own teaching and learning, and, thus, improve the quality of their teaching or learning practices.

This choice of research topic was especially significant to my own educational interests and experiences, and my interpretation of recent world events. The introduction of an instrument to measure the quality of university teaching caused me to consider the beliefs underlying the construction of such an instrument. Furthermore, my recent experiences supervising education students on their teaching practicum experiences has illustrated to me the vast difference between those preservice teachers who could link their practical approaches to their own beliefs and relevant educational theory, and those who could not. Those preservice teachers whose practice was not founded on coherent educational beliefs tended to be less able to reflect on their own teaching and experienced difficulty in designing relevant educational experiences for their students. Conversely, the preservice teachers who were aware of their own educational beliefs and

who were knowledgeable of relevant educational theories appeared more able to reflect their own teaching and designed experiences to match their students' learning needs.

Lastly, the area of focus investigated in this study became an especially poignant interest of mine following the tragedy of September 11, 2001 which had worldwide effects. This event highlighted for me the strong link between individuals' beliefs and their practical life choices and, consequently, directly influenced my choice of beliefs as a topic of investigation. Throughout the process of conducting, analysing and presenting the results of this research, the significance of this event in terms of worldwide beliefs has continued to be a global focus and, coincidentally, the fourth anniversary of this event coincided with the completion of the first draft of this thesis.

Problem Statement

The quality of student learning in higher education has shown to be affected by the educational beliefs held by university teachers and university students. Although the belief literature documents various examples of the educational beliefs held by either teachers or students, very little research has focused on the beliefs held by both of these groups within the same context. The problem is that we have limited understanding of how teachers' and students' educational beliefs are enacted at the same time within the same context. This study represents an attempt to extend the research in this area.

Purpose

This study aims to investigate, and contribute to, a fuller understanding of the educational beliefs held by university teachers and students, and the extent to which their beliefs overlap. Although the belief literature has provided guiding constructs which have framed the theoretical structure and conceptual basis of this study, the methodology at the core of the study has been designed in a way to allow for new categories, should they exist, of belief constructs to emerge. This intention reflects an

interpretivistic manner of inquiry based on a constructivist paradigm: "The aim of inquiry is understanding and reconstruction of the constructions that people (including the inquirer) initially hold, aiming towards consensus but still open to new interpretations as information and sophistication improve" (Guba & Lincoln, 1994, p. 111). By accessing the varied constructions of reality represented by the multiple perspectives of both teachers and students, the findings of this study provide a rich, detailed understanding of university teachers' and students' educational beliefs, as well as some understanding of the level of congruence between their educational beliefs.

Overall, the dual purposes of this study were guided by two major questions which emerged from a comprehensive review of the research into educational beliefs represented by past, recent and current literature:

- Research Question 1: What are the educational beliefs of university teachers and university students?

- Research Question 2: How similar are the educational beliefs of university teachers and university students?

As well as providing direction for the selection and creation of suitable data gathering and analysis methods throughout the study, these two research questions have also been adopted as overall organisational devices which are used to structure the report of the study's major findings.

Structure of the Thesis

The next chapter (Chapter 2) presents a review of the belief literature to date. The literature review is followed by an outline of the research methods used in this study in conjunction with an analysis of why such methods were selected (Chapter 3). Then, the four findings chapters (Chapters 4-7) present the results of analysing the data gathered throughout the study. The thesis concludes with a Discussion (Chapter 8) of the study's findings which links the outcomes of this study to previous research. The final chapter of the thesis (Chapter 9) concludes by presenting some limitations to the study, a summary of the study's key findings and areas for future research.

CHAPTER 2

LITERATURE REVIEW

This literature review presents an analysis of the main research studies conducted within the last few decades that have investigated and identified the educational beliefs about teaching and learning held by university teachers and university students. Because this literature review focuses primarily on the beliefs of university teachers and university students, most of the studies selected for inclusion in this review focus on tertiary education. However, some studies that were set within non-tertiary educational contexts have been included for their conceptual and/or methodological relevance.

Aims of this Literature Review

There were three main aims for conducting this literature review. Firstly, I wished to acquire a deep and broad conceptual understanding of the research findings from studies that explored teachers' and students' educational beliefs. Secondly, I anticipated that a review of the literature would reveal a number of areas which were under researched within the field of educational beliefs, specifically within the tertiary education context. Thirdly, the literature review was conducted in order to provide a strong theoretical framework to inform the conceptual, methodological and analytic bases for this research study.

After an initial review of the literature, five major categories of investigation were identified which related to the research questions:

(1) beliefs held by teachers about teaching;

(2) beliefs held by teachers about learning;

(3) beliefs held by students about learning;

(4) beliefs held by students about teaching; and

(5) the relationship between teachers' and students' educational beliefs.

The fifth group of belief studies combines various elements from the previous four categories. As well as being used as an organisational device to structure the literature review, this five tiered scheme was later used as a preliminary structure that assisted the data gathering, analysis and presentation methods adopted in this thesis.

This literature review begins with an overview of recent and past studies that have examined educational beliefs held by teachers and students within a variety of institutional contexts. Some studies have been cited in more than one section of the literature review in order to illustrate the diverse points raised by this research. As the review progresses, more focus is placed upon studies based within university environments with emphases upon teaching and learning beliefs from both students' and teachers' perspectives.

Scope of the Literature Review

Although the articles by Entwistle (1998) and Roche (2000) broadly consider the educational beliefs of university teachers and students through a collective consideration of the literature, other separate research studies are also considered in this literature review. Together, these broadly and narrowly focused studies form the belief literature accessed during the process of conducting this literature review, the nature, scope and organisation of which are illustrated in Figure 1.
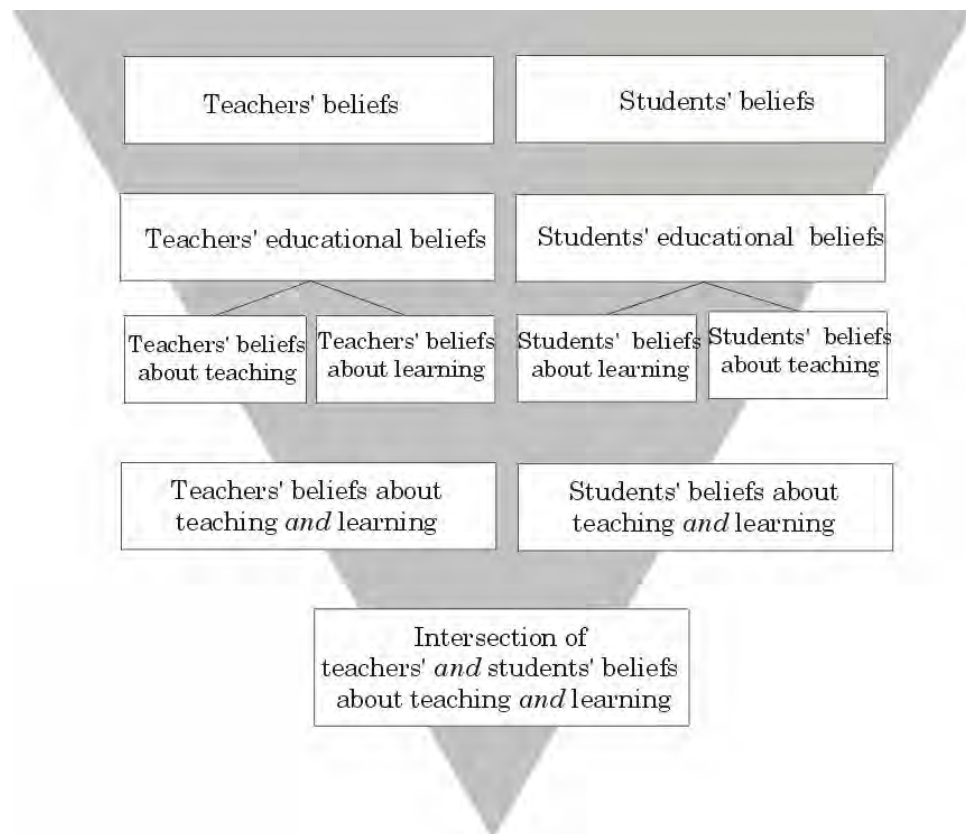
Figure 1. Scope, Nature and Organisation of Educational Belief Literature.

This representation of the literature, outlined in Figure 1, indicates that the least researched aspect of the belief literature is related to the intersection between teachers' and students' beliefs, and this will be verified in the following review.

<h3 style="text-align:center">The Literature</h3>

Before presenting the major groups of studies that emerged from a review of the belief literature, the work of two major authors in this field, Entwistle (1998) and Roche (2000), are examined to provide a broad but comprehensive overview. These authors are characterised by their extensive knowledge about and their ongoing involvement in research about educational beliefs. Two papers by these authors are especially important for this study. In Entwistle's paper (1998), *Conceptions of learning, understanding and teaching in higher education*, he identifies the work of Perry (1970), Säljö (1979a) and Marton and Saljo (1976) as making important contributions to our understanding of the development and nature of learning

beliefs. Entwistle (1998) reinforces the essential relationship between teaching and learning, confirming the link between students' conceptions of learning and teachers' conceptions of teaching.

Roche's article (2000) is a succinct summary of the various conceptions of, and approaches to, teaching and learning identified in the educational belief literature. Roche particularly considers how an individual's learning outcomes are influenced by their learning conceptions which, in turn, are influenced by their epistemological beliefs, suggesting that one's views of knowledge are inextricably linked with one's views of teaching and learning. Roche summarises the literature which has identified students' conceptions of learning (Marton, Dall'Alba & Beaty, 1993; Purdie, Hattie & Douglas, 1996) and teachers' conceptions of teaching (Dunkin & Precians, 1992; Kember, 1997; Kember et al., 2001; Martin & Balla, 1990). He also noted that the research consistently reports on similar hierarchical progressions between the two areas, conceptions of teaching and conceptions of learning. That is, teachers' conceptions of learning were considered to progress from simple to complex views about the nature and processes involved in learning, as were students' conceptions of learning.

Both Entwistle (1998) and Roche (2000) observe that the educational beliefs of teachers and students are often described in terms of being either transmissive or constructivist. This categorisation system has been adopted in many other belief studies as a convenient labelling mechanism used to track and investigate the educational beliefs of teachers and students.

Many of the studies cited in Entwistle's (1998) and Roche's (2000) work are incorporated within the following sections of the literature review which systematically present findings using the organisational framework portrayed in Figure 1.

Studies that Investigated the Beliefs Held by Teachers about Teaching

The bulk of the available educational belief literature has documented the beliefs held by teachers about teaching. Within this extensive field of belief literature, a number of subcategories of studies are apparent, including studies that specifically identified teachers' beliefs about teaching, studies that investigated how teachers' beliefs impact on their teaching practice, studies that examined the link between teaching and epistemological beliefs, studies about how teachers' beliefs are influenced by contextual factors and studies that investigated how teachers' beliefs are related to beliefs about learning. Each of these broad categories is now examined.

Beliefs about Teaching

A number of studies report on how teachers' beliefs about teaching have been identified and labelled (Åkerlind, 2004; Cliff, 1998; Curtner-Smith, 1997; Jewett, Bain & Ennis, 1995; Kember, 1997; Lawson, 1983; Maor & Taylor, 1995; Samuelowicz & Bain, 1992, 2001, 2002). A selection of these studies that have identified teachers' beliefs about teaching is now considered.

The progressive work of Samuelowicz and Bain has extended our views of university teachers' beliefs about teaching. The five orientations to teaching held by university teachers identified by Samuelowicz and Bain (1992) were extended to include seven orientations to teaching and learning in their later paper (Samuelowicz & Bain, 2001). These revised orientations include: (1) imparting information; (2) transmitting structural knowledge; (3) providing and facilitating understanding; (4) helping students develop expertise; (5) preventing misunderstandings; (6) negotiating meaning; and (7) encouraging knowledge creation. The conceptions of teaching (Samuelowicz & Bain, 1992) and orientations to teaching and learning (Samuelowicz & Bain, 2001) incorporate a range of both teaching-centred and learning-centred ideas about teaching and learning. Whereas the conceptions of teaching and learning identified by Samuelowicz and Bain

(1992, 2001) were established across a range of disciplines, other studies have been conducted within more specialised contexts.

University teachers' beliefs about teaching were also investigated by Kember (1997) and Åkerlind (2004). Kember (1997) found that the two main conceptions of teaching in a university context could be described as being either teacher centred/content oriented or student centred/learning oriented, with a middle category which focused just on student-teacher interaction. Åkerlind's study of how academics understand teaching (2004) also found that teachers view teaching primarily as a teacher-focused or a student-focused experience, ranging across four categories of description including: a teacher transmission focused experience; a teacher-student relations focused experience; a student engagement focused experience; and a student learning focused experience (p. 366). In addition to these foci, Åkerlind (2004, p. 273) found two other dimensions of teaching across these four categories that had not been found in earlier studies. She found that teachers viewed themselves as gaining benefits from the teaching-learning process and that they also viewed benefits of teaching for the broader community. Interestingly, this wider community based conception of teaching has also been noted by Cliff (1998) who suggested an additional communalistic conception of learning. This conception will be discussed later in this literature review within the section that identifies beliefs about learning.

This systematic partitioning of teachers' beliefs about teaching into categories which focus either on teachers or learners was also noted in studies that investigated teachers' beliefs in more specific academic domains. For example, some researchers have specifically investigated the teaching beliefs of physical education teachers (Lawson, 1983; Curtner-Smith, 1997; Jewett, Bain & Ennis, 1995). Lawson and Curtner-Smith both describe physical education teachers as having either coaching or teaching orientations, depending on whether they are concerned with teaching students about physical education issues or with coaching sports skills. Jewett, Bain and Ennis (1995) describe five value orientations to teaching

which range from concerns about how teachers teach through to concerns about how students learn. These value orientations are described as: disciplinary mastery; learning process; self-actualisation; social responsibility; and ecological integration. These five orientations suggest an emphasis on either students or teachers.

In a similar way to previous researchers in this area (Åkerlind, 2004; Kember, 1997; Samuelowicz & Bain, 1992, 2001), and also working within a specific field, Maor and Taylor (1995) describe two extremes of teaching conceptions as transmissionist-oriented pedagogy and constructivist-oriented pedagogy. Their method of labelling these two extreme categories of teacher pedagogy implies that teachers are primarily concerned with either transmitting content or facilitating student learning. This labelling method is similar to that used by Samuelowicz and Bain in their 2002 study which identified academics' orientations to assessment practice which they found "could be ordered along a continuum anchored at one end by an emphasis on knowledge reproduction and at the other by an emphasis on knowledge construction and/or transformation" (p. 173).

The significance of the studies cited so far that have focused on teachers' beliefs about teaching can be judged in the context of teachers' practices, or their approaches to teaching. This vital link between beliefs and practice provides a robust rationale for the intensive investigation that characterises much of the research in the field of educational beliefs.

Impact of Teaching Beliefs on Teaching Practice

A number of researchers have examined the impact of teachers' beliefs on their teaching practice (Andrews, Garrison & Magnusson, 1996; Berliner, 1989; Gilbert, 1997; Gow & Kember, 1993; Martin, Prosser, Trigwell, Ramsden & Benjamin, 2000; Nasr, Booth & Gillett, 1996; Oberg, 1989; Prosser & Trigwell, 1997; Rainer, 1999; Trigwell & Prosser, 1996). The examples included in this section of the literature review are presented in chronological order to highlight the historical progression of the thematic influences found among these research studies.

The significance of teachers' beliefs in relation to their teaching practice has been explored by Berliner (1989), Oberg (1989) and Gow and Kember (1993). These researchers have examined the consequential relationship between teachers' attitudes and thinking as the foundational bases of their teaching practice across a range of educational contexts. By specifically analysing the role of expectation in association with teachers' beliefs about planning, teachers' interactive thoughts and decisions, and teachers' theories and beliefs, the results of Berliner's study reinforce the connection between teacher thinking and teacher behaviour. His study demonstrated how a teacher's beliefs, theories and thoughts directly influenced their decisions about planning.

Conducted in the same year as the Berliner study (1989), Oberg's work (1989) continued the focus on connecting teachers' theoretical ideas with the "ground" of professional teaching practice. Using a methodology set within a practical context, Oberg "moved backwards" from teachers' descriptions of their work and then linked these descriptions to "teachers' beliefs and intentions" (p. 153). By focusing on the teachers' practical approaches to teaching, this research explored both the implicit and explicit elements of the link between teachers' practice and thinking by asking teachers to describe the routines of a typical day of teaching followed by a discussion of their educational beliefs.

Similarly, Gow and Kember's research (1993) within a tertiary context of a polytechnic college examined the relationship between the quality of learning experienced by students and their teachers' conceptions of teaching. Their results identify two central orientations to teaching which were defined in terms of learning quality: learning facilitation and knowledge transmission. For example, one of the teacher-participants in this study expressed facilitative beliefs about teaching:

> You've got to be able to make an environment where students really want to learn. If you do that, they are much more likely to understand why they learn. And then I think after that, the teacher should be a resource person … generally to guide the students, I don't see it as spoonfeeding. (Gow & Kember, 1993, p. 23)

In comparison, a teacher in the same study who believed teaching was primarily associated with imparting information described their main intention of teaching as being to "pass information onto students, that is the major goal" (Gow & Kember, 1993, p. 23).

In the late 1990s, five more research studies (Andrews et al., 1996; Martin et al., 2000; Nasr et al., 1996; Rainer, 1999; Trigwell & Prosser, 1996) also investigated the impact of teachers' beliefs and intentions on their teaching practices, their practical instructional choices and students' progress. As an example, Nasr et al. (1996) conducted a study which explored the relationship between university teachers' attitudes to effective teaching and their teaching performance. The findings from this study indicate that a strong relationship exists between lecturers' attitudes to teaching and their teaching performance; that is, positive changes in lecturers' attitudes towards effective teaching appear to correlate positively and significantly with increases in teaching performance. A similar outcome was noted in Andrews et al.'s study (1996) which suggests that, in order to improve teaching performance, both the beliefs and values of teachers need to be addressed in order to enhance skill development.

Trigwell and Prosser (1996) further investigated the relationship between university teachers' instructional intentions and their choice of teaching strategies. These researchers specifically analysed the intentions and practices of science lecturers within first year degree courses. They found that teachers with a conceptual change orientation to teaching often employed student-focused teaching strategies whereas teachers with information transfer teaching intentions tended to adopt teacher-focused teaching strategies. Prosser and Trigwell's (1997) later paper reports on their further investigation into the link, established in their study in the previous year, between how teachers perceive their teaching and how they actually teach. In the findings of this study, Prosser and Trigwell conclude that the way teachers perceive their teaching context is directly related to the way they approach their teaching.

The direction of influence represented in the work by Prosser and Trigwell (Prosser & Trigwell, 1997; Trigwell & Prosser, 1996) which explored how teachers' beliefs were influenced by their teaching environment is reversed somewhat in the Rainer study (1999) which investigated how university teachers' beliefs were enacted in the process of curriculum implementation. This study documented how teachers' beliefs influenced student outcomes, especially in terms of how a course was taught: "the existence of shared beliefs among faculty within a program account for the direction and magnitude of change in its graduates" (Rainer, 1999, p. 197). The findings of this study suggest that, not only do teachers' beliefs affect their own teaching practice, but they also influence the practical approaches to learning adopted by their students. This theme is also considered by Gilbert (1997) who investigated the teaching beliefs held by preservice teachers in urban schools. Findings from this study demonstrate how negative teacher expectations can impact on students' learning and behaviour.

Studies conducted after the late 1990s reinforce some of the earlier themes noted in the studies mentioned above, but especially focus on how teachers' beliefs influence teachers' *and* students' practices. Martin et al. (2000) further examined how teachers' intentions are linked to their teaching practice by analysing teachers' comments about their own teaching and beliefs. Such comments reveal a range of teaching intentions. One participant in their study described their teaching intentions in terms of student understanding:

> I want them to understand things, I don't want them to have to sit down and memorise A, B, C, D fits with F, G, H. I want them to understand it, so that we can build on that foundation of understanding and apply it to a number of things. (Martin et al., 2000, p. 401)

Other participants in their study had other teaching intentions, such as providing and replicating information:

The lecture is important in terms of imparting knowledge and so forth but we take it to be the main point."; "I tried to have them look at some fairly basic ideas … and I wanted them to replicate the findings reported in the research. (Martin et al., 2000, p. 403)

This study shows that teachers with teacher-focused approaches to teaching and information-transmission intentions view knowledge as an external commodity that is able to be transmitted to their students, a now familiar theme in the literature. On the other hand, teachers with student-focused approaches to teaching and conceptual change orientations appear more focused on how individual students construct knowledge. Martin et al. (2000) conclude with a recommendation for teachers to concentrate on both intentions and strategies in order to improve teaching practice and student learning outcomes.

As a collection, the studies presented above scrutinised the impact of teachers' beliefs on their practices, and vice versa. The consistent findings from these studies indicate there is a strong relationship between teachers' theoretical ideas (whether they are described as "beliefs", "intentions", "perceptions" or "orientations") and the practical way in which teachers teach (whether they are described as "approaches", "practices" or "strategies"). This validated belief-practice relationship provides much of the rationale for the study documented in this thesis.

The beliefs underlying teachers' ideas, as illustrated by the research studies and papers presented thus far, have been demonstrated to be significant determinants to the way teachers actually teach in practical situations. Additionally, teachers' core beliefs about knowing, that is, their epistemological beliefs, have been shown to impact on their educational beliefs and approaches to teaching.

Impact of Epistemological Beliefs on Beliefs about Teaching

Within the collection of studies about teachers' beliefs about teaching that have been accessed for this literature review, a further theme emerged. A large number of researchers (Archer, 1999; Brownlee, 1998, 2001, 2002, 2003; Brownlee, Boulton-Lewis & Purdie, 2002; Hofer & Pintrich, 1997;

Hofer & Pintrich, 2002; Howard, McGee, Schwartz & Purcell, 2000; Maor & Taylor, 1995; Perry, 1970; Pintrich, 2002; Schommer, 1990, 1993a, 1993b; Schommer, 1998; Schommer & Walker, 1995; Schommer-Aikens, Mau, Brookhart & Hutter, 2000; Schommer-Aikins, 2002; Schraw, 2001) have explored the link between how teachers' epistemological beliefs influence their teaching practices and their teaching beliefs, and, consequently, how such beliefs influence student learning.

Individuals' epistemological beliefs are generally considered to be "individuals beliefs about the nature of knowledge and the processes of knowing" (Hofer & Pintrich, 1997, p. 117). Based on the work of Perry (1970), Schommer (Schommer, 1990, 1993a, 1993b, 1998; Schommer & Walker, 1995; Schommer-Aikens et al., 2000; Schommer-Aikins, 2002), Brownlee (Brownlee, 1998, 2001, 2002, 2003; Brownlee et al., 2002) and Howard et al. (2000), individuals' epistemological beliefs are typically described as ranging from objectivist through to relativistic positions, also representing a continuum from naïve to sophisticated beliefs. Individuals with epistemological beliefs based on an objectivist position tend to view truth as absolute whereas those with more relativistic positions typically acknowledge the changing and borderless nature of knowledge.

In his discussion of current themes and future directions in epistemological research, Schraw (2001) acknowledges the significance of how teachers' epistemological beliefs affect students' learning, how valuable it is for teachers to consider their own epistemological beliefs and how teachers should discuss their epistemological beliefs with their students. Other researchers have documented the impact that personal epistemological beliefs have on teachers' beliefs about teaching. Pintrich (2002) especially notes that knowledge of one's personal epistemological beliefs impacts not only on learning, but also on instruction (p. 413). Additionally, Hofer (2002), in her consideration of personal epistemology as a psychological and educational construct, bolsters this idea by explaining that "Beliefs about knowledge and knowing have a powerful influence on learning, and deepening our understanding of this process can enhance our teaching effectiveness" (Hofer,

2002, p. 13). Thus, the connection between epistemology, learning and teaching beliefs has been identified.

Howard et al. (2000) and Archer (1999) also investigated teachers' beliefs from an epistemological perspective, with a particular focus on school teachers' beliefs. Howard et al. examined the impact of constructivist teaching methods on preservice teachers' epistemological beliefs and found that such teaching methods to be conducive to promoting epistemological belief change. They conclude that preservice teachers' epistemological beliefs are intricately related to their beliefs about teaching and learning. Archer (1999) also examined this link between educational and epistemological beliefs by investigating the beliefs of primary and secondary mathematics teachers. Archer found that secondary teachers tend to demonstrate a more learning area specific view of mathematical knowledge, whereas primary school teachers' believe mathematics to be an intricate part of their students' lives. Again, the findings of this study reveal a close correlation between teachers' teaching beliefs and teachers' epistemological beliefs.

This link between teachers' epistemological beliefs and teachers' teaching beliefs has been documented especially in terms of their combined impact on students' learning. Brownlee's paper (2003) explored the epistemological beliefs of two graduate teacher education students and found that there was a relationship between the epistemological beliefs and the teaching beliefs of each of the two participants. Those teachers with more relativistic beliefs about knowing tended to express constructivist views of teaching, whereas those with a more dualistic view of knowledge tended to have transmissive views of teaching. Although the aim of their study was to focus upon the teachers' use of computerised resources, Maor and Taylor (1995) found that a teacher's epistemological stance had a more profound impact on students' learning than the computerised resources used. Teachers with a transmissionist-orientated pedagogy provided less opportunities for students to experience higher level learning activities than did the teachers who held a constructivist-oriented pedagogy. Furthermore,

the teachers with epistemological beliefs with constructivist foundations tended to facilitate more collaborative knowledge construction experiences for their students. Maor and Taylor's study provides further evidence of the significant impact that teachers' beliefs have on their own teaching practices and the learning outcomes of their students.

Pintrich (2002) sums up the trend in the epistemological belief research: "The fairly well established trend is that individuals move from some more objectivist perspective through to a relativistic one, to a more balanced and reasoned perspective on the objectivist-relativistic continuum, with this latter position reflecting a more sophisticated manner of thinking" (p. 400). This interdependency that exists between teachers' teaching and epistemological beliefs illustrates how these two types of beliefs can be influenced by each other. Such beliefs can also be influenced by a range of contextual factors and these factors are now examined.

Influence of Context and Experience

A group of studies accessed for this literature review especially focused on how teachers' beliefs develop as a result of being exposed to a range of contextual factors and as a result of an increase in teachers' teaching experience (Brousseau, Book & Byers, 1988; Buchmann, 1989; Curtner-Smith, 1997; de Neve, 1991; Entwistle & Walker, 2000; Greene & Zimmerman, 2000; Hanrahan & Tate, 2001; Lawson, 1983; McCarty, Shaw & Davis, 1992; McKenzie, 1996; Nettle, 1998; Schuh, Walker, Kizzie & Mohammed, 2001; Whitman & Lai, 1990). The researchers of these studies tended to focus on the beliefs held by novice teachers and compared these to the beliefs held by expert teachers. Within these contexts, they examined influences such as professional socialisation, novice to expert progression and the teachers' widening awareness of teaching and learning issues.

The findings reported in some of these studies that examined the impact of contextual factors on teachers' beliefs provide evidence that processes such as professional socialisation do impact on teachers' beliefs (Lawson, 1983; Buchmann, 1989) whereas Curtner-Smith (1997) reports that teachers' coursework experiences were a stronger influence on the teachers' beliefs than

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their professional experiences. Nonetheless, Nettle's study (1998) found evidence of both belief stability and belief development in preservice teachers' beliefs during their practical experience, thus putting into question some of the findings reported in the research by Lawson (1983) Buchmann (1989) and Curtner-Smith (1997).

The teaching beliefs of inservice and preservice school teachers have also been investigated in an attempt to ascertain the impact of teacher experience on their beliefs (Brousseau et al., 1988; Greene & Zimmerman, 2000; Hanrahan & Tate, 2001). Although other contextual factors besides teaching experience were examined in these research examples, findings from these studies indicate that the most significant influence on teachers' beliefs is the length of teaching experience. Another set of studies further confirmed this finding by demonstrating that teachers' beliefs tend to become more complex and sophisticated as their teaching experience increases and their awareness of learning issues extends (de Neve, 1991; Dunkin & Precians, 1992; Entwistle & Walker, 2000; McKenzie, 1996). This developmental process associated with teachers' beliefs about teaching is comparable to the progressive sophistication that has been associated with epistemological beliefs (Bendixen, 2002; Brownlee, 1998, 2001; Chan, 2000; Howard et al., 2000; Jehng, Johnston & Anderson, 1993). However, like Nettle (1998), whose findings suggest that some preservice teachers' beliefs develop as a result of being influenced by contextual factors whereas other appear not to, Brownlee (2003) found that some preservice teachers' epistemological beliefs were influenced by teaching experience whereas others were not.

In addition to the influence of teaching experience and the impact of professional socialisation, other research shows that teachers' beliefs are also influenced by the cultural context in which the teacher works (Whitman & Lai, 1990) and whether or not the teacher is involved in reflection processes (Schuh et al., 2001). The Whitman and Lai (1990) study found the differences in teaching beliefs between teachers from Japan and Hawai'i were attributed to the teachers' socio-cultural differences, suggesting that the teaching context did in fact influence the teachers' beliefs. The teachers from the Hawai'ian

context believed that educational opportunities should be provided for every student whereas the teachers in the Japanese context valued the ability to teach the same content in similar ways to their students. In addition to the role of cultural background, the study by Schuh et al. (2001) found that the process of reflection played a significant role in the change or stability of a male university teacher's beliefs about teaching in that the teacher's involvement in reflection processes actually prevented him from retreating back into his traditional way of transmissive teaching. Findings from such research explain how the quality of some of the experiences that teachers encounter in their everyday work does influence their educational beliefs.

Overall, most of the research studies mentioned above provide evidence that teachers' beliefs are influenced by a range of contextual factors, including professional socialisation, teaching experience, cultural influences and reflective practices. However, a small group of studies suggest that the influences of experience and contextual factors do not appear to influence teachers' beliefs about teaching. Due to the mixed results from these studies, the findings from such research are, at times, conflicting and inconclusive. How teachers' beliefs are influenced by experience and particular contextual factors is an area that requires further research.

Link between Teachers' Beliefs about Teaching and Learning

A smaller group of studies investigated the link between teachers' views of learning and teaching across a range of contexts (Andrews et al., 1996; Bryan, 2003; Curtner-Smith, 1997; Doyle, 1997; Gill, Ashton & Algina, 2004; Greene & Zimmerman, 2000; Hancock & Gallard, 2004; McShane, 2002; Rainer, 1999).

One particular group of studies investigated the teaching and learning beliefs held by university teachers (Andrews et al., 1996; McShane, 2002; Rainer, 1999). McShane (2002) documented the metaphors used by university academics which were interpreted as reflecting the academics' beliefs about teaching and learning. Whereas some metaphors used to describe teachers (such as team leader, coach, performer, model, preacher) clearly placed the teacher at the centre of the teaching process, other

metaphors (such as mentor, lamplighter, tour guide, social worker, guide, facilitator) portrayed the belief that teachers' roles are primarily associated with the facilitation of learning. Also within the university context, Andrews et al. (1996) found that excellent university teachers typically integrated their beliefs about teaching with their beliefs about learning. A further commonality between the "excellent" teachers was that all of their teaching intentions for their students were associated with deep learning goals:

> Since the aim of teaching is the facilitation of learning, it is suggested that the learner's perspective must also be included in an attempt to understand the teaching-learning transaction. This view is supported by Ramsden (1992) who has argued that the best approach to improve teaching is by studying students' learning. (Andrews et al., 1996, pp. 81-82)

In the same way, Rainer's study (1999) also deduced that teachers' beliefs are related to and impact on student learning. By examining how university teachers' beliefs were enacted during the process of redesigning a course of study, Rainer found that teachers' beliefs about teaching a course of study had an impact on how the students in the course experienced learning.

A further group of studies concentrated on the link between the beliefs about teaching and learning held by preservice teachers (Bryan, 2003; Curtner-Smith, 1997; Doyle, 1997; Greene & Zimmerman, 2000). Doyle's study (1997) of preservice teachers' beliefs about teaching and learning found that teachers with more complex beliefs about teaching tended to have facilitative beliefs about learning. For example, a preservice teacher involved in Doyle's project, with a facilitative view of teaching, suggested that "the teacher should be a helper for the student. Facilitator, active listener, mediator, counselor, friend [sic]." (Doyle, 1997, p. 4). Similarly, the findings from Curtner-Smith's study (1997) about preservice teachers' beliefs about teaching and learning found that teachers who held more complex beliefs tended to incorporate more beliefs about learning within their expressed beliefs about teaching. Findings from Greene and Zimmerman's study (2000) of preservice teachers' beliefs found that the teachers with more complex learning beliefs viewed learning as an active

and social activity, and their beliefs about teaching acknowledged the role of the student as a contributor to the process of teaching. By showing the "nestedness" of preservice teachers' beliefs, the study by Bryan (2003) illustrated the strong connection that exists between a teacher's beliefs about teaching and their beliefs about learning

Just as teachers' beliefs were linked to their beliefs about learning, so too their teaching beliefs were linked to their epistemological beliefs about teaching and learning (Gill et al., 2004; Hancock & Gallard, 2004). Whereas Gill et al.'s study (2004) focused on the epistemological beliefs about teaching and learning held by preservice mathematics teachers, Hancock and Gallard's research (2004) examined the change in teaching and learning beliefs held by preservice science teachers over 70 hours of teaching practicum experience across a semester period. The beliefs about teaching and learning held by the participants in both studies were found to be either particularly associated with either teacher-directed or student-directed styles of teaching.

Overall, the studies presented above illustrate that teachers' beliefs about teaching are inextricably linked to their beliefs about learning. As Rainer (1999) explains: "A major influence on our vision of teaching is our view of learning" (p. 192). Further research into this field has been noted as an area that warrants future investigation (Bruce & Gerber, 1995; Samuelowicz & Bain, 2002; Trigwell, Prosser & Taylor, 1994).

Summary of Teachers' Beliefs about Teaching

The literature presented thus far in this review has:

- outlined various beliefs held by teachers about teaching;

- shown how teaching beliefs impact on teaching practice;

- demonstrated how teaching beliefs relate to epistemological beliefs;

- how contextual factors influence these teaching beliefs; and

- how beliefs about teaching are connected to beliefs about learning.

Overall, these studies suggest that teachers' teaching beliefs could be generally classified as ranging from transmissive through to facilitative. Teachers with transmissive beliefs about teaching are also described in the literature as having traditional and quantitative beliefs, and tend to teach in a very structured manner. On the other hand, teachers with facilitative beliefs about teaching are described in the literature as having constructivist and qualitative beliefs, and tend to teach in a less structured manner. As much of the literature that has been presented in this section of the literature review demonstrates a consistent relationship between teachers' beliefs about teaching and their beliefs about learning, the learning component of this relationship is further explored in the following collection of research studies.

Studies that Investigated the Beliefs Held by Teachers about Learning

In recent years, a group of studies have addressed the impact of teachers' beliefs about learning (Boulton-Lewis, Wilss & Mutch, 1996; Bruce & Gerber, 1995; Hancock & Gallard, 2004; Kippen, 2003; Orton, 1996; Pederson & Liu, 2003). Within this group of studies, subcategories emerged as I reviewed this literature, including studies that explored teachers' general beliefs about students' learning, studies that outlined teachers' beliefs about their own learning, studies that explored the impact of teachers' learning beliefs on their practice, and studies that indicated a connection between teachers' learning beliefs and their teaching beliefs. Although the titles of a number of additional studies appear to direct their research attention to the investigation of teachers' beliefs about teaching *and* learning, the findings of many of these studies still primarily focus on teachers' beliefs about teaching and tend to address beliefs about learning in a peripheral or incidental manner. The following research studies represent those studies that focus specifically on teachers' learning beliefs.

Beliefs about Student Learning

The studies that follow have been selected to represent some examples of how teachers' beliefs about learning have been conducted and

how such studies reinforce the importance of such research. Some of the studies in this collection are particularly focused on identifying teachers' beliefs about learning (Barrett & Rasmussen, 1996; Brownlee, 1998; Bruce & Gerber, 1995; Orton, 1996). Bruce and Gerber (1995) investigated university teachers' views about student learning and they identified six categories of learning conceptions held by teachers:

(1) acquiring knowledge through the use of study skills;

(2) the absorption of new knowledge and being able to explain and apply it;

(3) the development of thinking skills and the ability to reason;

(4) developing the competencies of beginning professionals;

(5) changing personal attitudes, beliefs or behaviours in responding to different phenomena; and

(6) the participative pedagogic experience.

Bruce and Gerber's study is significant as it explored conceptions of learning from a teacher's perspective, an area of belief literature that has historically been considered from the perspective of the student. This exploration of traditional fields from non-traditional perspectives is recommended by them for future researchers to gain a greater understanding of beliefs about learning: "Continued exploration of a phenomenon from the viewpoint of other groups in the teaching-learning environment will be fruitful" (Bruce & Gerber, 1995, p. 456). The study outlined in this thesis has adopted this recommendation by exploring the beliefs held by both students and teachers, and has investigated the phenomenon of belief similarity between these two groups.

Brownlee (1998) identified a number of learning conceptions held by preservice teachers and grouped them into three main categories: (1) beliefs about learning strategies; (2) beliefs about conceptions of learning; and (3) beliefs about learning outcomes. Within these categories, the participants' perceptions of learning emerged as reflecting either

transformative or reproductive ideas. Those with transformative learning beliefs typically described how learning affects their whole lives: "The way I am learning now has changed me as a person not only because it's a whole new way of learning but I think what I am learning has changed me as a person" (Brownlee, 1998, p. 9), whereas those who viewed learning as a more reproductive process described learning as "a process you go through when you come to know something new. Maybe just reinforcing something you already knew. Just expanding your mind, or your skills whatever it might be that you're learning about" (Brownlee, 1998, p. 10).

Orton (1996) highlighted the value of teachers reflecting on their own beliefs about learning, suggesting that such reflection enables teachers to clarify their thinking and thus ensures their practice is theoretically grounded. Orton's study focused on the idea that teachers need to construct their own knowledge about student learning. He suggests that teachers' beliefs about learning are influenced by their beliefs about the nature of knowledge. Like Orton, Barrett and Rasmussen (1996) also aimed to identify teachers' beliefs about learning, and findings from their study indicate that as teachers come into more contact with varied teaching events, their beliefs about learning become more student focused.

Overall, the studies selection for inclusion in this literature review that investigated teachers' beliefs about learning provide evidence that teachers tend to hold either reproductive or transformative conceptions of learning. Those with reproductive learning beliefs tend to view students as being passive and receptive, and believe that the replication of information is an important component of the learning process. On the other end of the continuum are teachers who have transformative beliefs about student learning. These teachers view students as being active and social, and consider that the meaning associated with knowledge is significant for students' learning. They believe learning is integral to the process of teaching, and that such learning involves the learners changing their views of the world and changing their views of themselves. Thus, teachers with reproductive learning beliefs are more likely to be focused on how students

gain knowledge whereas teachers with transformative beliefs about learning are more concerned with the students' personal growth and cognitive development.

Beliefs about Teachers' Own Learning

Some studies have focused particularly on teachers' beliefs about their own learning by extending and drawing on the literature about adult learning or andragogy (Knowles, 1990). For example, the study by Boulton-Lewis et al. (1996) investigated teachers' knowledge of their own learning. The dominant belief held by the adult learners in this study was that learning is a process of acquiring facts and skills. In a similar way, the study by Cliff (1999) investigated and documented the beliefs of teacher-learners engaged in postgraduate study about their own learning. The participants in Cliff's study (1999) expressed beliefs specifically about the process of learning, beliefs about themselves as learners, beliefs about themselves with multiple roles and beliefs about why they had embarked on further study. These studies provide examples of the beliefs held by teachers about their own learning and add to the research about teachers' beliefs about learning in general. Furthermore, teachers' beliefs about learning have been investigated in terms of how such beliefs impact on teaching practice and some of these studies are now considered.

Impact of Learning Beliefs on Teaching Practice

The impact of teachers' learning beliefs on their teaching practice has been investigated by Cronin-Jones (1991), Ballone and Czerniak (2001), Wilson et al. (2002) and Kippen (2003). Cronin-Jones' study (1991) investigated the impact that teachers' learning beliefs have on the choice of instructional strategies and, consequentially, on students' learning. For example, the study reports that those teachers who believe factual knowledge is the most important outcome of learning tend to teach in a way that employs drill and practice strategies. Ballone and Czerniak (2001) also found that the teacher's attitude to learning was one of the most significant influences on their choice of instructional strategies in science classrooms. This finding was further reinforced by Wilson et al. (2002) who reports on

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the link between the beliefs of social studies teachers in secondary schools with their instructional choices: "The results of the present study reveal a consistency between what teachers think and their instructional decisions when their beliefs and decisions are linked to a reader-based, process-centered approach" (Wilson et al., 2002, p. 17). Lastly, Pederson and Liu (2003) found that teachers' beliefs about student-centred learning directly influence their choice of instructional strategies.

Although conducted within the higher education context, Kippen's findings (2003) were similar to Cronin-Jones' (1991), Ballone and Czerniak's (2001) and Wilson et al.'s (2002). Based on the assumption that there are four different types of learning (that is, cognitive, affective, content and process) (2003, p. 20), Kippen examined how teachers promote deep learning within online learning environments. Results from this study indicate that teachers with theoretically grounded beliefs about teaching are inclined to implement instructional strategies that supported deep student learning.

These studies illustrate how teachers' beliefs about learning influence their teaching practices and, in turn, student learning. The literature also presents a group of studies that links teachers' beliefs about learning with their beliefs about teaching.

Link between Teachers' Beliefs about Learning and Teaching

The literature that has focused on the investigation of teachers' beliefs about learning is much less extensive than the literature on teachers' beliefs about teaching. However, this smaller collection of studies suggests that the way in which teachers view learning is related to the way in which they view teaching (Andrews et al., 1996; Bryan, 2003; Curtner-Smith, 1997; Doyle, 1997; Gill et al., 2004; Greene & Zimmerman, 2000; Hancock & Gallard, 2004; McShane, 2002; Rainer, 1999). From this literature, which has already been presented in detail in the previous section, it appears that most teachers' beliefs about student learning are generally based around either a facts-based view, centred on the idea that learning involves receiving information, or a conceptually richer view of learning, based on the idea that learning is a process of growth and change. The study outlined

in this thesis has taken these views into account by ensuring that the investigation has followed both themes of teaching and learning by selecting research methods that allow for the dual investigation of these beliefs. Interestingly, the hierarchical structure evident in the literature of teachers' learning beliefs is similar to the structure which emerged from the literature on teachers' teaching beliefs. That is, ideas expressed by teachers with transmissive beliefs about teaching were similar to the ideas expressed by teachers with reproductive views about learning. Conversely, teachers with facilitative teaching beliefs tended to express ideas which were classified as transformative beliefs about learning.

Summary of Teachers' Beliefs about Learning

The literature presented in this section of this review has:

- outlined various beliefs held by teachers about learning, incorporating their beliefs about students' learning as well as their own learning;

- shown that teachers' learning beliefs influence their teaching practice; and

- demonstrated how teachers' learning beliefs are also related to their teaching beliefs.

Overall, teachers were found to hold two main types of learning beliefs: reproductive and transformative. Teachers with reproductive learning beliefs tend to encourage their students to focus on retaining and reproducing information, whereas teachers with transformative beliefs about learning emphasise growth as change as part of the learning process.

Thus far, the studies presented in this literature review have focused on university teachers' beliefs about teaching and learning. The following two sections of the literature review present an account of research studies that have focused upon university students' beliefs about learning and teaching.

Studies that Investigated the Beliefs Held by Students about Learning

By far, of all the literature available on the educational beliefs of students, the majority of the research has investigated students' beliefs about learning. This area of research incorporates many investigations that have identified students' learning beliefs and students' epistemological beliefs. Some of these studies have also examined how these beliefs affect the students' study and learning practices.

Beliefs about Learning

Some studies have focused on identifying students' beliefs about learning (Cliff, 1998; Marton et al., 1993; Meyer, 2000a; Meyer & Boulton-Lewis, 1999; Purdie et al., 1996; Steketee, 1997; Van Rossum, Deijkers & Hamer, 1985). Van Rossum et al. (1985) found five qualitatively different learning conceptions which were similar to those found in an earlier study by Van Rossum and Schenk (1984) and those also described by Säljö (1979a, 1979b, 1983): (1) the increase of knowledge; (2) memorising; (3) acquisition of facts and procedures; (4) abstraction of meaning; and (5) an interpretive process. This research was built upon by Marton et al.'s work (1993) which has become a central piece of research about conceptions of learning and has been regularly cited since its initial publication. Marton et al. (1993) identified six conceptions of learning held by university students incorporating and extending Säljö's earlier research (1979a): (1) learning as increasing one's knowledge; (2) learning as memorising and reproducing; (3) learning as applying; (4) learning as understanding; (5) learning as seeing something in a different way; and (6) learning as changing as a person.

A few years after Marton et al.'s work (1993), Purdie et al. (1996) considered the existence of a community or moral based conception of learning, after research that compared the conceptions of learning among Japanese and Australian secondary school students. Findings from this study explain how Japanese students view learning as being a duty or social obligation, as well as a social competence and a lifelong process: "In several instances, an expression of learning as being difficult co-occurred with an

expression of the responsibility, duty, or obligation that one has both to oneself and to other people in society" (Purdie et al., 1996, p. 94). This study illustrates how students who were characterised as holding such a belief typically expressed ideas such as the following: "I learn so that I can become a good member of society and get on with other people easily" (Purdie et al., 1996, p. 94).

Cliff's work (1998) is significant as it also reinforces the possible existence of a "communalistic" conception of learning, based on the belief that learning is a moral or community obligation. Cliff (1998) concludes his paper by recommending that there is a "… need for further research into a conception which holds that learning is a moral obligation or service to the community" (p. 205). Meyer and Boulton-Lewis (1999) also acknowledge this possible additional conception of learning associated with duty. They conclude that this conception has also been partially identified in their own study and suggest that "duty" may well be a useful "modelling construct" when discussing students' conceptions of learning (Meyer & Boulton-Lewis, 1999, p. 301). Pratt's (1992) conception of learning as social reform with the aim of bettering society is also in alignment with such views.

Although most of the research associated with identifying students' beliefs about learning has been conducted in secondary schools and universities, Steketee's study (1997) identifies six conceptions of learning held by students in the lower, middle and upper grades of primary school: (1) generic learning; (2) physically doing; (3) knowing more things; (4) knowing harder things; (5) searching for meaning; (6) and constructing new understandings. Steketee's findings suggest that these conceptions of learning are graded from simple to complex, reflecting knowledge-oriented conceptions through to meaning-oriented conceptions of learning

The outcomes of many of the studies that have identified students' beliefs about learning imply that those conceptions associated with memorisation are associated with low levels of complexity. In contradiction to these common understandings, the research by Meyer (2000a, 2000b) investigated a number of memorisation models of student learning and

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found that the process of memorising can refer to a range of different processes, which paradoxically sometimes relate to deep learning. Meyer (2000a, 2000b) explains these processes as "memorising after understanding", "memorising with understanding" and "repetition as an aid to understanding" (p. 205). This idea that memorising is actually a component of the understanding process suggests that these two processes are not necessarily exclusive or opposite but that memory is indeed integral to learning. As such, Meyer's research provides evidence that individuals' views of learning that incorporate beliefs about memorisation may not necessarily always be associated with simplistic views of learning.

Meyer and Boulton-Lewis' research (1999) found evidence for learning conceptions which include learning as a process which can be influenced by example, learning as accumulation of knowledge and learning as seeing differently. However, despite their findings, instead of extending or confirming previous research about university or school students' conceptions of learning, the work by Meyer and Boulton-Lewis actually encourages the reader to reconsider the rigidity that is sometimes associated with categorising students' conceptions of learning:

> The results of the present study do not support a single clearly defined empirical model of conceptions of learning and associated constructs. Instead, there is consistent evidence that underlying empirical structures appear to be sensitive to the response context and other factors. (p. 289)

Despite this warning from Meyer and Boulton-Lewis, the belief literature does suggest that students' conceptions of learning can be identified and that such conceptions are frequently reflected in an hierarchical structure, beginning with conceptions of learning that are traditionally based on the accumulation of knowledge and memorisation through to the more complex conceptions of learning that are typically associated with changing views of the world, understanding and application of knowledge to the wider society.

As well as identifying the beliefs about learning held by students, much of the belief literature that focused on students' beliefs about learning

was associated with how these beliefs impacted on students' learning practice, study approaches and learning environments.

Impact of Learning Beliefs on Learning Practice

The link between students' beliefs and their learning approaches and study practices has been documented in the belief literature (Archer, Bourke & Cantwell, 1996; Chapple, 1999; Dart et al., 2000; Johnston, 2001; Parr, 1999; Taylor, 1996). As well as exploring how students' beliefs affect their own learning practices, other studies have explored the dialectical impact that students' beliefs can have on the wider educational context of the environment in which they learn.

The study by Archer et al. (1996) found evidence for a link between students' beliefs about learning and their practical choice of self-regulation strategies. The study shows that students with mastery-oriented or performance-oriented beliefs about learning adopt a more adaptive approach compared to students who hold alienated views about learning. Such students were found to be less flexible in their approach to self-regulation. Taylor's research (1996) also found a relationship between university students' conceptions of learning and their practical approaches to learning. Like Archer et al., Taylor (1996) found that the most academically successful students were those who had an "adaptive" approach to learning.

Dart et al. (2000) continued this investigation of the link between students' conceptions of learning and the learning approaches they adopted. Their study was conducted within a secondary school context. These researchers found that students with qualitative and experiential conceptions of learning were likely to use deep approaches to learning whereas students with quantitative conceptions were likely to use surface approaches. Also conducted within a secondary school, Parr's research (1999) investigated students' conceptions of learning with technology. Instead of examining how the learning context impacts on students' conceptions, Parr's research explored how students' beliefs actually affected the classroom context and was motivated by the observation that "the perspectives of students have been largely neglected" (p. 365). Instead of

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being examined from an outside-in perspective, the students in Parr's study were viewed "as active contributors to the complex classroom community" (p. 376). This advice can also be transferred to research situations in the higher education sector, in which both the beliefs of teachers and students are viewed as important, and reflect a learning environment that acknowledges how learning is a process that is co-constructed by both teachers and students.

Chapple's study (1999) also aimed to portray the students' perspective by investigating the impact that specific contextual factors have on students' learning conceptions:

> These insights into how students learn, their conception of learning and the factors associated with the approaches they take can assist me in planning my teaching strategies. I see my role is to facilitate deep learning by setting a positive climate for learning, clarifying the purposes of the learners, organising and making available learning resources, balancing intellectual and emotional components of learning and sharing feelings and thoughts with learners. (p. 5)

Results of Chapple's study indicate that students' beliefs about and approaches to learning are influenced by assessment, teaching style and the amount of teaching hours in their courses. Many of the participants in Chapple's study described the learning process in terms of specific knowledge and skills: "committing to memory information", "knowing what you are talking about with confidence" and "something you can draw on and apply and use" (Chapple, 1999, p. 3). Students who were categorised as having deeper learning conceptions described learning in terms of "the experience" and referred to making sense of reality and using facts and skills in practice (Chapple, 1999, p. 4).

Johnston (2001) clearly believed in the importance of considering the two perspectives of teaching and learning simultaneously and, instead of concentrating solely on learning beliefs and learning approaches, Johnston (2001) explored the link between approaches to learning and teaching within the same educational context:

> The student approach to learning is one significant factor but it is not the sole cause of variation in student understanding and performance. The approach to teaching is also significant in encouraging students to adopt a deeper approach to learning. Strategies that simultaneously address the student approach to learning and the teacher approach to teaching are likely to prove more effective than addressing either one or the other alone. (p. 182)

Findings from this study suggest that students adopt different learning approaches depending on the subject matter, their motivation and the learning task. The study outlined in this thesis takes Johnston's ideas one step further. Instead of focusing only on students' learning approaches and teachers' teaching approaches, this study extended these foci to include teachers' beliefs about teaching and learning, and students' beliefs about learning and teaching.

Impact of Epistemological Beliefs on Beliefs about Learning and Learning Practices

From the broader consideration of how a range of contextual influences are related to students' educational beliefs, this literature review now cites a group of studies that have explored how students' beliefs about learning are influenced by their epistemological beliefs, and vice versa (Brownlee, 2002; Chan, 2000, 2002; Conley, Pintrich & Vekiri, 2004; Jehng et al., 1993; Perry, 1970; Phillips, 2001; Pintrich, 2002; Schommer, 1990, 1993a, 1993b; Schommer & Walker, 1995; Schommer-Aikens et al., 2000; Schommer-Aikins, 2002; Schraw, 2001).

Perry's earlier investigation (1970) into students' epistemological beliefs about learning established the existence of four main epistemological positions, ranging from beliefs in absolute truths through to more flexible beliefs about knowledge: Dualism; Multiplism; Relativism and Commitment. In addition to these epistemological positions, Moore (2002), after his consideration of recent scholarship about the issues of learning, assessment and knowledge, suggests that an additional two other models of epistemological belief have emerged: an expertise model (involving moving from novice to expert within a specific academic domain) and an

enculturalisation/socialisation model (involving the evolution from being an outsider to an insider in terms of disciplinary based communities).

Furthermore, Schommer's work has also contributed many theoretical tenets to our understanding of epistemological beliefs. Her work has established that there are five types of epistemological belief systems relating to learning, including beliefs about simple knowledge, certain knowledge, omniscient authority, quick learning and innate ability. She asserts that epistemological beliefs are inextricably linked to students' learning practices and beliefs. This deduction was also reached by Schraw (2001): "Previous research indicates that students' epistemological beliefs affect their learning" (p. 461). Likewise, Pintrich (2002) echoes this acknowledgement in her discussion of future research directions about epistemological beliefs, suggesting that: "As we come to better understand how individuals think and reason about knowledge and knowing, we should not only be able to improve learning and instruction, but also come to better understand ourselves" (p. 413).

The epistemological positions identified in the literature by the researchers mentioned above, reflect an assortment of epistemological beliefs which range from simple to complex. These epistemological beliefs are considered to influence students' beliefs about learning and are inherent in many of the following research studies. Some of these studies identify the types of epistemological beliefs held by students, whereas others concentrate on how students' epistemological beliefs influence their learning beliefs, their practical approaches to learning and their actual learning outcomes.

One group of studies explored how students' epistemological beliefs are linked to their beliefs about learning (Brownlee, 2002; Schommer, 1993a; Schraw, 2001). Schommer's work (1993a) found that students with more sophisticated epistemological beliefs hold more complex beliefs about learning. Brownlee et al. (2002) also found evidence of a relationship between students' epistemological beliefs and their beliefs about learning and teaching. They found that students with naïve epistemological beliefs believe that knowledge is received. These students tend to hold mixed

(constructive and reproductive) beliefs about teaching and learning whereas students with sophisticated epistemological beliefs believe that knowledge is constructed and they tend to hold constructivist beliefs about teaching and learning. Schraw (2001) also linked the students' epistemological beliefs with the quality of their thinking and learning, suggesting that when students have more complex beliefs about knowledge, the quality of their thinking and learning is improved.

Other studies focused on the way in which students' epistemological beliefs become more complex as their learning experience increase (Conley et al., 2004; Schommer, 1993b). Findings from Schommer's research (1993b) confirms that students with more sophisticated epistemological beliefs also have a higher grade point average, indicating a reciprocal relationship between the quality of learning experienced by students, their academic performance and their epistemological beliefs. Reflecting what they acknowledge as a "target of increased research interest" (p. 186), Conley et al. (2004) investigated the epistemological beliefs of primary school age science students. Their research also demonstrates that students' epistemological beliefs about the source and certainty of knowledge become more complex over time.

As well as showing how students' epistemological beliefs become more complex over time, other studies have focused on how students' epistemological beliefs influence their practical approaches to learning and their choice of learning strategies (Chan, 2002; Phillips, 2001), their ability to integrate (Schommer, 1990) and interpret new information (Schommer & Walker, 1995), their achievement of higher grade point averages, their choice of problem solving strategies, their abilities to learn and their use of self regulation strategies (Schommer-Aikens et al., 2000).

Chan's (2002) investigation into the relationship between epistemological beliefs and study approaches of teacher education students found that there are definite links between students' epistemological beliefs and their motivation for learning, their choice of study strategies and learning approaches. Chan found that students who believe learning is a

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process that involves effort are more motivated to understand what they are learning whereas students who believe that knowledge is handed down by authority are more likely to choose surface learning strategies and less likely to be motivated by a need to understand. Similarly, Phillips' study (2001) explored how students' epistemological beliefs influence their choice of study strategies and abilities to solve unstructured problems. Findings from this study show how students who view knowledge as complex also tend to use study strategies that focus on consolidating knowledge.

Whereas Chan (2002) and Phillips' (2001) studies illustrate how students' epistemological beliefs affect their choice of study strategies, Schommer's study (1990) investigated how students' interpretation of information is influenced by their epistemological beliefs. She found that those students with dualistic epistemological beliefs were able to integrate complex information into their own knowledge base to a lesser degree than students with sophisticated epistemological beliefs. A few years later, Schommer and Walker (1995) found that students' epistemological beliefs to be indicators of their performance to comprehend information and may actually assist or impede students' learning. Schommer-Aikens et al.'s (2000) study found further evidence of how students' epistemological beliefs impact on their learning, suggesting that school students who hold complex epistemological beliefs and beliefs in gradual learning have higher grade point averages than their peers who hold more naïve epistemological beliefs. In her review of recent epistemological research, Schommer-Aikins (2002) clarifies the link between epistemological beliefs and learning. Examples cited included Dweck and Bempechat's (1983) claim that there is a connection between children's epistemological beliefs and their beliefs about the ability to learn, Schoenfeld's findings (1983, 1985) regarding the link between students' epistemological beliefs and their problem solving abilities, and Winnes' assertion (1995) of the link between students' epistemological beliefs and their abilities to be self-regulated learners.

Lastly, two other studies investigated how students' epistemological beliefs are shaped by their learning context. Chan's study (2000) found that

the cultural context in which students were studying had an impact on their epistemological beliefs whereas Jehng et al. (1993) found that students' epistemological beliefs were influenced by the specific academic domain in which they were learning: "This study shows that differences in individual beliefs about the nature of knowledge and learning are closely associated with level of education and field of study" (Jehng et al., 1993, p. 34).

Overall, the findings from the studies that investigated the links between students' epistemological beliefs and their beliefs about learning have clearly established that students' epistemological and learning beliefs are linked and influenced by each other.

Summary of Students' Beliefs about Learning

The majority of the studies in this section have focused on the beliefs about learning held by university students. Combined findings from these studies also suggest that:

- students' beliefs about learning influence their learning practices;

- students' learning beliefs develop as their learning experiences increase; and

- there is a relationship between students' epistemological beliefs and their learning beliefs

The studies that have focused on students' beliefs about learning indicate that there are two main extremes of students' learning conceptions ranging from quantitative through to qualitative conceptions of learning. Those who hold more quantitative beliefs about learning see learning as increasing one's knowledge, as memorising and reproducing, and as acquiring facts, retaining and applying them in practice. Students with more qualitative learning beliefs see learning as understanding or the abstraction of meaning, as interpreting reality in a different way, as changing as a person, and as a moral or community obligation.

In general, students' beliefs about learning have been consistently researched across the last few decades. Nevertheless, a consideration of the

combined literature in this area indicates that more research is required at the point of intersection between students' and teachers' beliefs, which has been especially incorporated into the study documented in this thesis.

Although most of the studies about students' beliefs were focused on their beliefs about learning, a smaller group of studies were located that were based on investigations of students' beliefs about teaching.

Studies that Investigated the Beliefs Held by Students about Teaching

This collection of belief studies was less extensive than the studies which focused on teachers' beliefs about teaching. This lack of evidence about students' beliefs about teaching was noted even as recently as 2004 by Sweeney, O'Donoghue and Whitehead who posit that: "The area of students' perspectives on different approaches to teaching at the tertiary level is a neglected area of research. This contrasts with the considerable research on the outcomes of teaching approaches at this level" (p. 311). The studies that have been included in this section of the literature review have been selected because of their relevance to students' beliefs about teaching in general and, more specifically, to students' beliefs about effective teaching. The articles in this section also provide evidence about how students' beliefs about teaching are influenced by their learning context.

Students' Beliefs about Teaching

Although very few studies exist that purposely set out to identify the beliefs held by students about teaching, there appears to be an increasing number of this type of research in recent years (Brownlee, 2001; Forrester-Jones, 2003; Grant, 2002; Kember & Wong, 2000). Forrester-Jones (2003) suggests that this trend reflects "changing students' status as consumers as well as participants in and contributors to an evolving process of learning" (p. 60).

In their exploration of students' beliefs about teaching, Kember and Wong (2000) found that students' teaching beliefs were linked to their learning beliefs. Moreover, Brownlee (2001) found evidence to link students' teaching

beliefs with their epistemological beliefs. Kember and Wong (2000) found that students evaluate their lecturers' teaching (scaled from non-traditional through to transmissive) through a lens coloured by their own conceptions of learning (scaled from active to passive). Brownlee (2001) found that the teaching beliefs held by a group of education student-teachers at university to be shaped by their epistemological beliefs: those with complex epistemologies appeared more student-focused in their teaching compared to their fellow students with less sophisticated epistemological beliefs who did not take learners' needs into consideration as much during their teaching. In her examination of how preservice teachers interpret messages from popular films which focus upon teachers in urban schools, Grant (2002) suggests that such films "reinforce naïve beliefs about teaching and learning by depicting classrooms in which students find right answers, authentic learning consists of using street language, and students are only extrinsically motivated" (p. 77). Her research suggests that teachers' superficially formed beliefs can be hindrances to their development of more complex beliefs about teaching.

Because this type of research into students' beliefs about teaching has not been a traditional line of inquiry, Kember and Wong (2000) advocate further utilisation of the student perspective on conceptions of teaching: "This study also suggests that research into the nature of quality in teaching would benefit from greater reliance upon the student perspective rather than the predominant researcher-driven perspective common to much of the research on this topic" (p. 94). The study documented in this thesis has heeded this recommendation by incorporating both the student perspective and the teacher perspective throughout all points of the study.

Students' Evaluations of Teaching

In addition to the limited selection of studies that focused specifically on students' beliefs about teaching in general, a further group of studies focused on the way in which students' evaluated effective teaching (Delucchi, 2000; Entwistle & Tait, 1990; Forrester-Jones, 2003; Rickards et al., 2001; Wazner, 1999; Young & Shaw, 1999). These studies reflect students' beliefs about effective teaching and effective teachers.

Findings from some studies which investigated students' evaluations of effective teaching (Forrester-Jones, 2003; Young & Shaw, 1999) indicate that students view effective teachers as those who are characterised by their "approachability, enthusiasm, availability for discussion and ability to build a good rapport" (Forrester-Jones, 2003, p. 67) and their "effective communication, a comfortable learning atmosphere, concern for student learning, student motivation and course organisation" (Young & Shaw, 1999, p. 677).

Another group of studies (Delucchi, 2000; Entwistle & Tait, 1990; Rickards et al., 2001; Wazner, 1999) found that students' beliefs about effective teaching are influenced by a number of factors. Entwistle and Tait (1990) found that students' beliefs about effective teaching are particularly associated with their ideas about how teachers present content. The studies by Wazner (1999) and Delucchi (2000) both investigated students' evaluations of their teachers and their teaching methods in terms of how students perceive their teachers' personality traits. Wazner's study investigated how students were affected by their perceptions of their teachers' use of humour whereas the findings from Delucchi's study (2000) suggest that teacher likeability is linked to overall ratings of teacher ability. Furthermore, findings from the study by Rickards et al. (2001) suggest that students' beliefs of effective teaching are coloured by their perceptions of how teachers interact with their students.

These studies, which focused on students' evaluations about effective teaching and teachers, provide some insights into the beliefs held by students about teaching. Overall, this group of studies indicates that students' beliefs about teaching are influenced by their own beliefs about learning, as well as how they perceive teachers' abilities to present course content, teachers' personality traits and teachers' interpersonal skills. Another set of studies investigated how students' beliefs about teaching were influenced by context and experience.

Influence of Context and Experience

File and Gullo's study (2002) found that students enrolled in early childhood education teacher preparation courses hold more constructivist beliefs about teaching than their fellow students enrolled in the primary education course. Smith (2002) investigated how the use of diverse professional readings influenced education students' beliefs about teaching. By exposing these student-teachers to texts that involved complex ideas within multicultural contexts, the teachers' beliefs developed to incorporate many of the views suggested in such texts.

The studies by File and Gullo (2002) and Smith (2002) explored the beliefs of university students about teaching, as well as how their beliefs were affected by course readings, their study experiences and their choice of speciality. Both studies found a link between the students' beliefs and the context in which the students were learning. However, the study by Tatto (1996) found that the learning context of another group of university students did not influence the students' teaching beliefs who participated in this context. Tatto found that most teacher education courses did not have a large impact on influencing the views of such students: "Our findings indicate that lay culture norms among enrollees are strongly ingrained and that most teacher education, as it is currently structured, is a weak intervention to alter particular views regarding the teaching and management of diverse learners" (Tatto, 1996, p. 155).

Thus, the combined findings of these studies, that concentrated specifically on the extent to which students' beliefs about teaching impacted on or were influenced by the context in which they studied, did not generate any definitive generalisations about whether or not the variables of context or experience consistently affected students' beliefs about teaching.

Summary of Students' Beliefs about Teaching

The literature that was accessed for this section of the literature review presented a sample of studies that focused on identifying students' beliefs about teaching, some of which investigated students' evaluation of

effective teaching and others examined the influence of context and experience on students' beliefs about teaching. Combined, these studies provide evidence that:

- students' learning beliefs are directly influenced by their epistemological beliefs;

- in some cases, the learning context also influences students' learning beliefs; and

- the findings from these studies, like the findings from studies about teachers' beliefs, tend to be reported in terms of how course content is presented, ranging from a non traditional to transmissive manner.

Up until this stage of the literature review, the issues of teaching and learning have been examined in a relatively atomistic manner. Although the focus of the study in this thesis begins with identifying the educational beliefs of teachers and students in a university context, one of the study's aims is to extend the current literature by investigating the manner in which teachers' and students' beliefs about teaching and learning beliefs are related, thus linking some of these separate concepts. The following section of the literature review focuses on this important potential overlap between teachers' and students' beliefs.

Studies that Specifically Linked Teachers' and Students' Beliefs

The educational beliefs about teaching and learning held by teachers and students have been documented in often unconnected studies. Many of the articles and research studies cited so far in this literature review provide evidence of such documentation across a range of educational contexts. These beliefs are frequently reported in terms of teachers' beliefs about teaching or learning, or in terms of students' beliefs about teaching or learning. Fewer studies have addressed teachers' beliefs about teaching and learning, or students' beliefs about teaching and learning within the confines of the same study. Consequently, the belief research to date provides very little examples of studies that have compared teachers' and

students' educational beliefs. Even fewer studies have investigated teachers and beliefs from within the same context and at the same time.

Areas of Further Research Suggested by Researchers

This disparity in the literature has also been noted by other researchers who have suggested that a more comprehensive approach to investigating teachers' and students' beliefs is now required (Forrester-Jones, 2003; Witcher, Sewall, Arnold & Travers, 2001), instead of investigating teachers' and students' beliefs separately. Witcher et al. (2001) purport an holistic view of the education process, which incorporates an holistic view of teaching and learning processes which they label as being "vision about the purpose and process of education" (p. 277).

In terms of how teachers' beliefs are investigated, Beck, Czerniak and Lumpe (2000) and Tobin, Tippins and Gallard (1994) recommend that students' beliefs should also be taken into account. Similarly, Forrester-Jones (2003), in her investigation into students' perceptions of teaching within a university context, acknowledges the limitation of a study which does not access the views of both teachers and learners simultaneously. She lamented "that the emic or insiders' (teachers') account of teaching sessions were not recorded" (p. 66).

It is this area of research in particular that the study reported in this thesis aims to pursue and extend in an attempt to provide a more comprehensive picture of the interaction between the beliefs of university students and teachers. While the actual point of overlap that exists between teachers' and students' beliefs is an under researched field, there are a small number of studies that have investigated the relationship between teachers' and students' beliefs (Baker & Moroz, 1996; Carter & Norwood, 1997; Peterson, 1988; Rickards et al., 2001; Tavares, Brzezinski & Silva, 2000; Trigwell, Prosser & Waterhouse, 1999; Wing, 1989), although most of these were conducted within primary or secondary school contexts (Baker & Moroz, 1996; Carter & Norwood, 1997; Peterson, 1988; Rickards et al., 2001).

School Teachers' and School Students' Beliefs

A few studies have investigated the beliefs held by both teachers and students within school settings. Although motivated by an intention to investigate how teaching and learning processes could be improved in a school setting, the outcomes of Peterson's study in 1988 emphasise the need to access the conceptions held by both teachers and students and to research teachers' and students' thinking within the same educational context. A year later, Wing (1989) conducted a study in which both preschool teachers and preschool students were interviewed and found that teachers' conceptions about reading and writing influenced their preschool students' conceptions of teaching and learning.

Almost a decade after Wing's study (1989), Baker and Moroz (1996) considered both the beliefs of teachers and students within a primary school setting, and especially focused on how teachers and students are able to construe the others' beliefs. The article is significant as it examines the teachers' and the learners' points of view about the same educational experience. Furthermore, the researchers of this study question the impact of belief mismatch on students' learning, concluding that: "The teaching/learning partners in the classroom need to be more aware of each others differing perspectives of the teaching/learning environment they experience" (Baker & Moroz, 1996, p. 9). The study by Baker and Moroz (1996) points to the significance of the interaction between the perceptions of students and teachers about the same topic, whether it be a subject, a situation or a process. The studies by Carter and Norwood (1997) and Rickards et al. (2001) also confirm the overlap between teachers' and students' beliefs as being worthy of further investigation. Carter and Norwood (1997) found that teachers' views of mathematics influenced their students' beliefs about learning as well as their intellectual development. The study by Rickards et al. (2001) showed that the way teachers perceive classroom interactions influence and are influenced by students' perceptions of the same interactions. Findings from this study highlight the value of examining the interdependence between teachers' and students' beliefs.

Although these studies (Baker & Moroz, 1996; Carter & Norwood, 1997; Peterson, 1988; Rickards et al., 2001; Wing, 1989) were focused on school contexts, their findings signal the significance of research into the connection between teachers and students. The following section of the literature review presents a small sample of studies that have investigated both the educational beliefs of university teachers and university students within the same context.

University Teachers' and University Students' Beliefs

Instead of examining students' approaches to learning solely from the students' perspective, the study by Trigwell et al. (1999) investigated the connection between teachers' teaching approaches and students' learning approaches, as well as the impact of teachers' beliefs on student learning. Findings from this study reveal that teachers who adopt a transmissive style of teaching, a common belief found in many studies, encourage their students to adopt surface learning strategies. Due to the earlier mentioned studies that strongly link beliefs and approaches to teaching and learning, this finding has implications for further investigations into the relationship between teachers' and students' beliefs. This belief-practice link is described by the authors as:

> Those teachers who conceive of learning as information accumulation to meet external demands also conceive of teaching as transmitting information to students, and approach their teaching in terms of teacher-focused strategies. On the other hand, those teachers who conceive of learning as developing and changing students' conceptions, conceive of teaching in terms of helping students to develop and change their conceptions and approach their teaching in a student-focused way. (Trigwell et al., 1999, p. 67)

Peterson's recommendation (1988), cited earlier, for future research studies to further explore teachers' and students' ideas concurrently has also been noted by Tavares et al. (2000) who considered the beliefs of teachers and students in the context of the higher education sector. By asking students similar questions to those asked of their university teachers, this study was able to make comparisons between students' and teachers' ideas about teaching. Their dialogue with students indicates that students believed teachers who were overly theoretically were less

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interested in students as individuals. Successful student learning processes were believed to be linked to their teachers' abilities to communicate.

Tavares et al.'s work (2000) is significant as it continues the trend reflected in the above-mentioned study by Peterson (1988) which acknowledges the importance of considering the beliefs of teachers *and* students within the same context. By accessing the beliefs of both teachers and students, the readers of this study can gain a wider insight into the educational context in which the teachers and students operate and understand the link between beliefs and learning.

Summary of Teachers' and Students' Beliefs

Due to the findings of these studies, combined with the clear impact such studies have on student outcomes, it would seem imperative to acknowledge the importance of examining both teachers' and students' beliefs in any study which involves the identification and analysis of educational beliefs. This observation has directly shaped the design of my second research question: How similar are the educational beliefs of university teachers and university students?

Thus far, the literature review has presented an analysis of research studies that have investigated the beliefs of teachers and students about teaching and learning. The following section of the literature review considers the common findings and themes that have been identified within and suggested by these collections of studies. These findings and themes are arranged in terms of a range of categories, trends, gaps and controversies within the current and recent belief literature, as well as areas suggested for future exploration.

Themes Evident in the Literature

Across the five major collections of research studies that were revealed during this review of the belief literature (presented above), a number of themes also became apparent from within and across these categories. These themes encompass:

- categories evident within the literature;

- controversies evident across the literature;

- gaps evident throughout the literature; and

- theoretical perspectives suggested by the literature.

Like the categories of belief studies mentioned thus far in this literature review, the themes that emerged from these categories have directed the selection of the research questions on which this thesis is based, as well as the decisions associated with the methodological design, the manner in which the data have been analysed and the methods used to report the findings.

The first conspicuous theme to emerge from this literature review was the manner in which the researchers chose their fields of research, the way they selected their research participants and their respective preoccupations with either teaching or learning. Their combined choices in these areas are reflected in the following sections of the literature review.

Categories Evident in the Literature

Belief Literature Consisting of Exclusive Categories of Teachers, Students, Teaching and Learning

The clearest thematic structure that was reflected throughout the belief literature accessed for this review was the way in which the research studies were based on the beliefs of particular groups – that is, teachers and students. While some of these belief studies limited their focus to teachers' and students' specific beliefs about the content area being taught or the discipline in which their course was positioned (for example, mathematics,

science or sociology), most of the studies explored teachers' and students' educational beliefs about teaching and learning in general.

Within the two major categories in the belief literature, studies that researched teachers' and students' beliefs, some studies especially investigated teachers' beliefs about teaching, while others concentrated upon teachers' beliefs about learning. Most studies that focused on teachers' educational beliefs were related to their beliefs about teaching. Similarly, the belief studies that explored students' educational beliefs also tended to focus on either their beliefs about learning or teaching, but were primarily focused on their beliefs about learning. Lastly, a less prominent category of the belief literature focused on the connection between teachers' and students' educational beliefs. These categories in the literature were used to arrange the major categories of this literature review which reported on the findings of the studies that focused on:

- teachers' beliefs about teaching;

- teachers' beliefs about learning;

- students' beliefs about learning;

- students' beliefs about teaching; and

- the link between teachers' and students' beliefs.

Belief Literature Divided by Educational Level

In addition to the clear categories in the literature based on whether teachers and/or students were being researched and the major types of educational beliefs (that is, teaching and learning), researchers who have thus far contributed to the belief literature have also tended to contextualise their research about teachers' and students' beliefs according to various educational levels. These levels encompass preschool, primary school, secondary school and tertiary education. The students within preservice teacher education courses in tertiary institutions were considered by some researchers as learners who were still enrolled in tertiary education courses, whereas other studies addressed these individuals as early career teachers.

Due to the context of this study, those studies that focused chiefly on the tertiary education level were especially targeted for this literature review.

Studies set within school contexts.

Many studies have investigated, identified and documented the beliefs of school teachers and students within early childhood, primary and secondary educational institutions. A review of these studies suggested that:

- most of these studies focused on teachers' educational beliefs (for example, McCarty, Abbott-Shim, & Lambert, 2001);

- fewer studies focused on the educational beliefs held by primary or secondary students (for example, Steketee, 1997); and

- very few studies investigated the educational beliefs of both school teachers and school students (for example, Wing, 1989).

Although these studies were not set within the tertiary education sector, the findings of these school-based research studies have been considered in this literature review due to the relevance of their choice of methodology, their scope of investigation and their findings about the nature of educational beliefs.

Studies set within the tertiary education context.

From reviewing a collection of studies that explored belief studies set within the tertiary education context, the following findings emerged:

- in more recent years, the number of studies that have focused on university teachers' and students' beliefs has increased;

- some studies have focused particularly on teachers' beliefs (for example, Entwistle & Walker, 2000);

- some studies have focused particularly on students' beliefs (for example, Archer et al., 1996); and

- few studies have adopted a dual focus by investigating or presenting their findings about the educational beliefs of both teachers and students within the same study (for example, Tavares et al., 2000).

Studies set within the context of preservice teacher education.

As well as the educational beliefs held by teachers and students within primary, secondary and tertiary educational institutions, there is another large proportion of the literature which has focused on the beliefs held by preservice teachers, who are also referred to as training or trainee teachers, teacher education students or student-teachers. A review of these studies suggests that:

- most of the belief literature has focused on preservice teachers' beliefs (Pajares, 1992); and

- this area of belief research has developed its own research instrument (Nottis, Feuerstein, Murray & Adams, 2000).

All in all, these studies, because of their specific concentration on preservice teachers, represent a trend in the teacher belief literature that requires particular attention. For this reason, some university teachers and students from the preservice teacher education context were subsequently targeted as participants for the study documented within this thesis.

Belief Literature Divided by Academic Domain

Other studies were conducted within specific disciplines or academic domains. A review of these studies found that:

- many of these belief studies were based within the field of education;

- there was debate about whether or not to conduct research studies across a narrow or broad range of disciplines;

- a number of studies were based within one discipline (Fives & Alexander, 2001) or one academic domain (for example, Johnston, 2001);

- fewer studies have examined the beliefs held by students or teachers from a range of disciplines (for example, Hativa, Barak & Simhi, 1999);

- controversial findings were noted from studies that were conducted within multi-discipline contexts with some suggesting that teachers' and students' beliefs were affected by academic domain, whereas the findings from other studies suggested the opposite; and

- further investigation was recommended into the link between an individual's views of teaching and their views of learning (Bruce & Gerber, 1995).

By accessing the beliefs of teachers and students from a wide range of contexts, it is anticipated that richer data could be gathered about their beliefs. Such a recommendation is suggested by a number of researchers (Berliner, 1989; Bruce & Gerber, 1995; Quinlan, 1999; Samuelowicz & Bain, 2001). The study documented within this thesis has also adopted this approach by accessing participants from a range of multi-disciplinary fields across varied university faculties.

Contextual Controversies Evident in the Literature

The presence of inconclusive and incongruent findings across a range of studies signals a number of controversial issues evident within this review of the literature. Most of these findings relate to whether or not teachers' and students' educational beliefs are influenced by certain contextual factors. Whereas the results of some studies claim that teachers' and students' educational beliefs are influenced by contextual factors, results from other studies suggest otherwise or shine some doubt upon the influence of context. As recently as 2002, Moore asks "How much, and in what specific ways, do learners' conceptions vary across learning contexts, and across various subgroups of students (race, class, culture, aptitude, etc.?" (p. 31). The contextual factors addressed in the literature include those relating to the influence of experience, coursework and resources, professional socialisation, experience, subject discipline, culture and gender. The findings from each of these areas of the literature are now presented.

Influence of Teaching and Learning Experience

Whether or not the extent of teachers' experience influences their beliefs has been explored in a number of studies. Correspondingly, the impact of students' learning experience on their beliefs has also been investigated. An examination of these studies has found that:

- many studies concentrated on the beliefs of novice or experienced teachers, and demonstrated that such teachers' beliefs progressed in complexity as their teaching experience increased (for example, Hanrahan & Tate, 2001);

- other studies found that students' educational beliefs become more complex as their learning experiences increase (for example, Eklund-Myrskog, 1997); and

- although most of the studies accessed for this review indicate that teachers' and students' educational beliefs become more complex with experience, other findings place this assumption under question (for example, Cliff, 1998).

Influence of Socialisation

Whether or not socialisation processes influence educational beliefs is an issue that was addressed within the belief literature with mixed results. The studies that focused on the impact of socialisation tended to be set within schools and focused mainly on teachers, especially preservice or early career school teachers. Findings from these studies indicate that:

- some preservice teachers' beliefs may be influenced by professional socialisation processes (for example, Buchmann, 1989); and

- other preservice teachers' beliefs and teaching perspectives remained similar to those they encountered during their teacher education coursework and were not necessarily influenced by professional socialisation processes (for example Graber, 1996).

Thus, some studies examined during this literature review supported the view that teachers' beliefs were influenced by the professional

socialisation processes, whereas other studies suggest teachers' educational beliefs are not affected by the socialisation process.

Influence of Subject Discipline

Whether or not the subject discipline or academic domain in which a teacher or a student teaches or learns affects their educational beliefs has not been categorically established by the educational belief research thus far. This inconsistency is reflected by two opposing sets of research findings which indicate:

- beliefs are affected by subject discipline (for example, File & Gullo, 2002); or

- beliefs are not necessarily affected by subject discipline (for example, Tatto, 1996).

The debate about whether or not teachers' and students' beliefs about teaching and learning are influenced by their academic domain is an area that has also been under investigation in the realm of epistemological belief research (Calderhead, 1996; Gill et al., 2004; Hofer, 2000; Schommer & Walker, 1995). An examination of this literature found that:

- earlier studies suggested that epistemological beliefs were general; and

- more recent studies have put forward the possibility that epistemological beliefs may be general or subject specific (for example, Gill et al., 2004).

Although the findings from most studies accessed for this review indicate that the contextual factor of subject discipline does influence the quality of teachers' and students' educational beliefs, perhaps the best recommendation to acknowledge after considering this research is the advice of Eklund-Myrskog (1997) who investigated the influence of context on students' educational beliefs: "The results thus showed that conceptions and approaches are to some extent contextually dependent" (p. 371).

Influence of Culture

Some of the researchers whose work has been reported in the belief literature have considered how teachers' and students' educational beliefs are influenced by cultural contextual factors. The main findings from these studies suggest that:

- differences among students' conceptions of learning are linked to differences in their cultural backgrounds (for example, Meyer & Kiley, 1998);

- socio-cultural differences accounted for the differences in some teachers' teaching beliefs (for example, Whitman & Lai, 1990); and

- cultural context may be an influence on preservice teachers' epistemological beliefs (for example, Chan, 2000).

Although these studies mentioned above did show some evidence that beliefs are influenced by cultural context, other studies indicate that ethnicity and cultural context do not influence students' educational beliefs (for example Conley et al., 2004).

Viewed collectively, these studies did not confirm whether or not the cultural context of teachers' and students' was an influence on their educational beliefs. This area of research has also been suggested as an avenue of potential investigation by Pintrich (2002) and has emerged as a topic of analysis in the Discussion chapter later in this thesis.

Influence of Gender

Although not typically investigated in isolation, the impact of gender on teachers' and students' beliefs has been explored in conjunction with a range of other contextual factors. In fact, Meyer (2000b) reports that "Gender as a source of variation in student learning is a relatively unexplored phenomenon within the student experience of learning literature … the evidence in support of gender-based differences is insufficient at this stage to sustain a generalised argument" (p. 171).

Findings from the studies that addressed the influence of gender in relation to educational beliefs include the following:

- gender does influence individuals' educational beliefs to some extent (for example, Baxter Magolda, 1988, 1993); or

- gender did not play an influential factor in the development or nature of students' educational beliefs (for example, Conley et al., 2004) or teachers' educational beliefs (for example, Brousseau et al., 1988); and

- gender is not considered a sufficient construct to explain group differences in epistemological beliefs (for example, Pintrich, 2002).

Conclusion about Contextual Influences on Beliefs

Despite the fact that some research supports the idea that teachers' and students' beliefs are influenced by contextual factors such as experience, socialisation, academic discipline, culture and gender, these issues have not been firmly consolidated or refuted by recent literature. However, the various understandings of the nature of contextual factors found throughout these studies may account for many of the discrepancies found in this area of the belief literature. Furthermore, to actually identify contextual factors as social variables within the field of educational research may be viewed as an almost unfeasible and even fruitless task.

Overall, the studies cited in this section of the literature review have concentrated on the contextual controversies associated with educational beliefs, and have predominantly focused on the educational or epistemological beliefs of preservice or experienced school teachers and school students. The studies set within tertiary education contexts have primarily been focused on university students compared to the few studies that focused on how university teachers' educational beliefs are affected by contextual factors. As well as redressing the imbalance from school to tertiary contexts, the study outlined in this thesis has addressed some of the contextual factors discussed in this section of the literature review, especially in terms of how such factors influence the educational beliefs of

university teachers and students. Findings from the study in terms of the influence of contextual factors on educational beliefs are presented in the Findings and Discussion chapters of this thesis.

As well as identifying the influence of context on educational beliefs that has been noted throughout the studies accessed for this literature review, the information gleaned from an analysis of these studies provides a comprehensive theoretical grounding for the study in this thesis.

Theoretical Perspectives Evident in the Literature

A study of the literature presented thus far in this review has revealed three dominant theoretical perspectives, including epistemological, educational and psychological perspectives, which offer a range of insights into how teachers' and students' beliefs are initially identified and, subsequently, how some of their beliefs are connected. The identification and connection between teachers' and students' beliefs are concerns that directly reflect the two main research questions around which this study has been designed and conducted.

Epistemological Perspective

Due to the close connection between the constructs of knowledge and learning, epistemology has emerged as a common theme throughout much of the belief literature. This overlap between beliefs about learning, beliefs about knowledge and the actual definition of knowledge itself signals an area of ambiguity and overlap within the literature that requires acknowledgement in this literature review. This uncertainty between the meanings of the terms "beliefs" and "knowledge", as well as the current debate about whether beliefs about learning are originated from beliefs about knowledge, or vice versa (Hofer & Pintrich, 2002; Schommer-Aikins, 2002), appears to have resulted in an expansion of epistemological belief studies in recent years: "Epistemological beliefs, or beliefs about the nature of knowledge and learning, have recently become a focal point of educational research" (Schommer-Aikens et al., 2000, p. 120).

Such research has been cited in this review, incorporating the findings of researchers who have documented the influence of teachers' and students' epistemological beliefs on views of, and approach to, teaching and learning. A review of these studies has found that:

- teachers and students with naïve epistemological beliefs, based on dualistic views of knowledge, tend to have transmissive teaching beliefs and reproductive learning beliefs, and teachers and students who express sophisticated beliefs about knowledge are more likely to have beliefs about teaching that focus on the facilitation of student learning and learning beliefs that focus on knowledge construction;

- students' learning experiences, especially in terms of learning activities and assessment, may influence their epistemological beliefs (for example, Brownlee et al., 2002);

- belief and knowledge systems are complex and interdependent (for example, Southerland, Sinatra, & Matthews, 2001); and

- individuals' belief systems develop as a result of interaction between teachers and students (for example, Gill et al., 2004) and length of teaching and learning experience (for example, Howard et al., 2000).

Overall, the literature that has focused on teachers' and students' beliefs about teaching and learning contains recurring references to the epistemological beliefs of teachers and students. Just as educational beliefs are influenced by an individual's epistemological beliefs, so too an individual's epistemological beliefs are influenced by their beliefs about teaching and learning.

Psychological Perspective

The general trend in the belief literature to examine the manner in which individuals enact their beliefs reflects a psychological perspective of educational beliefs. Researchers who view beliefs through a psychological lens focus on the way in which individuals acquire their beliefs, how they enact their beliefs through their behaviour, and how their beliefs develop as

a result of various influences. The relationship between teachers' and students' educational beliefs and their teaching and learning practices has been closely examined. Such studies have focused on the way teachers' beliefs influence their teaching practices and on the way students' beliefs influence their learning behaviours and practices.

An examination of these studies has produced the following points:

- teachers' beliefs are instrumental to their commitment to teaching and their "professional well-being" (Witcher et al., 2001, p. 278);

- teachers' beliefs influence their teaching practice (for example, Rainer, 1999), and teachers' practice can influence their beliefs (for example, Kember et al., 2001);

- students' beliefs influence their learning practices and study approaches (for example, Chapple, 1999);

- when there is a mismatch discrepancy between teachers' beliefs and their teaching practices (Leonard & Leonard, 2001; Raymond, 1997), this conflict may be due to teachers having both professed and enacted beliefs (Bryan, 2003), or ideal and working beliefs (Samuelowicz & Bain, 1992); and

- compared to the belief-practice mismatch noted within teachers' beliefs, parallels between students' beliefs and practices were less researched.

Overall, much of the literature accessed for this literature review that reflected a particularly psychological perspective on educational beliefs, has served to emphasise the value of investigating how such beliefs affect teaching and learning practices.

As Archer (2001) explains "Beliefs about ourselves and our psychological construction of the world impel our thinking and behaviour" (p. 2).

Hence, the outcomes, processes and instructional strategies expressed by the professors in this study might not coincide with their actual teaching practices. Future research needs to provide more information regarding the context of learning and the actual instructional practices in order to more fully comprehend the relationship between professors' approaches to teaching and students' approaches to learning. (Andrews et al., 1996, p. 101)

This psychological viewpoint indicates there is a direct link between how students' or teachers' beliefs influence their learning or teaching behaviour and practices. The outcome of the relationship between beliefs and practice also has significant consequences from an educational perspective, this being the third and most conspicuous theoretical perspective that has emerged from this literature review.

Educational Perspective

Of course, the majority of the themes and trends discussed in the belief research thus far in this literature review have deep connections with educational concepts, particularly those associated with teachers, students, teaching and learning. An examination of this educational perspective within the belief literature revealed the following points:

- very recent educational research has been focused on generalist areas of education, instead of within separate disciplines (Kemmis, 2001);

- much educational theory is based on the fundamental cause-effect link between educational beliefs and educational practice within a context that acknowledges socially constructed knowledge;

- the social and cognitive processes involved in knowledge construction (Vygotsky, 1978, 1987) reflect the importance of how the beliefs and practices of one group (such as teachers) may impact on the beliefs and practices of another group (such as students); and

- individual's beliefs exist within belief systems (Nespor, 1987).

So, instead of focusing on the entire realm of beliefs (including beliefs about self, about the subject being taught, about the administration system, etc.), this study has focused on the educational beliefs of university teachers

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and students, and recognises the social processes that facilitate the sharing of these beliefs between the two groups. Pajares (1992) describes this area as distinguishable from beliefs about subjects or disciplines:

> Therefore, as with more general beliefs, educational beliefs are required beliefs about confidence to affect students' performance (teacher efficacy), about the nature of knowledge (epistemological beliefs), about causes of teachers' or students' performance (attributions, locus of control, motivation, writing apprehension, math anxiety), about perceptions of self and feelings of self-worth (self-concept, self esteem), about confidence to perform specific tasks (self-efficacy). There are also educational beliefs about specific subjects or disciplines … (p. 316)

To conduct educational research into the area of educational beliefs, Nespor (1987) suggests that we need a "theoretically grounded model of 'belief systems' that can serve as a framework for systematic and comparative investigations" (p. 317). Her study emphasises the important link between how teachers teach and how they think about teaching. The six features of a belief system that she purports represent a useful theoretical foundation within the context of a study of educational beliefs. These features incorporate existential presumption (which include assumptions about the way things are); alternativity (indicating that beliefs include representations of "alternative reality" or "alternative worlds); affective and evaluative aspects (indicating that affect and evaluation are important indicators of the amount of energy teachers put into certain activities); episodic storage (suggesting that episodic memory is organised in terms of personal experiences, episodes or events); non-consensuality (noting that: components of belief systems are recognised as possibly being in dispute by those who hold them or by outsiders); and unboundedness (suggesting that, although beliefs are relatively stable, the manner in which they are applied to the real world is quite unpredictable) (Nespor, 1987). These features of beliefs and belief systems provide a backdrop for many of the findings that are presented later in this thesis.

Within the framework of this study, attention will be given to how the beliefs of teachers and students about teaching and learning are related to

each other. Despite the obvious link between the processes of teaching and learning, the beliefs associated with the two processes are characteristically complex and difficult to document (Pajares, 1992). Bruce and Gerber (1995) recommend further investigation into links between the conceptions of teaching and learning which would build upon Trigwell, Prosser and Taylor's work (1994). Nevertheless, the studies which do contribute to the discussion about how teaching and learning processes and beliefs are related have been particularly useful in this literature review and, indeed, in the selection of the topic for this PhD study (Curtner-Smith, 1997; Doyle, 1997; Entwistle, 1998; Entwistle & Walker, 2000; Evans et al., 1993; Gow & Kember, 1993; Greene & Zimmerman, 2000; Roche, 2000; Samuelowicz & Bain, 2001). From this point of view, it is this emphasis on educational beliefs that is the most important underlying theoretical thread that underpins and has directed this literature review, and the subsequent structure and focus of the study in this thesis.

Gaps Evident in the Literature

The process of reviewing relevant research for the purposes of this review has resulted in the identification of several gaps in the literature. These are now presented.

More Research Required in Higher Education

This literature review has thus far unveiled a collection of belief studies that have focused on the educational beliefs of teachers and students. However, within this collection, most of these studies have focused on teachers' teaching beliefs or students' learning beliefs, and many of these studies have further specialised by exploring the educational beliefs of school teachers, school students and preservice teachers in schools. Despite the abundance of research in these areas, there appears to be a lack of studies that have focused particularly on the educational beliefs of higher education teachers and students.

This gap in the literature has also been noted by Quinlan (1999) who observed that higher education teachers' beliefs have been investigated in

terms of how they enhance teaching practices but that "we still know little about the complexities of the educational beliefs that academics bring to their teaching in higher education" (p. 447). Quinlan's proposition about the need to further investigate the nature of beliefs of higher education teachers is reaffirmed by Hativa's (2000a) more recent claim that, despite the wealth of research about higher education teaching practices, there is still much less literature available on the rationale behind their practice:

> The last two decades have witnessed a growing tendency to perceive teaching as a professional activity requiring complex and demanding cognitive processes. Understanding teaching necessitates understanding teachers' thinking, beliefs and knowledge regarding teaching, learning and students. Research on teaching no longer consists solely on the examination of a teacher's overt classroom behaviour, and has changed its focus to more subtle and implicit aspects of teaching. However, there is only little published literature on this topic at the higher education level. (p. 331)

Even as recently as 2002, McShane regrets that "the qualitative research into academics' teaching beliefs and self-concept is meagre" (p. 1).

More Research Required to Investigate Teachers' Beliefs about Learning and Students' Beliefs about Teaching

Studies that have identified and explored teachers' beliefs about teaching and students' beliefs about learning have been thoroughly represented in the belief literature thus far. In comparison, teachers' beliefs about learning and students' beliefs about teaching in the same context have been less researched.

The studies that purport to investigate teachers' beliefs about learning often still focus primarily on teachers' beliefs about teaching. Furthermore, many of the studies that do investigate beliefs about learning do not necessarily identify such beliefs specifically from the teachers' point of view. Similarly, compared to the collection of studies that have researched teachers' beliefs about teaching, very few studies have been found that actually claim to examine students' beliefs about teaching. Apart from the research that reports on how students evaluate their teachers or how students evaluate specific teaching situations, very little research has been

conducted that purposely investigates students' beliefs about teaching in general. The study documented in this thesis has contributed to reducing this gap in the literature by investigating students' beliefs about learning *and* teaching, and teachers' beliefs about teaching *and* learning.

More Research Required Regarding the Similarity of Teachers' and Students' Beliefs

Although the educational beliefs of teachers and students have been the foci of many educational research studies in the latter part of last century and the first few years of this century, the similarity between teachers' and students' beliefs has not been consistently researched but has been demonstrated to be important. In some cases, the similarity or differences between teachers' and students' beliefs have been acknowledged as an unintended outcome of research studies that had initially set out to investigate the educational beliefs of teachers and/or students. The studies that have partially investigated the link between teachers' and students' beliefs have been predominantly set within school contexts, signalling a need to examine the links between teachers' and students' beliefs within the higher education sector.

More Research Required Regarding the Possible Hierarchical Nature of Educational Beliefs

Whereas some researchers (Marton et al., 1993) suggest that conceptions of learning are hierarchical in nature by reflecting complex and simple beliefs, other researchers warn against such classification systems (Meyer & Boulton-Lewis, 1999). This phenomenon is distributed throughout much of the literature about educational and epistemological beliefs. Such unresolved issues can be explored by conducting further research into the presence or absence of hierarchy within belief structures.

Conclusions from the Literature

The research accessed for this literature review has provided methodological, conceptual and theoretical directions for the manner in which this study has been designed, conducted, analysed and reported. The following sub-headings in this conclusion of the literature review have been reflected in the subsequent organisation of the study documented in this thesis in terms of research questions, research design, data gathering and analysis methods, and reporting formats.

Major Categories in the Literature

The collection of research studies investigated for this literature review were categorised into two overall groups – studies that focused on the educational beliefs of teachers and studies that focused on the educational beliefs of students. These two groups of studies were the most dominant within the belief literature and included some studies focused upon teachers' beliefs about teaching and learning, whereas other studies focused upon students' beliefs about teaching and learning. A third, yet smaller, group of studies were characterised by their exploration into the link between teachers' and students' beliefs.

Teachers' Educational Beliefs

This literature review has outlined and synthesised the findings from a variety of available studies which have explored the educational beliefs held by teachers in a range of educational contexts, with a particular emphasis on higher education. From these studies, it is evident that a number of beliefs about teaching and learning have been clearly identified and generally accepted by the educational research community. The one arena that is repeatedly suggested for further research in this area is that of higher education teachers' beliefs. For this reason, the study in this thesis has endeavoured to initially identify the beliefs held by higher education teachers and then to explore the relationships between these teachers' beliefs and their students' beliefs. These findings are documented in later chapters of the thesis.

Students' Educational Beliefs

The research examined in this literature review that focused on the educational beliefs held by students demonstrated a fundamental concern with what students actually believe about learning, with a few studies focusing on students' beliefs about teaching. These studies showed that students' educational beliefs typically reflect views about learning as either an integral or isolated part of their lives. The possibility of an additional conception of learning, one which takes into account the student's social or moral sense of obligation to the community, is evident only in very recent studies and has been cited as a possible area of investigation for future research. Because most of the research about students' educational beliefs has focused on their beliefs about learning, this study has endeavoured to further explore the relationships between these beliefs and the educational beliefs held by teachers. The outcomes of these explorations are reported in the findings in the later chapters of this thesis.

Links Between Teachers' and Students' Educational Beliefs, and Links Between Beliefs about Teaching and Learning

While recent educational research has identified the beliefs held by two groups, teachers and students, about two processes, teaching and learning, most of these studies have focused on just one of these areas. Fewer studies have reported on research findings from projects which have investigated an overlap between teaching and learning beliefs and even fewer studies have investigated the potential link between teachers' and students' educational beliefs. The very few studies that do report on these areas of overlap suggest that traditional or stereotypical views about the high levels of difference between teachers' and students' beliefs may be unfounded. These under researched connections between individuals' beliefs about teaching and learning, and teachers' and students' educational beliefs, were investigated in this study. Findings from these explorations are further explained in the findings chapters of this thesis. From this point of view, the advice by Johnston (2001), regarding a consideration of both teachers and students' views, is appropriate:

The student approach to learning is one significant factor but it is not the sole cause of variation in student understanding and performance. The approach to teaching is also significant in encouraging students to adopt a deeper approach to learning. Strategies that simultaneously address the student approach to learning and the teacher approach to teaching are likely to prove more effective than addressing either one or the other. (p. 182)

Educational Belief Development, and Link to Practice

Although this literature review revealed numerous studies that focused on the link between beliefs and practice, and how these beliefs develop over time, these two areas were not specifically investigated in this research study. Nevertheless, these two additional areas provided useful foundations from which to examine the belief literature. They provided vital contextual reasons for the significance of investigations into teachers' and students' beliefs. Besides, much research has already been documented about the link between beliefs and practice whereas the issue of how beliefs develop would require a different methodological design and timeframe from the processes employed in this study.

Impact of this Literature Review on this Study

The research study that is documented in this thesis was designed after considering the combined recommendations for future research revealed throughout this literature review. These recommendations suggest an investigation into the educational beliefs held by university teachers and students, and the similarity between their beliefs. Specific advice from these research studies has provided more detailed guidance for the study.

Studies which identify teachers' conceptions of, and approaches to, teaching, and students' conceptions of, and approaches to, learning are plentiful and reasonably well accepted in the educational research arena, being based on relatively established theoretical frameworks. However, the area of research that appears to be less represented in this collection of literature is that which pertains to the relationship between teaching and learning and, especially, to the way in which students' and teachers'

educational beliefs overlap and influence each other. This area, therefore, has been intensely investigated in the study outlined in this document.

Primarily, the literature review has indicated that further research is required to investigate the educational beliefs of teachers and students within the higher education sector. This persistent suggestion from the literature has guided the construction of the first research question: What are the educational beliefs of university teachers and university students? Furthermore, the lack of research that has been conducted into the similarity or differences between teachers' and students' beliefs at the higher education level has guided the formation of the second major research question: How similar are the educational beliefs of university teachers and university students?

The controversies and gaps within the literature have provided guidance in terms of how to analyse the data and how to present the findings. The issue as to whether contextual factors influence teachers' and students' educational beliefs has been a focus throughout the findings of this study, as has the issue concerning whether or not educational beliefs are hierarchical. These issues related to context and the hierarchical nature of beliefs have been examined in the findings chapters of this study. How individuals' beliefs about teaching are related to their beliefs about learning are also investigated in the findings chapters of this study.

A further imbalance was noted in the literature regarding the abundance of studies which have investigated teachers' beliefs about teaching, compared with the lack of studies that have investigated students' beliefs about teaching. This imbalance has been redressed in this study by ensuring that the investigation process has incorporated the exploration of students' teaching beliefs, along with an investigation of their learning beliefs. The literature also identified a lack of studies in the field of higher education about teachers' and students' beliefs so, in order to equalise this deficiency, this study was conducted within a university context. Lastly, the conclusions deduced from this literature review indicated that various

operational definitions were required to guide the structure and foundation of the study documented in this thesis.

Operational Definitions

To conclude this chapter, it is necessary to provide some operational definitions to guide the interpretation of this research. Due to the various understandings that have been traditionally assigned to many of the terms used in this research, it has been necessary to compile a set of specific operational definitions for use throughout this research project. The central concepts that require definition in this respect include: beliefs; educational beliefs; teachers; students; and belief similarity. Definitions of these major terms used in this research will function as a foundational consensus from which the entire study can be interpreted: "Definitions are basically conventions, general agreements among researchers that a particular term will represent a specific concept" (Pajares, 1992, p. 315).

The actual definition of the term *belief* as used in this study is paramount to its basis since there are so many interpretations of the term throughout the fields of educational and psychological research. Furthermore, the strong influence of epistemological research that is dispersed throughout this literature review has had a great bearing on the definition of the term, since knowledge is sometimes viewed as a component of individuals' beliefs or vice versa, with beliefs being viewed as a component of an individual's knowledge (Orton, 1996; Pajares, 1992; Schommer-Aikins, 2002; Southerland et al., 2001). This ambiguity about the meaning of knowledge, beliefs and learning is acknowledged by Pajares (1992) who even suggests that "Distinguishing knowledge from belief is a daunting undertaking" (p. 309) but that "it is unavoidable, for purposes of investigation, beliefs must be inferred" (p. 315).

Despite this admonition from Pajares (1992), the current study has adopted some recommendations from recent belief studies in order to define the term that has formed the conceptual basis of this study. The researchers cited in this review suggest that beliefs can be seen as statements which describe ideal situations and indicate any intention to practice. Rokeach

(1968) suggests that any statement preceded by "I believe" represents a statement of belief and that beliefs have cognitive, affective and behavioural components (p. 113). This definition of *belief* has been adopted in this study and the term *beliefs* has been used to include "conceptions of", "perceptions of", "attitudes to" and "ideas about". In fact, the interpretation of the term *belief* has encompassed such a wide range of meanings that the substitution of the term "philosophy" has been suggested for the term (Witcher et al., 2001, p. 277). A belief incorporates an individual's views about epistemology (relating to their view of knowledge), ontology (their view of the nature of being) and pedagogy (their view of teaching). Nespor (1987) also emphasises the role of "moods, feelings, emotions and subjective evaluations" (p. 323) in beliefs and, for this reason, the participants' comments about emotional issues related to their beliefs have also been recognised and documented.

This study has focused on university teachers' and students' educational beliefs about teaching and learning. The educational beliefs that a student or a teacher has are related to their abstract cognitive thoughts, their previous knowledge, their background, and their deep-seated ideas about teaching or learning. Combined, these beliefs are commonly referred to as *educational beliefs* and particularly include beliefs about the nature of teaching and learning.

Throughout the literature, there are numerous terms used to refer to the academic staff involved in teaching at universities – lecturers, teachers, professors, tutors and facilitators. For the purposes of this research project, the term *university teacher* has been used to refer to any academic staff member who teaches university students. Similarly, the term *university student* has been used to refer to any student who participates in an undergraduate or graduate course at university in any mode of study including online, external or internal. Once the scope of this document is narrowed to the specific context of the study, the terms *teachers* and *students* have been used to refer to university teachers and university students respectively.

In many research studies that have explored teachers' and students' beliefs, the term "domain knowledge" is frequently used to describe knowledge or content that is specifically related to a particular academic field or discipline. In this study, I have used the term "subject knowledge" to describe such knowledge instead of "domain knowledge", since it was the term most often used by the participants in the study.

This study also compares the beliefs held by university teachers and university students. *Belief similarity*, in this sense, is a term used to describe the degree to which the beliefs of one group or one individual are similar or different to the beliefs of another group or individual.

Theoretical Framework

As the final part of the literature review, it is now possible to bring together the major ideas found in the literature in diagrammatic form to represent the theoretical framework upon which the study is based (see Figure 2). From the information presented in this literature review, a clear theoretical framework emerged that has been used to represent the belief-practice-belief cycle within teaching and learning processes that occur within university settings. Additionally, the types of educational beliefs, the methods used by previous studies to identify teachers' and students' beliefs and the contexts of these studies are included.

The framework also places emphasis on the relationship between the educational beliefs of teachers and students, whatever this relationship may be, by placing teachers' and students' beliefs within the same arena. This point of overlap between teachers' and students' beliefs has been further explored in this study.

Study of Beliefs   **Belief-Practice-Belief-Cycle**

Teachers   Students
Teaching   Learning
Knowledge   Discipline
Resources   Institutions

About

Beliefs are influenced by

Curriculum
Institutional regulations
Expectations
Prior knowledge
Previous teaching and learning experiences
Cultural background
Academic background
Gender
Disciplinary knowledge
Professional socialisation

Questionnaires, inventories
Interviews
Observation of practice
Written journals
Self-reporting

Identified by

Teachers' and students' educational beliefs

Conceptions of teaching, learning, knowledge
Teaching and learning practice
Choice of study and learning strategies
Teaching and learning context
Institutional policies

- Universities (undergraduate, postgraduate),
  including courses for preservice teachers
- Specialist vocational and training colleges
- Secondary schools
- Primary schools
- Preschools

- Across various disciplinary contexts
- Within specific disciplinary contexts

Within contexts of

Beliefs have influences on

Course content
Curiculum design
Assessment
Learning outcomes
Application of knowledge
Evaluation of effective teaching

Figure 2. Theoretical Framework: Educational Beliefs and Practice.

CHAPTER 3

METHODOLOGY

Introduction

This chapter provides a description of the main intentions of the research, of the research participants and the research context, of the methods adopted to gather, analyse and report the data, and an account of how the qualitative and quantitative research processes used in the study were chosen and justified.

Research Questions and Research Intentions

As well as identifying and comparing the educational beliefs of a group of university teachers and students, the original purposes of this research were to also investigate the change that took place in their beliefs across a semester period and the manner in which the teachers and students in the study construed each other's beliefs. These research purposes were narrowed as the data gathering period proceeded, reflecting Creswell's (2002) advice to "expect your qualitative questions to change and to emerge during a study to reflect the participants' views of the central phenomenon and your growing (and deeper) understanding of it" (2002, p. 150). The purpose of the study became more focused to incorporate the identification and comparison of the educational beliefs held by the teachers and students who participated in the study. Accordingly, the two intentions of this study are represented by the following research questions:

- What are the educational beliefs of university teachers and university students?

- How similar are the educational beliefs of university teachers and university students?

Choice of Methodology

The nature and purpose of this study were the main determinants in selecting appropriate data gathering, analysis and reporting methods used during this research. In addition, the literature on teachers' and students' beliefs also offered valuable guidance and some timely cautions.

Methodological Trends and Recommendations from the Literature

The research studies included in the review of the belief literature provided numerous examples of data collection and data analysis methods. Although many of these research methods were particularly customised to individual research studies, some general trends were evident within the scope of this literature, and were used to inform the design of this study.

Using Multiple Methods

As opposed to an over reliance on one particular method, many researchers recommend the use of multiple data gathering methods in order to come to a better understanding of participants' realities (Denzin & Lincoln, 2000; Fontana & Frey, 1994; Hanrahan & Tate, 2001; Patton, 2002; Pintrich, 2002; Tashakkori & Teddlie, 1998). The decision to use a combination of such methods is based on the belief that by blending the "elements of one paradigm into another, so that one is engaging in research that represents the best of both worldviews" (Lincoln & Guba, 2000, p. 174). So, rather than adopting an immoderate approach as advocated by extremist qualitative or quantitative researchers, and, in doing so, extend what have been branded as the paradigm wars (Gage, 1989; Guba & Lincoln, 1994; Tashakkori & Teddlie, 1998), this study has followed a path of "paradigm relativism" (Tashakkori & Teddlie, 1998, p. 5), in which the paradigm best suited for the research problem at hand has been adopted. Eisenhart and Howe (1992) and Denzin and Lincoln, (1994) also recommend this approach to ensure the validity of the research in terms of matching data collection techniques with the research questions, and to facilitate breadth and depth of the research investigation.

Use of Both Predetermined and Non-Determined Constructs

Apart from the obvious segregation between the beliefs of teachers and the beliefs of students that were investigated in many previous studies, two main trends appear in the methodologies adopted for such studies. One group of studies uses predetermined belief constructs rather than beliefs that emerged from their studies. In order to express their beliefs, research participants in such studies are typically presented with a predetermined set of belief constructs to comment on or select which are often adapted from available literature or drawn from previously trialled and tested questionnaires. On the other hand, another groups of studies, which are more interpretivistic in nature, appear to adopt a more emergent, grounded approach to ascertaining the constructs used in their methodologies. The researchers in such studies do not assume strict boundaries in relation to the associated concepts and constructs, and do not necessarily expect their participants to mention a set range of topics. Instead, they provide mechanisms by which the participants themselves can actually nominate new areas of beliefs which may not have been previously considered by the researcher. Although the research study outlined in this thesis aims to recognise the strengths of both the emergent and non-emergent approaches, interpretivistic methods of gathering and analysing the data have been favoured.

Methodological Problems Noted in the Belief Literature

Recent criticism of certain types of belief studies were also taken into account, especially when designing the data gathering research tools used in this study. The literature contains cautions for researchers of teachers' and students' beliefs to ensure that their investigations are not conducted in a practice vacuum and that the concepts incorporated into their studies are not overly or unnecessarily categorised. Furthermore, some researchers admonish the use of data gathering methods which rely on self-reporting techniques, while other researchers acknowledge the problem associated with individuals who do not necessarily recognise their own beliefs.

The Problem of Self-Reporting

Although both interpretivistic and experimental belief studies employ self-reporting data gathering methods, such as questionnaires, journals and interviews, those which draw conclusions about educational practice from self-reporting discussions have been recently criticised (Ethell, Sandretto, & Heath, 2000; Oberg, 1989). Other researchers identify self-reporting methods as limitations to their study (for example, Nasr et al., 1996), especially in relation to the more traditional research criteria of validity and reliability (De Neve, 1991). However, despite the scepticism that has been associated with self-reporting techniques, other researchers have found a direct link between self-reported beliefs and observed practices (for example, McCarty et al., 2001). In consideration of the possible relationship between an individual's self-reported beliefs and their actual practice, some limits of self-reporting methods may be moderated if the researcher's actions are tempered by an awareness that participants' responses to such data collection methods may represent their ideal or espoused beliefs, as opposed to their working or enacted beliefs.

To address the perceived validity issues that may be associated with the sole use of self-reporting measures to collect data, this study has been designed to enable the participants to express their educational beliefs in discussions that are grounded within realistic, practical educational settings. To achieve this, the interviews that were conducted with the participants in this study all commenced with a short video depicting a number of practical teaching and learning scenarios within recent higher education contexts. This procedure enabled me to encourage the participants to refer to practical examples in their initial belief discussions and, as the semester progressed, the participants were consistently reminded to extend their belief explanations with references to either practical situations they had observed or examples from their own experiences.

Overall, despite the perceived problems associated with data gathering techniques that rely upon participants' self-reporting, the data

gathered throughout this study is assumed to represent the participants' espoused beliefs at the time of collection. The relationship between these stated beliefs and beliefs in action is acknowledged as an important point to be considered but this link is not under specific investigation in this study. Instead, the perceptions of the participants are sought and trusted in order to ensure that this "qualitative research is pragmatic, interpretivistic and grounded in the lives of people" (Marshall & Rossman, 1999, p. 2).

Over-Operationalising Constructs

A study of the belief literature has revealed a recent trend where researchers have been cautioned about over-operationalising educational constructs (Meyer & Boulton-Lewis, 1999; Roth, 1998; Taylor, 1996). The tendency to over categorise constructs, such as teaching and learning, has been noted as a possible problem associated with research processes which rely heavily upon questionnaires or inventories that are constructed solely from predetermined statements or items. Despite the use of such belief inventories to identify teachers' and students' beliefs across a range of contexts, Pajares (1992) suggests that such belief inventories should not be used alone "if richer and more accurate inferences are to be made" (p. 327). Bruner (1999) even goes so far to say that "test-based education research is condemned not only for its theoretical shallowness but for its political-ideological insensitivity" (p. 400).

To counteract cautions about the sole use of inventories in belief research, and to ensure that the educational constructs were not overly categorised, this study has used methods that enabled the collection and analysis of both qualitative data (verbal interviews and written responses to open-ended EBI items) and quantitative data (Likert-style responses to EBI items). So, rather than gathering both types of data for the purpose of confirmation, as is often the case in the traditional empirical interpretation of triangulation, the data were triangulated in order to supplement the knowledge offered by each data set.

Lack of Recognition of Own Beliefs

Although most individuals probably have some educational beliefs, if given the chance to discuss them, not everyone appears to be aware of such beliefs. In this study, some of the participants reported that they did not have any beliefs: "You know, I don't know. I don't actually have any beliefs, just get here and do it" (First interview with Lionel, Student in Class 1). However, when given the chance, such participants would typically express a range of beliefs about various educational topics. Also, as the semester progressed, and they were provided with increasing opportunities to reflect on and consider their own educational beliefs, the participants tended to become more forthcoming about expressing their beliefs.

In consideration of the above mentioned trends, recommendations and cautions from the literature, the research methods deemed appropriate for this study were selected in light of the following issues that were especially significant for this research.

Selection of Appropriate Methods for this Study

The decision to use an interpretivistic research methodology in this study was based on an intention to gain insights into the area of educational beliefs from a variety of perspectives, specifically those represented by both university teachers and university students. The methods chosen also needed to acknowledge the manner in which intellectual, practical and moral issues intersect in education (Schulman, 1999). Mixed methods of data collection and analysis were selected to ensure that the participants' could describe their beliefs by volunteering their ideas within informal interview structures as well as being able to nominate belief statements according to predetermined constructs in the Educational Belief Inventory (EBI). As well as being guided by the overall intention of the research and the specificity of the participants in the study, the choice of methods was directly influenced by the specific research questions (Blaikie, 2000; Creswell, 2002; Flick, 2004) which focused on the identification and comparison of the beliefs held by a group of teachers and learners within one particular higher education context. The various distinctive

characteristics of the study, described below, in conjunction with the intentions of the study and the advice from the literature, described above, guided the selection of these methods.

Methodology to Match the Nature of Beliefs

The choices of research methods used in this study has been influenced by the actual nature of educational beliefs. The manner in which the beliefs of an individual can be identified and documented by another individual is a complex procedure and one that must acknowledge the highly personal nature of beliefs as representative of a person's innermost thoughts and abstract ideals (Fang, 1996; Guba & Lincoln, 1994; Nespor, 1987; Pajares, 1992). For this reason, varied investigative processes have been selected for use in this study which have allowed for a range of interpretations of individuals' educational beliefs about teaching and learning, and have provided opportunities to explore the overlap between their beliefs. In this way, a fuller contextual description of the participants' beliefs has been made possible, more so than if a smaller range of data collection methods was used.

Methodology to Encourage Reflection

Reflection processes have been advocated by many researchers (Hativa & Goodyear, 2000; McAlpine & Weston, 2000; as appropriate research methods by which to investigate individuals' beliefs. Oberg (1989) goes so far as to say: "What is revealed in the act of reflection are the beliefs and intentions implicit in practice" (p. 155). The interviews in this study provided a group of university teachers with opportunities to reflect on their teaching beliefs and to consider how these beliefs were applied to practical teaching and learning situations. Likewise, by bringing into focus the students' beliefs about teaching and learning in the interviews with them, it was intended that the students' learning practices would become increasingly informed as they became more metacognitively aware about their learning strengths, weaknesses and preferences.

Methodology to Enable Exploration

As well as acknowledging the nature of educational beliefs and the strong link between reflection, beliefs and practice, the research methods utilised in this study were also chosen for their capacity to facilitate an exploratory examination of the data (Flick, 2004). Furthermore, Freebody (2003) views the process of investigative, exploratory educational research as being able to contribute to the overall quality of the social world:

> When educational research is driven by curiosity about the ever-changing, always normative, and often unnoticed seedbed of everyday cultural experience and aspiration, then it is above all a discourse of cultural optimism. The point of research is to discover things. The point of educational research is to change the social world by discovering better understandings of its qualities. (p. 218)

Since this study did not intend to locate evidence to prove or disprove a fixed hypothesis about higher education teachers' and students' beliefs, the identification and comparison of beliefs were intended to take place within a context of discovery and inductive analysis. As Shank and Villella (2004) explain, this type of qualitative research can be likened to the metaphor of a lantern: "Lanterns are used to allow light to illuminate dark areas so that we can see things that previously were obscure. Once we shed light on things, we understand them better" (p. 48). Since very few research studies or findings have focused on the comparison between teachers' and students' beliefs at any educational level, let alone the higher education context, interpretivistic methods were required that would assist the investigation of a topic where the researcher did not necessarily have a comprehensive understanding of the topic at hand (Tripp-Reimer, 1985). This study, therefore, is hypothesis-generating, rather than hypothesis-testing, and provides rich descriptive documentation about point of overlap between teachers' and students' educational beliefs, an area which has been under represented in recent educational literature.

Methodology to Access Varied Viewpoints within the Same Context

A consideration of varied viewpoints in interpretivistic research is a technique adopted to acquire a broad perspective and to ensure that a full

contextual picture of a given situation is constructed. In their investigation into students' perceptions of teaching within a higher education context, Forrester-Jones (2003) criticises studies which do not investigate such views from both teachers' and students' point of view: "The study was limited in that the emic or insiders' (teachers) account of teaching sessions were not recorded. This would have made for a more holistic evaluation" (p. 66). Likewise, Ball and Lampert (1999) suggest that investigations into teaching and learning "are often more fruitful when they are situated in reference to a common context" (p. 375).

Despite these observations, few studies have researched teachers' and students' beliefs within the same context. However, recent researchers recommend that both teachers' and students' perspectives are required in order to document and extend our understanding of educational beliefs (Åkerlind, 2004; Andrews et al., 1996; Bruce & Gerber, 1995; Prosser & Trigwell, 1997; Trigwell & Prosser, 1996; Wood, 2000). Bruce and Gerber (1995) particularly emphasise the significance of gaining multiple perspectives of the same phenomenon and, as such, recommend that "continued exploration of a phenomenon from the viewpoint of other groups in the teaching-learning environment will be fruitful" (p. 456).

Since this study intended to investigate teachers' and students' beliefs within the same context, the research methods were selected according to their capacity to access more than one viewpoint about the same topic from within the same context. The selection of such methods has a direct impact on the quality of the data collected. In fact, Samuelowicz and Bain (2001) suggest that the differences in much of the literature on teacher beliefs may be attributable to the manner in which data is collected. Instead of examining the two groups' beliefs in isolation, methods were required which enabled their beliefs to be viewed within the same temporal frame.

For these reasons, a variety of methods have been used in order to access an extensive range of viewpoints and to ultimately achieve a holistic understanding of the complex interplay between university teachers' and students' educational beliefs. This area of research is thus characterised by

a crossing of traditional boundaries (Ball & Lampert, 1999). Such a process would be difficult to achieve using solely quantitative research structures which are more characterised by compartmentalisation (Burns, 2000).

Methodology that Could Respond to the Need for New Instruments

Since data collection methods were required that would be suitable for use by both teachers and students, semi-structured interviews were considered to be the most appropriate data gathering instrument for this study. Additionally, a belief inventory was sought to provide an alternative means of data collection that would suit both teachers and students and would also facilitate the comparison of the beliefs of the two groups. Since no such instrument was located in my examination of the literature, an EBI was created specifically for this study based on a selection of items from previously used inventories. The creation of this instrument reflects the situation when research questions or problems arise that are not obviously linked to trialled and tested methodologies. In such cases, the researcher-as-bricoleur (Levi-Strauss, 1966; Lincoln, 2004; Lincoln & Guba, 2000) creates new tools or adapts existing ones to suit the purpose of the research, such as the creation of the EBI.

As well as bearing in mind the nature and purpose of the study when designing the study's methodology, in conjunction with the guidance from previous belief literature, the nature of the research context, the participants and various ethical issues were also acknowledged.

Research Context

This study was conducted at a metropolitan campus of a large university in Australia. The teacher-participants in the study included a mixture of individuals from various backgrounds including primary teaching, secondary teaching, multimedia and computer science. The student-participants in four of the classes (or tutorial groups) in the study were mainly undergraduate students and one class was made up of postgraduate students. Because the participants were made up of both teachers and students, namely one teacher and a group of students from the

same university class, each "set" of participants, were teaching and learning at the same time within the same context. For example, Class 5 was made up of one teacher, Dimitri, and 23 of his students. Since much of the data analysis that was conducted throughout the study was focused on the comparison of teachers' and students' beliefs within the same context, this involvement of teachers and students from the same class was essential and represented a new trend when compared to much previous research.

The EBIs were administered to all students in each of the classes during their tutorials. The teachers of these classes either completed the EBI during this tutorial time or in their own time soon after the tutorial. The interviews with selected participants from these classes were conducted in a location of the participants' choice. The teachers in the study were mainly interviewed in their own university offices whereas the students usually opted to meet me in an on-campus office or in the university library.

Research Participants

Since the primary purpose of this study was exploratory, the participants in this study were initially selected according to the principles of purposeful sampling for their information-rich possibilities "whose study will illuminate the questions under study" (Patton, 1990, p. 169). Strauss and Corbin (1998) suggest that the researcher should be open to participants who will enhance the purpose of discovery. One of the organisational conditions of selecting participants was that the students in the study were connected with a teacher in the study. Likewise, each teacher required a set of their own students to be involved in the study to enable comparison within the same context. Because the theory associated with belief studies consistently referred to cases which involved undergraduate and postgraduate education students, and preservice and inservice teachers, this literature influenced my decision to invite some interested teachers and students who taught or were enrolled in the education course.

After inviting two teachers and their classes to be involved in the study, further participants were purposefully selected by using a process

similar to snowball or chain sampling as well as opportunistic and theory-based construct sampling (Patton, 1990, pp. 177-179). Initial recommendations from a few interested university teachers triggered a subsequent chain of other informants who were interested in and keen to contribute to a study that focused on educational beliefs. From the pool of about ten university teachers and their classes that were approached and invited to participate in the study, seven teachers and their classes volunteered to participate. Once the study commenced, another class showed interest which broadened the data gathering pool. The addition of this extra set of participants meant that eight teachers and their classes began the study at the beginning of Semester 2, 2002.

Of the eight classes that commenced the study, five of these classes continued their involvement throughout the whole semester. The three classes that eventually withdrew from the study did so due to organisational difficulties associated with students attending interviews and completing the EBI. Three of the classes that completed the study were education classes – two postgraduate and one undergraduate. The other two classes were comprised of students who were enrolled in undergraduate multimedia and computer science units of study. Three of the teachers in the study had university recognised teaching qualifications and the other two university teachers held postgraduate qualifications in their field of expertise. These five teachers were generally concerned about high quality teaching and were specifically concerned with improving their own teaching. Furthermore, they were frequently referred to by their colleagues and students as "good teachers". Thus, the concerns of these teachers and the manner in which they were perceived may have been the catalysts to them becoming involved in the study.

In all, the research participants in this study included both university teachers and university students from five university classes, including a total of five teachers and 95 students. The classes included a mixture of postgraduate and undergraduate students across a range of disciplines including education, multimedia and computer science. Although the

teachers and students who volunteered to take part in the study represented a range of course levels, disciplines and experience levels, they were not intended to be representative of the wider population of teachers or students at the university at which the study took place. Nor were they intended to be representative of the wider national or global population of university teachers and university students.

All of the teachers and students in these classes were requested to complete the EBI at the beginning and end of the semester, and a selection of volunteers from within each of these classes were requested to write weekly journal reflections and to be involved in two to three interviews during the semester. The journal writing was not a success in the data gathering process with only a few of the selected volunteers from each class managing to contribute to their journals. The participants who did contribute to their journals tended to write about similar issues to the issues they discussed in the interviews so I decided not to use the data gathered in the journal writing procedures of the study as little was information was gained from these data sources.

<div align="center">

Ethics

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To ensure that the study was conducted ethically, a formal request was made to and approved by the Committee for the Conduct of Ethical Research at Edith Cowan University. *An Application to Undertake Research Involving Human Subjects* was submitted to obtain approval to conduct this study. Issues such as participant consent, participant anonymity, the use of pseudonyms and the manner in which the participants would be supported, as well as issues associated with the access to, storage of and confidentiality of records, were addressed in this application.

In consideration of how the study could be conducted ethically, the risks to participants and the benefits to participants and to humanity in general were noted. The only anticipated risk to participants was associated with the time taken to complete the interviews and journals. To reduce the intrusion on the participants' time, the interview times were restricted to 30-40 minutes. To prevent the participants' time being unduly monopolised

by any aspect of the research process, I maintained regular conversations with them to monitor the extent of their contributions.

It was anticipated that the participants would benefit from the study by becoming more aware of their own educational beliefs. This increased level of consciousness was expected to increase the teachers' and students' abilities to be more reflective about their own teaching and learning beliefs and practices. This consequence of reflection is featured in much of the belief literature (Entwistle & Walker, 2000; Hativa, 2000a; McAlpine & Weston, 2000; Nasr et al., 1996; Schuh et al., 2001). Furthermore, the outcomes of this study were expected to benefit humanity in general by contributing to our knowledge and understanding of the relationship between university teachers' and university students' educational beliefs. Although the belief literature provided guiding constructs which framed the theoretical structure and conceptual basis of the study, the methodology at the core of the study was designed in a way to allow for new categories of belief constructs to emerge. This intention reflected an interpretivistic manner of inquiry based on a constructivist paradigm: "The aim of inquiry is understanding and reconstruction of the constructions that people (including the inquirer) initially hold, aiming towards consensus but still open to new interpretations as information and sophistication improve" (Guba & Lincoln, 1994, p. 111). Ultimately, results of the study were expected to produce recommendations to improve the relationship between teachers and students at university and subsequently to improve the quality of tertiary teaching and learning.

Criteria for Evaluating the Qualitative and Quantitative Aspects of the Study

Mixed research methods were used in this study and, as such, a mixture of qualitative and quantitative criteria has been considered when evaluating these two aspects of the study. However, because the study was mainly interpretivistic in nature, the qualitative criteria dominated the evaluation of the methodology of the study. So, instead of applying the traditional criteria of reliability, validity and objectivity, labelled as the

"holy trinity" by Spencer, Ritchie, Lewis and Dillon (2003, p. 59), a set of general and specific criteria were adopted to judge the "goodness" (Lincoln & Guba, 2000, p. 164) of the qualitative aspects of the study's methodology.

To ensure that the criteria used in this study fitted the study's paradigm and epistemological underpinnings (Leininger, 1985; Spencer et al., 2003), the criteria were aligned with social constructivist theories and were chosen from a selection of recommended criteria cited in recent research papers that have evaluated qualitative research. The quantitative aspects of this study were judged in terms of traditional ideas of reliability and validity.

Evaluating the Qualitative Research Methods
General Principles for Evaluating Qualitative Research

Unlike the consensus evident amongst researchers about the criteria by which to judge quantitative research methodologies, there is understandably less clarity and formulaic direction about which criteria to apply to qualitative research. In fact, many researchers warn against the absolute application of such criteria to qualitative research which is, by its nature, wide ranging and varied. Garman (1994, 1996) suggests that, unlike quantitative research, "qualitative research is relatively lacking in canons and conventions" (p. 5). Subsequently, an assortment of general and specific criteria have been suggested by various researchers to judge the quality of qualitative research in terms of research design, ethics, data gathering, analysis and reporting techniques. General criteria, referred to by Spencer et al. (2003) as "guiding principles and central concepts" (p. 95), are often used to explain the overall features of such criteria. Similarly, Flick (1992) uses the criteria of rigour, breadth and depth, Eisner (1991) refers to coherence, consensus and instrumental utility and Mays and Pope (2000) simply adopt the principles of validity and relevance. In general, the criteria used to evaluate qualitative studies appear to be under just as much scrutiny as the research itself.

The criteria adopted to evaluate the quality of the research methods in this study also rely upon the reader for interpretation. Unlike more positivistic research traditions, the findings in this study do not purport to have exhausted all of the possibilities for data analysis. Instead, the Findings and Discussion chapters, while suggesting some ways to interpret the data gathered during this study, also encourage the reader to consider how such findings may relate to their own situation. In this way, the reader is encouraged to be a post participant in this research study.

So, instead of adopting a preset list of criteria, I have chosen to create a set of five guiding questions by which to judge the quality of the interpretivistic research methods used in this study. These questions have been essentially informed by the four central principles of Spencer et al.'s (2003) framework for evaluating interpretivistic research: contributory, defensible, rigorous, credible, as well as being informed by Garman's (1994, 1996) recommendations. These questions and guiding principles are also supported by specific criteria described by other researchers.

These guiding principles and criteria that have been used to evaluate qualitative research typically suggest a preoccupation with the logic and reasonableness of the research methods used. Other criteria, especially those suggested by Garman (1994, 1996) and Richardson (1997), are largely associated with the aesthetics of research processes and products rather than the rationality of inquiry. Such criteria convey a sense of the emotional intensity, vitality and even the spiritual or moral value of the research processes and findings. A movement to incorporate this element of research was predicted by Lincoln and Guba in 2000: "We may also be entering an age of greater spirituality within research efforts" (p. 185), acknowledged by Knoblauch (2004) as "apocalyptic voices" (p. 354) and described by Freebody (2003, p. 218) as a process that entails "moral effort for researchers and readers". Such criteria are associated with the participants' emotional involvement, the researcher's commitment and enthusiasm, and the manner in which the findings are presented to readers, especially in regards to their ability to communicate discovery, excitement and insight. This view of

research that acknowledges the import of forces such as logic, future impact and credibility, as well as emotional and spiritual pursuits can be likened to Schulman's (1999) manner of defining scholarship as "acts of the mind or spirit that are undertaken in disciplined ways and subsequently made public so that members of one's intellectual community can judge their worth and then use them to support the more general program of the community" (p. 160).

Since I considered these elements to be worthwhile, especially in the context of a research study which was centred on discussions about individuals' beliefs, some of which could be emotionally charged, I have included an additional guiding principle to Spencer et al.'s (2003) principles of evaluating the research in terms of its "affective" nature, based on Garman's terms "vitality" and "aesthetics" (1994, p. 7, 1996, p. 18). The combined principles that I used to judge the quality of this research are as follows:

> **Contributory** in advancing wider knowledge or understanding about policy, practice, theory or a particular substantive field. (Spencer et al., 2003, p. 20)
> **Defensible** in design by providing a research strategy that can address the evaluative questions posed. (Spencer et al., 2003, p. 20)
> **Rigorous** in conduct through the systematic and transparent collection, analysis and interpretation of qualitative data. (Spencer et al., 2003, p. 20)
> **Credible** in claim through offering well-founded and plausible arguments about the significance of the evidence generated. (Spencer et al., 2003, p. 20)
> **Affective** in nature by acknowledging the excitement associated with research discoveries, the emotional involvement of the participants and the enthusiasm of the researcher. (adapted from Garman, 1994, p. 7; 1996, p. 18)

From these general criteria, I developed the following general questions that have guided the evaluation of the quality of the qualitative research methods in this study:

- Have the findings of this study contributed to our knowledge and understanding of the educational beliefs of university teachers and

students? How has being involved in the research benefited the participants?

- Is the research design of this study defensible and linked to the study's research questions?

- Are the methods used to gather, analyse, interpret and present the data rigorous, systematic and transparent?

- Are the findings credible and supported by evidence?

- Do the research processes and findings communicate the emotional elements of how the participants and the researcher engaged in the research study?

The general principles used to justify the selection of the research methods used in this study incorporate a number of specific criteria which are outlined in Table 1.

Table 1

Guiding Principles and Specific Criteria used to Evaluate the Qualitative Nature and Methods of the Research

Guiding Principle	Guiding Question	Specific Criteria from Literature*
Contributory in advancing wider knowledge or understanding about policy, practice, theory or a particular substantive field.	Have the findings of this study contributed to our knowledge and understanding of the educational beliefs of university teachers and students? How has being involved in the research benefited the participants?	Instrumental utility (Eisner, 1991), utility (Garman, 1994, 1996) or useability
		Transferability or applicability, naturalistic generalisability (Stake, 1978; Stake & Trumbull, 1982), extrapolation (Patton, 1990, 2002), retrospective generalisability (Eisner, 1991), fit between the situation studied and others (Schofield, 2002), illuminative fertility (Shank & Villella, 2004)
		Future focus and contribution to research directions
		Ontological authenticity (Guba & Lincoln, 1989)
		Educative authenticity (Guba & Lincoln, 1989)
		Reciprocity (Patton, 1990, 2002)
Defensible in design by providing a research strategy that can address the evaluative questions posed.	Is the research design of this study defensible and trustworthy, and linked to the study's research questions?	Dependability
		Goodness (Lincoln & Guba, 2000; Smith, 1993), integrity (Garman, 1994, 1996), fittingness or consistency
		Auditability, audit trail (Whitt, 1991), transparency of methods, participatory accountability (Shank & Villella, 2004)
		Confirmability (Lincoln & Guba, 1985)
		Reflexivity (Creswell, 2002) and transparency of researcher's ideas, or external reliability (LeCompte & Goetz, 1982)

Table 1

Guiding Principles and Specific Criteria used to Evaluate the Qualitative Nature and Methods of the Research

Guiding Principle	Guiding Question	Specific Criteria from Literature*
Rigorous in conduct through the systematic and transparent collection, analysis and interpretation of qualitative data.	Are the methods used to gather, analyse, interpret and present the data rigorous, systematic and transparent?	Openness Clarity Ethics
	- Gathering data	Referential adequacy
		Use of multiple sources, multiple voicing (Gergen & Gergen, 2000), fairness (Lincoln & Guba, 2000)
		Transparency of data gathering methods
		Thick description
	- Interpreting and analysing data	Primary interpretations are systematic
		Secondary interpretations are systematic
		Transparency of data analysis methods
	- Reporting the findings	Empathic neutrality (Patton, 1990, 2002)
		Verite' (Garman, 1994, 1996), fittingness

Table 1

Guiding Principles and Specific Criteria used to Evaluate the Qualitative Nature and Methods of the Research

Guiding Principle	Guiding Question	Specific Criteria from Literature*
Credible in claim through offering well-founded and plausible arguments about the significance of the evidence generated.	Are the findings credible and supported by evidence?	Peer debriefing, peer confirmability
		Participant debriefing, participant confirmability
		Consensus and coherence (Eisner, 1991)
		Theoretical validity (Maxwell, 2002), relevance (Mays & Pope, 2000)
		Descriptive validity (Maxwell, 2002), verisimilitude (Garman, 1994, 1996), investigative depth (Shank & Villella, 2004)
		Interpretive validity (Maxwell, 2002), interpretive adequacy (Shank & Villella, 2004)
Affective in nature by acknowledging the excitement associated with research discoveries, the emotional involvement of the participants and the enthusiasm of the researcher.	Do the research processes and findings communicate the emotional elements of how the participants and the researcher engaged in the research study?	Vitality and aesthetics (Garman, 1994, 1996)
		Sacredness (Lincoln & Guba, 2000) and sacred places (Richardson, 1997)

*Relevant criteria from the literature has been accessed from a number of sources (Eisner, 1991; Garman, 1994, 1996; Gergen & Gergen, 2000; Guba & Lincoln, 1989; LeCompte & Goetz, 1982; Lincoln & Guba, 2000; Maxwell, 2002; Mays & Pope, 2000; Patton, 1990, 2002; Richardson, 1997; Schofield, 2002; Shank & Villella, 2004; Smith, 1993; Stake, 1978; Stake & Trumbull, 1982; Whitt, 1991)

Contributory

As to how the research was contributory, the following specific criteria were addressed:

- The study's utility was considered by judging how the findings compared to previous research in the Discussion chapter.

- The transferability of this study to other similar contexts was ensured by providing enough rich description of the participants' beliefs and contexts were provided in order to enable readers to compare their own situation to the situation described in this thesis.

- The participants' general awareness (or ontological authenticity) of their own teaching or learning environment was enabled by encouraging them to consider their own educational beliefs in conjunction with their awareness of being a teacher or a student in a large metropolitan university.

- The reciprocity of the study was taken into account by ensuring that the participants benefited from being involved in the research.

Defensibility and Trustworthiness

To ensure the defensibility or trustworthiness of the research design, the following specific criteria were addressed:

- The fittingness between the study's intentions and methods was ensured by providing full documentation in this chapter of the procedures used throughout the study.

- The auditability of the study has been considered by providing an account of the data gathering and analysis methods throughout the thesis and appendices so that the research processes are trackable.

- The study's reflexivity has been upheld by providing mechanisms, such as the pre-study interview of the researcher and a researcher's journal, by which the researcher's ideas and personal biases were made transparent.

Rigour

To ensure the research was rigorous in conduct and used systematic and transparent data collection, data analysis and data interpretation methods, the following specific criteria were addressed:

- The openness of the study to alternative ways of viewing theories was demonstrated in the Literature Review (in which varied theories associated with teachers' and students' beliefs were examined), in the process of open coding used to analyse the participants' belief statements and by ensuring all stages of the research processes were presented in an open manner.

- The study's referential adequacy was taken into account by mechanically recording the data using tape recorders and electronic word processors. Data gathered from these sources were then treated systematically to reveal both teachers' and students' beliefs.

- Ethical conduct of the research was ensured by being vigilant about the privacy and dignity of the participants, by closely consulting with the participants throughout the research processes and by ensuring that all records were kept confidential and secure.

- Findings were reported with empathic neutrality, ensuring that the researcher continued to be empathic but non-judgemental about the data offered by the study's participants.

Credibility

To ensure the research produced credible claims by offering well-founded and plausible arguments about the significance of the evidence generated, the following specific criteria were addressed:

- The process of peer debriefing was adopted where I asked an informed colleague to confirm the credibility of the findings throughout and at the end of the data analysis processes.

- To further ensure the study's credibility, the participants in the study were also debriefed using a process of member checking where each participant was able to comment on the researcher's interpretation of each interview.

- Crystallisation of data (Richardson, 1997) was enabled through the analysis of both qualitative and quantitative data to ensure "multiple voicing" (Gergen & Gergen, 2000, p. 1025) of various research participants, including the voice of the researcher.

- Coherence of the findings was ensured by asking a colleague who was neither a qualified teacher nor an education student to read the final thesis in order to reduce the occurrence of unnecessary or jargonistic educational terminology.

- The investigation into the participants' beliefs was prolonged across a semester period to provide the participants with more than one opportunity to express their educational beliefs and, thus, to enhance the study's descriptive validity.

- The interpretive validity of the study was upheld by ensuring that the emic perspective of the participants was always sought: codes were labelled according to the participants' own words and participants' own definitions of educational constructs were sought.

Affect

As to how the research was affective in nature, especially in relation to the excitement associated with research discoveries, the emotional involvement of the participants and the enthusiasm of the researcher, the following specific criteria were addressed:

- To communicate the sense of intensity and excitement of discovery surrounding the research, the participants' own words were used throughout the research in order to ensure that the emotions in their voices were made as clear as possible to the reader.

- An account of the gestures associated with the participants' comments were also communicated in this thesis to convey the full intensity of the participants' intentions.

- The participants' use of metaphors was considered to be a vital way in which to portray the emotionality that was typically reflected in many of the participants' belief statements.

- The particularly emotional excerpts from the participants' comments were highlighted throughout the Findings and Discussion chapters to endorse the recurring theme of the perceived value of emotions in teaching and learning contexts.

Although most of the data gathered and analysed in the study were of an interpretivistic nature, and thus required judging in terms of the criteria of good qualitative research, the supporting data that were gathered and analysed in the study to crystallise and triangulate the qualitative data were judged in terms of quantitative research criteria.

Evaluating the Quantitative Research Methods

The data gathered as a result of administering the EBI generated the only set of quantitative data analysed in this study. This data represented the participants' level of agreement to varied belief statements and was measured on a five point scale. This instrument was evaluated in terms of the criteria of validity and reliability as described by Burns (2000) and Creswell (2002). Rather than applying these criteria to the entire study, as was required when evaluating the qualitative aspects of the study, the criteria of validity and reliability were applied only to the instrument which enabled the gathering of the quantitative data, the EBI.

Reliability

The reliability of a study can be described as the extent to which it consistently measures what it purports to measure. When applied to the evaluation of an instrument, such as the EBI, Burns (2000) explains the

concept of reliability as being synonymous with "dependability, stability, consistency, predictability and accuracy" (p. 336). The reliability of the instrument used in this study was ensured by considering the length of the inventory as well as the consistency of the participants' responses to each item on the EBI.

Since the results of the EBI were intended to be used for comparing and supplementing the participants' responses with the participants' interview transcripts, the attainment of a final score was not the purpose of the administration of this instrument. For this reason, the internal consistency of the instrument was the most relevant form of reliability considered to evaluate the quality of this data gathering method. Consequently, the reliability of the instrument was especially considered in terms of the consistency of the responses provided by the participants to the EBI's individual items. The internal consistency method of checking reliability was employed by calculating Cronbach's alpha reliability coefficient to determine the reliability of the EBI. Since no particular subscales were being focused upon within the instrument, Cronbach's alpha reliability coefficient was deemed the most suitable for calculating the reliability of this entire instrument (Burns, 2000; Creswell, 2002). When the original version of the EBI was tested for reliability during the pilot study, this instrument was shown to have a reliability coefficient of .85, which is above the .8 coefficient level recommended for indicating reasonable reliability (Bryman & Cramer, 1990). When the items that recorded the lowest reliability levels were either deleted or modified, the final version of the EBI reflected an improved reliability coefficient of .90. Full details of how this instrument was constructed are provided later in this chapter under the subheading *Construction of the Pilot Educational Belief Inventory (EBI)*.

Validity

Creswell (2002) suggests that, to be valid, a research instrument must first be reliable. With measures taken to ensure the reliability of the EBI as outlined above, the validity of the EBI was considered with Burns'

(2000) definition of validity in mind: "validity assesses whether the test measures what it claims to measure" (p. 360). Of all the different types of validity that are typically examined in quantitative studies, content and construct validity, with some attention to face validity, were considered to be the most appropriate criteria by which to judge the validity of the EBI.

Firstly, the content validity of the instrument was ensured by using previously trialled and tested items from a number of experts' belief inventories (see Appendix Three for the source of the EBI items). Creswell (2002) suggests that content validity is best ensured by asking a group of experts if the items on the instrument are representative of the area of interest. The content validity of the instrument was thus substantiated by gaining experts' input to the construction of the EBI by asking a selection of authors for permission to use a selection of items from a variety of existing belief inventories.

While also recognising the value of content validity, Burns (2000) suggests that construct validity is the most important type of validity. Construct validity relies upon whether or not the results of the instrument provide satisfactory operational definitions of the phenomena being measured. The basic constructs of teaching, learning and knowledge that were incorporated into the EBI were interpreted via the understandings represented by the experts whose belief items were used in the EBI.

Lastly, the face validity of the instrument, while also being ensured by incorporating experts' judgement in the form of existing belief items, was taken into account during the process of trialling and modifying the EBI during the pilot study. The instrument was judged as having a high level of face validity as each item was able to be clearly linked to the constructs of either teaching, learning or knowledge by the experts. Some items related to more than one of these constructs. To further enhance the face validity of the instrument, the original version of the EBI which had the two open-ended questions listed at the end of the scale, was modified so that these items were located at the very beginning of the scale to ensure that the

participants' responses to these items were not overly influenced by the terms used or topics addressed in the subsequent Likert-style items.

Data Gathering Methods

The data were collected during the second semester of 2002 using two main methods of data collection: semi-structured interviews and an EBI.

Semi-Structured Interviews

The semi-structured interview was chosen as one of the primary methods of data collection in this study as it enabled me to understand the situation from the perspective of both university teachers and students, and also satisfied the criteria of defensibility and trustworthiness in qualitative research. Since I was intent on gaining as deep an understanding of the participants' beliefs as was possible, I took the advice of Fontana and Frey (1994) who describe interviews as "the most common and most powerful ways we use to try to understand our fellow human beings" (p. 361). Described as "the best of both worlds" (Freebody, 2003, p. 133), semi-structured interviews allow for some core issues to be addressed as well as providing opportunities to explore issues that arise as the interview progresses. This type of interview provided me with the opportunity to understand and identify the participants' educational beliefs and then to compare them, thus providing answers to the two main research questions in the study.

Advantages of Semi-Structured Interviews

The particular advantages of interviews in the context of this study of educational beliefs were considered in light of the processes required to investigate the participants' beliefs. Tashakkori and Teddlie (1998) also recommend the interview as a most appropriate data collection method when an in depth knowledge of issues is needed. The advantages of face-to-face interviews are explained by Taylor and Bogdan (1984) as being useful in developing rapport with participants, ensuring the participants' point of view is accessed, allowing the participants to use their own language and encouraging the interviewee to be an equal participant in the research

process. Semi-structured interviews were also flexible enough to allow time to explore unexpected digressions or "allow some latitude in the breadth of relevance" (Freebody, 2003, p. 133).

Rather than being bounded by measuring instruments designed according to expected categories and constructs, the interviewing situation enabled me to gain a more emic understanding of the participants' thoughts and beliefs. Furthermore, since the interviews explored some of the very personal beliefs of each interviewee, this style of interview was considered appropriate due to its likelihood of being able to foster a conversational flow of information between the researcher and the participant: "Such interviews which are conversational in style rather than based on a fixed schedule of questions, are natural extensions of the social relationships established in the course of participant observations" (Burns, 2000, p. 264). To achieve this natural, conversational tone in the interviews, the selection and design of questions were considered as starting points of the interview but the structure still allowed for the participants' interests to be explored in addition to the direction suggested by the interviewer's questions.

Two types of interviews were planned for the first phase of this research project: one pre study interview followed by a set of interviews with the teacher and student participants throughout the semester. Each interview was audio taped for the purposes of producing transcripts for content analysis.

Pre-Study Interview with the Researcher

To ensure the defensibility and trustworthiness of the data, I was interviewed as a co-participant in the study by my supervisor before the main interviews with the teacher-participants and student-participants began. The main purpose of this interview was to provide a transparent description of the main research instrument used in this study, the researcher. Rather than attempting to reach an unattainable level of author objectivity or detachment, the "positionality" (Lincoln, 1995, p. 280) of the researcher was thus featured in the research process and contributed to explaining the context of the study. Berg (1998) and Knoblauch (2004)

recommend the use of such processes so as to locate the researcher's position within the framework of the research study and to, consequently, enable the researcher to reflexively contemplate how his or her own beliefs influence their research.

This interview enabled my general views as a researcher and my specific educational beliefs to be made transparent to myself as well as to the reader of this thesis. The intended interview questions that had been planned for use in the interviews with participants were also trialled. Subsequently, the intended data recording and analysis methods were also tested during and after this interview, in preparation for the following interviews with participants of the study. As such, this pre-study interview ensured the reflexivity of the study by clarifying my beliefs as a researcher.

An analysis of the interview revealed that my educational beliefs about teaching and learning were primarily focused on how such processes transformed the learner's cognitive and emotional state. Many of my beliefs also focused on the role of knowledge in teaching and learning processes. Instead of considering the wider social ramifications of teaching and learning processes, most of my beliefs about teaching tended to be linked to how these beliefs influenced individual learners or groups of learners. My beliefs were found to reflect more of an individualistic, rather than a communalistic, view of teaching and learning. To use Pratt et al.'s (2001) dimensions of teaching, an analysis of my interview showed that I was more concerned with nurturing and developmental aspects of learning, rather than social reform or knowledge transmission. These aspects of my beliefs had an impact on the study since they were also evident in the researcher's journal that I kept throughout the research process (see *Researcher's Journal* later in this chapter) and naturally influenced my interpretation of the data gathered during the study. For example, when coding the data, I was particularly aware of the varied meanings implied by the participants' statements about how learning involved processes of change or growth.

The interview questions that had been prepared for use in the study were slightly modified as a result of this interview. Instead of continually

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using the terms "beliefs", "conceptions" and "perceptions" in the questions, I extended these terms to also include "ideas about" and "thoughts on" in order to reduce the educational jargon that was inherent in some of the original questions. Additionally, instead of primarily focusing on questions that were purposely seeking out the participants' educational beliefs about teaching and learning, teachers and students, the outcome of this interview also indicated the benefit of including questions which provided the participants with opportunities to link some of these terms.

In addition to reifying my own educational beliefs and providing some feedback about the questions I had planned to use in the ensuing interviews with participants, the analysis of the interview illustrated that manual data coding would prove unwieldy with large numbers of interview transcripts. As such, the experience of coding the data from this pre-study interview caused me to consider using a software program to assist in coding the interview and textual EBI data.

Lastly, this pre-study interview process highlighted the value of ensuring that each semi-structured interview was characterised by a natural informality that promoted an atmosphere that encouraged the participants to express their own beliefs about various issues that were beyond the focus of the research questions. As a result of this interview, I could see the value of incorporating time within each interview to explore some of each participant's particular educational interests and their beliefs that digressed from the actual planned questions.

Interviews with the Participants

The foremost purpose of all of the interviews was to identify the main educational beliefs held by both the teacher and the students in each of the five classes (Research Question 1), so that these beliefs could be compared during the analysis phase of the research (Research Question 2).

The teacher-participants and a few student volunteers from each class were interviewed two or three times throughout the semester. This involved interviewing 16 participants which equated to 46 interviews in all,

15 of which were with teachers and the remaining 31 interviews were with students. Multiple interviews were conducted in order to provide the participants with a number of opportunities to express their beliefs. Also, since I anticipated that different issues would influence the students and teachers at various stages of the semester, I decided to stagger their interviews to capture their ideas at three stages during the semester. As was expected, the participants tended to express more beliefs about the value of assignments and examinations in the later interviews, whereas they tended to focus their belief comments on the effective practices and expectations of their teachers or students in the earlier interviews. The interviews took place at the beginning, middle and end of the semester and provided the bulk of the data that were analysed throughout this study. Table 2 provides an account of the participants, using pseudonyms, and when they were interviewed during the semester:

Table 2

Interviews Conducted Throughout the Semester

Class	Participant	Interview 1	Interview 2	Interview 3	Total
1	Teacher	Morris	Morris	Morris	3
	Student 1	Shane	-	Shane	2
	Student 2	Lionel	Lionel	Lionel	3
2	Teacher	Hilary	Hilary	Hilary	3
	Student 1	Peter	Peter	Peter*	3
3	Teacher	Joseph	Joseph	Joseph	3
	Student 1	Anne	Anne	Anne	3
	Student 2	Trish	Trish	Trish	3
	Student 3	Tom	Tom	Tom	3
4	Teacher	Walter	Walter	Walter	3
	Student 1	Kiarn	Kiarn	Kiarn	3
	Student 2	Kent	Kent	-	2
5	Teacher	Dimitri	Dimitri	Dimitri	3
	Student 1	Therese	Therese	Therese	3
	Student 2	Marika	Marika	Marika	3
	Student 3	Zoe	Zoe	Zoe	3
Total		16	15	15	46

*Phone interview

The teachers were typically interviewed in their university offices whereas the students usually opted to have their interviews conducted at an on-campus location throughout the study. In one case, due to Peter's work commitments, I conducted his final interview over the phone (identified with an asterisk in the Table 2). To ensure the participants' anonymity, their original names have been substituted with pseudonyms.

Each interview lasted between 20-40 minutes and was audio taped for transcription purposes. Interviews were extended to allow the participants to express their ideas about general problems, in addition to their educational beliefs. In such cases, whilst realising that I was not in a position to provide specific advice, I tried to be an empathetic listener for the

participants, providing them with an avenue to express their frustrations and excitement about their studies or teaching experiences. This empathic neutrality (Patton, 1990, 2002) is advocated during the data gathering period.

A set of interview questions provided the basis of the discussions that took place during these interviews. Questions such as "What do you believe happens during the learning process?", "How would describe the qualities of a good teacher?", "How would you describe yourself as a learner?" and "In your opinion, what are the main differences between teaching and learning?", were included. A full account of these questions is provided in Appendix One: Interview Questions. These questions were mainly open-ended in nature to encourage the participants to explain their beliefs, understandings of and attitudes to teaching and learning, including their beliefs about effective teachers and effective learners. Such questions were designed to provide opportunities for discovery. These open-ended questions further ensured that the participants' views were collected in their original format which reflected their own view of reality and an emic understanding of the situation. An interview with open ended questions "permits greater flexibility than the close ended type and permits a more valid response from the informant's perception of reality" because "the only person who understands the social reality in which they live is the person themselves" (Burns, 1994, p. 279). By using open ended questions, the world of the research participant becomes more obvious and accessible to the researcher:

> The open-ended responses permit one to understand the world as seen by the respondents. The purpose of gathering responses to open-ended questions is to enable the researcher to understand and capture the points of view of other people without predetermining those points of view through prior selection of questionnaire categories (Patton, 1990, p. 24).

The first, second and third semi-structured interviews that took place with each participant across the semester were slightly different in nature. Because the interviews were designed to gain an in-depth understanding of the participants' beliefs, some of the questions used in the earlier interviews

were also used in some of the latter interviews. However, a few new areas were introduced by me or by the participants themselves as the semester progressed, in order to be more responsive to the participants' interests and the stage of the semester. Furthermore, the final interviews typically included conclusion questions such as "What do you consider to be your strongest belief about teaching?" in order to encourage the participants to summarise the beliefs they had expressed during the semester.

In addition to audio-taping and transcribing each interview, as the researcher, I composed written interview summaries and made observational notes about the interviews to provide a full contextual background to each interviewing incident.

Interview Summaries and Notes

At the close of each interview, I constructed a one page interview summary that provided a short account of the main beliefs expressed by the participant who has been interviewed. These one page summaries were used as member checks by providing the participants with a debriefing opportunity soon after each interview took place or at the beginning of their following interview. Each participant checked and modified these summaries in order to validate my interpretations. The participants typically took this request very seriously and carefully examined this documentation in light of their own beliefs. In all cases, the participants expressed an appreciation about being asked to be involved in the research in this way. Of the 46 interviews conducted, only two participants requested a few minor changes to the summaries. These summaries then became a method by which to supplement the interview data with the data generated by the administration of the EBI.

I also made notes at the end of each interview to record the contextual details of the interview and to complement the interview transcripts and summaries. These records provided such details as the mood of the participants at the time of the interview, their use of various gestures and the energy, emotion or apathy expressed in conjunction with some of their beliefs. These contextual details were not always evident in the

interview transcripts or summaries. These notes assisted my later analysis of the interview data and further ensured that I took account of the participants' affective and cognitive thoughts about educational beliefs.

Educational Belief Inventory (EBI)

Although the primary data used in this study were represented by the interview transcripts, an EBI was also used to substantiate and supplement the collection of qualitative data. The choice of this type of instrument was also linked to the research questions upon which the study is based. The participants' responses to the EBI items provided information which enabled me to identify which belief items the participants either agreed with, disagreed with or were neutral about (Research Question 1). Such data was then compared to ascertain the levels of similarity or difference that existed between the beliefs of the teachers and the students in the study (Research Question 2).

The research instruments that have been used in the belief studies to date have primarily been designed with the intention to investigate and measure either teachers' *or* students' beliefs about teaching *or* learning. A number of these instruments have been customised to suit particular groups, such as preservice teachers (Nottis et al., 2000), or specific purposes, such as the measurement of teacher beliefs about instructional media (Lawless, 1995). They include, for example, Schommer's Epistemological Belief Questionnaire (Schommer, 1998) and Prosser and Trigwell's Perceptions of the Teaching Environment Inventory (Prosser & Trigwell, 1997). Many of the instruments used in such studies are carefully-designed tools, characterised by robust theoretical bases and offer the benefit of having been trialled, tested and improved through continuous use. However, no known instruments appeared to be available that were suitable for both teachers and students that were able to measure the level of congruence between the educational beliefs of these two groups.

Since this study's purpose was to investigate teaching and learning beliefs in a broader context, the study required an instrument that was constructed for this specific purpose – one that both teachers *and* students

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could use and one that incorporated items about both teaching *and* learning beliefs. A select number of researchers who had designed a range of existing tools used in previous belief studies gave their permission for elements of these instruments to be incorporated into the EBI which was designed, trialled and modified purposely for this study.

Construction of the Pilot Educational Belief Inventory

The pilot version of the EBI consisted of 54 items including 52 Likert-style items and two open-ended items. The Likert-style items were presented as belief statements, beginning with the words, "I believe …" and participants were requested to record their level of agreement, disagreement or neutrality with each item using a 5-point scale. Eight items were created specifically for the instrument whereas a number of researchers gave permission for the use of items from their own previously constructed instruments (Evans, Ellett, Culross & Loup, 1993; Gow & Kember, 1993; Kember & Gow, 1994; Nottis, Feuerstein, Murray & Adams, 2000; Prosser & Trigwell, 1997; Schommer, 1998; Young & Shaw, 1999). See Appendix Three for a description of the source of these items. The open-ended items were placed at the end of the EBI and requested participants to complete two unfinished statements: "I believe effective teaching is …" and "I believe effective learning is …". Due to the exploratory nature of the study, the EBI items were not categorised into subscales but all items were based on concepts associated with educational and epistemological beliefs, and especially focused on the nature of teaching and learning. As such, the instrument was constructed to enable a basis of comparison of the beliefs held by the participants about a range of educational statements rather than a range of particular constructs. Thus, since the instrument was not designed with the intention to analyse the participants' beliefs about the inherent constructs in the instrument, factor analysis was not undertaken

Administration of the Pilot Educational Belief Inventory

A total of 19 trial participants volunteered to complete the pilot instrument, including seven university teachers and 12 university students with each volunteer taking about 10 minutes to respond to all of the items.

To increase the validity of the administration of the instrument, I directly observed the participants' behaviour and noted their verbal comments as they recorded their responses on the EBI (Burns, 2000). The Cronbach's alpha reliability coefficient was employed to measure the reliability of the pilot EBI (Burns, 2000; Creswell, 2002).

Construction and Implementation of Final Educational Belief Inventory

The final EBI consisted of 46 items including two open-ended items and 44 Likert-style items. Space was provided at the beginning of the inventory for the participants to respond to the two open-ended items. Participants were then requested to select a level of agreement or disagreement on a 5-point Likert scale to represent their response to the 44 belief items in the inventory ranging across the following categories: "strongly disagree"; "disagree"; "neither agree nor disagree", "agree" and "strongly agree". The EBI was administered to the students and teachers of five university classes at the beginning and the end of Semester 2, 2002. A copy of the final EBI that was administered in the study is located in Appendix One, together with the source of each of the questions in Appendix Two. The number of students and teachers that completed the EBI on these occasions are outlined below (Table 3).

Table 3
Numbers of Teachers and Students who Completed the EBI

| Class | Beginning of semester | | End of semester | |
	No. of teachers	No. of students	No. of teachers	No. of students
1	1	17	1	17
2	1	17	1	11
3	1	14	1	9
4	1	21	1	18
5	1	23	1	20
Total	5	92	5	75

The 97 participants, 5 teachers and 92 students, that completed the EBI at the beginning of the semester (EBI-1) and the 80 participants, 5 teachers and 75 students, who completed the EBI at the end of the semester(EBI-2), were made up of 77 matched pairs of participants (5 teachers and 72 students). There were three extra students who completed the second EBI at the end of the semester who did not complete the first EBI, and 20 students who completed the first EBI but did not complete the second one. There was one EBI that was discarded due to a suspicion that the responses were nonsensical. In this case, the responses formed perfect diagonal patterns across the EBI page rather than representing a typical random appearance of other completed EBIs. Based on the responses of the participants who took part in the study (100 participants completed 176 EBIs in total), the reliability coefficient was .85 overall.

Reflection on the Development of the Educational Belief Inventory

The manner in which the participants completed both the trial and the final EBI indicated that the process of personal reflection about one's own educational beliefs is a challenging, and sometimes confronting, experience. Whereas some participants appeared to enjoy completing this instrument, as was evident by their smiles and relaxed manner, or were not perturbed by it, other participants found the experience disconcerting, judging by their physical unease and, in some cases, angry verbal comments and facial expressions.

The course of action adopted from the initial construction and trial of the pilot EBI through to the construction and implementation of the instrument in its final form was a process which was primarily driven by the overall intention of the research study – to identify university teachers' and students' educational beliefs and to investigate the links between their beliefs. At first, adoption of the traditional use of subscales within the EBI was considered, but consistently decided against in preference for a less deterministic layout that was more in tune with an exploratory investigation. Lastly, the inclusion of both open-ended and Likert-style items in the EBI allowed for the collection of data which incorporated

participants' original belief statements with their opinions about existing belief items.

Participants' Reflective Journals and Researcher's Journal

A researcher's journal was kept by me throughout the entire study. Starting off as a paper based booklet that I used in the first months of the study, I soon converted the journal into an electronic document for ease of use and to facilitate more convenient searching, tracking and linking of ideas. The participants were also encouraged to keep a weekly reflective journal throughout the data gathering period to record their thoughts about their own educational beliefs as they progressed through the semester.

Participants' Reflective Journals

The same research participants who were interviewed during the study were requested to make journal entries to enable me, as the researcher, to access their emic perspective on familiar, practical teaching and learning episodes in which both groups of participants were involved. The participants were asked to spend approximately 10-15 minutes to record their thoughts about teaching and learning at the closure of their weekly classes in response to questions such as "How do you believe your lecturer or tutor helped you learn this week?" or "How did you help your students learn this week?"

Although five teachers and eleven students were requested to keep these journals, less than half of the participants successfully completed them. Since these records were so intermittent and tended to include the same ideas that the participants offered during their interviews, the data generated from the journals were not formally analysed.

Researcher's Journal

In order to ensure that I continually reflected upon my own beliefs, I also kept a daily journal throughout the study which provided me with a location to consider, document and track my own beliefs in relation to the beliefs expressed by the participants. This journal enabled me to keep memos to record the analysis process and theoretical notes about the

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findings that gradually emerged from the analysis process (Strauss & Corbin, 1998). This process ensured my reflexivity as a researcher by enabling me to clarify and compare my beliefs with the beliefs expressed by the participants (Berg, 1998). This clarification became especially important during the data analysis phases of the study by ensuring that I could bracket my own beliefs, as identified in the pre-study interview and this journal, while interpreting the data so that the data analysis did not just become a record of my own reflections on the participants' beliefs. This journal also facilitated conversations with informed colleagues who provided feedback about confirming or modifying my data interpretations.

After each of the interviews and after each administration of the EBI, I also used the researcher's journal to make notes about the context of these occasions to support subsequent data analysis. I made special notes if I observed that one class or one group of participants tended to spend an extra long time completing the EBIs, or if participants displayed obvious signs of discomfort, happiness or other strong emotions. For example, some of the participants continuously pulled their hair or rubbed their foreheads during interviews when they were expressing or thinking about their beliefs. On the other hand, some participants appeared very happy when having someone listen to their beliefs about teaching and learning. Some even hugged me during or at the end of the interview. In a few cases, the participants were moved to tears when they recounted a story in which they elaborated on some of their beliefs, especially when explaining positive or negative examples of how they had been treated as child-learners. Such strong emotions also surfaced when the participants described an incident when they, or their students, had been either encouraged or discounted as an adult learner at university.

Keeping this journal also provided me with a means to record my hunches, surprises and ongoing interpretations of the data as it was being gathered. At the close of the data gathering period and during the later analysis phases, the journal provided me with opportunities to document my realisations about some of the findings that were gradually being revealed.

Subsequently, the journal provided me with a method which enabled me to compare and track my interpretations as I analysed more and more data. In some cases, my interpretations and analysis of the data had reached a point where similar findings were repeatedly being revealed and the researcher's journal proved to be useful in corroborating these observations. Strauss (1987) recommends that when such a point of saturation is reached, coding and analysis of the data becomes speedier and more systematic.

Data Analysis Methods

The data gathered during the study were analysed to determine the answers to the two main research questions which were focused on identifying and comparing the educational beliefs held by the university teachers and students who took part in this study. The main sources of data gathered throughout the study included:

- Transcriptions from verbal semi-structured interviews with the researcher and the participants;

- The participants' responses to open-ended EBI items;

- The participants' responses to Likert-style EBI items;

- The researcher's interview summaries and notes; and

- The researcher's journal.

The main qualitative data from the study represented the bulk of the data and were comprised of the interview transcriptions and the written responses to the open-ended EBI items. These data were systematically open coded and analysed to determine, and subsequently compare, the educational beliefs held by the teachers and students in the study. Findings from the fine grained or minute analysis of this data were triangulated with findings from more general analyses of the qualitative data gathered from the researcher's journal, interview summaries and interview notes.

The quantitative data in the study were made up of the participants' responses to the Likert-style EBI items. Although the EBI was administered at the beginning and end of the semester, the participants' responses to the

second EBI were interpreted as representing their current beliefs since these were the most recently reported. Lastly, the findings from an analysis of the qualitative and quantitative data were considered concurrently to determine where each set of findings either supplemented or substantiated the other.

In order to answer the first research question about the identification of the participants' beliefs, the entire group of participants, including all five classes, were considered *en masse*. To answer the second research question about the comparison of the teachers' and students' beliefs, the participants were considered at an individual level within their five classes so that the individual teacher's beliefs could be compared to the beliefs of the students in their class. The second question was also answered by comparing all of the teachers' beliefs with all of the students' beliefs in the study. Since the number of students in the study (95 students) outnumbered the number of teachers in the study (5 teachers), non-parametric statistics were used where appropriate for comparison purposes.

Although the following sections in this chapter are presented under distinct and linear headings, the data analysis process was not linear and began in earnest soon after the first piece of data was collected. This enabled me to make continual theoretical notes to link the data with previous literature and to note my own progressive observations of various patterns that emerged from the data. Such a process particularly facilitated the minute analysis (Strauss, 1987) of the qualitative data.

Qualitative Data Analysis Methods

The qualitative data in the study were systematically open coded in order to identify and construct the themes that represented the participants' belief comments, adopting a process similar to inductive analysis. The participants' belief comments were identified from interview and EBI data as those statements that typically began with phrases such as "I believe …", "I really think that …", "When it comes to teaching, I reckon …" or "I consider that effective learning involves …". These phrases were often found

at the beginning of the participants' responses to questions about their beliefs about effective teachers, learners, teaching and learning.

This process of open coding the participants' belief comments was chosen in order to establish the major themes present in their beliefs as well as to ascertain the patterns among their statements (Freebody, 2003) by establishing the frequency and the topics reflected in their beliefs. Strauss and Corbin's (1998) suggestions about the process of open coding guided the process used to code the data gathered in this study. They describe open coding as "the analytic process through which concepts are identified and their properties and dimensions are discovered" (Strauss & Corbin, 1998, p. 101). During this process of coding, the data revealed a set of themes, sub-themes and sub-theme categories which were used to examine and classify the participants' various beliefs. The processes used to analyse the qualitative data are now outlined.

Initial Examination and Preliminary Coding of the Qualitative Data

To begin the open coding process, Strauss (1987) recommends that the researcher "ask the data a specific and consistent set of questions" (p. 30). These questions were primarily guided by the research questions upon which this study is based. An initial examination of the data substantially impacted on the direction and focus of the study. In addition to identifying and comparing the teachers' and students' beliefs, the original intention of the study was also to investigate how their beliefs changed throughout a period of one semester and how the teachers and students were able to construe each other's beliefs. The original set of research questions included the following:

- What are the educational beliefs of university teachers and university students?

- How similar are the educational beliefs of university teachers and university students?

- How did the educational beliefs of university teachers and university students change across a semester period?

- How were the teachers able to construe the educational beliefs of their students and how were the students able to construe the educational beliefs of their teachers?

However, the initial stages of data analysis revealed information that influenced my decision to reduce the scope of the study. The data that was collected purposely to identify the participants' beliefs reflected far more complexities and diversity than was originally anticipated. Moreover, this data also suggested some variations from the theories found in current literature about university teachers' and students' beliefs. While obviously requiring further analysis, these discrepancies also intimated different and more varied constructs than had previously been suggested in the contemporary belief literature. Consequently, due to the complex nature of the beliefs expressed by the participants in the study, the comparison of the teachers' and students' beliefs, which relied upon the identification of their beliefs, also became a more complex analysis procedure than was initially expected. So, to ensure that the subsequent data analysis processes were manageable and credible, the original four research questions were reduced to the first two research questions listed above.

Decision to Use Software Program for Data Management

The role of computer technology during data gathering and analysis processes qualitative research has been recognised as a way in which communication processes within research studies are emphasised and by which data can be managed (Ball & Lampert, 1999; Knoblauch, 2004; Strauss & Corbin, 1998; Weitzman, 2000; Weitzman & Miles, 1995). However, such authors are careful to advise that, although such computer software programs can assist in the management of the data analysis process, they are not able to analyse the data *per se*.

Because this study was intended to be more exploratory than confirmatory in nature, and in consideration of how complex and diverse the

data appeared in this initial examination, a data management software program was required to assist the subsequent coding and analysis processes. I required a program that had the capacity to manipulate large quantities of electronic textual data minutely (Strauss, 1987) for the intense purpose of revealing underlying patterns and trends. Because I expected the coding process to allow for the gradual emergence of additional codes and categories, I also required a program that would allow for iterative manipulations and modifications of these classifications. These reasons, as well as the management difficulties I had encountered with previous manual data coding, influenced my decision to select a data management software program that had screen coding capabilities and supported automated code revision practices (Weitzman & Miles, 1995). At the time, the most appropriate software tool available that fulfilled these requirements was QSR NUDIST 6.0.

Substantive Coding of the Qualitative Data

Once an initial exploration of the data had been undertaken, followed by the decision to use the QSR NUDIST 6.0 software as a means to manage the data electronically and to enable content analysis of the data, the substantive data coding began.

Substantive coding of each relevant piece of data.

The provisional classification of the qualitative data involved assigning codes, in the form of words or small phrases, to each of the textual elements of the qualitative data which represented the participants' educational beliefs. Instead of relying upon coding labels from either the researcher's belief framework or from current educational theory, this process of coding enabled me to open the investigation as widely as possible (Berg, 1998). Purdie, Hattie and Douglas (1996) also recognise the advantage of this process of open coding: "Although we recognised the impossibility of banning completely from mind any preformed notions of possible categories, the aim of this type of analysis is to remain as open as possible to the meanings intended by the respondents" (p. 92).

This system of open coding was favoured above and beyond a top-down application of predetermined constructs because it allowed for the use of many *in vivo* codes (Strauss, 1987; Strauss & Corbin, 1998). So, in most cases, the labels of the codes directly reflected the wording of the participants' verbal or written comments. However, although mainly *in vivo* codes were used to label each piece of data, the names of some codes were also drawn from commonly recognised constructs in the belief literature. Some textual elements were assigned more than one code when the meaning of the participants' comment related to more than one area.

Discarding some codes.

This first stage of open coding produced a set of codes, some of which were attached to many of the participants' belief comments whereas other codes were only linked to a few of their comments. Unless the participants felt very strongly about a particular comment or the comment represented a topic that had not yet been represented in the contemporary belief literature, some of the less significant codes were discarded. In order to ensure that the process of discarding such codes was systematic, the decisions to discard certain codes (and the data associated with these codes) were guided by the following criteria, two of which noted the qualitative nature and one of which recognised the quantitative nature of the codes:

> **Qualitative criteria 1**: If codes were deemed important by the researcher, despite occurring infrequently within the data, then they were included in the final code collection. Such codes may have been considered as being important if they were aligned with recurring themes in the literature or they may have been codes that represented new themes that had not yet been reported, or had rarely been reported, in the literature.

> **Qualitative criteria 2**: The significance of the belief codes were considered in terms of the range of participants who mentioned the beliefs represented by these codes. For example, if one code was represented by only five comments but these were all from different participants, this code was considered more important than a code that was represented by five comments from the same person. Similarly, if a spread of students and teachers mentioned the belief, this would be considered important.

Quantitative criteria: If codes were represented by less than 10 comments out of a total of 11 488, the beliefs expressed in these codes were considered to be less important, and therefore not necessary to report in depth.

Classification of codes into categories.

Once certain codes were discarded, the coding process focused on categorising the remaining codes in order to determine the underlying themes in the data in the form of a "coding frame" (Berg, 1998, p. 238). Similar or related codes were grouped together to form categories. Just as the codes had been labelled as much as possible to reflect the participants' own vocabulary, so too, the names of each category were primarily derived from the participants' own words.

These categories were further named and renamed, extended and collapsed, and structured and restructured in order to authentically reflect the information in the data being coded. To reduce repetition within the final coding structure, a number of very similar codes were merged. This process of sorting and resorting the codes is similar to the process of axial coding (Strauss, 1987; Strauss & Corbin, 1998) which takes place after open coding has been completed. During this process of successive reorganisation and categories of the codes, a number of patterns emerged. An example of this process follows.

An example of the coding process.

This example illustrates the coding process whereby some of the raw data were coded using an open-coding approach. These codes were then grouped along with other similar data and these groups of codes formed categories. Some of these categories were then linked to other categories while others were merged together due to their parallel references. Patterns within these categories emerged and formed themes, sub-themes and sub-theme categories which, in turn, formed the major thematic framework within which much of the study's outcomes have been reported.

Table 4 shows some of the raw data in conjunction with the assigned provisional codes, as well as who expressed the beliefs and whether they

were broadly related to teaching, learning or both teaching and learning. In many cases, *in vivo* codes were used to reflect the participants' choice of words.

Table 4
Initial Codes Allocated to Raw Data

Participants' Comments (Raw Data)	Belief expressed by teacher or student	Belief about teaching or learning	Provisional Code/s
I believe effective teaching is initially giving the students the resources and tools and then moving to a hands-on approach.	Student	Teaching	Giving students resources/ Hands-on approach
I believe effective learning is when you have good learning resources, whether that be a good textbook, good lecture notes or good teaching.	Student	Learning	Using learning resources/ Examples of learning resources
As a teacher it is your duty to make the most of time and resources to provide or facilitate an education which allows for difference and excellence.	Student	Teaching	Teachers using resources/ Facilitate learning/ Teacher's duty Catering for difference
Effective teaching is providing opportunities and suggested resources for students to engage in meaningful activities which challenge their current knowledge and understanding.	Teacher	Teaching	Teachers suggesting resources/ Challenge students' current understanding/ Providing meaningful activities
The slides are helpful because he can go the step by step procedure.	Student	Teaching	Types of useful resources/ Technological resources/ Procedural teaching

Table 4
Initial Codes Allocated to Raw Data

If I actually draw something - if I actually get involved in actually creating my own interpretation of something.	Student	Learning	Creating own interpretation
I believe effective learning is when you have good learning resources, whether that be a good textbook, good lecture notes or good teaching.	Student	Learning	Types of useful learning resources
I think it [using technology in their learning, specifically PowerPoint] helped them to organise their thinking so that they could present it publicly, so they had to understand it and then - and then present it succinctly, you know, in five points per slide, whatever it might have been,	Teacher	Learning	Types of useful learning resources/ Technological resources
So you use different - a range of media and you can use different forms in your teaching whether it be lecturing or the tutes.	Teacher	Teaching	Types of useful teaching resources/ Technological resources
And I'd listed - listed the websites and they had to choose one, and the Blackboard [online courseware] allowed you to save weekly notes and resources for each particular task and so it was - it was nicely structured.	Teacher	Learning/ Teaching	Types of useful learning resources/ Technological resources/ Provision of resources/ Structuring material

These provisional codes were then considered in terms of their relationship to each other. Within this set of participants' beliefs, two broad categories about resources emerged, including:

- beliefs about teaching resources; and

- beliefs about learning resources.

Within these two broad categories, other sub-categories were revealed including:

- beliefs about the provision of learning resources by teachers;

- beliefs about the use of learning resources (including technological resources) by students;

- beliefs about the use of teaching resources(including technological resources) by teachers; and

- beliefs about students creating resources during the process of learning.

Since many of these beliefs were dual coded as relating to other topics besides resources, these data links were documented within the overall coding structure. In terms of the participants' resource focused beliefs, coding labels were refined to reflect the nature of the participants' beliefs and some beliefs were merged to combine parallel views. Because the participants' beliefs about teaching resources were clearly related to their beliefs about learning resources, in both nature and structure, these two sets of beliefs were presented alongside each other.

Finally, the structure reflected in this set of beliefs about teaching and learning resources contributed to the formation of the overall thematic structure that emerged from coding all such raw qualitative data, as outlined in Table 5. More details of this process are outlined in the following chapter.

Table 5

Resource Focused Beliefs about the Processes of Teaching and Learning

Nature of Belief	Beliefs about Teaching	Beliefs about Learning
Provision/Use of resources for learning	Teaching involves providing students with resources for learning (texts, other material, teacher as resource, computerised resources).	Students use and interact with resources in the learning process (texts, other material, teacher as resource, other students, experts, computerised resources).
Using teaching resources	Teaching involves using communication and presentation resources for teaching.	-
Students create resources	-	Students create documents, notes, electronic files and resources in the learning process.

Emerging patterns.

Once all of the relevant qualitative data had been assigned codes and associated categories, some patterns began to emerge. From this point, both the structure of the codes and the participants' actual comments could be interpreted and analysed (Berg, 1998). In order to identify the underlying themes within and across these codes and categories, I attempted to determine the links, similarities and trends between these codes in order to detect the overall emerging themes in the data. These processes have been outlined in the above example where the participants' beliefs about teaching and learning resources were coded and categorised.

Although my expectations, primarily informed by the belief literature, were that the participants would have had different beliefs about teaching and learning, and teachers and students, the coding and subsequent categorisation process indicated that their beliefs about these areas were remarkably similar and not always distinct. Likewise, my assumption that the teachers in the study would have had quite different beliefs from the

students in the study, or at least would have expressed beliefs about different subjects from the students in the study, was also contradicted by the process of coding the data. An analysis of the data suggested that, instead of being a study that focused on the differences between teachers' and students' beliefs, the research became an exploration of the similarities between the beliefs of these two groups.

Many of the participants' comments required double coding in that their educational belief comments were not only related to either their beliefs about teaching or their beliefs about learning. In many cases, some of their statements embodied their beliefs about both teaching and learning. Additionally, participants themselves also noted the links between teaching and learning, and often commented on the lack of difference between these two concepts. Thus, the need to separate the participants' belief comments about teaching from their belief comments about learning became more and more redundant. Because of this obvious trend that emerged from the coding process, the participants' beliefs about teachers and students, are presented alongside each other in this thesis. Likewise, their beliefs about the teaching process and the learning process are also grouped together. This structure continues throughout the Findings and Discussion chapters despite the divided use of these two concepts in much historical and contemporary educational literature.

Also informed by much of the belief literature, especially the research on teaching and learning conceptions, my expectation that many of the participants' beliefs would be easily categorised within hierarchies was also challenged. Although some of the participants' beliefs did reflect some aspects of these hierarchies, the same participants' beliefs were also aligned with other levels within the same hierarchies. Such coding indicated that the beliefs of some participants tended to be less hierarchical than previous research suggests since they concurrently held what I regarded as both naïve and complex beliefs about particular topics.

Another trend which emerged from the coding and categorisation process indicated that the participants' beliefs about teaching, learning and

knowledge were not always distinct, although these constructs were represented by discrete items in the EBI and other belief inventories. Instead, the participants' beliefs about knowledge were dispersed throughout their general educational beliefs about teachers, students, teaching and learning. This pattern reflects Hofer and Pintrich's (2002) supposition that an individual's epistemological beliefs should not be viewed as being separate from their learning and teaching beliefs.

As well as noticing that the participants' beliefs repeatedly reflected epistemological themes, the coding process also revealed that many of the participants were highly aware of the emotional and social elements of teaching and learning processes. Although these elements have been discussed at length in the field of educational psychology and social constructivism, such elements have not always featured strongly in the belief literature, which has tended to focus on individuals' beliefs about the cognitive aspects of teaching and learning. However, from the moment I began gathering data, the participants' inclusion of emotional and social comments in conjunction with their educational beliefs was unmistakeable and featured strongly across many of their beliefs about a wide range of topics. This observation was further confirmed by the participants' tendency to demonstrate strong emotions when discussing their educational beliefs.

As well as noting that the participants' sensitivity to the cognitive, social and emotional elements of teaching and learning, the process of coding their beliefs also uncovered a layered awareness of issues related to themselves, as well as issues related to their educational institution, their local community and the wider society. In this way, their beliefs represented a multi-tiered awareness of how teaching and learning impacted on individuals as well as acknowledging a wider frame of reference.

Final thematic structure.

Despite these varied patterns that emerged from coding the data, the strongest thematic structure that was revealed during this analysis process was related to the topics associated with the participants' educational beliefs. The participants tended to explain their beliefs about teaching and

learning in terms of a range of topics which were then used to group the codes and categories into larger themes. The participants persistently expressed beliefs about teachers and students, the process of teaching and learning, the content being taught and learnt in their courses, and the purposes of teaching and learning. These four areas formed the major themes that emerged from coding the qualitative data in the study. Within these topical themes, various sub-themes and sub-theme categories also surfaced and these allowed for the illustration of the patterns in the data mentioned above. Since some of the participants expressed beliefs that spanned across a range of levels within hierarchies, this was an important feature that I wanted to preserve in the final coding structure in order to illustrate the co-existence of different beliefs held by some participants about the same topic or concept, some of which were quite opposing.

The adoption of this thematic framework using themes, sub-themes and sub-theme categories to present the participants' beliefs ensured that the outcomes of the data analysis reflected the themes that were grounded in the data gathered from the study. Although these categories and themes took into consideration the themes that were evident in the literature, these did not dominate the formation of the thematic structure. Instead, the thematic structure provided the means by which to describe and compare the beliefs of the teachers and the students in the study. A detailed account of the themes, sub-themes, sub-theme categories and beliefs are outlined in Appendix Four. Once these themes, sub-themes, sub-theme categories and beliefs were finalised through the coding process, this structure was considered in the Discussion chapter in terms of how it compared with and furthered established educational theory.

Consideration of Data in Interview Summaries

The interview summaries that were written at the end of each participant interview were used as member checks for the participants to view, verify and amend where necessary in order to confirm that I had faithfully interpreted their comments. These interview summaries and subsequent member checks represented my preliminary analysis of the data

and also ensured that the participants were involved not just in the data gathering process but also in the data analysis stages of the research. The interview summaries were not coded since they reflected a summary of the participants' beliefs expressed during the interviews.

Consideration of Data in Researcher's Journal and Interview Notes

As the researcher, I made consistent observations and reflections about the progress of the study in my own journal. While some of these observations were subsequently invalidated by the systematic coding process, others were confirmed by such processes.

In addition to the journal, I also made specific notes at the close of each interview to record my observations about the context of the interviews. These notes provided a richer contextual description than was reflected in some of the interview transcripts and EBI responses, by focusing especially on the non-text elements of the interviews. The interview observational notes also provided an avenue to record details when the participants appeared to have difficulty in expressing their educational beliefs. At times, this would be demonstrated by their simple admissions that they did not have any beliefs. Other participants would typically pause for long periods and admit that they were finding it quite difficult to express their beliefs while others would express their beliefs in conjunction with gestures that seemed to indicate discomfort. Such participants would either explain how difficult the process was for them or demonstrate their discomfort by frowning, scratching their heads, rubbing their foreheads, squirming or throwing their arms in the air. Such observations were considered alongside the data analysis processes that took place after the data were gathered. The participants tended to have less difficulty expressing their educational beliefs as the semester progressed. This was indicated primarily by a decrease in the participants' discomfort during the interviews. Likewise, the second administration of the EBI at the end of the semester also indicated that the participants were more able to easily make decisions about the beliefs listed on the inventory.

In this way, the researcher's journal and the interview observation notes were used to support the findings based on other qualitative and quantitative analysis processes.

Method of Belief Comparison

The combined qualitative data analysis processes enabled me to identify and categorise the participants' educational beliefs. However, a method was also required which enabled the comparison of the teachers' and students' beliefs. In order to systematically compare the beliefs of the two groups, a Degree of Similarity (DoS) Scale was devised. This method facilitated an analysis process in which the teachers' beliefs within each theme, sub-theme and sub-theme category could be compared to their students' beliefs. A full account of this scale is provided in Chapter 6.

Quantitative Data Analysis Methods

The quantitative data in the study were analysed in two ways. Firstly, these data were analysed statistically in order to provide partial answers to the two research questions in the study. Secondly, the quantitative data were further analysed by aligning the participants' responses to each of the EBI items to the beliefs that were categorised within each of the themes, sub-themes and sub-theme categories to assist with triangulation. Details about these two methods of analysing the quantitative data gathered in the study are outlined below.

Statistical Analysis to Answer Research Question 1

Since the EBI did not adopt a predetermined structure of subscales, the analysis of the participants' responses to the EBI items was conducted on an item-by-item basis and, as such, was not motivated by an intention to obtain an overall score for each participant or an overall score for each participant's responses to groupings of items. For these reasons, the participants' responses to the EBI items were considered using descriptive statistics rather than inferential statistics such as factor analysis.

To facilitate the statistical examination of this data, each of the participants' responses to each of the 44 Likert-style items were allocated a

numerical code to represent raw scores from one through to five according to their levels of disagreement, agreement or neutrality. The "strongly disagree" responses were allocated a score of one, the "disagree" responses a score of two, the "neutral" responses a score of three, the "agree" responses a score of four and the "strongly agree" responses a score of five. These scores were then interpreted as reflecting a quantitative measure of the participants' educational beliefs. From this raw data, mean scores were calculated to represent the responses of the whole group of participants to each of the EBI items. A Level of Agreement-Disagreement Scale was constructed to guide the interpretation of these mean scores. For example, mean scores of between 4.50 and 5.00 were interpreted as indicating strong levels of agreement whereas mean scores of between 2.50 and 3.49 were interpreted as indicating neutral responses.

For items with a significant difference, the frequencies of each of the participants' responses to these items were then calculated in order to gain an understanding of how often the participants as a whole group agreed, disagreed or expressed neutrality about each of the 44 Likert-style EBI items. Standard deviations of the raw scores were calculated to provide an indication of the spread of scores across the 44 different EBI items.

In all, the raw scores, frequencies, means and standard deviations provided information about the various levels of agreement, neutrality or disagreement expressed about each of the EBI items by each of the individual participants and by the participants as a whole group. The results of these statistical analyses are presented in Chapter 5 and discussed in Chapter 8.

Statistical Analysis to Answer Research Question 2

To provide answers to the second research question, the degree of similarity or difference between the beliefs of the teachers and the students in the study was determined by comparing the participants' levels of agreement on each of the 44 Likert-style EBI items.

Since the data which represented the participants' responses to these items was non-parametric in nature due to the uneven size of the two groups, two tailed Mann-Whitney U tests were conducted. The tests compared the differences in the mean scores which represented the participants' responses to the 44 EBI items. These tests are particularly appropriate for comparing two uneven sets of variables or two independent samples (Coakes & Steed, 2003) when "the assumptions for the parametric t test cannot be met" and is particularly useful because "The test does not require equal numbers in the two conditions" (Burns, 2000, p. 189). These analyses enabled statistically significant differences to be identified. The results of these statistical analyses are presented in Chapter 7 and discussed further in Chapter 8.

Coding of EBI Items to Answer Research Question 1

In addition to the statistical analysis of the participants' responses to each of the Likert-style EBI items, the thematic structure that emerged from coding the qualitative data was used to group the participants' responses to each of the Likert-style EBI items. This process documented the parallels that existed between the beliefs expressed by the participants in this study and most of the beliefs reported in previous literature, some of which were included as items in the EBI. In some cases, the EBI items were aligned to more than one of the themes or sub-themes that emerged from this thematic structure.

All of the educational beliefs about teaching and learning that were represented by the selection of items included in the EBI were linked to themes and sub-themes within the coded set of participants' belief statements. However, not all of the sub-themes within the thematic structure that emerged from the coding process could be recognised in the items used in the EBI. This disparity suggested that the beliefs expressed by the participants represented some beliefs about teaching and learning not regularly cited in the research so far. For example, no EBI items were coded as being related to Sub-theme 2.1: Beliefs about teaching and learning as processes which occur within institutions, or Sub-theme 4.1: Beliefs about

the short-term purposes of teaching and learning. Since the EBI items represented beliefs that had already been recognised in previous research, these two sub-themes not reflected in the EBI items revealed two types of beliefs that were only evident in the qualitative data.

This integration of the findings from the qualitative data with the treatment of the quantitative data provided a method of analysis that enabled further triangulation of the findings. This method of coding the EBI items according to the findings of an analysis of the qualitative data represents a method of analysis that has not yet been used in previous studies of educational beliefs. The process of coding each of the EBI items produced a group of items that were categorised as being related to each theme and sub-theme within the thematic structure that emerged from coding the qualitative data. Once the coding of the EBI items was completed, the teachers' and students' responses to the EBI items within these groupings underwent supplementary statistical comparisons in order to further substantiate the findings from other analyses of the qualitative and quantitative data.

Comparison of Qualitative and Quantitative Data Analyses

In order to gain a fuller understanding of the participants' beliefs, the findings that were determined from analyses of the qualitative data were compared with the findings that were produced from analyses of the quantitative data. Patton (1990) suggests that the "triangulation of qualitative and quantitative data is a form of comparative analysis" that "it is worth using multiple methods, comparison analysis, and convergent validity checks to enhance the quality and credibility of findings" (pp. 466-467). To reflect the interpretivistic nature of this study, this comparison process was governed primarily by the greater significance ascribed to the qualitative data and their subsequent analyses. For this reason, the comparison of the two sets of data was driven by the nature of and the findings that emerged from the qualitative data and its analysis.

The results of the EBI analysis (based on the quantitative data) were compared with the results of the interview transcript analyses (based on the

qualitative data). Each instance where the findings of the qualitative data and the quantitative data were compared in order to fully identify the participants' beliefs, and answer the first research question, are documented in Chapter 5. The analysis of the qualitative data and the analysis of the quantitative data are further compared to ascertain the level of similarity between the teachers' and the students' beliefs. Results of these comparisons were used to answer the second research question and are presented in Chapter 7.

Methods used to Report the Findings

The methods used to report the findings of the study were informed by the outcomes of an analysis of the qualitative data in the study and were guided by the study's two main research questions which were concerned with the identification and comparison of the educational beliefs held by the teachers and students in the study. The earlier chapters of this thesis are presented primarily in accordance with the two research questions and the key ideas which emerged from the belief literature review. The structure of the subsequent chapters in the thesis predominantly reflects the thematic framework that emerged from an analysis of the coded qualitative data. Explanations of these structures are assisted by flowchart diagrams which are employed to "show the density and complexity of the theory" (Strauss & Corbin, 1998, p. 238) and "to keep a record of the analytic process" (p. 241). The use of these features as organisational devices enabled connections to be made to the overall aims of the study throughout the analysis and reporting stages.

Findings from analyses of the qualitative and quantitative data were examined in order to identify the participants' beliefs, and to find answers to the first research question which are presented in Chapters 4 and 5 respectively. Chapter 5 also includes some points of triangulation between the two sets of data. Chapters 6 and 7, respectively, present the findings from analyses of the qualitative and quantitative data that were examined in order to compare the teacher' and students beliefs. Chapter 7 also includes some points of triangulation between the two sets of data.

Chapter 8 presents a summary and discussion of the combined findings used to answer the two research questions in conjunction with past research findings as well as recommendations for future research directions.

The reporting methods used in this thesis are based on an acknowledgement that the findings are intended to be considered in terms of the participants in the study. Transference of the findings from this study to other similar contexts may be made by the readers of the thesis but generalisation from these findings to the wider population of teachers and students has not been the purpose of this study.

Summary: Data Gathering, Data Analysis and Reporting Methods

The data gathering, data analysis and reporting methods used throughout this study have been designed and selected to reflect the central lines of inquiry on which the research project was based, as expressed specifically in the research questions. Although relying mainly on semi-structured interviews, the data gathering methods also involved the administration of an EBI. Other data gathered throughout the study included the regular reflections of the researcher in a researcher's journal, the notes taken by the researcher after each interview and EBI administration, and the interview summaries used as member checks to involve the participants in the data interpretation processes in the study.

The data analysis methods used throughout the study relied largely on a system of open coding of the qualitative data. This analysis was corroborated and authenticated by triangulation with the findings of analyses of the quantitative data in which means, frequencies and standard deviations were calculated, in addition to the conduct of various Mann-Whitney U tests for belief comparison purposes. In addition to these tests for difference, methods of comparing the qualitative and quantitative data were devised to determine degrees of teacher-student belief similarity.

Overall, the data gathering and data analysis methods were always motivated by the dual aims of identifying and comparing the educational beliefs held by the teachers and students in the study. In this way, the

study's two main research questions were constantly being used as filters through which the data were interpreted. In addition to the trends detected during a review of the belief literature and the thematic framework that emerged from an analysis of the qualitative data, the study's main questions provided appropriate categories which were used to structure the reporting methods used to communicate the findings of the study. Lastly, the ways in which the data was grouped throughout the study also provided various structures within which the findings were reported.

Table 6 outlines a summary of the main data gathering, analysis and reporting methods adopted to answer to the two major Research Questions in the study.

Table 6
Summary of Research Questions, Data Gathering Methods, Data Analysis Methods and Data Reporting Methods

Research Question	Data Gathering Methods	Data Analysis Methods	Data Reporting Methods
1. What are the educational beliefs of university teachers and university students?	Identification of researcher's beliefs through a pre-study interview with the researcher	Open-coding of interview data Comparison of data with emergent themes	
	Identification of beliefs from responses to Likert-style and open-ended items at the beginning and the end of the semester from: - Educational Belief Inventory (EBI) completed by teachers; and - Educational Belief Inventory (EBI) completed by all students	Open-coding of responses to open-ended EBI items to identify emergent themes Open-coding of EBI items Calculation of means, frequencies and standard deviations of numerically coded Likert-style EBI responses Application of Level of Agreement-Disagreement Scale to mean scores	Findings from quantitative data (Likert-style responses to EBI items) reported in Chapter 4 Discussion of these reported findings in Chapter 8
	Identification of beliefs from semi-structured interviews conducted 2-3 times throughout the semester with: - Teachers; and - Selected students	Open-coding of interview data	Findings from qualitative data (open-ended responses to EBI items and interview data) reported in Chapter 5 Discussion of these reported findings in Chapter 8
	Interview Summaries and Notes Participants' Reflective Journals Researcher's Journal	Used to confirm and triangulate with EBI and interview data	-

Table 6
Summary of Research Questions, Data Gathering Methods, Data Analysis Methods and Data Reporting Methods

Research Question	Data Gathering Methods	Data Analysis Methods	Data Reporting Methods
2. How similar are the educational beliefs of university teachers and university students?	Comparison of beliefs from responses to Likert-style and open-ended items twice at the beginning and the end of the semester from: - Educational Belief Inventory (EBI) completed by teachers; and - Educational Belief Inventory (EBI) completed by all students	Mann-Whitney U tests to compare teachers' and students' responses to Likert-style EBI responses Degree of Similarity (DoS) Scale - Method of Belief Comparison applied to coded interview data	Findings from quantitative data (Likert-style responses to EBI items) reported in Chapter 6 Discussion of these reported findings in Chapter 8
	Comparison of beliefs from face-to-face semi-structured interviews conducted 2-3 times throughout the semester with: - Teachers; and - Selected students	Degree of Similarity (DoS) Scale - Method of Belief Comparison applied to coded interview data	Findings from qualitative data (open-ended responses to EBI items and interview data) reported in Chapter 7 Discussion of these reported findings in Chapter 8
	Interview Summaries and Notes Participants' Reflective Journals Researcher's Journal	Used to confirm and triangulate comparisons of EBI and interview data from teachers and students	-

Conclusion to this Chapter

The nature of the study directly influenced the selection of the research methods created for and used throughout all stages of the study. The selection of these methods was also informed by successful methods that have been used previously in research studies cited in the belief literature. Since the purpose of the study was mainly investigative, the methods employed were not prompted by an intention to supplant previous knowledge about educational beliefs (Schwandt, 1996) but proposed to extend our existing understanding of the educational beliefs held by some university teachers and students, and thus build upon the work of others according to the principle of generativity (Schulman, 1999). A special emphasis on exploring the relationship between the beliefs of these two groups provided a further direction for the study. The methods used were chosen for their capacity to conceptualise and contribute to current theory (Strauss & Corbin, 1998). As such, the processes adopted to conduct the study incorporated data gathering and analysis methods that were predominantly interpretivistic in nature. Furthermore, as well as providing some insights into the topic under study, the outcomes of the main data analysis processes provided a structure in which the subsequent findings and the discussion about the findings were presented.

In order to enable systematic comparison, validation and triangulation of the methods and findings, the research methods used in the study were constantly cross checked and concurrently considered throughout all phases of the research. In most cases, findings from an analysis of the qualitative data were corroborated by findings from analyses of the quantitative data. In all cases, a comparison of the qualitative and quantitative data provided a richer description of the participants' educational beliefs than would have been possible with less data.

CHAPTER 4

IDENTIFICATION OF TEACHERS' AND STUDENTS' BELIEFS: FINDINGS FROM AN ANALYSIS OF THE QUALITATIVE DATA

Introduction

This chapter explains the methods used to code and analyse the qualitative data collected throughout this study. An analysis of this data formed a set of findings which provided me with information that contributed to answering the first research question: What are the educational beliefs of university teachers and university students? Emergent findings are organised and described within themes, sub-themes and sub-theme categories (see Appendix Four).

The qualitative data used to present the findings in this chapter were gathered from two main sources including the interviews held throughout the semester and the participants' written responses to the open ended items in the Educational Belief Inventory (EBI). These sets of data were combined in order to ascertain the beliefs held by the participants in one semester. Rather than enabling me to conduct an aetiological study of the participants' beliefs, or to study how their beliefs have evolved, this data has provided a snapshot of the beliefs the participants expressed during a one semester period of teaching. Since many of the interview questions and the EBI items requested participants to express their beliefs about effective teachers, effective students, effective teaching and effective learning, many of the codes also came to reflect the theme of effectiveness.

The two sources of qualitative data analysed for this chapter were systematically open coded. The participants' belief comments initially appeared to suggest two separate high level categories: 1) beliefs about teachers and teaching; and 2) beliefs about students and learning. However,

as the coding process progressed, the emerging level of correspondence between the participants' beliefs about the process of teaching and the process of learning became increasingly evident. A parallel similarity between their beliefs about teachers and their beliefs about students also emerged. Thus, the need to separate the participants' belief comments about teaching from their belief comments about learning became less useful. Because of this trend that emerged from the coding process, the participants' beliefs about teachers and students are presented together. Likewise, their beliefs about the teaching process and the learning process are also grouped.

Four similar and definitive themes emerged. There were also some comments that were not easily categorised into any of these four major themes; these comments were labelled as uncoded comments. These five themes, along with their frequency of comments, are outlined in Figure 3.

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┌─────────────────────────────────────────────────────────────────┐
│   Educational beliefs about teaching and learning (11488 comments)│
└─────────────────────────────────────────────────────────────────┘

┌──────────────┐  ┌──────────────┐  ┌──────────────┐  ┌──────────────┐
│  Theme 1:    │  │  Theme 2:    │  │  Theme 3:    │  │  Theme 4:    │
│ Beliefs about│  │ Beliefs about│  │ Beliefs about│  │ Beliefs about│
│ teachers and │  │ the processes│  │ content taught│ │ the purposes │
│  students    │  │ of teaching  │  │ and learnt   │  │ of teaching  │
│ (3124        │  │ and learning │  │ (519         │  │ and learning │
│  comments)   │  │ (6931        │  │  comments)   │  │ (681         │
│              │  │  comments)   │  │              │  │  comments)   │
└──────────────┘  └──────────────┘  └──────────────┘  └──────────────┘

          ┌──────────────────────────────────────┐
          │ Uncoded comments (233 comments)       │
          └──────────────────────────────────────┘
```

Figure 3. Thematic Structure of Participants' Educational Beliefs.

As the coding of the participants' belief comments progressed, a number of sub-themes and further sub-theme categories were identified within each of the four major themes. The structure suggested by the emergence of these major themes, sub-themes and sub-theme categories provided the choice of the major headings and subheadings in this chapter.

Although the main purpose of this chapter is to identify the beliefs held by both teachers and students, based on the structure suggested by Figure 3, an indication of which beliefs were held by the teachers and which beliefs were held by the students has also been provided throughout this chapter in order to provide an overall introduction to the focus of Chapter 6 which examines the similarity between teachers' and students' beliefs. Additionally, in order to provide an indication of the prevalence of these beliefs across the whole group of participants, the descriptors "all", "most", "many", "some" or "few" are used to describe how many of the teacher-participants and how many of the student-participants held these beliefs, according to the code explained in Table 7.

Table 7
Code to Proportional Comments

Proportion of Participants	Percentage
All	100%
Most	More than 60%
Many	41-60%??
Some	21-40%
Few	up to 20%

The first of the four major themes, Theme 1: Beliefs about teachers and students, is now presented. In order to demonstrate the process used to code, analyse and present the findings of this chapter, the first sub-theme of Theme 1 is presented in fine detail accompanied by supporting quotes from participants. This sub-theme is presented in detail since it was the first major sub-theme to emerge from the process of coding the data. The latter sub-themes are presented in a less detailed summarised format but were analysed using an identical process.

Theme 1: Beliefs about Teachers and Students

The first major theme that emerged represented the participants' beliefs about the two main stakeholder groups involved in university education – university teachers and university students. Many of the participants possessed these beliefs.

Three sub-themes emerged from the participants' belief comments about teachers and students related to teachers' and students' knowledge, innate characteristics and learnt abilities. These three sub-themes are outlined in Figure 4.

```
┌─────────────────────────────────────────────────────────────┐
│        Beliefs about teachers and students (3124 comments)    │
└─────────────────────────────────────────────────────────────┘

┌──────────────────────────┐        ┌────────────────────────────┐
│ Teachers and students have│───────▶│ 501 comments by students   │
│       knowledge           │        └────────────────────────────┘
│     (775 comments)        │        ┌────────────────────────────┐
└──────────────────────────┘───────▶│ 969 comments by students   │
                                     └────────────────────────────┘
┌──────────────────────────┐        ┌────────────────────────────┐
│ Teachers and students have│───────▶│ 351 comments by teachers   │
│   innate characteristics  │        └────────────────────────────┘
│     (879 comments)        │        ┌────────────────────────────┐
└──────────────────────────┘───────▶│ 424 comments by students   │
                                     └────────────────────────────┘
┌──────────────────────────┐        ┌────────────────────────────┐
│ Teachers and students have│───────▶│ 221 comments by teachers   │
│      learnt abilities     │        └────────────────────────────┘
│     (1470 comments)       │        ┌────────────────────────────┐
└──────────────────────────┘───────▶│ 658 comments by students   │
                                     └────────────────────────────┘
```
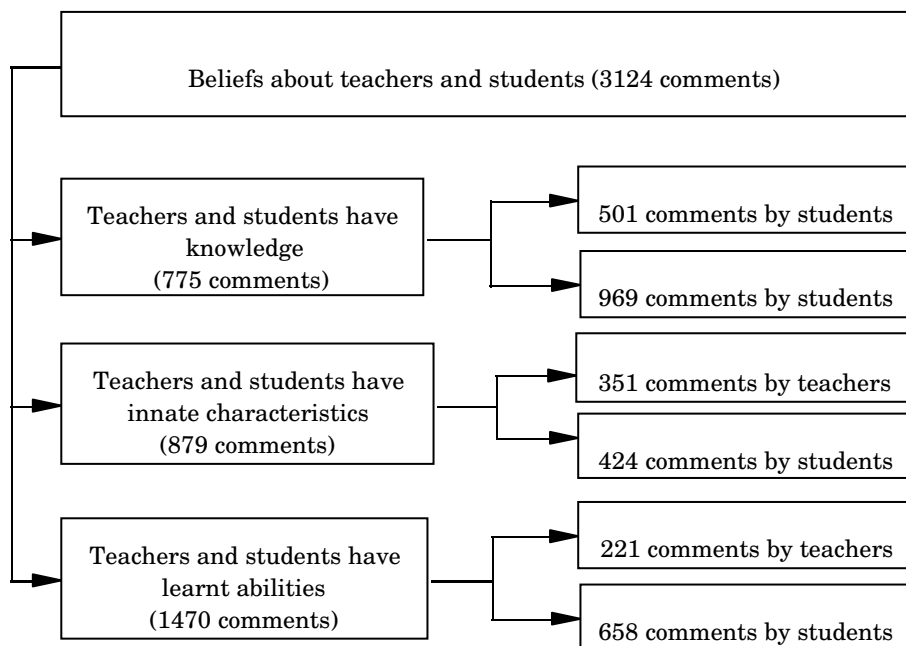
Figure 4. Beliefs about Teachers and Students: Theme 1 Sub-Themes.

Each of the sub-themes outlined in the above figure are now explained in order to develop an answer to the first Research Question which focuses on the identification of the participants' educational beliefs.

Sub-Theme 1.1: Beliefs about Teachers' and Students' Knowledge

Many of the participants believed that teachers and students have various types of knowledge, with some types of knowledge being held by both teachers and students, and some being held just by teachers. Based on

the teachers' and students' beliefs about different types of knowledge, this sub-theme was further sub divided into the following categories:

- Sub-theme category 1.1.1: Beliefs about teachers' and students' subject knowledge;

- Sub-theme category 1.1.2: Beliefs about teachers' and students' self knowledge; and

- Sub-theme category 1.1.3: Beliefs about teachers' pedagogical knowledge.

Each of these sub-theme categories is now explained, with supporting quotations from the participants.

Sub-Theme Category 1.1.1: Beliefs about Teachers' and Students' Subject Knowledge

Many of the participants in the study believed that teachers and students held knowledge of the subject they were teaching or studying, and that this knowledge developed during their teaching and learning experiences at university. Such knowledge is sometimes referred to as domain-specific knowledge, and includes examples such as the geological expertise held by oil riggers or the specialised botanical knowledge of horticulturalists. I use the term "subject knowledge" in this sub-theme category instead of "domain-specific knowledge", since it was the term most often used by the participants in the study. The participants' comments about subject knowledge were mainly expressed in terms of the topics and subjects they were teaching or studying.

The participants offered a collection of comments about teachers' subject knowledge and students' subject knowledge. From this group of coded comments about subject knowledge, a further three categories of beliefs emerged including the participants' beliefs about three aspects of the nature of subject knowledge: the source of subject knowledge; the currency of subject knowledge; and the developing and existing levels of subject knowledge held by teachers and students. The participants' beliefs about

these aspects of the nature of subject knowledge are further explained below and supported by direct quotations from the participants' comments.

Source of subject knowledge: Teachers' and students' subject knowledge.

Most of the participants believed that teachers should be a source of subject knowledge for their students and many of the participants believed that students gained subject knowledge from their teachers, the course materials and other students. Effective teachers were viewed as those who facilitated student access to the teachers' own subject knowledge, and whose knowledge of the subject was clearly more extensive than their students' subject knowledge:

> I think the teacher does have obviously more knowledge and information and expertise in this particular area and they need to set that out for the learner in a variety of ways so they can access that information and learn themselves.
> (First interview with Joseph, Class 4 Teacher, Line 231)

> I'm telling you, he's a knowledgeable person, no doubt. He knows what he is teaching, that's [sic] important thing … He is a fantastic … he is a knowledge person and I honour him for that … From his face, you can just make it out like he knows everything … It's really different to find teachers like Morris, that's the thing. Morris is really good, he knows everything about it, as I mention, he's a complete man, no doubt, no, there is no other lecturers you will find like that, you know, just give you the knowledge, no doubt.
> (Third interview with Shane, Class 1 Student, Lines 9-12, 70, 346)

While teachers were seen to be a source of subject knowledge, some of the participants in the study believed that students could access subject knowledge via the content presented by their teacher, as well as from the course materials and from their fellow students:

> I'll read through the book - if it's something in a book - or I'll try and … I'll just keep reading it and then if it gets too much so that I can't understand it, I'll ask either my friends, 'cause they're pretty good at maths, or my boyfriend is very good at maths, and then, if I still don't understand it, then I'll go to Dimitri [her teacher].
> (Second interview with Zoe, Class 5 Student, Line 115)

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Kiarn, a student from Class 4, along with a group of her fellow students, decided to form a study group outside regular class hours. She explained how her involvement in this informal group had a favourable impact upon her learning and enabled her to ascertain whether or not she required her teacher's assistance:

> It gave momentum to - to - to my learning. I mean, I really was, like, slowing down, so it gave me a push start and - and it - it was good because I could cross-check with them. Like, I - if I didn't know how to do something and then they couldn't help me, then I know, OK, I'm in trouble, I need to see a lecturer now.
> (Third interview with Kiarn, Class 4 Student, Lines 164-165)

Currency of subject knowledge: Teachers' and students' subject knowledge.

Some of the participants expressed comments about the currency of teachers' and students' subject knowledge that were primarily articulated in terms of the currency of knowledge. The students were especially forthright about the need for teachers' knowledge to be current. Whether they were discussing the knowledge provided to students by teachers, or the knowledge gained by students from teachers, the participants believed that teachers' and students' subject knowledge should be up-to-date:

> I believe effective teaching is proposing relevant information, up-to-date information.
> (EBI-2 response, Student no. 63 from Class 4)

> I take on board the fact that, that that's part of it, that you've got to give them current and critical information.
> (First interview with Hilary, Class 2 Teacher, Line 113)

Walter, one of the teachers in the study who taught in the field of multimedia, believed that the currency of the content in his course was almost more important than the actual content itself, such was the high emphasis placed upon providing students with up-to-date knowledge. He maintained what he regarded as a high quality of teaching in this course by ensuring that his knowledge was current and attuned to recent developments and innovations in his relevant field. Due to the important nature of the currency of the subject knowledge in this course, Walter

explained that it was pointless for him to be overly concerned about the content being taught since it changed so frequently:

> I'm not precious about what I teach and the content that I teach so - because well, in my area, it's going to date anyway so it's - who cares? (First interview with Walter, Class 4 Teacher, Line 280)

Some of the students in the study also appreciated the need for teachers and students to access subject knowledge that was up-to-date and related to current world events. While discussing his ideas with me about effective teachers, Shane, a student from Class 1, explained his belief that teachers should be able to link their subject knowledge to current events:

> Professor [sic] should always think about what is new and going on in the world, what I should give the students, what I should say to the students, so that what … how it should be linked to these current studies as well as the world, the world that is going around. (First interview with Shane, Class 1 Student, Line 318)

Similar to the beliefs outlined above, other participants in the study also used a selection of terms to express their beliefs about the need for students' and teachers' subject knowledge to be contemporary. Terms such as "up-to-date", "current", "the newest thing", "the latest type of issue", "up with the times", "fresh" and "keep it alive" were frequently used when discussing the currency of subject knowledge.

Teachers' developing and students' existing depths of subject knowledge: Teachers' and students' subject knowledge.

Some of the participants in the study acknowledged that teachers' subject knowledge continued to develop and that students held varied depths of subject knowledge. Depth of knowledge was interpreted in terms of the complexity of the knowledge held by teachers and students. The participants believed that these varied depths of subject knowledge differed according to the stages of their respective teaching careers and learning experiences. They believed that teachers' depth of knowledge would gradually become more complex as they progressed through their teaching careers and as they continued to learn from their students, and that

students' depth of knowledge would increase in complexity as they progressed through their university courses.

While discussing the need for teachers to continually expand their own subject knowledge, Peter, a student in the study, expressed his belief that teachers ran the risk of "ending up a bit stale unless you can actually extend yourself in some way" (Second interview with Peter, Class 2 Student, Line 197). The following comments were also typical of participants' beliefs about the value of teachers developing their subject knowledge and the importance of teachers continuing to learn:

> I believe effective teachers teach something with fully [sic] understanding of part of the subject then develop it with new ideas.
> (EBI-2 response, Student no. 55 from Class 4)

> I believe effective teaching involves continual learning.
> (EBI-2 response, Student no. 91 from Class 5)

According to some of the other participants in the study, teachers can extend their own subject knowledge by having contact with their students:

> Well, a good teacher should be a good learner, and they should learn from the students, I believe.
> (First interview with Morris, Class 1 Teacher, Line 763)

> Without learning it you can't teach it, without teaching it you can't learn because you learn from your students. You know, their feedback, their questions.
> (First interview with Lionel, Class 1 Student, Lines 752-756)

As well as believing that the depth of teachers' subject knowledge continues to develop, both students and teachers were aware of the diverse levels of knowledge that students brought to the university learning context. For example, both the teacher and a student from Class 1 explained how the students in this class came from varied backgrounds and, thus, held varied levels of prior subject knowledge:

> There are some experienced people, yeah, you've got people that are third year or finals year computing science students we've got those that have done their working courses.
> (Second interview with Morris, Class 1 Teacher, Lines 10-11)

There are, how you say, fifteen per cent [sic] students understands everything and there's ten per cent [sic] students who can say like this OK, we know this already.
(First interview with Shane, Class 1 Student, Line 213)

Other participants reflected their own current levels of knowledge and recognised that other students held varying levels of knowledge:

But our levels of knowledge was [sic] very different in the class because there were some who were really experts.
(Second interview with Kiarn, Class 4 Student, Line 81)

Some of that stuff I've already done.
(First interview with Lionel, Class 1 Student, Line 299)

A lot of it - for me, I think because I've actually been working in the communications field for quite a few years, I really have understood most of the theory and a lot of the theory so that isn't so much a help to me. I mean it's always good to be refreshed but, for me, learning a lot of this software is what's really helpful for me because I'm taking the basis of what I'd known and been practising for years and learning new tools to be able to further and hopefully better do my field.
(Second interview with Kent, Class 4 Student, Lines 86-87)

In general, the participants believed that the levels of subject knowledge held by teachers and students were not necessarily static and developed as each group interacted with the other.

Summary of beliefs about teachers' and students' subject knowledge.

When expressing their beliefs about teachers' knowledge, the participants' comments included repeated references to the need for teachers to be learners in order to maintain the currency of their knowledge and to ensure that they continued to extend their knowledge. Their beliefs about students' knowledge acknowledged the way in which students could increase and extend their knowledge, by gaining knowledge from their teachers, and also by accessing resources and interacting with their fellow students.

Table 8 identifies the participants' beliefs within this sub-theme category and indicates whether "all", "most", "many", "some", "few" or "none"

of the teachers and students in the study held each of these beliefs. This summary system has also been used in later similar tables.

Table 8
Participants' Beliefs about Teachers' and Students' Subject Knowledge

Nature of Belief	Beliefs about Teachers	By Ts	By Ss	Beliefs about Students	By Ts	By Ss
Source of subject knowledge	Teachers should be the source of subject knowledge.	All	Most	Students gain subject knowledge from the course, teacher and other students.	Many	Some
Currency of subject knowledge	Teachers' subject knowledge should be current.	Most	Some	Students' subject knowledge should be current.	None	Few
Existing and developing depths of subject knowledge	Teachers continue to learn about their subject.	Many	Some	Students already possess some subject knowledge.	All	Many

As well as holding beliefs about teachers' and students' subject knowledge, many of the participants also expressed beliefs about teachers' and students' self knowledge. This sub-theme category is now presented.

Sub-Theme Category 1.1.2: Beliefs about Teachers' and Students' Self Knowledge

Many of the participants in the study believed that teachers and students should, and did, possess various degrees of self knowledge. They believed this self knowledge was comprised of a combination of self-awareness of their own personal qualities as well as a capacity to reflect on their own role in the processes of learning or teaching. These participants further believed this self knowledge had some bearing on their effectiveness as teachers and learners.

The participants offered comments about teachers' self knowledge and students' self knowledge. I grouped these responses into three categories: their personal knowledge; their knowledge gained by reflecting on their own learning; and their knowledge gained by reflecting on how they teach or how they were taught. Participants' beliefs about these three aspects of self knowledge are now explained.

Personal knowledge: Teachers' and students' self knowledge.

Some of the participants believed that teachers should know themselves in personal and professional terms. Hilary, the teacher of Class 2, expressed this as "my sense of myself as a teacher" (Interview 3, Line 5). One of the students in the study suggested that being an effective teacher involved "knowing your strengths and weaknesses" (Student no. 93, Class 5). Effective teachers were viewed as those who were "sure of who they were". These participants believed that teachers should be aware of and reflect on their own personal qualities as well their own teaching skills:

> I believe effective teaching is being sure of who you are so that the students know where they stand.
> (EBI-1 response, Student no. 48 from Class 3)

> As a teacher, you should, you know, be comfortable in yourself and also comfortable in your own teaching …
> (Third interview with Joseph, Class 4 Teacher, Line 341)

The participants' beliefs about self knowledge reflected the assumption that this type of knowledge influences teachers' and students' teaching and learning effectiveness. Whereas some of the participants in the study believed that effective teachers were those who knew themselves both personally *and* professionally, their beliefs about the type of self knowledge held by effective students were stated only in terms of students' knowledge about their own learning. The participants believed that effective students were those who were metacognitive about and familiar with their own learning strengths and weaknesses:

I think that if they [students] realised, you know, their strengths and weaknesses, I think that if they identified that they have strengths and weaknesses in their own learning, I think that that would probably help …
(First interview with Anne, Class 3 Student, Line 166)

The following self-reflective comment by Peter, a student from Class 2, demonstrated his belief that a student's awareness of their role in the learning process could actually enhance their own learning effectiveness:

I mean, if you're focusing on learning, well then I think you're going to be better off as a learner. You know, if you're actually aware of the processes that you're going through to actually try and encode information that you're getting so that you can actually retrieve it later on ... If you're aware of the processes, you can go through to make that - to actually learn that information effectively, I think definitely helps. I think you need to be aware of - of yourself as a learner, to be the best learner you can.
(First interview with Peter, Class 2 Student, Lines 154-157)

Some students also noticed that their teachers were attentive to the element of metacognition that assists learning:

I believe my teacher believes that effective learning is revising how you learn.
(EBI-2 response, Student no. 93 from Class 5)

Most of the participants in the study further explained their ideas about learners' self-awareness by expressing specific beliefs about what students should know about their own learning. For example, they espoused beliefs about the value of students knowing their own learning preferences:

You need to know what - how you learn the best, what suits you and just the way you best learn.
(First interview with Zoe, Class 5 Student, Line 190)

I'm very much aware of my own learning styles and people say to me - 'oh you take notes and blah, blah, blah, and I didn't think to write that down'.
(First interview with Anne, Class 3 Student, Line 128)

Reflection on own learning: Teachers' and students' self knowledge.

Some of the participants in the study believed that students and teachers gained self knowledge through reflecting on their own learning. Most of their comments were related to the value of students reflecting on their own learning. In order to enhance learning, they believed it was important for students to be independently engaged in the process of reflection:

> Yeah, I think that's really important so that students can gauge their progress and reflect on where they've come from and see themselves gaining ground.
> (First interview with Tom, Class 3 Student, Line 240)

> And then, I think it's great when somebody raises a point in contrast to that because it actually stops you thinking and makes you think about, well what are my ideas about it, not just listening.
> (First interview with Anne, Class 3 Student, Line 194)

Tom, a student from Class 3, believed that the benefits of reflection for learning could be applied more widely to life in general as well as contributing to one's sense of self:

> Oh yes, because, you know, you've got to have independence about it. You can't just be gauging it against what somebody else thinks, it's how meaningful it is for you in your life, you know, it's your life. And at the same time, you know, by reflecting on your own learning, you know, you can extrapolate from that, that it's reflecting on your own behaviour, on your own place in the world you know, from a big picture to a small picture.
> (First interview with Tom, Class 3 Student, Lines 276-277)

Through this process of self-reflection, the students in the study believed they could gain knowledge about their own learning abilities which would, in turn, enhance the quality of their learning:

> I believe effective learning is knowing how you learn.
> (EBI-2 response, Student no. 93 from Class 5)

> I think it's important for everyone to understand what their best way of grasping something is. You can't always go with what works for somebody else, you have to have developed and understand how you best internalise, you know, what's going on in your learning.
> (First interview with Kent, Class 4 Student, Lines 136-137)

As well as believing in the rewards of self reflection for students, many of the participants also expressed beliefs about how valuable it is for teachers to reflect on their own learning. For example, one of the teachers commented on the benefits of being involved in this research project because the process encouraged him to reflect on his own teaching and learning:

> Having to write, jot down what happened - how did you benefit from it and your understanding, learning and teaching - has been really good, it's been quite a positive thing in the process.
> (Second interview with Joseph, Class 3 Teacher, Line 9)

Reflection on teaching: Teachers' and students' self knowledge.

In addition to believing that teachers and students should reflect on their own learning, many of the participants in the study believed that effective teachers reflect on their own teaching. Effective teachers were viewed as those teachers who analysed their own teaching actions and considered how these processes affected students:

> I believe effective teaching is being sensitive to student concerns, reflecting on my own and their practice.
> (EBI-1 response, Teacher from Class 2)

> I believe effective teaching is being reflective, and not seeing change as a threat, devising new ways to teach.
> (EBI-2 response, Student no. 91 from Class 5)

> I believe effective teaching involves getting future teachers to think for themselves, and as a teacher, plus analyse themselves.
> (EBI-1 response, Student no. 88 from Class 5)

> I guess one of the ... one of the things that I made myself do to start off with but now I just do it, is at the end of any teaching that I do in the semester, is to sit down and have a professional conversation with them [the students] about reflecting on my teaching.
> (First interview with Hilary, Class 2 Teacher, Lines 378-379)

Students were also viewed as being capable of gaining self knowledge by reflecting on the way they are taught. This knowledge was deemed to be useful for students' own learning:

It's [being involved in this study] actually helped me reflect on - it's made me reflect on exactly what I do to learn and thinking of my teacher, Dimitri, that's helped me too 'cause I'm doing teaching, it's helped me to, you know, my ways of how I'm going to teach, it's kind of helped me look at that.
(Second interview with Zoe, Class 5 Student, Lines 5-6)

'Cause then you can actually analyse how you've learnt and take the good qualities of what you've learnt and how you've been taught and to, sort of, discriminate which you want to follow and which you want to, sort of, throw away.
(First interview with Trish, Class 3 Student, Line 413)

Thus, many of the participants believed that it was valuable for both teachers and students to be aware of and reflect on the teaching process.

Summary of beliefs about teachers' and students' self knowledge.

The participants believed that both teachers and students should reflect on their own learning, and on the way they teach or are taught. They offered more statements that reflected their beliefs about students' self knowledge than teachers' self knowledge. Furthermore, whereas the teachers were quite forthright about expressing their beliefs regarding students' self knowledge, the students were more hesitant about expressing their beliefs about teachers' self knowledge levels. The beliefs expressed about students' self knowledge were especially focused on students' awareness of themselves as learners and their abilities to reflect on their own learning. In comparison, the belief comments expressed by participants about teachers' self knowledge were described more broadly in terms of teachers' awareness of their own personal qualities in addition to their own teaching skills.

Table 9 identifies the participants' beliefs within this sub-theme category and indicates the proportion of the teachers and students in the study who held each of these beliefs.

Table 9
Participants' Beliefs about Teachers' and Students' Self knowledge

Nature of Belief	Beliefs about Teachers	By Ts	By Ss	Beliefs about Students	By Ts	By Ss
Personal knowledge	Teachers should know themselves.	Many	Some	Students should be aware of themselves as learners.	Many	Most
Reflection on own learning	Teachers should reflect on their own learning.	Few	Few	Students should reflect on their own learning.	Many	Most
Reflection on teaching	Teachers should reflect on their own teaching.	Most	Some	Students should reflect on how they are taught.	None	Some

As well as expressing beliefs about teachers' and students' subject knowledge and self knowledge (Sub-theme categories 1.1.1 and 1.1.2), many of the participants also expressed beliefs about teachers' pedagogical knowledge. This sub-theme category is now outlined.

Sub-Theme Category 1.1.3: Beliefs about Teachers' Pedagogical Knowledge

Many of the participants in the study believed that effective teachers held particular pedagogical knowledge, specifically about learning and learners. Unlike the earlier two sub-theme categories within this sub-theme, the participants did not express similar beliefs about students having such pedagogical knowledge.

The participants expressed beliefs about three aspects of the nature of teachers' pedagogical knowledge of learning and learners: the differences between students; the various aspects of students' learning (including cognitive, social, emotional aspects); and the role of mistakes and misunderstandings in learning. Their beliefs about these aspects of the nature of teachers' pedagogical knowledge are further explained below with supporting evidence in the form of the participants' comments.

Differences between students: Teachers' pedagogical knowledge.

Most of the participants believed that teachers should know that all learners are different and that different learners proceed at different rates throughout the learning process. Effective teachers were viewed as those who could act upon this knowledge by catering for and responding to differences among students:

> I believe effective teaching is being able to consider all individual students - cater for all students' needs.
> (EBI-1 response, Student no. 22 from Class 2)

> I think it is quite important to try and extend each individual and maybe not teach to the - the higher level of students or teach to the lower level of students or - you know, just try and really individualise each student's learning.
> (Third interview with Peter, Class 2 Student, Line 185)

As well as knowing how to accommodate the needs of various students, the participants in the study believed that teachers who had a knowledge of learning and learners would understand the developmental nature of learning and would, therefore, realise that different students develop at different rates:

> I believe effective teaching is knowing students' developmental needs.
> (EBI-1 response, Student no. 93 from Class 5)

Other participants believed that effective teachers were those who understood how students learned:

> My teacher believes that effective teaching is being able to understand how students learn and what concepts they understand.
> (EBI-1 response, Student no. 92 from Class 5)

As well as being aware of the differences between students' abilities and learning styles, the participants in the study believed that effective teachers were also able to gauge their students' progress and, consequently, were able to tailor their teaching to suit their students' learning requirements. Some of these participants expressed beliefs that the teachers' teaching style should take into account students' learning styles,

and that teachers should be aware of how they react to students in terms of their interpersonal and relationship skills:

> I believe effective teaching is an awareness of how one responds to students.
> (EBI-1 response, Student no. 48 from Class 3)

> I believe effective teaching is more than the passing of knowledge. It's equipping students with the skills to seek their own knowledge. This has to be done by taking into account personal teaching style and how that will impose on student learner style.
> (EBI-1 response, Student no. 90 from Class 5)

> And if you actually squash their own [the students'] personalities and their own expressions and their styles in order to get them to conform to your learning style, the way that you want them to learn, they're never going to be able to do their best and so you've got to be able to compromise and - and like I said before, be diverse in - in how you teach and the different, you know, and the different attitudes that you take into the classroom as well.
> (Third interview with Anne, Class 3 Student, Line 417)

Students are multi-faceted: Teachers' pedagogical knowledge.

As well as believing that effective teachers should know that all students are different, some of the participants in the study believed that teachers should consider students' other characteristics, beyond just their cognitive abilities:

> I believe effective teaching is being able to impart knowledge in different ways at different levels i.e., holistically.
> (EBI-1 response, Student no. 42 from Class 3)

> I believe effective teaching is providing methods, inspiration, information and resources with encouragement for students to engage with and actively incorporate into their learning experience, not just for the subject area, but for life in general as a whole person.
> (EBI-1 response, Student no. 43 from Class 4)

Some of the participants perceived effective teachers as educators who could take into account the affective elements of students' personalities, including their self-esteem, in conjunction with their academic learning:

> And in dealing with them [students], making sure that their self esteem and their dignity's intact even if you're furious and you feel like running all over them in the carpark!
> (Second interview with Joseph, Class 3 Teacher, Line 107)

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As such, effective teachers were viewed by some of the participants as those who considered the emotional, social and intellectual needs of their students.

Role of mistakes and misunderstandings in learning: Teachers' pedagogical knowledge.

Many of the participants in the study also believed that teachers' pedagogical knowledge should incorporate an understanding that learning entails making mistakes and rectifying misunderstandings. Effective teachers were viewed as those who would allow for and encourage such processes. This aspect of a teacher's pedagogical knowledge was mainly commented on by the teachers, rather than the students, in the study:

> I think some students as well are - are not - they are - I notice some of them are - you - you - they make mistakes and they think that indicates they're not very good at something where the fact they're making mistakes is actually a part of learning, you know … and I said they're all mistakes that I've made and make.
> (Third interview with Morris, Class 1 Teacher, Line 94)

Another teacher in the study, while construing how a hypothetical visitor to his class might observe the way he taught his students, explained that he believed the process of making mistakes was both an accepted and an expected part of the learning process:

> OK, they'd see learners trying things out, making mistakes, learning through trial and error, seeking information …
> (First interview with Walter, Class 4 Teacher, Line 117)

Summary of beliefs about teachers' pedagogical knowledge.

Many of the participants in the study held specific beliefs about teachers' pedagogical knowledge about learning and learners which mainly focused upon knowledge of the differences between students. They did not express beliefs about such knowledge being held by students.

Table 10 identifies the participants' beliefs within this sub-theme category. Additionally, a dash (-) listed alongside a belief indicates that

neither the teachers nor the students in the study held this belief. This system continues to be used in later similar tables.

Table 10

Participants' Beliefs about Teachers' Pedagogical Knowledge

Nature of Belief	Beliefs about Teachers	By Ts	By Ss	Beliefs about Students	By Ts	By Ss
Differences between students	Teachers know that all learners are different.	All	Most	-	-	-
Students are multi-faceted - cognitive, social, emotional, etc	Teachers know how to treat students holistically.	Some	Some	-	-	-
Role of mistakes and misunderstandings in learning	Teachers know that learning involves making mistakes and rectifying misunderstandings.	Many	Some	-	-	-

Summary of Sub-Theme 1.1: Beliefs about Teachers' and Students' Knowledge

The structure of this sub-theme and its sub-theme categories, together with the frequency of belief comments, are shown in Figure 5.
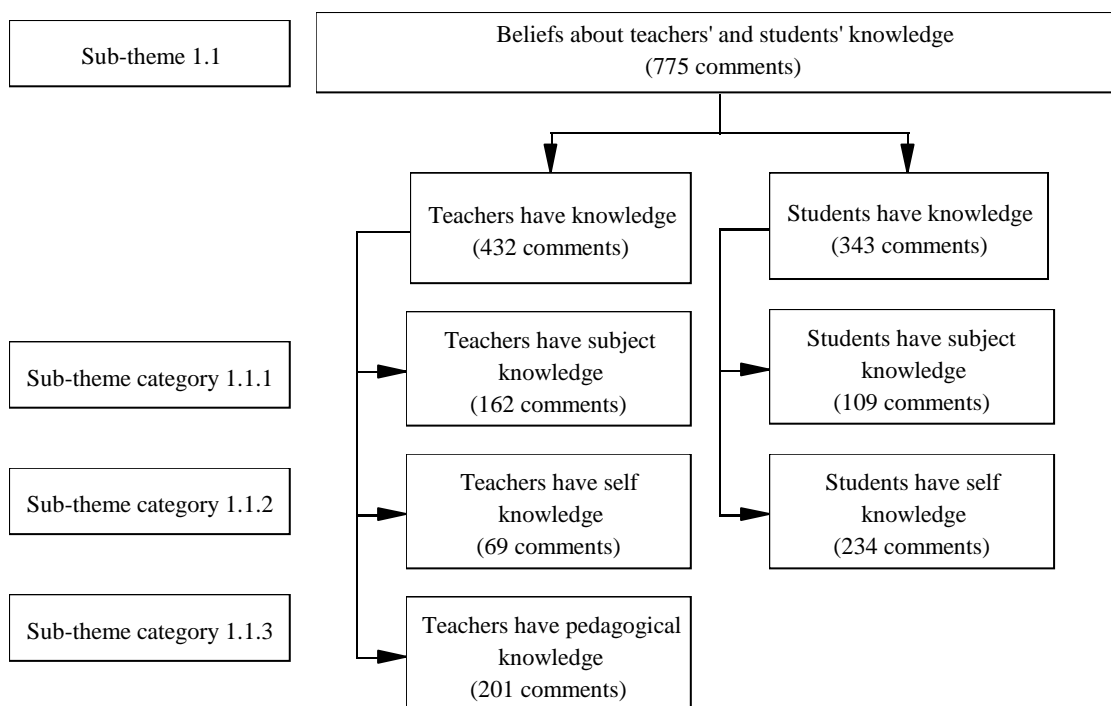
Figure 5. Sub-Theme 1.1: Participants' Beliefs about Teachers' and Students' Knowledge (and Comment Frequencies).

As well as believing that teachers and students possessed particular types of knowledge, many of the participants in the study also believed that effective teachers and students had a range of innate characteristics. These beliefs are presented in Sub-theme 1.2.

Sub-Theme 1.2: Beliefs about Teachers' and Students' Innate Characteristics

Many of the participants in the study expressed beliefs that I viewed as being related to teachers' and students' innate characteristics, especially their natural dispositions and general attitudes. The participants' belief comments were coded using a similar process that was used to analyse the previous sub-theme. Three sub-theme categories emerged:

- Sub-theme category 1.2.1: Beliefs about teachers' and students' likes, dislikes and attitudes;

- Sub-theme category 1.2.2: Beliefs about teachers' and students' personality traits; and

- Sub-theme category 1.2.3: Beliefs *about* teachers' and students' beliefs.

Although the entire study focused on the participants' educational beliefs, the comments in this third sub-theme category are distinguished from the participants' general beliefs as they represent their beliefs *about* beliefs, or what I have termed "metabeliefs".

Rather than illustrating each of these sub-theme categories with detail (as was included in the findings illustrated in Sub-theme 1.1), just summaries of the beliefs are provided together with supporting quotations.

Sub-Theme Category 1.2.1: Beliefs about Teachers' Students' Likes, Dislikes and Attitudes

Many of the participants in the study believed that teachers and students were characterised by their particular likes, dislikes and attitudes towards teaching, learning and teachers and students. Their comments typically referred to teachers' and students' feelings about learning, teaching and the subject matter in their courses, and how their feelings influence the learning process when teachers' and students' beliefs are positively aligned. The participants frequently mentioned teachers' feelings about the teaching profession as well as the way in which teachers' feelings influence how they treat their students. Many belief statements within this group of comments were coded as being specifically related to the beneficial implications of teachers having a positive and respectful attitude to students. The beliefs expressed by participants about students' likes, dislikes and attitudes towards teachers and learning frequently included references to students' motivation, interest and commitment to learning, as well as their general attitudes towards teachers, the subject and the level of challenge involved in learning.

Table 11 identifies the participants' beliefs within this sub-theme category, in conjunction with supporting quotes.

Sub-Theme Category 1.2.2: Beliefs about Teachers' and Students' Personality Traits

Some of the participants in the study believed that effective teachers and effective students have particular personality traits. Their belief comments frequently included references to both emotional and cognitive aspects of teachers' and students' personalities. These personality traits were viewed as innate and some of them were seen as being beneficial to learning. The participants' belief comments about a teacher's personality traits ranged across a variety of emotional and intellectual aspects of a teacher's character, including the way teachers personally interact with students. The participants' belief comments about students' personality traits were described predominantly in positive terms, ranging from comments about students' creativity and open-mindedness through to beliefs about how some students have "natural" learning predispositions.

Table 12 identifies the participants' beliefs within this sub-theme category, in conjunction with supporting quotes.

Sub-Theme Category 1.2.3: Beliefs about Teachers' and Students' Beliefs

Some of the participants in the study possessed beliefs about the beliefs (metabeliefs) held by teachers and students. Their metabeliefs were expressed in terms of their own personal beliefs as well as their beliefs about others' teaching and learning, and acknowledged that these beliefs either changed or remained static as their experiences as students increased. Some of these participants believed that teachers' and students' beliefs changed over time whereas others believed they did not.

Table 13 identifies the participants' beliefs within this sub-theme category, in conjunction with supporting quotes.

Table 11
Participants' Beliefs about Teachers' and Students' Likes, Dislikes and Attitudes

Nature of Belief	Beliefs about Teachers	By Ts	By Ss	Beliefs about Students	By Ts	By Ss
Positive attitude to teaching or learning and the subject	Teachers should enjoy, be enthusiastic about and be committed to teaching. *I think he is passionate about what he's doing and I think he ... the impression I get is that he cares about his students. (First interview with Kent, Class 4 Student, Line 244)*	Most	Most	Students should enjoy, be motivated about, committed to and involved in learning. *Learning's still very much based on motivation, personal motivation and personal desire to learn, it sort of gets you through. (Third interview with Anne, Class 3 Student, Line 350)*	Most	Most
Positive attitude to students or teachers	Effective teachers are interested in students and treat them with respect. *The most important thing is that in a classroom a student feels like they belong, that they have a sense of worth, and just generally know that in the classroom, who they are and what they do will be respected.(First interview with Trish, Class 3 Student, Line 470)*	Most	Most	Students learn best when they like and respect their teacher. *It makes it so much easier ... and not only that they like you, but at least they can have open access to you as anyone else can, but they're treated fairly and all the rest of it and that you take an interest in them. (Third interview with Joseph, Class 3 Teacher, Line 364)*	Many	Many
Acknowledgement of difficulties in teaching or learning	Teaching is challenging. *It's very stressful, a very stressful job. (Third interview with Therese, Class 5 Student, Line 537)*	Many	Some	Learning is challenging. *Yeah and it's, it's not an easy process, it's an uncomfortable one. (First interview with Hilary, Class 2 Teacher, Line 359)*	Some	Some

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Table 12

Participants' Beliefs about Teachers' and Students' Personality Traits

Nature of Belief	Beliefs about Teachers	By Ts	By Ss	Beliefs about Students	By Ts	By Ss
Natural qualities	Effective teachers are born teachers.	Few	None	Some students are born good learners.	Some	Some
	I think sometimes good teachers are born. (First interview with Dimitri, Class 5 Teacher, Line 287)			*Maybe some of it is inherited ... I've come across people that are brilliant at physics and brilliant at maths ... I mean it's easy to believe they inherited it! That's the sort of thing that is the nature/nurture debate. (Third interview with Morris, Class 1 Teacher, Lines 589-590, 592, 602)*		
Cognitive personality traits	Teachers should be open-minded and intelligent.	Many	Many	Students should be creative, open-minded and have common sense.	Many	Some
	To be taught by someone who is open minded, can understand where the students are coming from, relate to the students, be understanding, you know, just generally be human.(First interview with Trish, Class 3 Student, Line 169)			*I believe effective learning is being open to new experiences and knowing that you can never know everything about a topic. (EBI-2 response, Student no. 15 from Class 1)*		

Table 12

Participants' Beliefs about Teachers' and Students' Personality Traits

Nature of Belief	Beliefs about Teachers	By Ts	By Ss	Beliefs about Students	By Ts	By Ss
Emotional personality traits	Teachers should be empathetic, personable, approachable, modest, patient and calm.	Many	All	-	-	-
	He was friendly. But there are some teachers that I would not approach. Just by having them as a teacher, you can tell that they're not approachable and they'll probably eat you! (Third interview with Marika, Class 5 Student, Lines 429-431)			-		
Self-confidence	Teachers should be confident	Few	Few	Students should be confident	Few	Many
	I believe effective teaching is being sure of who you are so that the students know where they stand. (EBI-1 response, Student no. 48 from Class 3)			*I believe effective learning is when you work enough to be confident with your performance as a student. (EBI-1 response, Student no. 60 from Class 4)*		
Evidence of personality	Teachers should let their personality be evident in their teaching.	Some	Few	-	-	-
	Being an effective teacher is being someone who's human, who divests or invests a lot of themselves in what they're doing. (Third interview with Joseph, Class 3 Teacher, Lines 331-332)					

Table 13
Participants' Beliefs about Teachers' and Students' Beliefs (Metabeliefs)

Nature of Belief	Beliefs about Teachers	By Ts	By Ss	Beliefs about Students	By Ts	By Ss
Possession of beliefs	Teachers have beliefs and these are sometimes different from other teachers.	Many	Some	Students have beliefs.	Many	Many
	You've really got to know what you believe, I think, when you're a teacher. (Second interview with Anne, Class 3 Student, Lines 175-176)			*Students have their own beliefs - their own thinking, their own understanding. (Third interview with Joseph, Class 3 Teacher, Line 121)*		
	It's just the fact that there are just different beliefs, it doesn't mean to say that you've got to be nasty or you're not a nice person, it's just different ideas of teaching.(Second interview with Trish, Class 3 Student, Line 184)					
Instability of beliefs	Teachers' beliefs change.	Many	Few	Students' beliefs change.	Some	Many
	Things are maybe confirmed constantly. Your beliefs may be confirmed and you know, it's not necessarily they're - they're extremely strengthened in any way but, you know, it's just the constant, you know just a re-awakening to the same, you know, beliefs that you may have. (Third interview with Peter, Class 2 Student, Lines 195-196)			*But it's not - it's not static, it's always changing, so whatever they thought is - is definitive now might not be, you know, four weeks into next year when they're teaching in front of a class. (Third interview with Joseph, Class 3 Teacher, Line 316)*		

Table 13

Participants' Beliefs about Teachers' and Students' Beliefs (Metabeliefs)

Nature of Belief	Beliefs about Teachers	By Ts	By Ss	Beliefs about Students	By Ts	By Ss
Stability of beliefs	Teachers' beliefs don't change.	Few	None	Students' beliefs don't change.	Few	Many
	Not really, no, not really, no, I'm not complex, I don't think that I change all the time! (Third interview with Dimitri, Class 5 Teacher, Line 358)			*Oh OK, I was thinking about this on the way here, in the car and nothing's changed. (Third interview with Trish, Class 3 Student, Line 326)*		

Summary of Sub-Theme 1.2: Beliefs about Teachers' and Students'
Innate Characteristics

The structure of this sub-theme and its sub-theme categories, together with the frequency of belief comments, are shown in Figure 6.
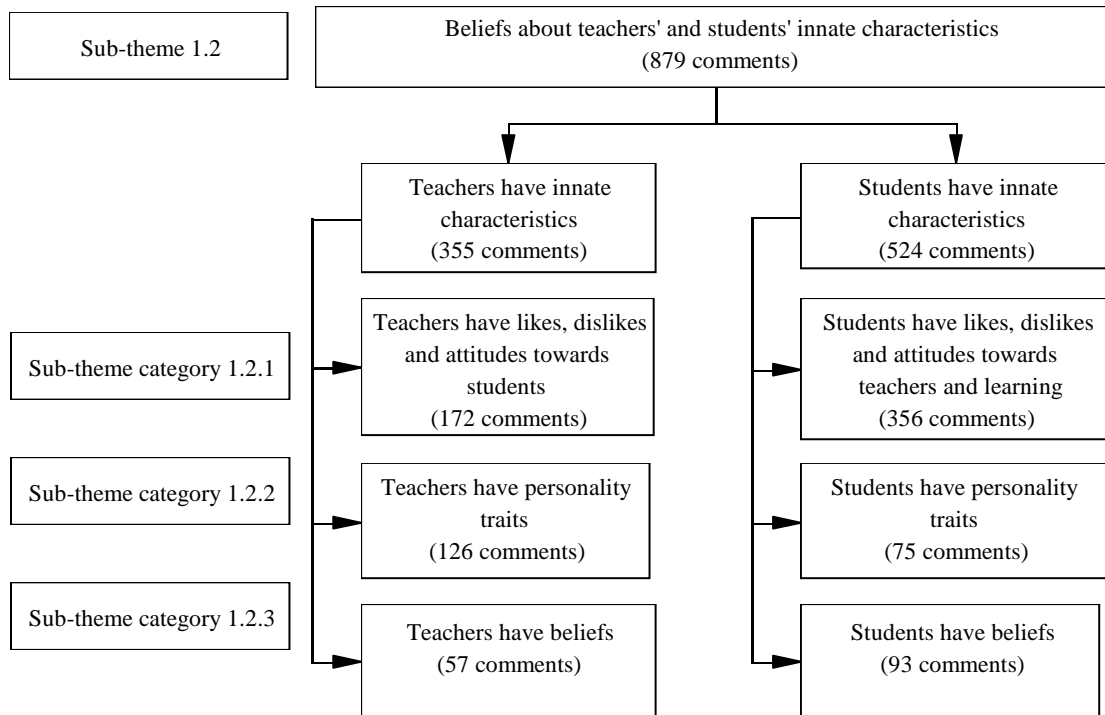
Figure 6. Sub-Theme 1.2: Participants' Beliefs about Teachers' and Students' Innate Characteristics (and Comment Frequencies).

As well as believing that teachers and students had certain types of innate characteristics, many of the participants in the study also believed that effective teachers and students had various abilities that could be learnt and further developed. These beliefs are presented in Sub-theme 1.3.

Sub-Theme 1.3: Beliefs about Teachers' and Students' Learnt
Abilities

The participants' comments indicated that they held beliefs about some types of learnt abilities held by teachers and students. These abilities formed the following sub-theme categories within this sub-theme:

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- Sub-theme category 1.3.1: Beliefs about teachers' and students' abilities to use various different teaching and learning strategies, respectively;

- Sub-theme category 1.3.2: Beliefs about teachers' and students' abilities to deal with students;

- Sub-theme category 1.3.3: Beliefs about teachers' and students' abilities to act as independent professionals/learners;

- Sub-theme category 1.3.4: Beliefs about teachers' abilities to present content; and

- Sub-theme category 1.3.5: Beliefs about students' abilities to think metacognitively.

The beliefs that were classified into each of these sub-theme categories are now explained.

Sub-Theme Category 1.3.1: Beliefs about Teachers' and Students' Abilities to Use Various Different Teaching and Learning Strategies

Many of the participants in the study believed that effective teachers are able to use various different teaching strategies, and that effective students are able to use various different learning strategies. Their comments acknowledged the value of possessing a range of such strategies and noted how teachers' use of certain teaching strategies can increase their students' learning outcomes. Such teachers were viewed as being able to motivate students and to motivate themselves. The participants' belief comments about students suggest that effective students should be able to use a variety of learning strategies and that some students were naturally adept at learning.

It was at this stage of the coding process that the boundary between teaching and learning became less definite as I noticed that the topics mentioned by the participants in their belief comments about teaching repeatedly appeared to be parallel to the topics included in their belief comments about learning. Furthermore, in many cases, the participants

commented on the processes of teaching and learning as a combined process. Consequently, from this point in the coding process, the participants' beliefs about teaching and learning were grouped alongside each other.

Table 14 identifies the participants' beliefs within this sub-theme category, in conjunction with supporting quotes.

Sub-Theme Category 1.3.2: Beliefs about Teachers' and Students' Abilities to Deal with Students

Many of the participants in the study believed that teachers should be able to deal effectively with students, and that students should be able to deal effectively with other students, especially in regards to communication, providing assistance and behaviour management. The participants' belief comments within this sub-theme category were predominantly associated with the ability to communicate with students, either as a teacher or as a fellow student.

Table 15 identifies the participants' beliefs within this sub-theme category, in conjunction with supporting quotes.

Sub-Theme Category 1.3.3: Beliefs about Teachers' and Students' Abilities to Act as Independent, Professional Teachers and/or Learners

Many of the participants in the study possessed beliefs about the abilities of teachers and students to act independently – as professional teachers or learners. The comments from the participants within this sub-theme category included references to how teachers and students should be organised, professional, independent and responsible for their own development and improvement. The participants commented on how teachers should be qualified, how they should prepare for and improve their own teaching, and how they should interact with their colleagues. The participants' comments about students in this sub-theme category were expressed in terms of how students should be organised and responsible for their own learning.

Table 16 identifies the participants' beliefs within this sub-theme category, in conjunction with supporting quotes.

Sub-Theme Category 1.3.4: Beliefs about Teachers' Abilities to Present Content to Students

Most of the participants in the study possessed beliefs about the abilities of teachers to present course content to their students. They described effective teachers as being able to present material in skilful, entertaining and timely ways. Their comments typically included references to the use of appropriate technological presentation resources.

Table 17 identifies the participants' beliefs within this sub-theme category, in conjunction with supporting quotes, and indicates the proportion of the teachers and students in the study who held each of these beliefs.

Sub-Theme Category 1.3.5: Beliefs about Students' Abilities to Think Metacognitively

It was evident from their comments that most of the participants held beliefs about the abilities of effective students to think metacognitively in terms of being aware of themselves as learners and in terms of being able to reflect on their own learning processes, and that students could become more effective learners by engaging in metacognitive thought.

Table 18 identifies the participants' beliefs within this sub-theme category, in conjunction with supporting quotes.

Table 14

Participants' Beliefs about Teachers' Teaching Strategies and Students' Learning Strategies

Nature of Belief	Beliefs about Teachers	By Ts	By Ss	Beliefs about Students	By Ts	By Ss
Possession of strategies	-	-	-	Students should possess learning strategies.	Many	Few
	-			*So that is probably my strongest belief of learning, that teaching and learning should all be about making students better learners and that means self-regulating cognitively and emotionally. (First interview with Walter, Class 4 Teacher, Line 288)*		
Adaptability of different strategies	Effective teachers adapt their teaching strategies to suit different learners and learning situations.	All	Most	Students use various learning strategies.	All	Most
	I'd still probably fundamentally find that, you know, the most important thing is your understanding of students' needs and, you know, developing strategies that actually meet those needs. (Third interview with Peter, Class 2 Student, Lines 183-185)			*They become better learners in terms of learning how to learn because if they're able to know what their weakness is, their strengths are, what kinds of approaches they're comfortable with and they're not comfortable with, then they're going to be better no matter what kind of learning context they find themselves in. (First interview with Walter, Class 4 Teacher, Lines 143-144)*		

Table 14

Participants' Beliefs about Teachers' Teaching Strategies and Students' Learning Strategies

Nature of Belief	Beliefs about Teachers	By Ts	By Ss	Beliefs about Students	By Ts	By Ss
Naturally held strategies	-	-	-	Some students have natural learning strategies.	Few	Few
	-			*It seems a bit like that sometimes (like auto-pilot). (First interview with Pete, Class 2 Student, Line 144)*		
Strategies which identify the teachable moment.	Effective teachers' awareness of the learning environment enables them to determine the teachable moment.	Some	Many	-	-	-
	So he was actually feeding off the students to actually see what he needed to teach … Yeah and he's actually quite aware of what we're learning and - and if we've missed something, he'll go back over it and - and you know, it's - it's good in a way … Yep, oh that's the key to why he's such a good lecturer I think, it's because he can actually pinpoint - you know, where everyone's coming from, where they're going. (Third interview with Anne, Class 3 Student, Lines 14, 103, 107)			-		

Table 14

Participants' Beliefs about Teachers' Teaching Strategies and Students' Learning Strategies

Nature of Belief	Beliefs about Teachers	By Ts	By Ss	Beliefs about Students	By Ts	By Ss
Clear teaching strategies	Effective teachers' teaching strategies are clear and rational.	Most	Most	-	-	-
	OK, I think effective teaching then is having clear structure, clear goals - I mean I'm talking practical issues here. (First interview with Walter, Class 4 Student, Line 78)					
	He's clear on what - what he wanted to teach. (Third interview with Kiarn, Class 4 Student, Line 17)			-		
Use of self-motivating strategies	Teachers use teaching strategies which motivate them as teachers.	Few	Most	-	-	-
	I believe effective teaching is being able to teach students in a way which is motivating and exciting for them as well as yourself. (EBI-1 response, Student no. 44 from Class 3)					

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Table 15

Participants' Beliefs about Teachers' and Students' Abilities to Deal with Students

Nature of Belief	Beliefs about Teachers	By Ts	By Ss	Beliefs about Students	By Ts	By Ss
Dealing with differences among students	Teachers should be able to deal with various students' needs. *I now believe that there are quite different teaching strategies for different student needs and there needs to be a definite awareness of where your students are and how's [sic] the best method or strategy to teach your students. (Second interview with Peter, Class 2 Student, Line 24)*	Most	Many	-	-	-
Communication with students	Teachers should be able to communicate with groups of students and individual students. *I also believe that effective teaching is where the teacher is able to communicate to every member of the class, being able to ignore the "know-it-all" and be more concerned with those who may know nothing at all. (EBI-1 response, Student no. 56 from Class 4)*	Many	Most	Effective students communicate with other students. *Helping each other learn by asking questions and participating in discussions also aids learning. (EBI-1 response, Student no. 11 from Class 2)*	None	Few

Table 15

Participants' Beliefs about Teachers' and Students' Abilities to Deal with Students

Nature of Belief	Beliefs about Teachers	By Ts	By Ss	Beliefs about Students	By Ts	By Ss
Assisting students	Teachers should be available to assist students.	All	Most	Learners assist and encourage each other to learn, especially by forming their own study groups.	Few	Few
	I believe effective teaching is checking and reinforcing information and generally being available for students when they need additional help. (EBI-1 response, Student no. 99 from Class 5)			*We all go like meet up sometimes in the library um, after coffee or something and we go and talk about our assignment and what we did today, like if we didn't understand something we'd just confirm everything. (First interview with Marika, Class 1 Student, Line 67)*		
Managing student behaviour	Teachers should be able to manage students' behaviour.	Few	Most	-	-	-
	I believe effective teaching is being prepared for students to misbehave and being able to deal with it accordingly so as to not disrupt the dynamics of the class. (EBI-1 response, Student no. 40 from Class 3)					

Table 16

Participants' Beliefs about Teachers' and Students' Abilities to Act as Independent Professionals/Learners

Nature of Belief	Beliefs about Teachers	By Ts	By Ss	Beliefs about Students	By Ts	By Ss
Professionalism, formal accreditation	Teachers should be professional and qualified.	None	Many	-	-	-
	It makes you feel a lot better that he is qualified to ... He's a qualified person to teach. (Second interview with Lionel, Class 1 Student, Lines 197, 226)					
Responsibility for own teaching or learning	Effective teachers reflect on and incorporate feedback from others in order to improve their teaching.	All	Many	Effective learners are responsible for their own learning.	All	Most
	Whereas with teaching I feel that there's two people involved because, you know, I think my feedback to Joseph would affect his teaching. (First interview with Anne, Class 3 Student, Line 332)			*A student can learn by himself as well, that's important but he should have that ability, you know, it's like it's important to have the ability in a student, to learn by himself. (Third interview with Shane, Class 1 Student, Line 311)*		

Table 16

Participants' Beliefs about Teachers' and Students' Abilities to Act as Independent Professionals/Learners

Nature of Belief	Beliefs about Teachers	By Ts	By Ss	Beliefs about Students	By Ts	By Ss
Organisation	Effective teachers are organised and prepared.	Many	Many	Effective learners are organised.	Few	Some
	I think he prepares well for - for classes, yeah … Yes, and that good teachers are organised, Walter is very - is organised in the way he teaches so that - I - I guess that I find his teaching very easy to follow. (First interview with Kiarn, Class 4 Student, Lines 390, 404)			*It also requires organisation and the ability to balance all aspects of one's life. (EBI-1 response, Student no. 88 from Class 5)*		
Technological skills	Effective teachers have appropriate technological skills.	Few	Few	-	-	-
	You use different, a range of media. You can use different forms in your teaching whether it be lecturing or the tutes. (Third interview with Joseph, Class 3 Teacher, Lines 342-343)					
Interacting with colleagues	Being an effective teacher involves interacting with your colleagues.	Many	Few	-	-	-
	I believe effective teaching is about the collegial relationship. (Third interview with Hilary, Class 2 Teacher, Line 264)					

Table 17

Participants' Beliefs about Teachers' Abilities to Present Content to Students

Nature of Belief	Beliefs about Teachers	By Ts	By Ss	Beliefs about Students	By Ts	By Ss
Presentation style	Effective teachers are skilled, entertaining, timely and appropriate presenters. *He's, like, an interesting orator, you know, he talks well so I think that helps and he tells jokes. Again, it makes you little bit [sic] remember more, yeah. (Third interview with Kiarn, Class 4 Student, Lines 78, 80)*	Most	All	-	-	-
Use of presentation resources	Effective teachers use appropriate presentation resources. *I believe effective teaching is using teaching equipment such as slides, flow chart can help much [sic] for teaching. (EBI-2 response, Student no. 64 from Class 4)* *So it [use of PowerPoint] - it facilitated the delivery of - of the information and - and yeah, helped in the - yeah, in public delivery. So it, yeah so - and that's a big part of being a teacher isn't it? (Third interview with Tom, Class 3 Student, Lines 201-202)*	Many	Most	-	-	-

Table 18
Participants' Beliefs about Students' Abilities to Think Metacognitively

Nature of Belief	Beliefs about Teachers	By Ts	By Ss	Beliefs about Students	By Ts	By Ss
Awareness of self as learner	-	-	-	Effective students are aware of their own qualities as a learner.	Many	Most
				If you're focusing on learning, well then I think you're going to be better off as a learner. You know, if you're actually aware of the processes that you're going through to actually try and encode information that you're getting so that you can actually retrieve it later on …. I think you need to be aware of yourself as a learner, to be the best learner you can. (First interview with Peter, Class 2 Student, Lines 154-157)		
Reflection	-	-	-	Effective Students should reflect on their own learning, and how they are taught.	Most	Most
				I think that's really important that students can gauge their progress and reflect on where they've come from and see themselves gaining ground … You can't just be gauging it against what somebody else thinks, it's how meaningful it is for you in your life, it's your life, and at the same time, you know, by reflecting on your own learning, you know, you can extrapolate from that, that it's reflecting on your own behaviour, on your own place in the world, you know, from a big picture to a small picture. (First interview with Tom, Class 3 Student, Lines 240 & 277)		

Summary of Sub-theme 1.3: Beliefs about Teachers' and Students'
Learnt Abilities

The structure of this sub-theme and its sub-theme categories, together with the frequency of belief comments, are shown in Figure 7.

Sub-theme 1.3	Beliefs about teachers' and students' learnt abilities (1470 comments)

	Teachers have learnt abilities (901 comments)	Students have learnt abilities (569 comments)
Sub-theme category 1.3.1	Teachers have abilities to use various teaching strategies (313 comments)	Students have abilities to use various learning strategies 109 comments)
Sub-theme category 1.3.2	Teachers have abilities to deal with students (242 comments)	Students have abilities to deal with other students (51 comments)
Sub-theme category 1.3.3	Teachers have abilities to act as independent professionals (192 comments)	Students have abilities to act as independent learners (178 comments)
Sub-theme category 1.3.4	Teachers have abilities to present content (154 comments)	
Sub-theme category 1.3.5		Students have abilities to think metacognitively (231 comments)

Figure 7. Sub-Theme 1.3: Participants' Beliefs Teachers' and Students' Learnt Abilities (and Comment Frequencies).

Summary of Theme 1: Beliefs about Teachers and Students

The participants' coded belief comments about the qualities of effective teachers and effective students formed three clear sub-themes, including their beliefs about:

- teachers' and students' knowledge;

- teachers' and students' innate characteristics; and

- teachers' and students' learnt abilities.

A summary of this theme, including the various sub-themes and sub-theme categories, that emerged from coding the participants' belief comments is outlined in Figure 8.
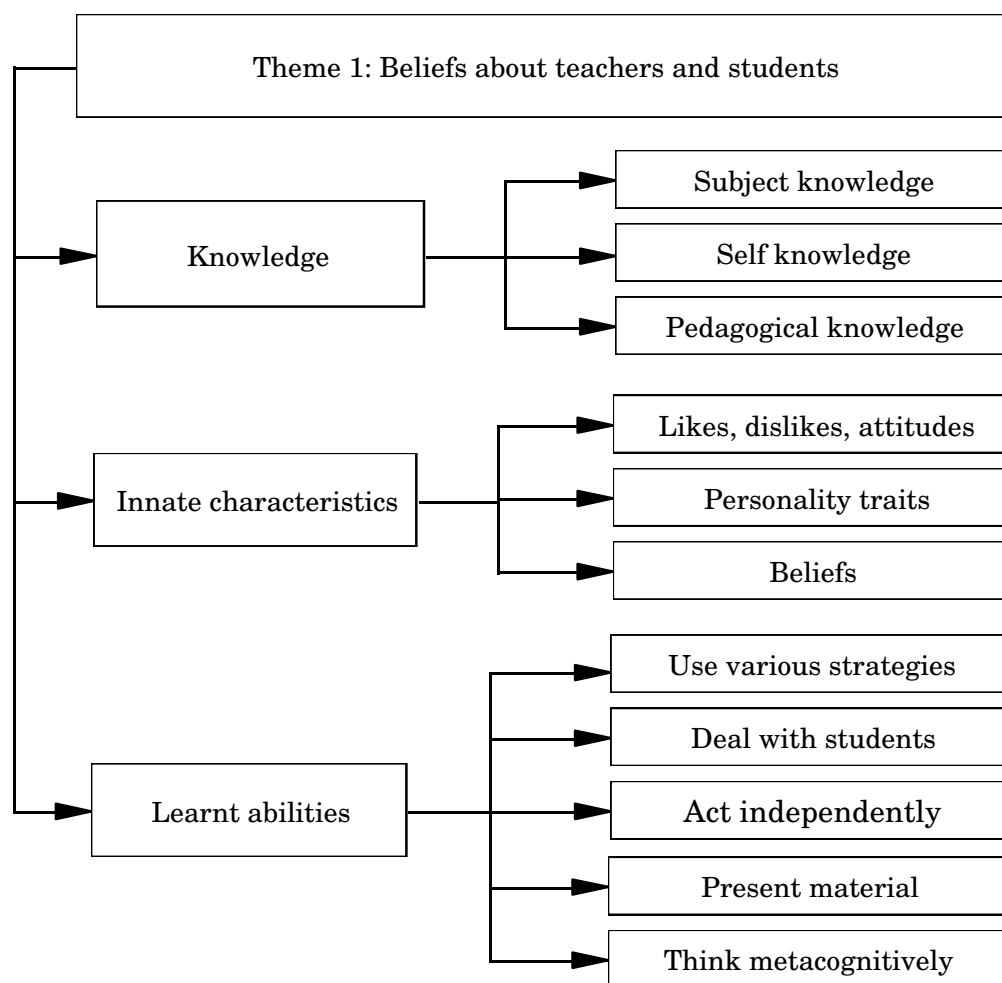
Figure 8. Structure of Theme 1: Beliefs about Teachers and Students.

Considering the emerged findings from the process of coding and analysing the data so far (presented as Theme 1), it is possible to gain an understanding of how the participants perceived the qualities of effective university teachers and effective university students. The beliefs about

teachers and students held by the participants in the study are listed in Tables 19 and 20, with the more strongly held beliefs listed at the beginning each list.

Table 19
Participants' Beliefs about Teachers

Effective teachers are skilled, entertaining, timely and appropriate presenters.

Effective teachers adapt their teaching strategies to suit different learners and learning situations.

Teachers know that all learners are different.

Teachers should be available to assist students.

Teachers should be empathetic, personable, approachable, modest, patient and calm.

Effective teachers' teaching strategies are clear and rational.

Teachers should be able to communicate with groups of students and individual students.

Teachers should be the source of subject knowledge.

Teachers should enjoy, be enthusiastic about and be committed to teaching.

Effective teachers are interested in students and treat them with respect.

Effective teachers use appropriate presentation resources.

Effective teachers reflect on and incorporate feedback from others in order to improve their teaching.

Effective teachers are organised and prepared.

Teachers should be able to deal with various students' needs.

Teachers use teaching strategies which motivate them as teachers.

Effective teachers' awareness of the learning environment enables them to determine the teachable moment.

Teachers should be able to manage students' behaviour.

Teachers should be open-minded and intelligent.

Teachers should reflect on their own teaching.

Teachers' subject knowledge should be current.

Teachers continue to learn about their subject.

Teachers have beliefs and these are sometimes different from other teachers.

Table 19
Participants' Beliefs about Teachers

Teachers know that learning involves making mistakes and rectifying misunderstandings.

Teaching is challenging.

Teachers should know themselves.

Teachers know how to treat students holistically.

Teachers should be professional and qualified.

Teachers' beliefs change.

Being an effective teacher involves interacting with your colleagues.

Teachers should be confident.

Teachers should let their personality be evident in their teaching.

Effective teachers have appropriate technological skills.

Teachers should reflect on their own learning.

Effective teachers are born teachers.

Teachers' beliefs don't change.

Table 20
Participants' Beliefs about Students

Effective learners are responsible for their own learning.

Students should enjoy, be motivated about, committed to and involved in learning.

Effective students are aware of their own qualities as a learner.

Effective students reflect on their own learning, and how they are taught.

Students should be aware of themselves as learners.

Students should reflect on their own learning.

Students use various learning strategies.

Students already possess some subject knowledge.

Students have beliefs.

Students learn best when they like and respect their teacher.

Students' beliefs change.

Students gain subject knowledge from the course, teacher and other students.

Students should be creative, open-minded and have common sense.

Table 20
Participants' Beliefs about Students

Students should be confident.

Students' beliefs don't change.

Learning is challenging.

Some students are born good learners.

Students should possess learning strategies.

Effective learners are organised.

Students should reflect on how they are taught.

Learners assist and encourage each other to learn, especially by forming their own study groups.

Some students have natural learning strategies.

Students' subject knowledge should be current.

Effective students communicate with other students.

As well as expressing beliefs about teachers and students (Theme 1), most of the participants in the study also expressed beliefs about the teaching process and the learning process (Theme 2). The findings from an analysis of their coded comments about these processes are now presented.

Theme 2: Beliefs about the Processes of Teaching and Learning

The second major theme that emerged represented the participants' beliefs about two major processes in university education – teaching and learning. Most of the participants possessed these beliefs.

The participants' comments that were coded as being related to this theme suggested a focus upon seven different areas: institutions, knowledge, resources, context, activity, student and effort. These seven areas formed the sub-themes of this theme, the details of which are outlined in Figure 9.
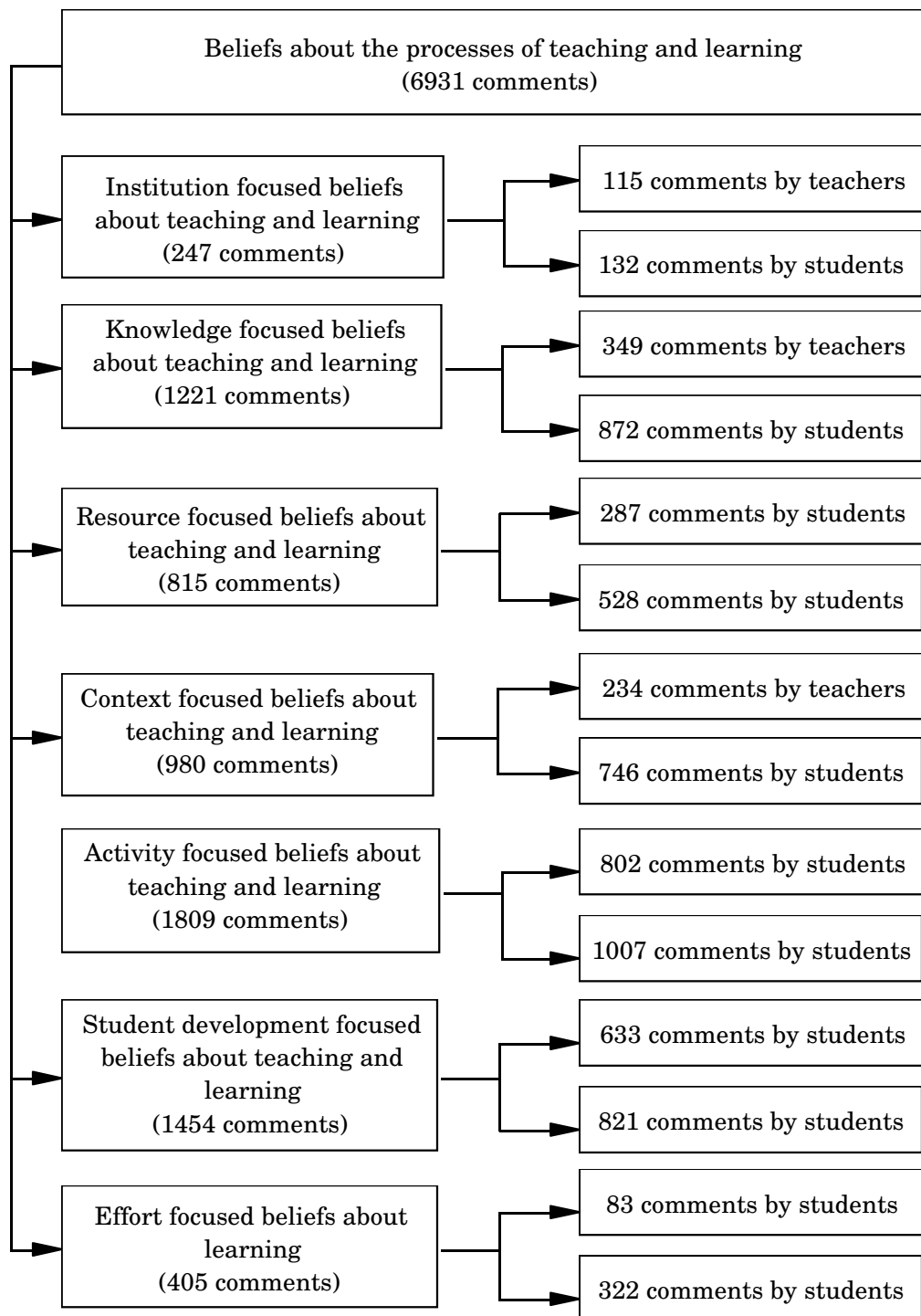
Figure 9. Beliefs about the Processes of Teaching and Learning: Theme 2
Sub-Themes.

Each of the sub-themes outlined in the above figure will now be
explained in order to develop an answer to the first Research Question
which focuses on the identification of the participants' educational beliefs.

Sub-theme 2.1: Institution Focused Beliefs about the Processes of Teaching and Learning

Many of the participants in the study expressed belief comments that were coded as relating to how the processes of teaching and learning took place within educational institutions. Unlike most of the other sub-themes that were formed as the basis of participants' comments, their institution focused beliefs did not suggest additional sub-theme categories. Their belief comments in this sub-theme referred to how teaching and learning are processes that are influenced by policies, syllabi and time limits, and frequently involve large numbers of students. Their beliefs about teaching included references to how teaching processes can be negatively influenced by the institution's influences Their beliefs about learning within this sub-theme were typically interspersed with references to how students were obliged to fulfil certain requirements (such as attendance, assignments and examinations) of the units or courses in which they were involved.

Table 21 identifies the participants' beliefs within this sub-theme, in conjunction with supporting quotes.

Table 21

Participants' Institution Focused Beliefs about the Processes of Teaching and Learning

Nature of Belief	Beliefs about Teaching	By Ts	By Ss	Beliefs about Learning	By Ts	By Ss
Course requirements and time constraints	Teaching involves balancing course requirements and workload within institutional time constraints.	Most	Most	Learning involves getting through course material within time limits.	Most	Most
	One of the problems … is the fact that you've got a certain syllabus that you must get through in - in a certain time. (Third interview with Morris, Class 1 Teacher, Line 321)			*That was a requirement to actually pass the unit so that was a pretty big motivating factor given that you have to pass units to graduate, well that was quite important. (Third interview with Peter, Class 2 Student, Line 53)*		
Institutional rules and policies	Teaching involves adhering to institutional rules and policies.	Few	Many	-	-	-
	Having these policies in place ensures that there's some kind of, you know, consistency. (Third interview with Walter, Class 4 Teacher, Line 187).					
Course design and organisation	Teaching is influenced by course design and organisation.	Most	Few	-	-	-
	What you're trying to do is individualise instruction, which is of course very hard in a sort of homogenous university setting. (First interview with Walter, Class 4 Teacher, Line 186)					

Summary of Sub-theme 2.1: Institution Focused Beliefs about the
Processes of Teaching and Learning

The structure of this sub-theme and the frequency of the participants'
belief comments are shown in Figure 10.
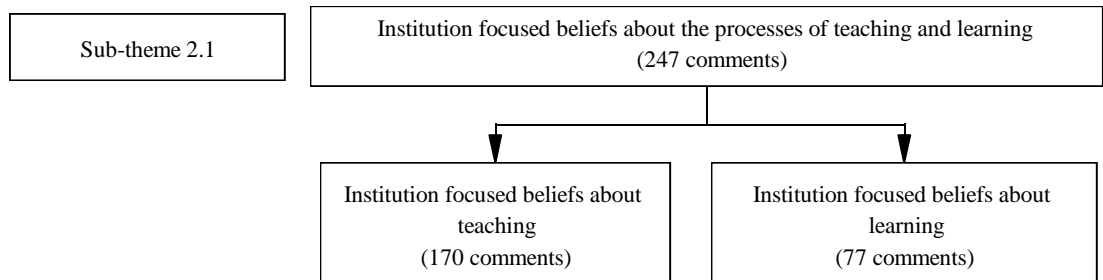
Figure 10. Sub-Theme 2.1: Institution Focused Beliefs about the Processes
of Teaching and Learning (and Comment Frequencies).

As well as having institution focused beliefs about the processes of
teaching and learning, most of the participants in the study also held
knowledge focused beliefs. These beliefs are presented in Sub-theme 2.2.

Sub-theme 2.2: Knowledge Focused Beliefs about the Processes of
Teaching and Learning

The participants in the study expressed beliefs that teaching is a
process of managing knowledge and that learning is a process of dealing
with knowledge. From these knowledge focused belief comments about the
processes of teaching and learning, a further two sub-theme categories
emerged:

- Sub-theme category 2.2.1: Beliefs about teaching as a process of
  providing knowledge, and learning as a process of receiving
  knowledge; and

- Sub-theme category 2.2.2: Beliefs about teaching as a process of
  facilitating the construction of knowledge, and learning as a process
  of constructing knowledge.

The beliefs that were classified into each of these sub-theme categories are now explained.

Sub-Theme Category 2.2.1: Beliefs about Teaching as a Process of Providing Knowledge, and Learning as a Process of Receiving Knowledge

Most of the participants in the study believed teaching to be a process of providing knowledge, and learning to be a process of receiving knowledge. The term "knowledge" was often used by the participants in the study to describe the content of a course or the subject matter of the unit being taught. The participants' belief comments in this sub-theme category illustrated their understanding of teaching and learning as processes that involve the transfer of information between teachers and students. Their comments about teaching included recurring references to how teachers should present information and knowledge to students in an understandable manner that is supported by examples. Their beliefs about learning as a process of receiving knowledge frequently included statements about how students receive, absorb, observe and remember information.

Table 22 identifies the participants' beliefs within this sub-theme category, in conjunction with supporting quotes.

Sub-Theme Category 2.2.2: Beliefs about Teaching as a Process of Facilitating the Construction of Knowledge, and Learning as a Process of Constructing Knowledge

Most of the participants in the study believed that teaching was a process of facilitating the construction of knowledge, and that learning was a process of actually constructing knowledge, with an emphasis on active learning rather than the more passive processes described in the previous sub-theme category. While they believed that effective teachers were involved in preparing and structuring knowledge, their comments within this sub-theme category concentrated primarily on students' learning. They also acknowledged that students had acquired certain levels of knowledge

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before they entered their university courses and that their knowledge levels were built upon during their learning at university.

Table 23 identifies the participants' beliefs within this sub-theme category, in conjunction with supporting quotes.

Table 22

Participants' Beliefs about Teaching as Providing Knowledge, and Learning as Receiving Knowledge

Nature of Belief	Beliefs about Teaching	By Ts	By Ss	Beliefs about Learning	By Ts	By Ss
Provision of and receiving information	Teaching involves providing students with information	All	All	Learning involves receiving information and gaining knowledge	All	Most
	With teaching, it's imparting the knowledge and information and hopefully to the best of their ability but whether there's any learning going on might be another thing. (First interview with Tom, Class 3 Student, Line 298)			*I believe effective learning is being able to take in all the conveyed information within the lecture or lab. (EBI-2 response, Student no. 10 from Class 1)*		
Explanation of information	Teaching involves explaining information to students	Many	All	-	-	-
	Explaining the concepts in a manner that would be understood by even those who are not in that field of study. (EBI-1 response, Student no. 3 from Class 1)					
Provision of and observing examples	Teaching involves providing students with examples	Many	All	Learning involves observing demonstrations of examples	Many	Many
	I believe an effective teacher is one that is understandable with clear and working examples. (EBI-2 response, Student no. 8 from Class 1)			*I like all the examples and actually seeing things like a video or something like that. (First interview with Zoe, Class 5 Student, Line 76)*		

Table 22

Participants' Beliefs about Teaching as Providing Knowledge, and Learning as Receiving Knowledge

Nature of Belief	Beliefs about Teaching	By Ts	By Ss	Beliefs about Learning	By Ts	By Ss
Retaining information	-	-	-	Learning involves remembering information	Few	Most
				I believe effective teaching is when your students understand what you say and remember it after the class. (EBI-1 response, Student no.73 from Class 4)		

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Table 23

Participants' Beliefs about Teaching as Facilitating Knowledge Construction, and Learning as Constructing Knowledge

Nature of Belief	Beliefs about Teaching	By Ts	By Ss	Beliefs about Learning	By Ts	By Ss
Structuring information and building upon existing knowledge	Teaching involves structuring knowledge for students.	All	All	Learning involves building upon students' current knowledge.	Most	Most
	I believe effective teaching is presenting the information in a well structured professional manner. (EBI-1 response, Student no. 60 from Class 4)			*I believe effective learning is understanding each bit of information as it is given to you and then compiling it all together to get and formulate knowledge. (EBI-2 response, Student no. 40 from Class 3)*		
	He goes through a type of search engine, it's like a refinery or something [sic] type of thing, he percolates that knowledge. So he will go through that refinery, he will refine the answers in his head. (Third interview with Shane, Class 1 Student, Lines 228-230)			*I believe effective learning is when students can use what they've learnt in class for the real life and can create their own idea by using the knowledge which they have. (EBI-2 response, Student no. 64 from Class 4)*		

Table 23

Participants' Beliefs about Teaching as Facilitating Knowledge Construction, and Learning as Constructing Knowledge

Nature of Belief	Beliefs about Teaching	By Ts	By Ss	Beliefs about Learning	By Ts	By Ss
Selecting and working with information	Teaching involves providing students with choice, while facilitating knowledge construction.	Most	Some	Learning involves working with and selecting knowledge.	Most	All
	There are multiple paths that students can take through that material. (Third interview with Morris, Class 1 Teacher, Line 12)			*Learning to me is students coming across information, ideas, that may be initially confusing, disorienting for which they need to find a resolution and that takes place through a process of interpretation and meaning. So they're making sense of new information. (First interview with Walter, Class 4 Teacher, Lines 176-177)*		
New knowledge	-	-	-	Learning involves creating knowledge.	Most	All
				Learning is setting up the structures and the environment and the context and the social part of it to help students to build that confidence so that they can find the resources and use them and come up with a confident expression of their new knowledge. (Third interview with Hilary, Class 2 Teacher, Line 325)		

Summary of Sub-theme 2.2: Knowledge Focused Beliefs about the
Processes of Teaching and Learning

The structure of this sub-theme and its sub-theme categories, together with the frequency of belief comments, are shown in Figure 11.
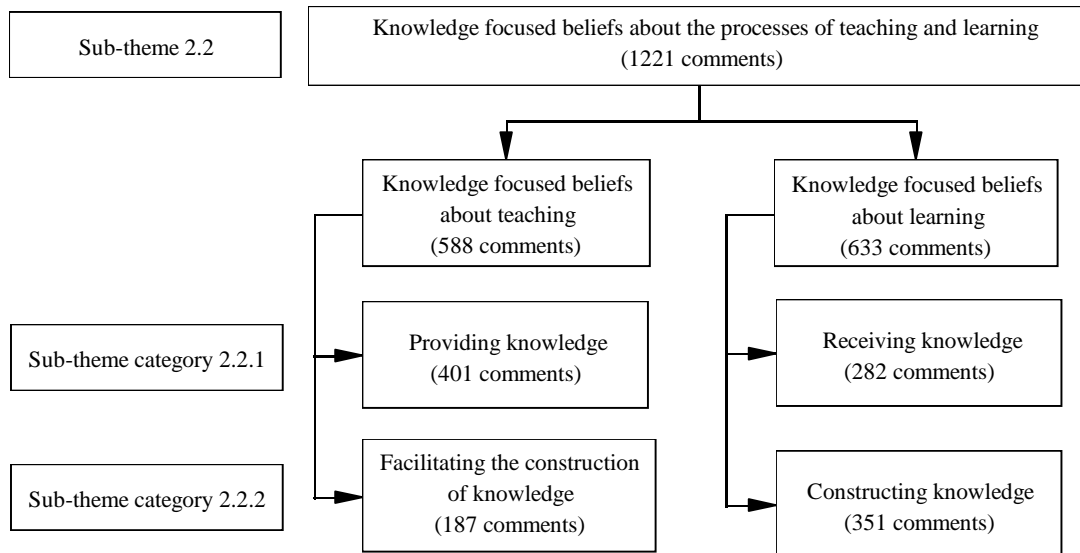
Figure 11. Sub-Theme 2.2: Knowledge Focused Beliefs about the Processes of Teaching and Learning (and Comment Frequencies).

As well as having knowledge focused beliefs about the processes of teaching and learning, most of the participants in the study also held resource focused beliefs. These beliefs are presented in Sub-theme 2.3.

Sub-theme 2.3: Resource Focused Beliefs about the Processes of
Teaching and Learning

Most of the participants in the study expressed comments that reflected resource focused beliefs about the processes of teaching and learning, especially in terms of how resources are used to support student learning. The resources that were referred to in these comments include paper based and technological materials (such as computers, books, multimedia, the internet, models and diagrams) and people (including teachers, other students and experts). Unlike most of the other sub-themes

that were formed as the basis of participants' comments, their resource focused beliefs did not suggest additional sub-theme categories.

Table 24 identifies the participants' beliefs within this sub-theme, in conjunction with supporting quotes.

Table 24

Participants' Resource Focused Beliefs about the Processes of Teaching and Learning

Nature of Belief	Beliefs about Teaching	By Ts	By Ss	Beliefs about Learning	By Ts	By Ss
Provision/Use of resources for learning	Teaching involves providing students with resources for learning (texts, other material, teacher as resource, computerised resources). *I believe effective teaching is initially giving the students the resources and tools and then moving to a hands-on approach. (EBI-1 response, Student no. 15 from Class 1)*	All	Most	Students use and interact with resources in the learning process (texts, other material, teacher as resource, other students, experts, computerised resources). *I believe effective learning is when you have good learning resources, whether that be a good textbook, good lecture notes or good teaching. (EBI-1 response, Student no. 60 from Class 4)*	All	All
Using teaching resources	Teaching involves using communication and presentation resources for teaching. *The slides are helpful because he can go the step by step procedure. (Third interview with Shane, Class 1 Student, Line 70)*	Most	Most	-	-	-
Students create resources	-	-	-	Students create documents, notes, electronic files and resources in the learning process. *If I actually draw something - if I actually get involved in actually creating my own interpretation of something. (First interview with Peter, Class 2 Student, Line 183)*	Many	Most

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Summary of Sub-theme 2.3: Resource Focused Beliefs about the Processes of Teaching and Learning

The structure of this sub-theme and the frequency of the participants' belief comments are shown in Figure 12.
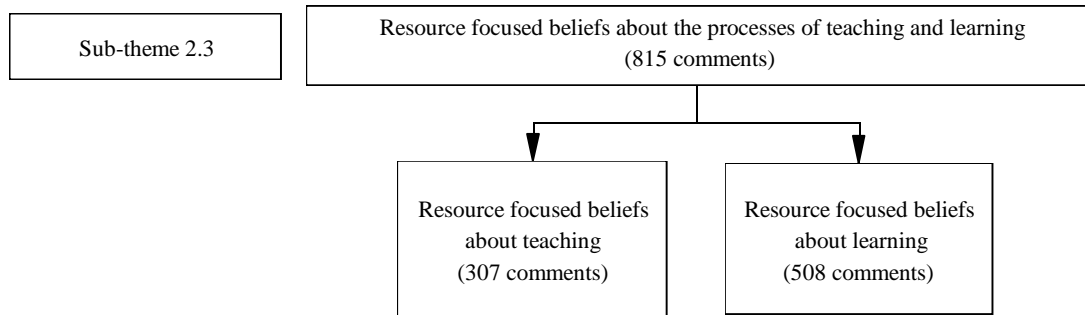
Figure 12. Sub-Theme 2.3: Resource Focused Beliefs about the Processes of Teaching and Learning (and Comment Frequencies).

As well as having resource focused beliefs about the processes of teaching and learning, many of the participants in the study also held context focused beliefs. These beliefs are presented in Sub-theme 2.4.

Sub-theme 2.4: Context Focused Beliefs about the Processes of Teaching and Learning

The comments that were coded into this category reflected the participants' beliefs about the context of teaching and learning – the learning environment. Their comments acknowledged that this environment was affected by both teaching and learning processes, and that these processes were, in turn, affected by the environment, suggesting a dialectical process. Their beliefs acknowledged that such an environment was multidimensional. The varied aspects of the learning environment mentioned by the participants formed the four sub-theme categories within this sub-theme. All except the category about the physical context reflected beliefs about both teaching and learning:

- Sub-theme category 2.4.1: Beliefs about the affective and social aspects of teaching and learning environments;

- Sub-theme category 2.4.2: Beliefs about the academic aspects of teaching and learning environments;

- Sub-theme category 2.4.3: Beliefs about the behaviour management aspects of teaching and learning environments; and

- Sub-theme category 2.4.4: Beliefs about the physical aspects of teaching environments.

The beliefs that were classified into each of these sub-theme categories are now explained.

Sub-Theme Category 2.4.1: Beliefs about the Affective and Social Aspects of Teaching and Learning Environments

Many of the participants in the study believed teaching to be a process which involves creating and maintaining the affective and social aspects of the learning environment, and that the learning process is influenced by the affective and social aspects of the learning environment. The participants' belief comments in this sub-theme category frequently included references to how the learning climate, atmosphere or environment is affected by the affective, social and interpersonal aspects of teaching and learning, especially in terms of positive or negative relationships between teachers and students. Many of the participants' beliefs focused on how the learning context influenced students' feelings and, consequently, the quality of students' learning.

Table 25 identifies the participants' beliefs within this sub-theme category, in conjunction with supporting quotes.

Sub-Theme Category 2.4.2: Beliefs about the Academic Aspects of Teaching and Learning Environments

Most of the participants in the study believed that teaching involves creating and maintaining the academic aspects of the learning environment, and that the learning process is influenced by the academic aspects of the

learning environment. The academic aspects of the learning environment that participants included in their comments were related to intelligence, workload and the level of challenge in learning. Their beliefs about learning acknowledged how learning involved making mistakes and rectifying misunderstandings.

Table 26 identifies the participants' beliefs within this sub-theme category, in conjunction with supporting quotes.

Sub-Theme Category 2.4.3: Beliefs about the Behaviour Management Aspects of Teaching and Learning Environments

Some of the participants in the study believed that teaching involves creating and maintaining the behaviour management aspects of the learning environment, and that the learning process is influenced by the behaviour management aspects of the learning environment. The participants' comments within this sub-theme category characteristically included remarks about how the learning environment could be disrupted by uncooperative students and how teaching involves managing student behaviour and preventing misbehaviour.

Table 27 identifies the participants' beliefs within this sub-theme category, in conjunction with supporting quotes.

Sub-Theme Category 2.4.4: Beliefs about the Physical Aspects of Teaching Environments

Many of the participants in the study believed that teaching involves creating and maintaining the physical aspects of the learning environment. These comments included references to aspects of the learning environment such as room space and types of rooms used for university classes, and how such physical aspects of the learning environment affected student grouping and room access. They did not express parallel beliefs about the learning process within this sub-theme category.

Table 28 identifies the participants' beliefs within this sub-theme category, in conjunction with supporting quotes.

Table 25
Participants' Beliefs about the Affective and Social Aspects of Teaching and Learning Processes

Nature of Belief	Beliefs about Teaching	By Ts	By Ss	Beliefs about Learning	By Ts	By Ss
Positive attitudes/ Acknowledgement of affective and social influences on learning	Teaching involves modelling positive attitudes. *I find that the way [lecturer's name] teaches us in Music Education is fantastic. It's the kinaesthetic, it's the emotions, it's the cognitive thing. It's all happening at the same time, yeah. Just brilliant, she is a brilliant model. (First interview with Therese, Class 5 Student, Lines 572-575)*	None	Few	Learning is influenced by students' emotions, feelings, likes, dislikes. *I've never liked science in primary school, or in high school. I find it really boring and then, I don't pay attention and then I don't do anything because I don't find it exciting but now I'm with Dimitri's class, I go, "I'll complete these 'cause I know how to do them". I never thought it could be so fun (Second interview with Marika, Class 5 Student, Lines 334-337, 513)*	Some	Many
Negative influences on the learning environment	-	-	-	Learning is influenced by students' learning experiences which can be negative. *You get this sort of mental - like everything's shutting down and I don't know anything now. It's like that with that subject, if you've missed one, you think I just don't know anything and when you're in there the following lesson, nothing really make sense and I'm afraid to ask. I feel embarrassed to ask, which I've got to get over. It's the emotional thing again and things shut down. (Second interview with Therese, Class 2 Student, Lines 11-13, 17)*	Few	Most

Table 25

Participants' Beliefs about the Affective and Social Aspects of Teaching and Learning Processes

Nature of Belief	Beliefs about Teaching	By Ts	By Ss	Beliefs about Learning	By Ts	By Ss
Positive learning environment/ Positive influences on the learning environment	Teaching involves creating a positive learning environment by focusing on learning. *I guess what I'm trying to do all the time is to build a learning environment where we use a level of confidence and trust so that you can put forward your question and have your colleagues critique it and it's taken in a constructive way. (First interview with Hilary, Class 2 Teacher, Line 133)*	All	All	Learning is influenced by students' learning experiences which can be positive. *It was just a lot of fun, you'd have a laugh and, I didn't miss one class … I just wanted to have a laugh and have some fun. And the last lecture we had … I just laughed for about thee hours non-stop, it was great, it was just wonderful, it was great. (Second interview with Trish, Class 3 Student, Lines 213-216)*	Many	Most
Positive relationship environment	Teaching involves creating positive relationships with students. *Effective teachers are able to form personal relationships. (Second interview with Walter, Class 4 Teacher, Line 62)*	All	Most	Learning is influenced by students' relationships with the teacher and other students. *Learning for me is more possible if I am in a relationship with the teacher and so I can see the point of what we are doing and I can see that it is of benefit and worthwhile to the learning enterprise. (EBI-2 response, Teacher from Class 3)*	Many	Some

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Table 26

Participants' Beliefs about the Academic Aspects of Teaching and Learning Environments

Nature of Belief	Beliefs about Teaching	By Ts	By Ss	Beliefs about Learning	By Ts	By Ss
Provision of academic challenge/ Meeting academic challenge	Teaching involves providing students with an appropriate level of academic challenge and workload.	Many	Some	Learning involves dealing with academic challenge and workload issues.	Many	Many
	I believe effective teaching is providing opportunities and resources for students to engage in meaningful activities which challenge their current knowledge and understanding of a particular area. (EBI-1 response, Teacher from Class 2)			*I believe effective learning is going outside your comfort zone. (EBI-1 response, Student no. 93 from Class 5)*		
Dealing with difficulties	-	-	-	Learning involves dealing with difficulties and rectifying mistakes and misunderstandings.	All	All
				I think some students … make mistakes and they think that indicates they're not very good at something where the fact they're making mistakes is actually a part of learning, you know … and I said they're all mistakes that I've made and make. (Third interview with Morris, Class 1 Teacher, Line 94)		

Table 27

Beliefs about the Behaviour Management Aspects of Teaching and Learning Environments

Nature of Belief	Beliefs about Teaching	By Ts	By Ss	Beliefs about Learning	By Ts	By Ss
Student misbehaviour	Teaching involves managing students' behaviour.	Few	Many	Disruptive, unmotivated students negatively influence the learning environment.	None	Some
	I believe effective teaching is being prepared for students to misbehave and being able to deal with it accordingly so as to not disrupt the dynamics of the class. (EBI-1 response, Student no. 40 from Class 3)			*It just gets really annoying when you're sitting there and, you know, you want to learn and you want to know what's going on, then - then the people around you going, "No, don't do it". (Third interview with Zoe, Class 5 Student, Lines 236-237)*		
Preventative classroom management	Teaching involves implementing preventative management strategies.	Few	Few	-	-	-
	I believe effective teaching is using preventative strategies to avoid discipline. (EBI-2 response, Student no. 48 from Class 3)					

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Table 28

Beliefs about the Physical Aspects of Teaching Environments

Nature of Belief	Beliefs about Teaching	By Ts	By Ss	Beliefs about Learning	By Ts	By Ss
Physical space	Teaching involves being aware of and structuring the physical learning environment. *That's right, even social groups and which way you can better structure the classroom and even seating arrangements to maybe suit their - your teaching and their behaviour. (Second interview with Peter, Class 2 Student, Line 97)*	Some	Many	-	-	-

Summary of Sub-theme 2.4: Context Focused Beliefs about the Processes of Teaching and Learning

The structure of this sub-theme and its sub-theme categories, together with the frequency of belief comments, are shown Figure 13.
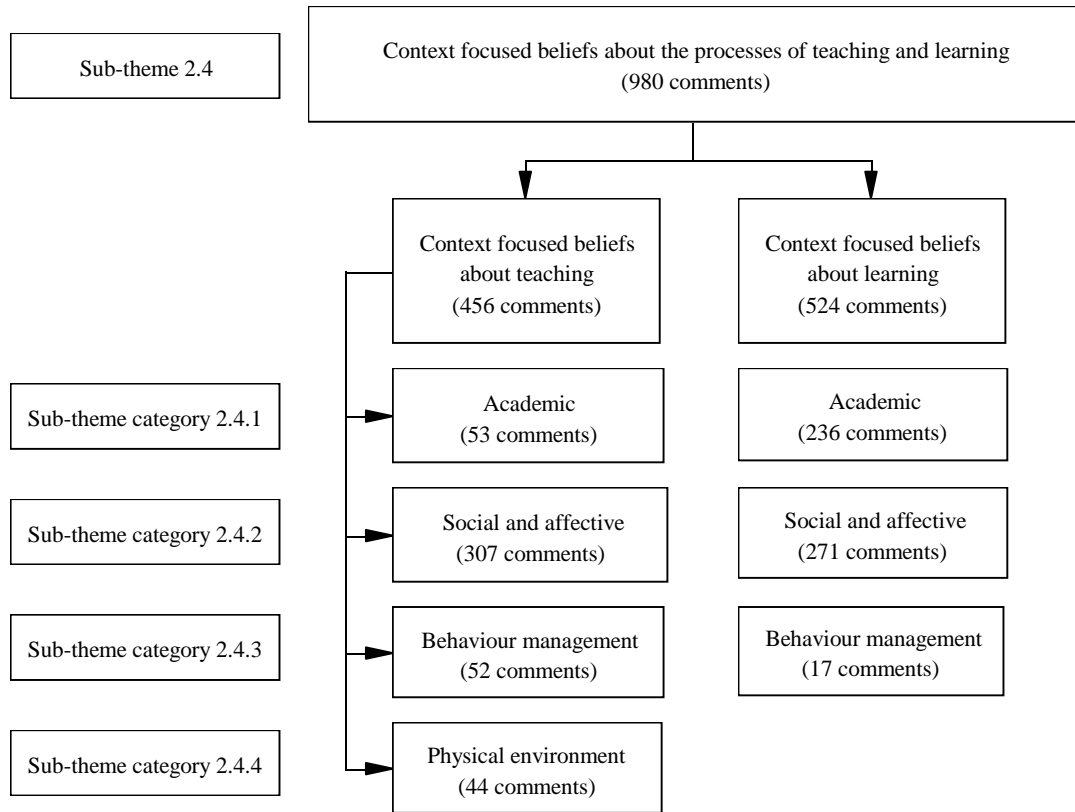
Figure 13. Sub-Theme 2.4: Context Focused Beliefs about the Processes of Teaching and Learning (and Comment Frequencies).

As well as having context focused beliefs about the processes of teaching and learning, most of the participants in the study also held activity focused beliefs. These beliefs are presented in Sub-theme 2.5.

Sub-Theme 2.5: Activity Focused Beliefs about the Processes of Teaching and Learning

Most of the participants in the study expressed beliefs about teaching as a process of designing, providing and evaluating learning activities, and learning as a process of completing and contributing to learning activities. Belief comments that were coded as being related to this sub-theme were

predominantly associated with activities and tasks that were designed to activate and support the learning process. The participants' belief comments acknowledged the range of these learning activities, and these are represented in the following sub-theme categories:

- Sub-theme category 2.5.1: Beliefs about completing task-focused activities in teaching and learning;

- Sub-theme category 2.5.2: Beliefs about assessment activities in teaching and learning;

- Sub-theme category 2.5.3: Beliefs about interactive activities in teaching and learning; and

- Sub-theme category 2.5.4: Beliefs about questions in teaching and learning.

The beliefs that were classified into each of these sub-theme categories are now explained.

Sub-Theme Category 2.5.1: Beliefs about Completing Task-Focused Activities in Teaching and Learning

Most of the participants in the study believed that teaching involves designing, providing and evaluating task-focused learning activities, and that the learning process involves completing and contributing to task-focused learning activities. The beliefs expressed about teaching in this sub-theme category were similar to those expressed about learning. The term "task-focused learning activities" has been used within this sub-theme category to mean any activities that specifically require students to be particularly active such as hands-on, practical, online, individual, open-ended and problem solving activities. The beliefs expressed by the participants about learning in this sub-theme category typically included references to "doing" and applying skills.

Table 29 identifies the participants' beliefs within this sub-theme category, in conjunction with supporting quotes.

***Sub-Theme Category 2.5.2: Beliefs about Assessment Activities in
Teaching and Learning***

Most of the participants in the study believed that teaching involves
designing, providing and evaluating assessment activities, and that learning
involves completing and contributing to assessment activities. The
participants' comments in this sub-theme category typically referred to
assessment activities such as assignments and examinations, and how such
activities could impact on student learning and teaching processes. Their
comments about learning within this sub-theme tended to include
speculations about the reasons behind completing assessment activities.

Table 30 identifies the participants' beliefs within this sub-theme
category, in conjunction with supporting quotes.

***Sub-Theme Category 2.5.3: Beliefs about Interactive Activities in
Teaching and Learning***

Many of the participants in the study believed that teaching involves
designing, providing and evaluating interactive learning activities, and that
learning involves completing and contributing to interactive learning
activities. The comments in this sub-theme category include references to
tasks in which students interact and discuss issues with other students and
their teachers, or tasks in which students interact with some type of
learning resource. Interactive learning activities were mainly described as
having some level of person-person interaction such as discussion, group
work and the process of assisting other students.

Table 31 identifies the participants' beliefs within this sub-theme
category, in conjunction with supporting quotes.

***Sub-Theme Category 2.5.4: Beliefs about Questions in Teaching and
Learning***

Many of the participants in the study believed that teaching involves
encouraging, asking and answering questions, and that learning involves
asking and answering questions. When expressing their beliefs about
teaching as a process relating to using questions, the participants made

frequent mention of how a teacher should ask students' questions, respond to their questions and encourage their questions. The beliefs expressed by participants about learning as a process involving questioning included frequent references to how students should take advantage of opportunities to ask questions, in order to enhance their own learning.

Table 32 identifies the participants' beliefs within this sub-theme category, in conjunction with supporting quotes.

Table 29

Participants' Beliefs about Completing Task-Focused Activities in Teaching and Learning

Nature of Belief	Beliefs about Teaching	By Ts	By Ss	Beliefs about Learning	By Ts	By Ss
Active learning	Teaching involves designing activities that encourage students to actively complete tasks (including online, individual, open-ended, structured and problem solving activities).	All	All	Learning involves students actively completing tasks (including online, repetitive, and example-based activities).	All	Most
	The ideal way for me to teach is where I play as little active role in the learning environment, but the structuring that I put in place has allowed the students to take on board the responsibility and the enjoyment of the learning process and the process is the important thing rather than the product. (First interview with Hilary, Class 2 Teacher, Line 82)			*My belief is that the students have shown me this semester that they've learnt a lot by doing. (Third interview with Joseph, Class 3 Teacher, Line 27)*		
Hands-on, practical activities	Teaching involves facilitating tasks that are specifically hands-on and practical activities.	All	All	Learning involves completing activities that are specifically hands-on and practical activities.	Most	All
	It's not just telling and if you just tell a student, they forget it when they walk out the door but if they manipulate, they do things, they record things and discuss it, it may stay there. (Third interview with Dimitri, Class 5 Teacher, Line 77)			*Students do learn best by actually engaging with material in an authentic way and practising skills in the realistic way so they're applying their skills. (First interview with Walter, Class 4 Teacher, Line 122)*		

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Table 30

Participants' Beliefs about Assessment Activities in Teaching and Learning

Nature of Belief	Beliefs about Teaching	By Ts	By Ss	Beliefs about Learning	By Ts	By Ss
Provision of and contribution to assessment tasks	Teaching involves providing appropriate assessment tasks.	All	Most	Learning involves completing assessment tasks.	Most	All
	Yes well - yes I mean, I think one should incorporate a range of assessments including hands-on assessments which is what we've done so there's hands-on assessments. (Third interview with Morris, Class 1 Teacher, Line 241)			*I understand the logic behind assignments, you should learn and they put you through the assessment and they get whatever you learn, they get the idea, that's important … I apply whatever I learn to the assignments and I try to get the maximum out of it. (Third interview with Shane, Class 1 Student, Lines 143, 147)*		
Provision of and learning from feedback	Teaching involves providing feedback about assessment tasks.	All	Some	Learning involves receiving feedback about assessment tasks.	All	Most
	Assessment's something that, unless you're doing it to provide feedback, then it's pretty much valueless. (Third interview with Walter, Class 4 Teacher, Line 198)			*I don't mind the negative feedback 'cause then I can improve on it but then give me some positive stuff, to keep me on track. (Second interview with Marika, Class 5 Student, Line 62)*		

Table 30

Participants' Beliefs about Assessment Activities in Teaching and Learning

Nature of Belief	Beliefs about Teaching	By Ts	By Ss	Beliefs about Learning	By Ts	By Ss
Assessment for evaluation of learning	Teaching involves using assessment to evaluate learning and to provide teaching direction. *Instead of a teacher merely teaching or instructing students on what they should understand, a good teacher will find out what a student really does understand and adapts the curriculum accordingly. (EBI-1 response, Student no. 52 from Class 3)*	All	Most	-	-	-
Examinations are negative	-	-	-	Examinations are not a good measure of learning. *I know all the work but I just for some reason can't relax enough and besides that, I think that they're [examinations] a waste of - they're not a true test of your competencies, they should grade by what you do during the week, your attendance. (Second interview with Lionel, Class 1 Student, Line 370)*	Few	Some

Table 31

Participants' Beliefs about Interactive Activities in Teaching and Learning

Nature of Belief	Beliefs about Teaching	By Ts	By Ss	Beliefs about Learning	By Ts	By Ss
Interaction between students	Teaching involves the facilitation of interaction between students to encourage learning.	All	Most	Learning involves interaction between students.	All	Most
	I believe effective teaching is providing opportunities for students to share their knowledge development with colleagues and reflect / respond to each other's ideas. (EBI-1 response, Teacher from Class 2)			*I find that group work particularly helps in kind of refreshing your ideas on how to actually do things within your own work, like assignments and those type of things because you will have ideas and you'll bounce off other people's ideas. (First interview with Peter, Class 2 Student, Line 145)*		
Students assist each other to learn	Teaching involves the facilitation of interaction between students to encourage students to assist each other to learn.	Some	Some	Learning involves students assisting each other to learn.	Few	Few
	I'm also a great believer in, they have to explain to their partner, or I try to put a bit of responsibility onto them by saying, you're here to learn together. (First interview with Dimitri, Class 5 Teacher, Line 640)			*I think having some friends who have the same amount of commitment helped a lot too … I was lucky because I found some friends who also were serious about their work so we could talk about lectures and we could discuss - discuss things. (Third interview with Kiarn, Class 4 Student, Lines 135 & 139)*		

Table 31

Participants' Beliefs about Interactive Activities in Teaching and Learning

Nature of Belief	Beliefs about Teaching	By Ts	By Ss	Beliefs about Learning	By Ts	By Ss
Interaction between teacher and student	Teaching involves the facilitation of student-teacher interaction.	All	Many	Learning involves student-teacher interaction.	Most	Some
	I believe effective teaching is being able to connect with students and to help them enjoy learning in a way that they understand and can relate to. (EBI-1 response, Student no. 27 from Class 2)			*I believe effective learning is about interaction between teacher and students. (EBI-1 response, Student no. 13 from Class 1)*		

Table 32

Participants' Beliefs about Questions in Teaching and Learning

Nature of Belief	Beliefs about Teaching	By Ts	By Ss	Beliefs about Learning	By Ts	By Ss
Responding to and asking questions	Teaching involves responding to students' questions.	Many	Many	Learning involves students asking questions.	Most	Most
	I believe effective teaching is to know everything about the concept when the questions are asked. Answers must be clear in students' mind. (EBI-2 response, Student no. 75 from Class 4)			*If you're afraid to ask a question you're not going to learn something. (First interview with Lionel, Class 1 Student, Line 790)*		
Encouraging and answering questions	Teaching involves asking and encouraging students to ask questions.	All	Most	Learning involves students answering questions.	None	Few
	I believe effective teaching is allowing students to ask questions and be able to provide answers which will aid in understanding the material. (EBI-1 response, Student no. 3 from Class 1)			*As a teacher I need to challenge their answers to check for their conviction and understanding behind the answer. (EBI-1 construed response, Student no. 85 from Class 5)*		

Summary of Sub-Theme 2.5: Activity Focused Beliefs about the Processes of Teaching and Learning

The structure of this sub-theme and its sub-theme categories, together with the frequency of belief comments, are shown in Figure 14.
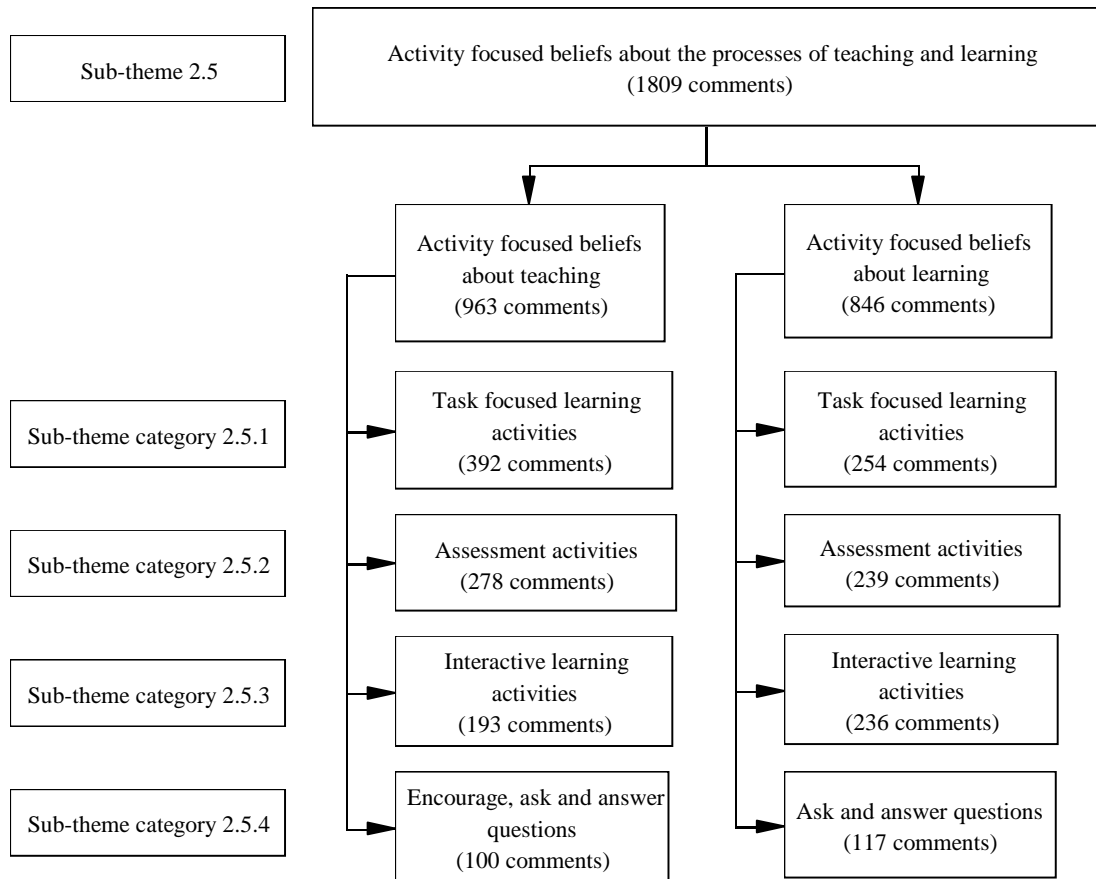
Figure 14. Sub-Theme 2.5: Activity Focused Beliefs about the Processes of Teaching and Learning.

As well as having activity focused beliefs about the processes of teaching and learning, many of the participants in the study also held beliefs which focused on student development. These beliefs are presented in Sub-theme 2.6.

Sub-theme 2.6: Student Development Focused Beliefs about the Processes of Teaching and Learning

The participants in the study expressed beliefs about teaching as a process that involves fostering each student's development, and they held

similar beliefs about learning, viewing it as a process of development for each student. Their belief comments reflected a particular focus on the development of each individual student, as opposed to learning that takes place amongst a group of students. Their comments acknowledged five varied aspects of development that students experience within the processes of teaching and learning and these are represented by the following sub-theme categories:

- Sub-theme category 2.6.1: Beliefs about students' academic development in teaching and learning;

- Sub-theme category 2.6.2: Beliefs about students' metacognitive development in teaching and learning;

- Sub-theme category 2.6.3: Beliefs about students' skill development in teaching and learning;

- Sub-theme category 2.6.4: Beliefs about students' personal development in teaching and learning; and

- Sub-theme category 2.6.5: Beliefs about students developing at their own rate in teaching and learning.

The beliefs that were classified into each of these sub-theme categories are now explained.

Sub-Theme Category 2.6.1: Beliefs about Students' Academic Development in Teaching and Learning

Most of the participants in the study believed that teaching is a process of fostering each student's academic development, and that learning is a process of academic development for each student. The participants' comments that formed this sub-theme category embraced topics such as knowledge, understanding, intelligence, critical thinking and intellectual development. The academic development noted in this sub-theme category was more focused on conceptual development than the beliefs which were coded into the following sub-theme category, which focused on the students' developing abilities to reflect upon their own academic progress

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(metacognitive development). In terms of the participants' beliefs about both teaching and learning in this sub-theme category, very few of their beliefs were related to students' intelligence.

Table 33 identifies the participants' beliefs within this sub-theme category, in conjunction with supporting quotes.

Sub-Theme Category 2.6.2: Beliefs about Students' Metacognitive Development in Teaching and Learning

Many of the participants in the study believed that teaching involves fostering each student's metacognitive development, and that learning is a process of metacognitive development for each student. In this case, metacognitive development refers to the process of students becoming more cognisant of and reflective about their own learning processes. The participants' belief comments in this sub-theme category were largely focused on the value of students taking responsibility for their own learning as well as their ability to reflect on and monitor their own learning.

Table 34 identifies the participants' beliefs within this sub-theme category, in conjunction with supporting quotes.

Sub-Theme Category 2.6.3: Beliefs about Students' Skill Development in Teaching and Learning

Some of the participants in the study believed that teaching involves fostering each student's skill development, and that learning is a process of skill development of each student. This career-focused set of comments were characterised by references to students' future employment and professional lives, and were particularly focused on technological skills. The participants' teaching belief comments in this sub-theme category frequently mentioned how teachers generally encourage students to think of their career futures. The beliefs expressed by participants about learning within this sub-theme are characterised by how students should develop skills that will assist them in their future workplaces.

Table 35 identifies the participants' beliefs within this sub-theme category, in conjunction with supporting quotes.

Sub-Theme Category 2.6.4: Beliefs about Students' Personal Development in Teaching and Learning

Many of the participants in the study expressed beliefs about teaching as being a process of fostering each student's personal development, and learning as a process of personal development for each student. The comments that were coded into this sub-theme typically explained how students develop their own personal values, attitudes and views of the world, reflecting the participants' acknowledgement of students' emotional growth, their creativity and their individuality. Their comments about learning incorporated references to the value of self-development, specifically in terms of creativity, spirituality, individuality and personal growth. The participants also mentioned how students develop attitudes and values, and how they form perceptions of their own role in society and their own views of the world.

Table 36 identifies the participants' beliefs within this sub-theme category, in conjunction with supporting quotes.

Sub-Theme Category 2.6.5: Beliefs about Students Developing at Their Own Rate in Teaching and Learning

Most of the participants in the study believed that teaching is a process of fostering each student to develop at their own rate, and that learning is a process that involves each student developing at their own rate. The participants' comments in this sub-theme included explanations about how students develop and learn at different rates, and were characterised by the participants' understanding of teaching and learning as processes that should be customised to suit individual students' rates of development. Both their comments about teaching and learning within this sub-theme category mentioned the value of students developing their own levels of independence.

Table 37 identifies the participants' beliefs within this sub-theme category, in conjunction with supporting quotes.

Table 33

Participants' Beliefs about Students' Academic Development in Teaching and Learning

Nature of Belief	Beliefs about Teaching	By Ts	By Ss	Beliefs about Learning	By Ts	By Ss
Extending students' knowledge	Teaching involves extending each student's knowledge.	Most	Some	Learning involves each student extending their knowledge.	All	Most
	Particularly at the higher ed. level, effective teaching is using the students' skills, knowledge and background, and building upon that in some direction (Second interview with Joseph, Class 3 Teacher, Line 49)			*I believe effective learning is when a student enlarges and expands their knowledge base, allowing them to comment and experience new limits and concepts. (EBI-1 response, Student no. 37 from Class 2)*		
Understanding	Teaching involves extending each student's level of understanding.	All	Most	Learning involves each student developing their level of understanding.	All	All
	Teaching is - I guess making sure that students understand what your idea is, making the student share that same idea. (Third interview with Kiarn, Class 4 Student, Line 376)			*I believe effective learning comes about through a sound knowledge and understanding of a given topic/concept. (EBI-1 response, Student no. 27 from Class 2)*		

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Table 33

Participants' Beliefs about Students' Academic Development in Teaching and Learning

Nature of Belief	Beliefs about Teaching	By Ts	By Ss	Beliefs about Learning	By Ts	By Ss
Development of thinking skills and intelligence	Teaching involves enabling each student to develop academically and to think critically.	All	Few	Learning involves each student developing their intelligence.	None	Few
	I try to develop critical thought about the topic. (First interview with Morris, Class 1 Teacher, Line 449)			*I think learning is … more than just intelligence, different types of intelligence. I mean, there's you know, there's - there is the seven different types of intelligence. (Third interview with Peter, Class 2 Student, Line 254)*		

Table 34

Participants' Beliefs about Students' Metacognitive Development in Teaching and Learning

Nature of Belief	Beliefs about Teaching	By Ts	By Ss	Beliefs about Learning	By Ts	By Ss
Learning responsibility	Teaching involves encouraging each student to be responsible for their own learning. *I believe effective teaching is enabling students to become pro-active, independent learners - i.e., taking personal responsibility for their own learning. (EBI-1 response, Student no. 45 from Class 3)*	Some	Some	-	-	-
Learning awareness and reflection	Teaching involves encouraging each student to be aware of, monitor and reflect on their own learning. *What I'm really trying to ask them to do is not reflect on whether they like something or like the process but to try to help them to really build those reflective processes that allow you to do that cognitively, which you can't do without reflecting. The higher order thinking and the higher order learning happens from reflecting on the materials that you've been reading and the ideas that that you've had and then sometimes on the process through which you've, you've synthesised that information. (First interview with Hilary, Class 2 Teacher, Lines 284-285, 287)*	Most	Some	Learning involves each student developing their abilities to be aware of, monitor and reflect on their own learning. *Oh yeah, I think so, the reflection's a - you know, one of the biggest parts of learning I think, as a - as a teacher and a student as well. (Third interview with Peter, Class 2 Student, Line 264)*	Most	All

Table 35
Participants' Beliefs about Students' Skill Development in Teaching and Learning

Nature of Belief	Beliefs about Teaching	By Ts	By Ss	Beliefs about Learning	By Ts	By Ss
Learning skills and IT skills	Teaching involves encouraging each student to develop their general learning and IT skills.	All	Some	Learning involves each student developing their general learning and IT skills.	Most	Most
	So I force a kind of regular level of activity which actually has students doing things like using the internet for research or doing things like looking at computer advertisements and those kinds of things which I guess I just considered to be general kind of technology skills that they should be developing. (Second interview with Walter, Class 4 Teacher, Line 140)			*Well, it assists you in learning to use the technology. (Third interview with Tom, Class 3 Student, Line 197)*		
Professional skills	Teaching involves encouraging each student to develop professionally.	None	Few	Learning involves each student developing professionally.	Some	Some
	I believe effective teaching is imparting knowledge to students following the curriculum and more so that students can leave the university educated, knowledgeable and skilled to enhance their chances and ability of securing jobs that they have studied for during their course. (EBI-2 response, Student no. 9 from Class 1)			*I believe effective learning is being able to understand what is going on especially in the units, and being confident to use this later, outside school work, and having knowledge and skills acquire work for you. (EBI-1 response, Student no. 56 from Class 4)*		

Table 36

Participants' Beliefs about Students' Personal Development in Teaching and Learning

Nature of Belief	Beliefs about Teaching	By Ts	By Ss	Beliefs about Learning	By Ts	By Ss
Development of personal values and attitudes	Teaching involves facilitating each student's development of personal values and attitudes.	Most	Many	Learning involves each student developing personal values and attitudes.	Few	Few
	And if you actually squash their own personalities and their own expressions and their styles in order to get them to conform to your learning style, the way that you want them to learn, they're never going to be able to do their best. (Third interview with Anne, Class 3 Student, Line 417)			*I think it extends beyond that into also the realm of, you know, spirituality, the act of physically doing things, these kind of things. I think, you know, learning is a very broad thing and I think it's the central part of our life and our development as an individual. (Third interview with Peter, Class 2 Student, Lines 255-256)*		
Development of views	Teaching involves facilitating each student to develop or change their point of view.	All	Many	Learning involves growth and change for each student.	Few	Some
	I believe effective teaching is influencing the views of a student by exposing them to ideas and concepts they were previously unaware of thereby leading to a change in how they think and act. (EBI-2 response, Student no. 12 from Class 1)			*Learning to me is a process of self-development and it's not just acquiring knowledge but it's assimilating that knowledge into your own personality and life and making - making meaning from - from information and experiences. (Third interview with Tom, Class 3 Student, Lines 284-285*		

Table 37

Participants' Beliefs about Students Developing at Their Own Rate in Teaching and Learning

Nature of Belief	Beliefs about Teaching	By Ts	By Ss	Beliefs about Learning	By Ts	By Ss
Individual rates of progress	Teaching involves allowing each student to progress at their own rate.	All	Many	Learning involves each student progressing at their own rate.	Most	Most
	Teaching is … trying to meet the needs of the majority of students and trying to extend each student individually to try and extend each individual and maybe not teach to the higher level of students or teach to the lower level of students, just try and really individualise each students' learning. (Second interview with Peter, Class 2 Student, Line 185)			*And it's tricky because I think we have a pretty diverse bunch of students … I tend to let students go on ahead and move on if they want and keep working at their own pace. (First interview with Walter, Class 4 Teacher, Line 43)*		
Independence	Teaching involves encouraging each student to be an independent learner who can make their own learning choices.	Many	Most	Learning involves each student developing their abilities to become an independent learner.	Most	Most
	We try to do everything for them and I think I'm pulling back from that a little bit to try to get them to do more themselves … Let them wonder about that and ask questions the following week. (Third interview with Dimitri, Class 5 Teacher, Lines 307, 313)			*Yah, it's like a student can learn by himself as well, that's important but he should have that ability, you know, it's like it's important to have the ability in student, to learn by himself. (Third interview with Shane, Class 1 Student, Line 311)*		

Summary of Sub-Theme 2.6: Student Development Focused Beliefs about the Processes of Teaching and Learning

The structure of this sub-theme and its sub-theme categories, together with the frequency of belief comments, are shown in Figure 15.
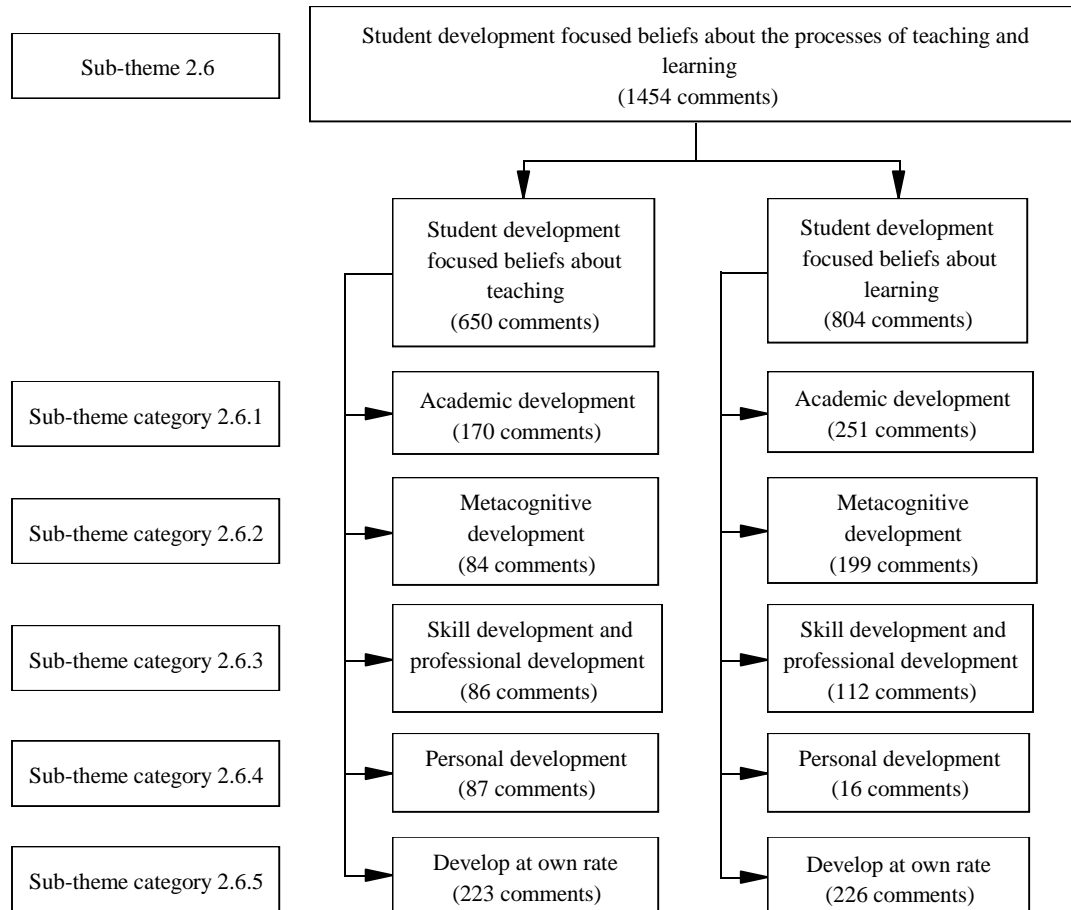
Figure 15. Sub-Theme 2.6: Student Development Focused Beliefs about the Processes of Teaching and Learning (and Comment Frequencies).

As well as having beliefs that focused on student development within the processes of teaching and learning, many of the participants in the study also held effort focused beliefs. These beliefs are presented in Sub-theme 2.7.

Sub-theme 2.7: Effort Focused Beliefs about the Process of Learning

Some of the participants in the study expressed beliefs about how the process of learning involves some level of effort. Unlike the previous six sub-

theme categories in this sub-theme, parallel beliefs about the process of teaching were not expressed by the participants in the study. From within this sub-theme of effort-focused belief comments, a further two categories emerged:

- Sub-theme category 2.7.1: Beliefs about learning as a process that involves low levels of effort; and

- Sub-theme category 2.7.2: Beliefs about learning as a process that involves high levels of effort.

The beliefs that were classified into each of these sub-theme categories are now explained.

Sub-Theme Category 2.7.1: Beliefs about Learning as a Process that Involves Low Levels of Effort

Some of the participants in the study believed that learning was a process that involved low levels of effort but none of the teachers in the study offered comments that reflected this belief. The belief comments within this sub-theme category typically included references to the simplicity and easiness involved in the learning process.

Table 38 identifies the participants' beliefs within this sub-theme category, in conjunction with supporting quotes.

Sub-Theme Category 2.7.2: Beliefs about Learning as a Process that Involves High Levels of Effort

Conversely, most of the participants in the study, including teachers and students, believed that learning is a process that involves high levels of effort. Their belief comments within this sub-theme category acknowledged the difficulty, complexity and time associated with the learning process. The participants' comments also reflected their understanding of learning as a process that, despite its difficulties and time demands, can be rewarding.

Table 39 identifies the participants' beliefs within this sub-theme category, in conjunction with supporting quotes.

Table 38

Participants' Beliefs about Learning as a Process that Involves Low Levels of Effort

Nature of Belief	Beliefs about Teaching	By Ts	By Ss	Beliefs about Learning	By Ts	By Ss
Simplicity of learning	-	-	-	Learning is easy and simple, and requires a low level of effort.	None	Many
				But now it's so much easier to learn. (First interview with Trish, Class 3 Student, Line 131)		
Automaticity of learning	-	-	-	Learning is almost automatic and involves a low level of effort.	None	Few
				Learning can be, maybe for undergraduates, maybe involuntary, they just want to get enough to go through the exams. (First interview with Kiarn, Class 4 Student, Line 446)		
				I think you get the motions downpat pretty much and maybe you tend not to think about what you're doing so much after a certain point because you've been doing it for a while. (First interview with Peter, Class 2 Student, Line 139)		

Table 39

Participants' Beliefs about Learning as a Process that Involves High Levels of Effort

Nature of Belief	Beliefs about Teaching	By Ts	By Ss	Beliefs about Learning	By Ts	By Ss
Difficulty of learning	-	-	-	Learning is difficult and challenging. *I believe effective learning is challenging yourself - stepping out of comfort zone and be willing to expand your knowledge. (EBI-2 response, Student no. 87 from Class 5)* *It's, it's not an easy process, it's an uncomfortable one. (First interview with Hilary, Class 2 Student, Line 359)*	All	Most
Complexity of learning	-	-	-	Learning involves students in a complex process that involves a high level of effort. *I believe effective learning is being enthusiastic, eager and making the efforts both in and out of formal educational institutions by way of doing the readings, studying, researching and putting in 100% effort where possible. (EBI-2 response, Student no. 88 from Class 4)*	All	Most
Time needed for learning	-	-	-	Learning is time-consuming. *And I can see that there could be a difficulty as well in the fact that it is quite a time-consuming and, it takes a lot of effort to go through this kind of process but I can definitely see the rewards at the end of it. (Second interview with Peter, Class 2 Student, Line 147)*	Some	Many

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Summary of Sub-theme 2.7: Effort Focused Beliefs about the
Processes of Teaching and Learning

The structure of this sub-theme and its sub-theme categories, together with the frequency of belief comments, are shown in Figure 16.
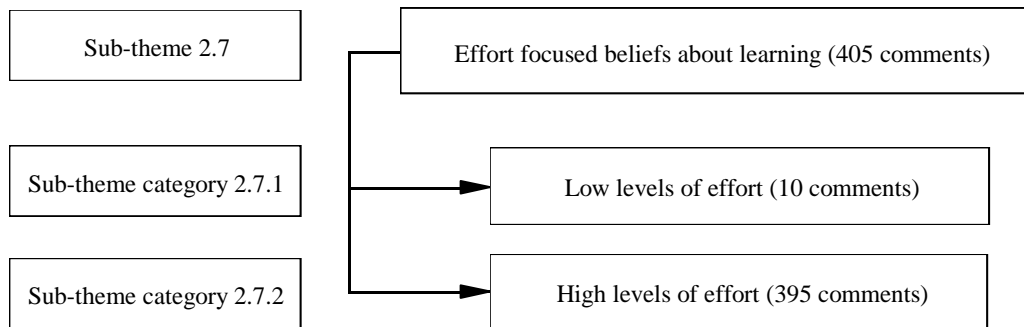
Figure 16. Sub-Theme 2.7: Effort Focused Beliefs about the Processes of Teaching and Learning (and Comment Frequencies).

Summary of Theme 2: Beliefs about the Processes of Teaching and
Learning

The participants' belief comments about the processes of teaching and learning formed seven clear sub-themes, including their beliefs about:

- institution focused beliefs about the processes of teaching and learning;

- knowledge focused beliefs about the processes of teaching and learning;

- resource institution focused beliefs about the processes of teaching and learning;

- context focused beliefs about the processes of teaching and learning;

- activity institution focused beliefs about the processes of teaching and learning;

- student development focused beliefs about the processes of teaching and learning; and

- effort focused beliefs about the processes of teaching and learning.

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A summary of this theme, including the various sub-themes and sub-theme categories, that emerged from coding the participants' belief comments is outlined in Figure 17.
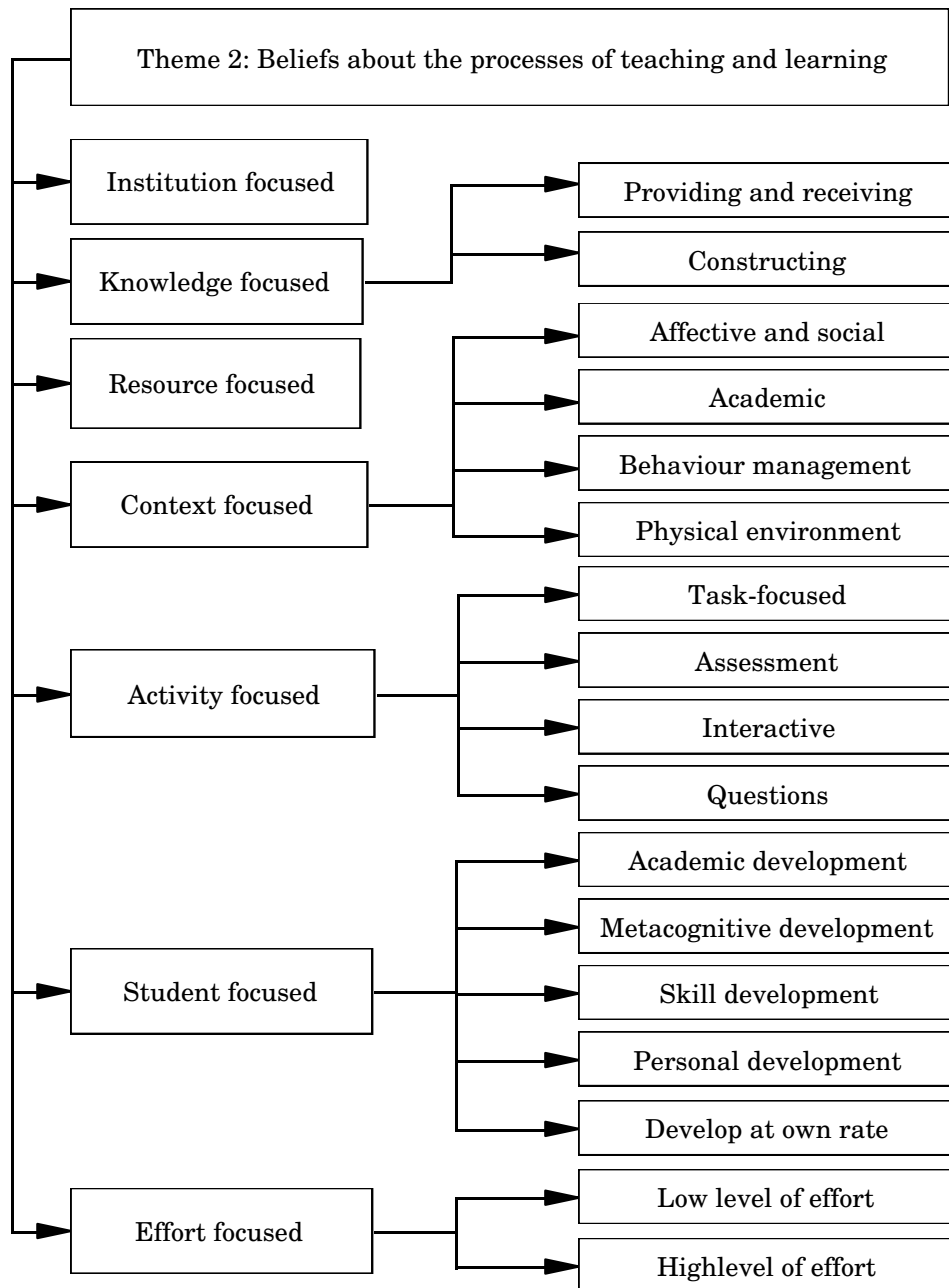
Figure 17. Structure of Theme 2: Beliefs about the Processes of Teaching and Learning.

Some of the beliefs evident within the sub-themes of this theme are linked to the participants' beliefs that were coded into Theme 1: Beliefs about teachers and students. For example, the participants' belief comments

about teaching as a process of managing knowledge had obvious links to their beliefs about the knowledge held by teachers (Theme 1: Beliefs about teachers and students). Furthermore, the participants' beliefs about the role of knowledge in the process of teaching and learning were also linked to their beliefs about the content being taught and learnt (Theme 3: Beliefs about the content being taught and learnt). Because of these transparent links across the major themes of the coded comments in this study, this overlapping nature of some of the coded comments was accommodated by coding them into more than one theme.

Considering the emerged findings from the process of coding and analysing the data that was viewed as being related to Theme 2, it is possible to gain an understanding of how the participants perceived effective teaching and learning processes. The beliefs about the processes of teaching and learning held by the participants in the study are listed in Tables 40 and 41, with the more strongly held beliefs listed at the beginning of each list.

Table 40
Participants' Beliefs about Teaching

Teaching involves designing activities that encourage students to actively complete tasks (including online, individual, open-ended, structured and problem solving activities).

Teaching involves facilitating tasks that are specifically hands-on and practical activities.

Teaching involves providing students with information.

Teaching involves structuring knowledge for students.

Teaching involves explaining information to students.

Teaching involves extending each student's level of understanding.

Teaching involves providing students with examples.

Teaching involves the facilitation of interaction between students to encourage learning.

Teaching involves balancing course requirements and workload within institutional time constraints.

Teaching involves providing appropriate assessment tasks.

Table 40
Participants' Beliefs about Teaching

Teaching involves providing students with resources for learning (texts, other material, teacher as resource, computerised resources).

Teaching involves using assessment to evaluate learning and to provide teaching direction.

Teaching involves asking and encouraging students to ask questions.

Teaching involves using communication and presentation resources for teaching.

Teaching involves allowing each student to progress at their own rate.

Teaching involves encouraging each student to be an independent learner who can make their own learning choices.

Teaching involves facilitating each student to develop or change their point of view.

Teaching involves the facilitation of student-teacher interaction.

Teaching involves facilitating each student's development of personal values and attitudes.

Teaching involves responding to students' questions.

Teaching involves encouraging each student to develop their general learning and IT skills.

Teaching involves extending each student's knowledge.

Teaching involves providing feedback about assessment tasks.

Teaching involves providing students with choice, while facilitating knowledge construction.

Teaching involves encouraging each student to be aware of, monitor and reflect on their own learning.

Teaching involves adhering to institutional rules and policies.

Teaching involves enabling each student to develop academically and to think critically.

Teaching involves the facilitation of interaction between students to encourage students to assist each other to learn.

Teaching is influenced by course design and organisation.

Teaching involves encouraging each student to be responsible for their own learning.

Teaching involves creating a positive learning environment.

Teaching involves creating positive relationships with students.

Table 40
Participants' Beliefs about Teaching

Teaching involves being aware of and structuring the physical learning environment.

Teaching involves managing students' behaviour.

Teaching involves providing students with an appropriate level of academic challenge and workload.

Teaching involves encouraging each student to develop professionally.

Teaching involves implementing preventative management strategies.

Teaching involves modelling positive attitudes.

Table 41
Participants' Beliefs about Learning

Students use and interact with resources in the learning process (texts, other material, teacher as resource, other students, experts, computerised resources).

Learning involves dealing with difficulties and rectifying mistakes and misunderstandings.

Learning involves each student developing their level of understanding.

Learning involves receiving information and gaining knowledge.

Learning involves working with and selecting knowledge.

Learning involves creating knowledge.

Learning involves students actively completing tasks (including online, repetitive, and example-based activities).

Learning involves completing activities that are specifically hands-on and practical activities.

Learning involves completing assessment tasks.

Learning involves interaction between students.

Learning involves each student developing their abilities to be aware of, monitor and reflect on their own learning.

Learning is difficult and challenging.

Learning involves students in a complex process that involves a high level of effort.

Learning involves each student extending their knowledge.

Learning involves each student progressing at their own rate.

Table 41
Participants' Beliefs about Learning

Learning involves each student developing their abilities to become an independent learner.

Learning involves receiving feedback about assessment tasks.

Learning involves getting through course material within time limits.

Learning involves building upon students' current knowledge.

Learning involves students asking questions.

Students create documents, notes, electronic files and resources in the learning process.

Learning is influenced by students' learning experiences which can be positive.

Learning involves dealing with academic challenge and workload issues.

Learning involves each student developing their general learning and IT skills.

Learning involves remembering information.

Learning involves observing demonstrations of examples.

Learning is influenced by students' learning experiences which can be negative.

Learning is influenced by students' emotions, feelings, likes and dislikes.

Learning is time-consuming

Learning is influenced by students' relationships with the teacher and other students.

Learning involves student-teacher interaction.

Examinations are not a good measure of learning.

Learning involves each student developing professionally.

Learning is easy and simple, and requires a low level of effort.

Learning involves growth and change for each student.

Disruptive, unmotivated students negatively influence the learning environment.

Learning involves students assisting each other to learn.

Learning involves each student developing personal values and attitudes.

Learning is almost automatic and involves a low level of effort.

Learning involves each student developing their intelligence.

Learning involves students answering questions.

As well as expressing beliefs about the processes of teaching and learning (Theme 2), many of the participants in the study also expressed beliefs about the content taught by teachers and learnt by students (Theme 3). The findings from an analysis of their coded comments about these beliefs are now presented.

Theme 3: Beliefs about Content Taught and Learnt

The third major theme that emerged represented the participants' beliefs about the content taught by teachers and learnt by students within university courses. Many of the participants possessed these beliefs. The term "content" is used throughout this theme as an eclectic term which incorporates concepts such as "knowledge", "information", "course material" and "course content". When describing the content being taught or learnt in their courses, the participants often used these terms interchangeably to mean the same thing.

Of the four themes that emerged from participants' educational belief comments across the whole study, their beliefs about the content taught and learnt had the least number of comments and represented the least significant of the four themes. It is reported to demonstrate the seemingly low emphasis placed on course content by the participants in the study.

Two main sub-themes emerged from the participants' belief comments about the content taught and learnt in their courses; they believed that content was either simple or complex. A further group of comments have also been included in this theme that are more descriptive of content rather than being actual belief comments. These comments have been labelled "Description of the content being taught and learnt" (Sub-theme 3.3).

The sub-themes within this theme, Theme 3, are outlined in Figure 18.

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┌─────────────────────────────────────────────────────────────────┐
│     Beliefs about the content being taught and learnt (519 comments) │
└─────────────────────────────────────────────────────────────────┘

┌──────────────────────────┐        ┌──────────────────────────┐
│ The content taught and learnt │    │  3 comments by teachers  │
│  is simple, limited and    │      └──────────────────────────┘
│      unchanging            │      ┌──────────────────────────┐
│    (85 comments)           │      │  82 comments by students │
└──────────────────────────┘        └──────────────────────────┘

┌──────────────────────────┐        ┌──────────────────────────┐
│ The content taught and learnt │    │ 157 comments by teachers │
│  is complex, linked and    │      └──────────────────────────┘
│      changeable            │      ┌──────────────────────────┐
│    (434 comments)          │      │ 277 comments by students │
└──────────────────────────┘        └──────────────────────────┘

┌──────────────────────────┐        ┌──────────────────────────┐
│ Description (not belief)   │      │  77 comments by students │
│ comments about content     │      └──────────────────────────┘
│  taught and learnt         │      ┌──────────────────────────┐
│    (155 comments)          │      │  78 comments by students │
└──────────────────────────┘        └──────────────────────────┘
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Figure 18. Educational Beliefs Theme 3: Beliefs about Content Taught and Learnt.

Each of the sub-themes outlined in the above figure will now be explained in order to develop an answer to the first Research Question which focuses on the identification of the participants' educational beliefs.

Sub-theme 3.1: Beliefs about Content Taught and Learnt as Being Simple, Limited and Unchanging

Some of the participants in the study expressed comments which represented their beliefs about the simple, limited and unchanging nature of their course content. The comments offered by the participants within this sub-theme included descriptions of course content as being bounded and fixed within the limits of a curriculum which was viewed as also being quite set, defined and fairly unchangeable. Such content was viewed as being detailed, accurate and able to be memorised. The participants' comments incorporated views about how effective teachers should be able to impart accurate knowledge and provide students with the "right answers". Their views about the content learnt reflected a concern with receiving full and detailed knowledge from their teachers and with being able to retain this

knowledge in order to replicate it at a later date, possibly in an examination. Unlike most of the other sub-themes that emerged from the coding process, further sub-theme categories did not emerge from the comments that were grouped together in this sub-theme.

Table 42 identifies the participants' beliefs within this sub-theme, in conjunction with supporting quotes.

Table 42

Participants' Beliefs about Content Taught and Learnt as Being Simple, Limited and Unchanging

Nature of Belief	Beliefs about Teaching	By Ts	By Ss	Beliefs about Learning	By Ts	By Ss
Completeness of content	Content taught should be complete and fully detailed.	Few	Some	Content learnt should be complete and fully detailed.	Few	Few
	A teacher gives the knowledge, then he gets the knowledge, or rather the information, what he is going to give to a student, the information should be perfect and should be well-grounded and should be complete, that's important. (Third interview with Shane, Class 1 Student, Line 227)			*That's what I'm saying, if you want to get the whole knowledge at a stretch, or, rather, if it is necessary at the point, that you get the whole knowledge without going into the depth, then something should be available. (First interview with Shane, Class 1 Student, Line 119)*		
Accuracy of content	Content taught should be accurate.	None	Few	-	-	-
	I believe effective teaching is preaching to students telling them this is right, this isn't. (EBI-2 response, Student no. 97 from Class 5)					
Memorisation content	-	-	-	Content can be memorised.	Few	Most
				I believe effective learning is being able to absorb information (on a long term basis) and then recall that information when required. (EBI-1 response, Student no. 18 from Class 1)		

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Summary of Sub-Theme 3.1: Beliefs about Content Taught and
Learnt as Being Simple, Limited And Unchanging

The structure of this sub-theme and the frequency of the participants'
belief comments are shown in Figure 19.

Figure 19. Sub-Theme 3.1: Participants' Beliefs about Content Taught and
Learnt as Being Simple, Limited and Unchanging (and Comment
Frequencies).

As well as having beliefs about the simple nature of content taught
and learnt, many of the participants in the study also held beliefs about the
complex nature of content. These beliefs are presented in Sub-theme 3.2.

Sub-Theme 3.2: Beliefs about Content Taught and Learnt as Being
Complex, Linked and Changeable

Many of the participants in the study expressed comments that were
coded as representing their beliefs about the complex, linked and
changeable nature of course content. The participants' comments within this
sub-theme indicated views of course content as being made up of meaningful
sets of information that students were able to link together to form
connected understandings. Because the participants believed that content is
not easily bounded and constantly required updating, their comments
acknowledged that it was not always possible to define the limits of such
content due to its intricate, changing and complex nature. Because of this,
the participants believed that teachers' and students' knowledge always
requires updating. Their views about course content emphasised
understanding above and beyond the memorisation of knowledge. Unlike
most of the other sub-themes that emerged from the coding process, further

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sub-theme categories did not emerge from the comments that were grouped together in this sub-theme.

Table 43 identifies the participants' beliefs within this sub-theme, in conjunction with supporting quotes.

Table 43

Participants' Beliefs about Content Taught and Learnt as Being Complex, Linked and Changeable

Nature of Belief	Beliefs about Teaching	By Ts	By Ss	Beliefs about Learning	By Ts	By Ss
Complexity of content	Content taught is complex and authentic.	Few	Few	Content learnt is complex and authentic.	Most	Most
	I'm understanding how knowing all the nitty-gritty basics is really important to knowing the more advanced stuff. (Second interview with Kent, Class 4 Student, Line 23)			*I believe effective learning is the ability to identify between important foundation/primary concepts (and link operation in the real world) and to connect them to similar operation in different areas therefore allowing me to map development of concepts in a historical/cultural/technological context. (EBI-1 response, Student no. 67 from Class 4)*		
Linked components of content	Content taught is made up of linked concepts.	All	Most	Content learnt is made up of linked concepts.	All	Most
	It does relate back to what you do within the real world … Yeah, they - the links are definitely there, the links are definitely there, yes. (First interview with Peter, Class 2 Student, Lines 103-104)			*Yeah, I think a good learner links new knowledge with their existing knowledge so they're always trying to interpret what they're getting within their frame of reference. (First interview with Walter, Class 4 Student, Line 156)*		

Table 43

Participants' Beliefs about Content Taught and Learnt as Being Complex, Linked and Changeable

Nature of Belief	Beliefs about Teaching	By Ts	By Ss	Beliefs about Learning	By Ts	By Ss
Changing nature of content	Content taught is continually changing, extending and improving.	All	Some	Content learnt is continually changing, extending and improving.	Few	Few
	I believe effective teaching is going to teach what nowadays need - the world is going to change... In other words, teaching needs to be updated all the time. (EBI-1 response, Student no. 55 from Class 4)			*It's not static, it's always changing so whatever they thought is definitive now might not be, you know, four weeks into next year. (Third interview with Joseph, Class 3 Teacher, Line 316)*		

Summary of Sub-Theme 3.2: Beliefs about Content Taught and Learnt as Being Complex, Linked and Changeable

The structure of this sub-theme and the frequency of the participants' belief comments are shown in Figure 20.
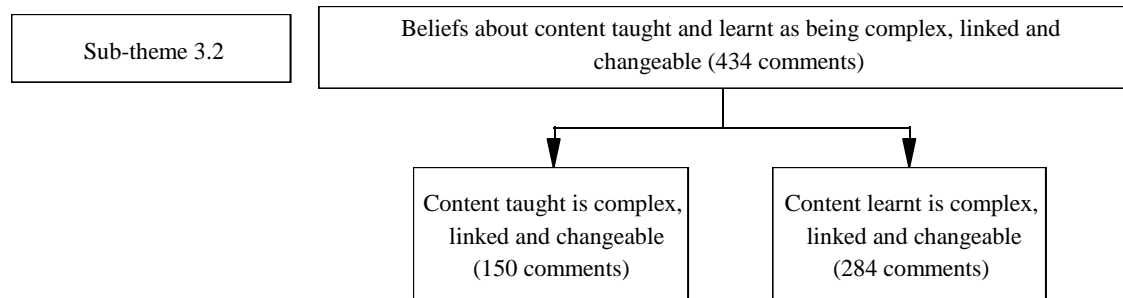
Figure 20. Sub-Theme 3.2: Participants' Beliefs about Content Taught and Learnt as Being Complex, Linked and Changeable (and Comment Frequencies).

Sub-theme 3.3: Descriptive Comments about Content Taught and Learnt

When the participants were asked to express their educational beliefs, most of them interpreted this request at some time throughout the study as an opportunity to describe the content being taught in the courses in which they were enrolled or taught instead of expressing their beliefs about such content. Comments such as the following were expressed by the participants:

> Well, [inaudible], and then after the OSI model and the TCP/IP model, it's different, it only has four levels but they're the same thing, you know.
> (Third interview with Lionel, Class 1 Student, Line 94)

> What really we've mainly done - concepts and properties of the four operations and introduction to computations and things.
> (Second interview with Dimitri, Class 5 Teacher, Line 291)

Although this phenomenon lessened as the study progressed, a proportion of the participants' comments were coded as being descriptive of or explanatory about the content rather than overt statements of belief.

They appeared to perceive education in terms of content delivery. Although these comments did not necessarily provide insight into the participants' actual educational beliefs, the presence of these descriptive comments within the context of discussions about beliefs signified examples of when the participants either could not or chose not to articulate their beliefs.

Summary of Sub-Theme 3.3: Descriptive Comments about Content Taught and Learnt

The structure of this sub-theme and the frequency of the participants' belief comments are shown in Figure 21.
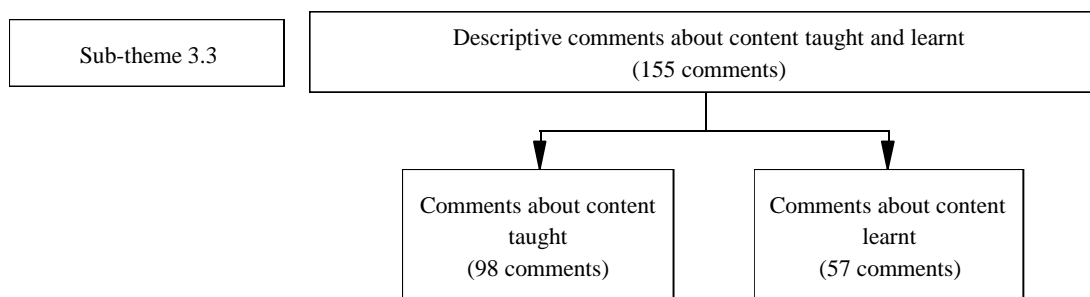
Figure 21. Sub-Theme 3.3: Participants' Descriptive Comments about Content Taught and Learnt (and Comment Frequencies).

Summary of Theme 3: Beliefs about Content being Taught and Learnt

The participants' coded belief comments about content being taught and learnt formed two clear sub-themes, including their beliefs about:

- content being taught and learnt as simple, limited and unchanging; and

- content being taught and learnt as complex, linked and changeable.

An additional sub-theme was also found among the participants' belief comments about content being taught and learnt – a group of descriptive comments about content being taught or learnt.

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A summary of this theme, including the various sub-themes that emerged from coding the participants' belief comments, is outlined in Figure 22.
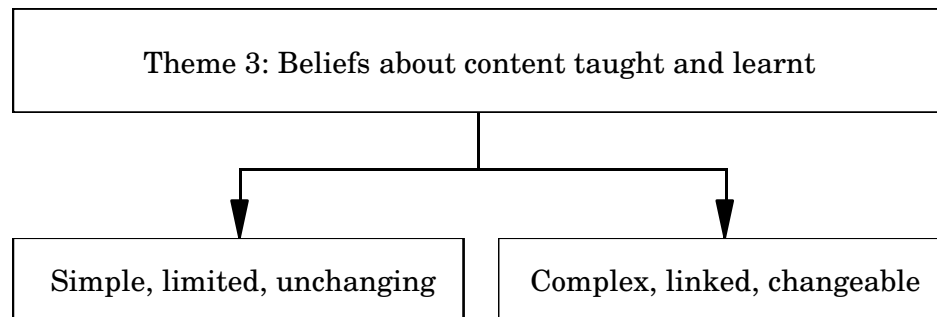
Figure 22. Structure of Theme 3: Beliefs about Content Taught and Learnt.

Considering the emerged findings from the process of coding the participants' belief comments that were related to Theme 3, it is possible to gain an understanding of what beliefs the participants held about the content taught and learnt in their university courses. These beliefs are listed in Tables 44 and 45, with the more strongly held beliefs listed at the beginning of each list.

Table 44
Participants' Beliefs about Content Taught

Content taught is made up of linked concepts.
Content taught is continually changing, extending and improving.
Content taught should be complete and fully detailed.
Content taught is complex and authentic.
Content taught should be accurate.

Table 45
Participants' Beliefs about Content Learnt

Content learnt is made up of linked concepts.
Content learnt is complex and authentic.
Content can be memorised.
Content learnt is continually changing, extending and improving.
Content learnt should be complete and fully detailed.

As well as expressing beliefs about the content taught and learnt (Theme 3), most of the participants in the study also expressed beliefs about the purpose of teaching and learning (Theme 4). The findings from an analysis of their coded comments about these beliefs are now presented.

Theme 4: Beliefs about the Purposes of Teaching and Learning

A fourth major theme that emerged from the qualitative data, represented by the participants' educational belief comments, involved their beliefs about the purposes of teaching and learning involved in university courses. The term "purpose" was used in this theme to also encompass such terms as "use", "meaning" and "application" of the processes of teaching and learning.

Two main sub-themes emerged from the participants' belief comments about the purposes of teaching and learning: they held beliefs about the short term and the long term purposes of teaching and learning. The two sub-themes in this theme are outlined in Figure 23.

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┌─────────────────────────────────────────────────────────────────┐
│     Beliefs about the purposes of teaching and learning (681 comments)     │
└─────────────────────────────────────────────────────────────────┘

  ┌──────────────────────────┐        ┌──────────────────────────────┐
  │   The short term purposes of │        │   34 comments by teachers    │
  │   teaching and learning      │───────▶└──────────────────────────────┘
  │      (182 comments)          │        ┌──────────────────────────────┐
  └──────────────────────────┘        │   148 comments by students   │
                                       └──────────────────────────────┘

  ┌──────────────────────────┐        ┌──────────────────────────────┐
  │   The long term purposes of  │        │   150 comments by teachers   │
  │   teaching and learning      │───────▶└──────────────────────────────┘
  │      (499 comments)          │        ┌──────────────────────────────┐
  └──────────────────────────┘        │   349 comments by students   │
                                       └──────────────────────────────┘
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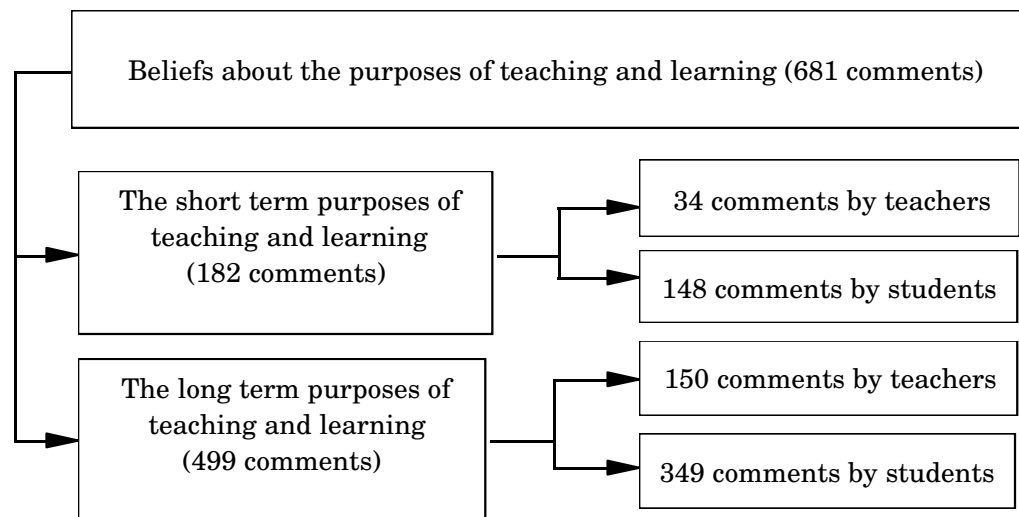
Figure 23. Educational Beliefs Theme 4: Beliefs about the Purposes of Teaching and Learning.

Each of the sub-themes outlined in the above figure will now be explained in order to develop an answer to the first Research Question which focuses on the identification of the participants' educational beliefs.

Sub-Theme 4.1: Beliefs about the Short Term Purposes of Teaching and Learning

Many of the participants expressed comments were related to beliefs about the short term purposes of teaching and learning. In the context of this sub-theme, the phrase "short term" was used to refer to the projected time span within a university course that incorporated intervals of hours, months or semesters. Their comments referred to how the processes of teaching and learning impact on students' lives in terms of their immediate future, and were predominantly focused upon the immediate outcomes and applications of completing university courses. Further categories did not emerge from the comments that were grouped together in this sub-theme.

Table 46 identifies the participants' beliefs within this sub-theme, in conjunction with supporting quotes.

Table 46
Participants' Beliefs about the Short-Term Purposes of Teaching and Learning

Nature of Belief	Beliefs about the Short-Term Purpose of Teaching	By Ts	By Ss	Beliefs about the Short-Term Purpose of Learning	By Ts	By Ss
Students' academic progress	Teaching involves encouraging and expecting students to do well academically at university.	Some	Most	Learning involves students doing well academically at university.	Few	Some
	I believe effective teaching is being able to teach students in a way which is motivating and exciting for them … therefore encouraging the students to want to learn and know more about the subject. (EBI-1 response, Student no. 44 from Class 3)			*I believe effective learning is making the most of opportunities and extending your practice as a student as to achieve to your highest potential. (EBI-1 response, Student no. 29 from Class 2)*		
Course completion by students	Teaching involves enabling students to complete course requirements.	Many	Many	Learning involves students completing course requirements and gaining qualifications.	Most	All
	… getting them through the exams and encouraging them and that type of thing. (First interview with Morris, Class 1 Teacher, Line 53			*I believe effective learning is understanding concepts, theories, notes and coursework to a level that is considered satisfactory. (EBI-2 response, Student no. 4 from Class 1)*		

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Summary of Sub-Theme 4.1: Beliefs about the Short Term Purposes of Teaching and Learning

The structure of this sub-theme and the frequency of the participants' belief comments are shown in Figure 24.
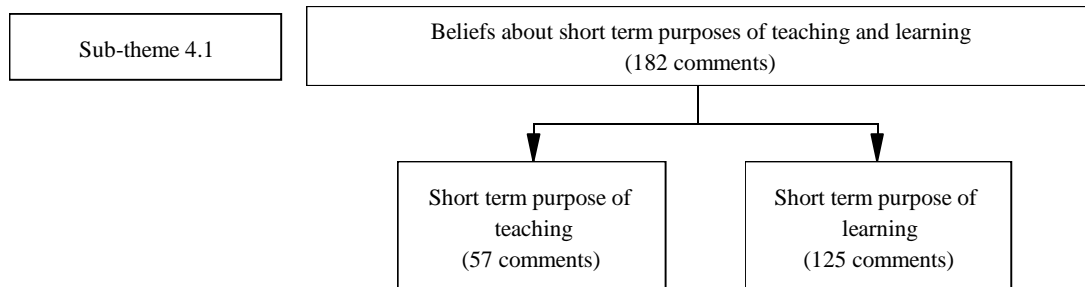
Figure 24. Sub-Theme 4.1: Participants' Beliefs about the Short Term Purposes of Teaching and Learning (and Comment Frequencies).

As well as having beliefs about the short term purposes of teaching and learning, most of the participants in the study also held beliefs about the long term purposes of teaching and learning. These beliefs are presented in Sub-theme 4.2.

Sub-Theme 4.2: Beliefs about the Long Term Purposes of Teaching and Learning

Most of the participants in the study expressed comments that were coded as being related to beliefs about the long term purposes of teaching and learning. In the context of this sub-theme, the phrase, "long term" was used to refer to the anticipated time span beyond a student's university course. Such comments typically referred to how current teaching and learning processes would impact on the students' ability to apply their learning to a wide range of future circumstances. The participants tended to comment on students' future employment and their professional lives beyond just "getting a degree", as well as their "daily", "everyday", "real" or "personal" lives as members of the wider society. Most of their coded comments in this sub-theme were related to the importance of students developing skills and abilities to use and apply in the community, society

and everyday life. Unlike most of the other sub-themes that emerged from the coding process, further sub-theme categories did not emerge from the comments that were grouped together in this sub-theme.

Table 47 identifies the participants' beliefs within this sub-theme, in conjunction with supporting quotes.

Table 47

Participants' Beliefs about the Long Term Purposes of Teaching and Learning

Nature of Belief	Beliefs about the Long-Term Purpose of Teaching	By Ts	By Ss	Beliefs about the Long-Term Purpose of Learning	By Ts	By Ss
Employment and professional life	Teaching involves providing students with employment-related, professional skills and abilities.	Most	Some	Learning involves developing employment-related professional skills and abilities.	Most	Most
	I believe effective teaching is conceived with the students' increasing understanding of a topic and whether the student is able to apply those concepts and principles effectively in the work they do. (EBI-2 response, Student no. 61 from Class 4)			*I believe effective learning is striving to attain knowledge imparted by teachers during the course of study and successfully achieve their degree and use it to actively secure professional positions in the workforce. (EBI-1 response, Student no. 9 from Class 1)*		
Everyday life	Teaching involves providing students with skills and abilities to use and apply in the community, society and everyday life.	All	Most	Learning involves developing skills and abilities to use and apply in the community, society and everyday life.	Many	All
	I believe effective teaching is providing students with the lifelong skills they need in order for them to become an effective member of our society. (EBI-2 response, Student no. 22 from Class 2)			*I believe effective learning is being able to apply the knowledge you have learned in daily life. Using knowledge and understanding to improve standard of life. (EBI-2 response, Student no. 99 from Class 5)*		

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Table 47

Participants' Beliefs about the Long Term Purposes of Teaching and Learning

Nature of Belief	Beliefs about the Long-Term Purpose of Teaching	By Ts	By Ss	Beliefs about the Long-Term Purpose of Learning	By Ts	By Ss
Life-long learning	-	-	-	The purpose of learning is to continue learning.	Many	Some
				And as far as learning, I think learning is - as a - I think learning is a lifelong process and basically, it's just - I'd define it as the acquiring of new skills, processes, ideas, concepts, those kind of things and I think it's more than just intelligence. (Third interview with Peter, Class 2 Student, Line 253)		

Summary of Sub-Theme 4.2: Beliefs about the Long Term Purposes of Teaching and Learning

The structure of this sub-theme and the frequency of the participants' belief comments are shown in Figure 25.

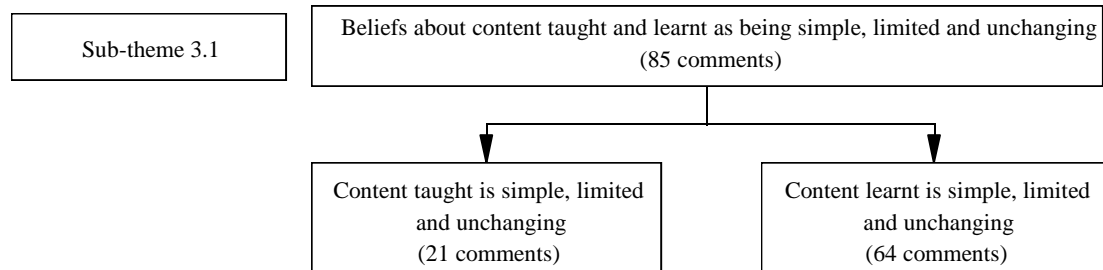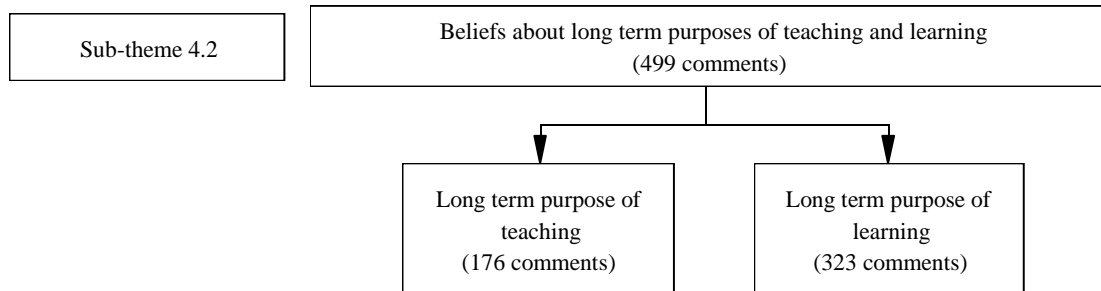*Figure 25.* Sub-Theme 4.1: Participants' Beliefs about the Long Term Purposes of Teaching and Learning (and Comment Frequencies).

Summary of Theme 4: Beliefs about the Purposes of Teaching and Learning

The participants' coded belief comments about the purposes of teaching and learning formed two clear sub-themes, including their beliefs about:

- the short term purposes of teaching and learning; and

- the long term purposes of teaching and learning.

A summary of this theme, including the various sub-themes and sub-theme categories, that emerged from coding the participants' belief comments is outlined in Figure 26.
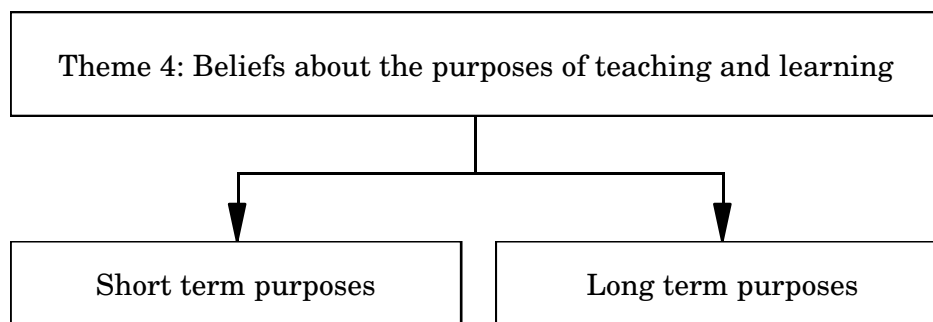
Figure 26. Structure of Theme 4: Beliefs about the Purposes of Teaching and Learning.

Considering the emerged findings from the process of coding and analysing the data that were related to Theme 4, it is possible to gain an understanding of the participants' beliefs about the purposes of teaching and learning. These beliefs are listed in Tables 48 and 49, with the more strongly held beliefs listed at the beginning of each list.

Table 48
Participants' Beliefs about the Purposes of Teaching

Teaching involves providing students with skills and abilities to use and apply in the community, society and everyday life.
Teaching involves encouraging and expecting students to do well.
Teaching involves enabling students to complete course requirements.
Teaching involves providing students with employment-related, professional skills and abilities.

Table 49

Participants' Beliefs about the Purposes of Learning

Learning involves students completing course requirements and gaining qualifications.

Learning involves developing skills and abilities to use and apply in the community, society and everyday life.

Learning involves developing employment-related professional skills and abilities.

The purpose of learning is to continue learning.

Learning involves students doing well academically at university.

As well as expressing beliefs that were coded within the four themes described above, some of the participants' beliefs were not able to be accommodated into these themes. These beliefs are now presented.

Teaching and Learning Beliefs: Other Codes

Although the majority of the participants' comments were obviously related to one or more of the main themes that emerged from the entire collection of their coded comments, a small group of comments did not appear to be related to either of these themes and did not clearly represent any additional themes or categories. Table 50 outlines a selection of examples of these comments with an indication of the topics represented by these comments, in order of the codes with the most comments.

Table 50
Examples of Uncoded Participants' Comments

Uncoded Comment	Topic of Uncoded Comment
No, in learning, there is no humour and there is - that should be fun, definitely, but there is no humour necessary because they are not presenting to anybody, they're [students] getting their information. If you are adding humour, then information will be distracted, yeah.	Learning does not involve humour.
I think in her general approach to treating us as professionals, treating us as teachers already while we're still at uni. I think a lot of the skill that - we are at the stage where we're very ready to get out there and teach and in some ways, I feel more now like a teacher than I do a student.	Transition from being a student to being a teacher.
Speaking to students as equals is also effective as I have experienced instances where a teacher has taught as my superior intellectually and this has intimidated me.	Treating students equally.
I think it extends beyond that into also the realm of you know, spirituality, the act of physically doing things, these kind of things.	Learning as related to spirituality.

Conclusion to this Chapter

Of all the coded comments made by participants, four clear themes emerged which were able to encompass participants' beliefs about:

- teachers and students (Theme 1);

- the processes of teaching and learning (Theme 2);

- the content being taught and learnt (Theme 3); and

- the purposes of teaching and learning (Theme 4).

Each of these themes suggested further sub-themes and, in some cases, the sub-themes were further categorised into other sub-theme categories. Figure 27 represents the overall structure, incorporating the major themes and sub-themes that emerged from the process of coding the participants' belief comments.
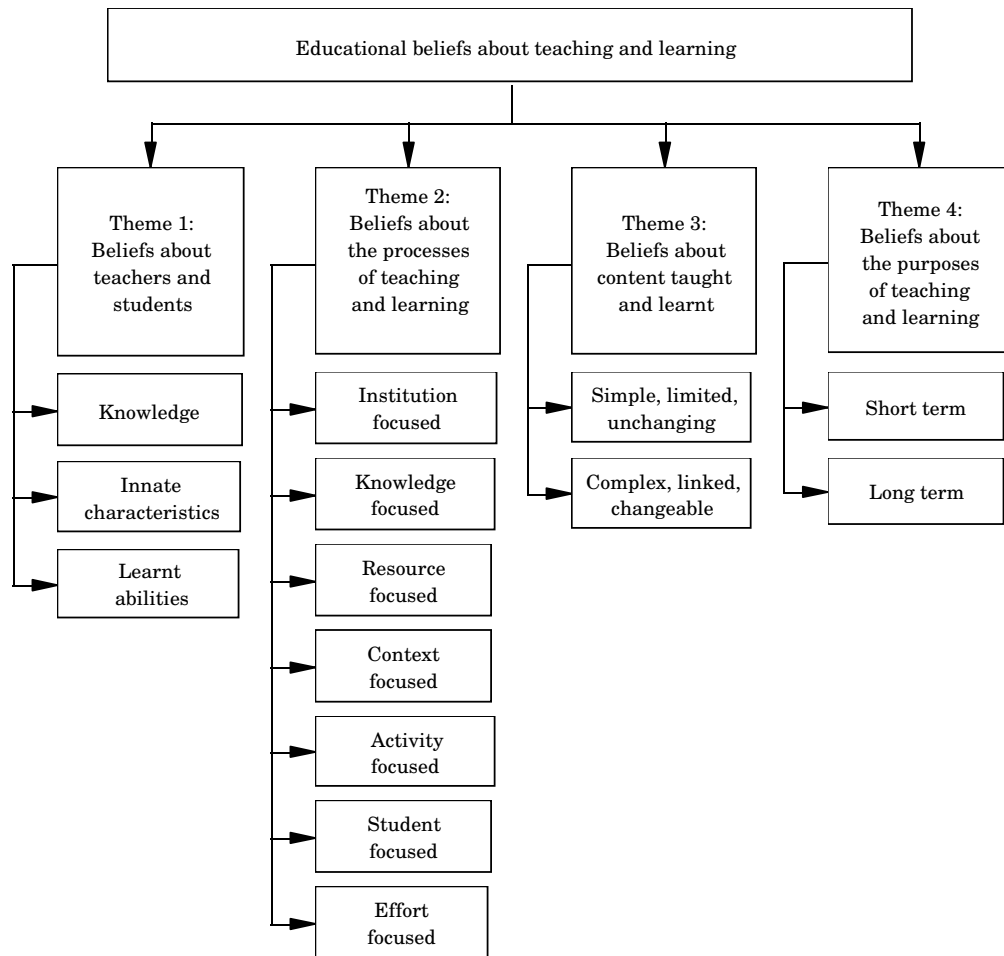
Figure 27. Thematic Structure that Emerged from Coding Participants'
Belief Comments.

The findings presented in this chapter have enabled me to identify
the educational beliefs held by the participants (both university teachers
and university students). Using the thematic structure that emerged from
coding the participants' comments (as indicated in Figure 27), the
participants' beliefs were able to be presented according to themes, sub-
themes and sub-theme categories (see Appendix Four).

As well as providing a set of themes, sub-themes and sub-theme
categories, the nature of, the range of and the links between the
participants' belief comments also suggested a set of observations. These
observations are outlined below and then further analysed in Chapter 8:
Discussion.

Range of Belief Comments

The participants' comments provided evidence that the teachers and the students in the study held beliefs about the stakeholders and the processes related to university teachers and teaching processes that occur within the university context. Likewise, they also held beliefs about university students and the learning processes that take place within the university context. In addition to their beliefs about teachers and students, and the processes of teaching and learning, the participants' also expressed belief comments that were related to the content taught and learnt at university and the actual purposes or outcomes that resulted in the processes of teaching and learning. These results suggest that the university teachers and the university students who took part in this study held beliefs about teaching and learning that represented a range of educational topics, contexts, processes, individuals and timeframes.

Parallel Nature of Belief Comments about Teaching and Learning

Repeatedly, the outcomes of the process of analysing the participants' belief comments presented evidence that their beliefs about teaching corresponded in focus and structure to their beliefs about learning. In some cases, the participants' beliefs about teaching and learning were expressed in the same sentence. This pattern that emerged from the coding process has become an instrumental finding of this research and was utilised to arrange the results and the findings of the entire study.

Links between the Belief Comments across the Four Themes

As well as indicating a parallel structure between the participants' beliefs about teaching and learning, the analysis of the participants' belief comments outlined in this chapter also signified an overlap in many of their beliefs that were coded into the four major themes of the study. For example, the participant's beliefs about the knowledge held by teachers and learners (Theme 1, Sub-theme 1.1) often overlapped with their beliefs about how the processes of teaching and learning involved knowledge construction (Theme 2, Sub-theme 2.2). These links were accommodated within the

coding process by double-coding some of the participants' comments. Such links suggest that many beliefs overlap with each other and connections were revealed in a number of cases.

Hierarchical and Non-Hierarchical Nature of the Belief Comments

The structure reflected within the set of themes, sub-themes and sub-theme categories that emerged from the process of coding the participants' comments is also noteworthy. In some cases, the participants' belief comments formed categories within sub-themes that were non-hierarchical. For example, Sub-theme 1.1 includes the comments that participants offered about teachers' and students' knowledge. Their belief comments were further classified into three sub-theme categories, representing their beliefs about subject knowledge, self knowledge and pedagogical knowledge. In this case, the sub-theme categories did not suggest a hierarchy of beliefs in terms of complexity or focus.

On the other hand, the participants' beliefs that were coded as being related to Sub-theme 2.2, which included the participants' belief comments about teaching and learning as processes of managing or dealing with knowledge, did suggest a hierarchical structure. The participants' comments within this sub-theme were further categorised into two sub-theme categories: beliefs about teaching as the process of providing knowledge, and learning is the process of receiving knowledge; and beliefs about teaching as the process of facilitating the construction of knowledge, and learning is the process of constructing knowledge. The structure within this sub-theme suggests that some participants' expressed comments that reflected teaching and learning beliefs that were related to more traditional, instructivist conceptions of teaching and learning, whereas other participants' held beliefs were more indicative of facilitative, constructivist conceptions of teaching and learning. Interestingly, some individual participants expressed beliefs that were coded as being related to both levels of such a hierarchy.

Proportion of the Belief Comments across the Four Themes

Although the findings of this study are not entirely conditional upon the actual quantity of comments that were coded into each of these four themes, the uneven spread of comments across the four themes is noteworthy. Most of the participants' comments were coded as being either related to their beliefs about teachers and students (27% of all comments), or their beliefs about the teaching and learning process (60% of all comments). However, a much smaller proportion of their coded comments contributed to the remaining two themes: only 5% of their comments were coded as being related to their beliefs about content and knowledge, and only 6% represented their beliefs about the purpose of teaching and learning. Despite these relatively small amounts of comments that were coded into these last two themes, the themes have been included in this study for this very reason – that is, the surprising lack of emphasis placed on these two areas by both the teachers and the students in the study. Lastly, there were a group of coded comments that were not categorised into one of these four themes (233 comments).

Indication of Similarity between Teachers' and Students' Beliefs

Although this was not the purpose of this chapter, the qualitative data that was analysed in preparation of this chapter indicates that very similar beliefs were held by the teachers and the students in the study. In this way, an analysis of the data for the purposes of establishing the beliefs held by the group of participants as a whole also established the similarity between the beliefs held by the two main groups of participants who took part in the study. This theme of similarity is further explored at an individual level in Chapter 6, which includes an analysis of the data in terms of contributing to answering the second research question of the study: How similar are the educational beliefs of university teachers and university students?

Link to the Next Chapter

This chapter has provided the results of the analysis of two sets of qualitative data –the data gathered during the verbal interview process and the written data gathered from the participants' responses to the open-ended items on the EBI. The results presented in this chapter have contributed to answering the first research question of this study: What are the educational beliefs of university teachers and university students? The following chapter presents a further selection of evidence with which to answer this research question – based on the results of an analysis of quantitative data.

CHAPTER 5

IDENTIFICATION OF TEACHERS' AND STUDENTS' BELIEFS: FINDINGS FROM AN ANALYSIS OF THE QUANTITATIVE DATA

Introduction

This chapter presents an analysis of the quantitative data collected throughout the study. The outcomes of this analysis are combined with the outcomes of the analysis of the qualitative data, presented in Chapter 4, in order to present a comprehensive view of the beliefs held by the teachers and students who took part in the study and to provide answers to the first research question: What are the educational beliefs of university teachers and university students?

The quantitative data analysed in this chapter were made up of the participants' responses to 44 statements in the Educational Belief Inventory (EBI). Like the findings gained from analysing the qualitative data in the previous chapter, this data has provided a snapshot of the beliefs the participants expressed during a one semester period of teaching, rather than enabling me to conduct an aetiological or a developmental study of the participants' beliefs.

The 44 items were listed on the EBI in a random order. So, instead of analysing the quantitative data represented by the participants' scored responses to these 44 items based on the order of their appearance on the instrument, these items have been grouped using the thematic structure that emerged from coding the qualitative data.

Grouping the EBI items enabled me to make a direct thematic connection between the qualitative and quantitative data gathered throughout the study. The first two levels of the structured framework, which incorporated themes and sub-themes, that emerged from coding the

qualitative data of the study, have been utilised to group the quantitative data in this chapter. The third level of the structured framework, which incorporated sub-theme categories, that emerged from the coding process was not used in this analysis as it was too fine-grained.

Each of the 44 Likert-style items on the EBI was aligned to at least one relevant theme and sub-theme. Table 51 outlines a representative example of how EBI items were allocated to Sub-theme 1.1: Teachers' and students' knowledge. The participants' responses to each of the EBI items could then be directly compared with the participants' verbal and written comments that were analysed in the previous chapter. This triangulation process ensured that the data analysis processes applied to each set of data were connected. Table 52 indicates how all of the EBI items were aligned with the themes and sub-themes within the thematic structure that emerged from the coding process outlined in the previous chapter.

Table 51

Allocation of EBI Items to Sub-Theme 1.1: Teachers' and Students'
Knowledge

Item No.	Item	Teachers' or Students' knowledge
2	I believe that university teachers should act as resource persons by giving and sharing information.	Teachers'
4	I believe teaching is an activity aimed at changing students' understanding of the world.	Teachers'
5	I believe teaching is concerned with increasing students' understanding of a topic.	Teachers'
11	I believe learning is about developing knowledge of myself.	Students'
16	I believe learning is about increasing my own knowledge.	Students'
18	I believe learning is about me developing as a person.	Students'
19	I believe the knowledge of how to study is usually learned as we grow older.	Students'
26	I believe that effective university teachers understand how they, themselves, learned the subject they are teaching.	Teachers'
27	I believe that an effective university teacher reflects on how they teach.	Teachers'
34	I believe an expert is usually someone who was born to be an expert.	Teachers', Students'
38	I believe that effective university students understand things quickly.	Students'
39	I believe that effective university students aim to get the big ideas from a reading rather than just the details.	Students'
40	I believe that effective university students seek links between different activities, ideas and subjects.	Students'
43	I believe that effective university students check their own understanding.	Students'

Table 52

EBI Items Coded as Being Related to Each Theme and Sub-Theme

Theme	Sub-Theme	Item No.
1: Beliefs about teachers and students	1.1: Teachers' and students' knowledge	2, 4, 5, 11, 16, 18, 19, 26, 27, 34, 38, 39, 40, 43
	1.2: Teachers' and students' innate characteristics	1, 24, 30, 33, 37
	1.3: Teachers' and students' learnt abilities	14, 15, 19, 25, 28, 29, 31, 32, 35, 36, 41, 42, 44
2: Beliefs about the processes of teaching and learning	2.1: Institution focused beliefs about teaching and learning	-
	2.2: Knowledge focused beliefs about teaching and learning	6, 16, 17, 23, 26, 39
	2.3: Resource focused beliefs about teaching and learning	2
	2.4: Context focused beliefs about teaching and learning	3, 14, 15, 24, 25, 28, 30, 31, 32, 36
	2.5: Activity focused beliefs about teaching and learning	8, 10, 35, 41
	2.6: Student development focused beliefs about teaching and learning	3, 4, 5, 7, 9, 11, 12, 13, 16, 18, 19, 20, 24, 28, 33, 35, 43, 44
	2.7: Effort focused beliefs about learning	21
3: Beliefs about content taught and learnt	3.1: Beliefs about content taught and learnt as being simple, limited and unchanging	16, 17, 22, 34
	3.2: Beliefs about content taught and learnt as being complex, linked and changeable	1, 5, 6, 26, 39, 40
4: Beliefs about the purposes of teaching and learning	4.1: Short term purposes of teaching and learning	-
	4.2: Long term purposes of teaching and learning	4, 8, 13, 42

Once the EBI items had been aligned with these themes and sub-themes, the participants' responses to particular EBI items were statistically analysed, and means and standard deviations were calculated.

The mean for each question, which could range from scores of one through to five, represents the various levels of agreement, neutrality or disagreement for each item held by the participants as a whole group. According to these mean scores, a Level of Agreement-Disagreement Scale was constructed to guide the interpretation of these scores, with the stronger levels of agreement being allocated a narrower range of scores. This scale is outlined in Table 53.

Table 53
Level of Agreement-Disagreement Scale

Level of Agreement (Raw Score)	Equivalent Mean Score Range
Strongly agree	4.50-5.00
Agree	3.50-4.49
Neither agree nor disagree	2.50-3.49
Disagree	1.50-2.49
Strongly disagree	1.00-1.49

This Level of Agreement-Disagreement Scale was used to interpret the disagreement, agreement or neutrality held about each item by the whole group of participants in the study. A full analysis of how agreement, disagreement and neutrality levels were allocated to each EBI item according to their mean scores, along with an outline of how each EBI item could be aligned directly with the beliefs which emerged from an analysis of the qualitative data, can be found in Appendix Five. Table 54 provides a summarised version of this analysis in which levels of agreement, disagreement and neutrality about each of the EBI items, as they have been aligned to the sub-themes, are reported.

Table 54

Level of Agreement, Disagreement or Neutrality of EBI items within Sub-Themes

Theme	Sub-theme	Agreement	Disagreement	Neutrality
1	1.1	11	1	0
	1.2	4	0	1
	1.3	12	0	1
2	2.1	0	0	0
	2.2	5	1	0
	2.3	1	0	0
	2.4	9	0	1
	2.5	4	0	0
	2.6	17	0	1
	2.7	0	0	1
3	3.1	1	2	1
	3.2	6	0	0
4	4.1	0	0	0
	4.2	3	0	1

Conclusion to this Chapter

The findings from the analysis of the quantitative data in this chapter have been triangulated with the findings from an analysis of the qualitative data, as outlined in the previous chapter. This comparison was facilitated by aligning the EBI items with the corresponding sub-themes which emerged from coding the qualitative data.

The process of aligning each of the EBI items demonstrated that the beliefs represented by each of these items generally corresponded with one or more of the coded beliefs within the emerged thematic structure. This alignment gave me confidence to match some of the beliefs cited in the EBI with the participants' belief comments represented by the qualitative data. In some cases, the EBI items were coded as being related to more than one of the themes or sub-themes in this thematic structure. There were no items

remaining that did not correspond to any of the themes and sub-themes of this structure.

This comparison of the EBI items with the emerged thematic structure found that all of the beliefs which emerged from coding the participants' belief comments were represented in the range of EBI items which had been selected from a range of existing belief inventories. Although all the EBI items were reflected in corresponding beliefs from the thematic structure, there were some sub-themes from this structure that were not reflected in the EBI items. For example, no EBI items were related to Sub-theme 2.1: Beliefs about teaching and learning as processes which occur within institutions, or Sub-theme 4.1: Beliefs about the short-term purposes of teaching and learning. Since the EBI items represented beliefs that had already been recognised in previous research, these two sub-themes that were not reflected in the EBI items have revealed two new types of beliefs that were evident only in the qualitative data collected during the study.

These findings provide a collection of beliefs with which the participants either agreed, disagreed or neither agreed nor disagreed, and these beliefs have been arranged within themes and sub-themes based on the emerged thematic structure which was formed as a result of coding the qualitative data. These findings (as presented in Table 54) indicate that most teacher and student participants agreed with the EBI items, with few areas of disagreement or neutrality. Combined, these findings suggest that the participants' responses to the EBI items generally supported the findings that emerged when the qualitative data were coded and analysed

Overall, the findings presented in this chapter have contributed specifically to answering the first research question: What are the educational beliefs of university teachers and university students?

CHAPTER 6

SIMILARITY BETWEEN TEACHERS' AND STUDENTS' BELIEFS: FINDINGS FROM AN ANALYSIS OF THE QUALITATIVE DATA

Introduction

This chapter presents an analysis of the qualitative data gathered from interviews with each teacher and a selection of their students. The outcomes of this analysis were used to answer my second research question: How similar are the educational beliefs of university teachers and university students? The chapter begins with an explanation of the analysis methods used to determine similarity between the teachers' and the students' beliefs, in conjunction with an explanation of how these analysis methods utilise three different interpretations of the data. The chapter concludes with a set of findings from each of these three analyses and a general conclusion.

Firstly, the qualitative data that represented the teachers' and students' beliefs were interpreted on a class-by-class basis. As such, the first analysis framework involved the qualitative data being analysed in order to ascertain the degree of similarity or difference that existed between the teachers' and students' beliefs within each of the five separate classes. Within this class based analysis framework, the beliefs held by the teacher from each class were compared with a selection of their students. For example, the beliefs of Kiarn and Kent, the two students who were interviewed from Class 4, were compared with the beliefs of Walter, the teacher of the class of which they were a part.

Data was then interpreted using themes that emerged from coding the study's qualitative data, as presented in Chapter 4. This second analysis framework involved a comparison of the beliefs of all of the teachers and all

of the students in the study from all of the five classes. This analysis was conducted in order to determine the degree of similarity or difference that existed between all of the teachers' and all of the students' beliefs.

Lastly, the third analysis framework involved determining the degree of similarity or difference that existed between all of the teachers' beliefs and all of the students' beliefs just about teachers and teaching, and just about students and learning.

For the purposes of brevity, only samples of the analysis processes used to prepare this chapter have been included, rather than every analysis.

Since levels of similarity or difference between teachers' and students' educational beliefs have not yet been a prime focus of educational research, methods of data comparison had to be devised for use in this study. In order to apply a consistent judgement about belief similarity or difference, a Degree of Similarity Scale was constructed in order to ascertain the degree of similarity between the beliefs held by the teachers and the students who participated in the study. The use of this scale ensured that the qualitative data analysis methods were both defensible and rigorous.

When instances of teacher-student belief similarity were detected during analysis of the interview transcripts, the Degree of Similarity Scale was applied. The degree of belief similarity between teachers' and students' beliefs was determined by comparing the number of instances where the beliefs were held by the students in the class compared to the number of instances where the same belief was held by their teacher. The percentage-based proportions of belief similarity were found by considering the proportions of teacher-student belief comparisons and were then applied to each case of teacher-student belief similarity. Table 55 outlines how each degree of similarity was determined within the Degree of Similarity Scale. Table 56 illustrates an example of how the level of belief teacher-student similarity was determined by applying the Degree of Similarity Scale.

Table 55
Degree of Similarity (DoS) Scale

Degree of Similarity	Proportion of Belief Similarity
Maximum	100%
High	68-99%
Medium	34-67%
Low	1-33%
Minimum	0%

Once the participants' beliefs were identified, whether or not these beliefs were held by teachers and/or students was determined. Then, these instances were compared within each class. The number of times where each belief was held were counted and expressed in fractional terms to indicate the proportion of instances where the belief was evident. In the case illustrated in Table 56, the teacher's beliefs were compared with two of their students about three different beliefs, providing six points of teacher-student belief comparison. These comparisons indicated that the two students' beliefs were similar to the teacher's beliefs in five out of six cases (5/6 = 83%), indicating a "high" degree of similarity, based on the Degree of Similarity Scale.

Table 56
Example 1: Degree of Similarity (DoS) Scale

Belief	T1	S1a	S1b	DoS
Teachers should be the source of subject knowledge.	✓	✓	✓	High (5/6)
Teachers' subject knowledge should be current.	✓	✗	✓	
Teachers continue to learn about their subject.	✓	✓	✓	

Conversely, in the case illustrated in Table 57, where the students did not express any beliefs that were similar to their teacher's beliefs in a

possible four cases, the degree of similarity could be described as "minimum" (0/4 = 0%).

Table 57
Example 2: Degree of Similarity (DoS) Scale

Belief	T1	S1a	S1b	DoS
Effective teachers are skilled, entertaining, timely and appropriate presenters.	✗	✓	✓	Minimum (0/4)
Effective teachers use appropriate presentation resources.	✗	✓	✓	

First Analysis Framework: Class-by-Class Comparisons

Within this first analysis framework, the beliefs held by the teacher in each of the five classes were compared with interviewed students in each of their classes. The overall degree of teacher-student belief similarity was first determined for each of the sub-theme categories, sub-themes and themes within the thematic structure outlined in Chapter 4.

The purpose of determining these degrees of teacher-student belief similarity in association with each of the themes of this study is to explore whether the beliefs held by the teachers and students in this study are either similar or different overall. Although there is weak evidence in the literature about the negative impact on learning of mismatched teacher-student beliefs, the influence of congruent beliefs has yet to be investigated. Since the belief literature has yet to present evidence of such similarity, it is anticipated that these results will further knowledge about the relationship between the beliefs held by higher education teachers and students within the same context.

The same process used to compare the beliefs held by the teacher and students in Class 1 was used to compare the beliefs held by the teacher and their students in each of the other four classes. The process of comparative analysis that was conducted in order to ascertain the degrees of similarity between the teacher's and students' beliefs about teachers' and students' knowledge (Sub-theme 1.1) is outlined below. This analysis sample is

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representative of the procedure used to compare the beliefs within all of the sub-themes held by the teachers and students in all of the five classes in the study but is not repeated for those classes.

Class 1: Comparison of Teachers' and Students' Beliefs

Based on the quotations from their interview transcripts, the beliefs held by the Class 1 teacher, Morris, and two of his students, Lionel and Shane, were identified and compared. The Degree of Similarity Scale was then applied to these comparisons within each of the sub-theme categories. These calculations were then used to determine the degree of similarity between each of the sub-themes and, consequently, within each of the themes. An example of this process follows by using the Class 1 teachers' and students' beliefs to show how the Degree of Similarity Scale was applied. The comparisons of the teachers' and students' beliefs from Classes 2, 3, 4 and 5 are provided in summarised table formats.

Class 1: Teacher-Student Comparison of Beliefs about Teachers and Students (Theme 1)

The presentation of these results begins with a comparison of the actual quotations from the teachers and students in the class. This is followed by an application of the Degree of Similarity Scale to determine a degree of teacher-student beliefs similarity and, lastly, these comparisons are concluded with a summary of belief comparisons in table format.

Class 1: Teacher-student comparison of beliefs about teachers' and students' knowledge (Sub-theme 1.1).

Sub-theme 1.1 was about the beliefs held by the participants about teachers' and students' knowledge. The sub-theme categories that were part of this sub-theme included beliefs about: teachers' and students' subject knowledge (Sub-theme category 1.1.1); teachers' and students' self knowledge (Sub-theme category 1.1.2); and teachers' pedagogical knowledge (Sub-theme category 1.1.3).

Using the Degree of Similarity Scale, the beliefs held by the teacher and the students in Class 1 about teachers' and students' subject knowledge

(Sub-theme category 1.1.1) were shown to be similar. For example, Morris, the Class 1 teacher, and two of his students, Lionel and Shane, all expressed beliefs about how a teacher should extend their knowledge of the subject they teach. Their explanations of this belief also coincided with the fact that they all believed that a teacher's subject knowledge would be extended by interaction with their students:

> Well, a good teacher should be a good learner, and they should learn from the students, I believe.
> (First interview with Morris, Class 1 Teacher, Line 753)

> But if he doesn't know anything alright, if he doesn't know particular stuff, and if the student is telling him that I read through this, this and this stuff, it's pretty good for the Professor as well ... When a person teaches, he learns, that's the thing.
> (First interview with Shane, Class 1 Student, Lines 322, 374)

> Without learning it, you can't teach it, without teaching it you can't learn because you learn from your students. You know, their feedback, their questions.
> (First interview with Lionel, Class 1 Student, Lines 752-756)

The teacher and the students' beliefs about students' subject knowledge were also similar, with Morris, Lionel and Shane all expressing beliefs about how students typically possess certain levels of subject knowledge before they start their university courses. Lionel spoke about his personal experience that he brought along to the unit:

> Yeah, I've had a lot more experience than that.
> (First interview with Lionel, Class 1 Student, Line 660)

Shane acknowledged the knowledge already held by some of his fellow students:

> Fifteen per cent [sic] students understands everything and there are ten per cent [sic] students who can say like this, OK, we know this already.
> (First interview with Shane, Class 1 Student, Line 213).

Morris also recognised that some students come to their university courses with knowledge gained from their workplaces:

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> We've got people in industry that are in the unit that just probably want a qualification.
> (Second interview with Morris, Class 1 Teacher, Line 11).

These belief quotations show evidence to indicate similarity between the teacher's and the students' beliefs in this sub-theme category. The Degree of Similarity Scale was then applied to these belief manifestations by determining whether the beliefs about teachers' subject knowledge held by Morris, the Class 1 teacher, were similar to Shane and Lionel's beliefs, the two Class 1 students. Firstly, Morris' belief about "teachers as a source of knowledge" was compared with Lionel's belief about this topic, providing one point of comparison. Then, Morris' belief about "teachers as a source of knowledge" was compared with Shane's belief about this topic, providing another point of comparison. Further comparisons were determined for the following two beliefs about teachers' knowledge: "teachers' subject knowledge should be current"; and "teachers continue to learn about their subject". These comparisons provided six points of comparison. Overall, the beliefs of two of the students in this class about *teachers'* subject knowledge were similar to the beliefs of their teacher in five out of six manifestations of this belief. This degree of similarity can be described as "high" (see Table 55), based on the Degree of Similarity Scale.

Next, Morris' beliefs about students' subject knowledge were compared to Lionel's beliefs and then to Shane's beliefs. Since there were three beliefs identified about students' subject knowledge, this process involved six points of comparison. The degree of similarity between their beliefs about *students'* subject knowledge was also found to be "high", being similar in five out of six beliefs (see Table 58).

On the whole, when the Class 1 teacher's and students' beliefs about teachers' subject knowledge and students' subject knowledge were combined, the degree of similarity between their beliefs for this sub-theme category was high, being similar in 10 out of 12 instances of belief comparison. These findings are summarised in Table 58 in which Lionel and Shane, the students from Class 1, are referred to as Student 1a (S1a) and

Student 1b (S1b), and Morris, the teacher from this class, is referred to as Teacher 1 (T1).

Table 58
Class 1 Teacher-Student Belief Similarity about Sub-Theme Category 1.1.1: Beliefs about Teachers' and Students' Subject Knowledge

Belief about Teachers	T1	S1a	S1b	DoS
Teachers should be the source of subject knowledge.	✓	✓	✓	High (5/6)
Teachers' subject knowledge should be current.	✓	✗	✓	
Teachers continue to learn about their subject.	✓	✓	✓	
Belief about Students	**T1**	**S1a**	**S1b**	**DoS**
Students gain subject knowledge from the course, teacher and other students.	✗	✗	✗	High (5/6)
Students' subject knowledge should be current.	✗	✗	✓	
Students already possess some subject knowledge.	✓	✓	✓	
Sub-theme category 1.1.1 (Overall DoS): High (10/12)				

There was some similarity between the beliefs *not expressed* by the teacher and the students in Class 1 about teachers' and students' self knowledge (Sub-theme category 1.1.2). As acknowledged in previous chapters, the participants who did not express particular beliefs were not necessarily viewed as not holding these beliefs. Since the interviews were only semi-structured, some participants discussed some topics, and others did not, since the topics selected in the interviews were largely directed by the participants themselves.

At this stage, it is worth considering that the data analysis process used to determine the degree of similarity between the teacher's and students' beliefs was based on the application of the Degree of Similarity Scale that was created specifically for this study. At this point, findings align well with the results of the quantitative data analyses, leading me to trust the validity of the Degree of Similarity Scale.

Morris expressed one of the three beliefs about teachers' self knowledge that emerged from the overall thematic structure, based on the beliefs of all of the participants in the study. However, students Lionel and Shane did not express such beliefs. In this respect, their lack of beliefs expressed in this area was similar in four out of six possible cases.

The beliefs held by Morris, the teacher, and his students about students' self knowledge were not as similar. Morris did not express the belief that students should be aware of how they learn. However, both Lionel and Shane did express such a belief, explaining that:

> I'm aware of the way I learn … you just know how you learn.
> (First interview with Lionel, Class 1 Student, Lines 275, 287)

> You are aware of what you are learning about and what you are listening for.
> (First interview with Shane, Class 1 Student, Line 369)

Furthermore, neither Morris, Lionel nor Shane expressed the belief that students should reflect on the way they learn, thus indicating a high level of teacher-student beliefs similarity, based on their lack of belief expression about this topic. However, whereas Morris did express the belief that students' should reflect on how they are taught, neither of the interviewed students expressed this belief, indicating a lower level of teacher-student belief similarity about this particular belief.

These belief quotations, or lack of them, were used as evidence to ascertain the degree of similarity between the teacher's and the students' beliefs in this sub-theme category. Overall, the beliefs of two of the students in this class about teachers' self knowledge were classified as being similar to the beliefs of their teacher in four out of six cases. This degree of similarity can be described as "medium", based on the Degree of Similarity Scale (Table 55). On the other hand, the degree of similarity between their beliefs about students' self knowledge was "low", being similar in only two out of six cases. On the whole, the degree of similarity between the teachers' and the students' beliefs for this sub-theme category was medium, being

similar in six out of 12 instances of belief comparison. These findings are summarised in Table 59.

Table 59
Class 1 Teacher-Student Belief Similarity about Sub-theme Category 1.1.2: Beliefs about Teachers' and Students' Self Knowledge

Belief about Teachers	T1	S1a	S1b	DoS
Teachers should know themselves.	✘	✘	✘	Medium (4/6)
Teachers should reflect on their own learning..	✓	✘	✘	
Teachers should reflect on their own teaching..	✘	✘	✘	
Belief about Students	**T1**	**S1a**	**S1b**	**DoS**
Students should be aware of themselves as learners.	✘	✓	✓	Low (2/6)
Students should reflect on their own learning.	✘	✘	✘	
Students should reflect on how they are taught.	✓	✘	✘	
Sub-theme category 1.1.2 (Overall DoS):	Medium (6/12)			

Some of the beliefs expressed by the Class 1 teacher and his students about teachers' pedagogical knowledge (Sub-theme category 1.1.3) were similar. For example, Morris, the teacher, and one of his students, Lionel, believed teachers should understand that all learners are different. While explaining how effective teachers realise that all students are different, Lionel described a teacher who was not able to gauge the different reactions from his students as someone who did not know "whether they've lost 'em or they've gained 'em, and that's a problem" (Third interview with Lionel, Class 1 Student, Line 424). Morris, the teacher, also believed that teachers should know that all learners are different, and acknowledged that "there are huge differences in students" and that "people learn in different ways" (Second interview with Morris, Class 1 Teacher, Lines 225, 256). In this case, there was some similarity between the beliefs held by the teacher and one of the two students interviewed from his class.

Overall, the beliefs of two of the students in this class about teachers' pedagogical knowledge were similar to the beliefs of their teacher in three

out of six cases, as illustrated in Table 60. This degree of similarity can be described as "medium", based on the Degree of Similarity Scale (Table 55).

Table 60
Class 1 Teacher-Student Belief Similarity about Sub-theme Category 1.1.3: Beliefs about Teachers' Pedagogical Knowledge

Belief about Teachers	T1	S1a	S1b	DoS
Teachers know that all learners are different.	✓	✓	✗	Medium (3/6)
Teachers know how to treat students holistically.	✗	✗	✗	
Teachers know that learning involves making mistakes and rectifying misunderstandings.	✓	✗	✗	
Sub-theme category 1.1.3 (Overall DoS): Medium (3/6)				

Once the degrees of similarity were determined for each sub-theme category within Sub-theme 1.1, an overall measure of similarity was determined for this sub-theme which incorporated the Class 1 teachers' and students' beliefs about teachers' and students' knowledge by simply totalling the sub-category scores. The beliefs held by the teacher and the students in this class were similar in 19 out of 30 cases, indicating a "medium" degree of belief similarity.

The degrees of similarity that existed between the Class 1 teacher's and students' beliefs about the various sub-categories of beliefs within the final two sub-themes (Sub-theme 1.2 and Sub-theme 1.3) of this theme were determined. Similar processes that have been outlined above were used to ascertain the degrees of similarity within Sub-theme 1.2 and Sub-theme 1.3. The results of these analyses are presented in Table 61 which, for convenience, also includes the results of Sub-theme 1.1.

Table 61

Class 1 Teacher-Student Belief Similarity about Theme 1: Beliefs about Teachers and Students

Beliefs about	Degree of Similarity
Sub-theme 1.1: Knowledge	Medium (19/30)
Sub-theme 1.2: Innate characteristics	High (33/40)
Sub-theme 1.3: Learnt abilities	Medium (26/48)
Theme 1: Teachers and students	Medium

As the same procedures outlined above in Sub-theme 1.1 were used to determine the degree of similarity for the following themes, these are presented in summarised table formats from here onwards.

Class 1 Teacher-Student Comparison of Beliefs about the Processes of Teaching and Learning (Theme 2)

The degrees of similarity that existed between the Class 1 teacher's and students' beliefs about the various sub-categories of beliefs within the seven sub-themes (Sub-theme 2.1 through to Sub-theme 2.7) of this theme were determined. The results of these analyses are presented Table 62.

Table 62

Class 1 Teacher-Student Belief Similarity about Theme 2: Beliefs about the Processes of Teaching and Learning

Beliefs about	Degree of Similarity
Sub-theme 2.1: Institution	Maximum (8/8)
Sub-theme 2.2: Knowledge	Medium (12/22)
Sub-theme 2.3: Resources	Medium (5/8)
Sub-theme 2.4: Context	High (19/28)
Sub-theme 2.5: Activity	Medium (26/40)
Sub-theme 2.6: Student development	High (30/42)
Sub-theme 2.7: Effort	High (7/10)
Theme 2: Process of teaching and learning	High

Class 1 Teacher-Student Comparison of Beliefs about Content Taught and Learnt (Theme 3)

The degrees of similarity that existed between the Class 1 teacher's and students' beliefs about the various sub-categories of beliefs within the two sub-themes (Sub-theme 3.1 and Sub-theme 3.2) of this theme were determined. The results of these analyses are presented in Table 63.

Table 63
Class 1 Teacher-Student Belief Similarity about Theme 3: Beliefs about Content Taught and Learnt

Beliefs about	Degree of Similarity
Sub-theme 3.1: Simple nature of content	Medium (3/8)
Sub-theme 3.2: Complex nature of content	Medium (8/12)
Theme 3: Content taught and learnt	Medium

Class 1 Teacher-Student Comparison of Beliefs about the Purposes of Teaching and Learning (Theme 4)

The degrees of similarity that existed between the Class 1 teacher's and students' beliefs about the various sub-categories of beliefs within the two sub-themes (Sub-theme 4.1 and Sub-theme 4.2) of this theme were determined. The results of these analyses are presented in Table 64.

Table 64
Class 1 Teacher-Student Belief Similarity about Theme 4: Beliefs about the Purposes of Teaching and Learning

Beliefs about	Degree of Similarity
Sub-theme 4.1: Short term	Medium (5/8)
Sub-theme 4.2: Long term	Low (3/10)
Theme 2: Purposes of teaching and learning	Medium

Summary of Class 1 Teacher-Student Comparison of Beliefs

The process of comparing the Class 1 teacher's beliefs with the beliefs of the two interviewed students from his class indicated there was a

medium degree of similarity between their beliefs overall. In terms of the different themes within the study, a comparison of the teacher's and the students' beliefs showed there was a high degree of similarity in their beliefs about the processes of teaching and learning (Theme 2), whereas a comparison of their beliefs about the other three themes (Themes 1, 3 and 4) indicated a medium degree of similarity in each case.

The results of the degrees of belief similarity in terms of the beliefs within each of the four themes for the Class 1 teacher and two of his students are outlined in Table 65.

Table 65
Overall Class 1 Teacher-Student Belief Similarity

Beliefs about	Degree of Similarity
Theme 1: Teachers and students	Medium (78/118)
Theme 2: Process of teaching and learning	High (107/158)
Theme 3: Content taught and learnt	Medium (11/20)
Theme 4: Purposes of teaching and learning	Medium (8/18)
Overall	Medium

Class 2: Comparison of Teachers' and Students' Beliefs

The same comparative processes of comparing the beliefs that were held by the Class 1 teacher and his students were applied to the beliefs held by the Class 2 teacher, Hilary, and one of her students, Peter. The summarised results are presented in Table 66.

Table 66
Class 2 Teacher-Student Belief Similarity about Themes 1-4

Beliefs about		Degree of Similarity
Theme 1: Teachers and students	Sub-theme 1.1: Knowledge	High (12/15)
	Sub-theme 1.2: Innate characteristics	Medium (11/20)
	Sub-theme 1.3: Learnt abilities	High (18/24)
	Theme 1: Teachers and students	High
Theme 2: The processes of teaching and learning	Sub-theme 2.1: Institution	Medium (2/4)
	Sub-theme 2.2: Knowledge	Medium (5/11)
	Sub-theme 2.3: Resources	Medium (2/4)
	Sub-theme 2.4: Context	High (10/14)
	Sub-theme 2.5: Activity	High (14/20)
	Sub-theme 2.6: Student development	Medium (10/21)
	Sub-theme 2.7: Effort	Medium (3/5)
	Theme 2: Processes of teaching and learning	Medium
Theme 3: Content taught and learnt	Sub-theme 3.1: Simple nature of content	High (3/4)
	Sub-theme 3.2: Complex nature of content	High (5/6)
	Theme 3: Content taught and learnt	High
Theme 4: The purposes of teaching and learning	Sub-theme 4.1: Short term	High (3/4)
	Sub-theme 4.2: Long term	High (4/5)
	Theme 4: Purposes of teaching and learning	High

Summary of Class 2 Teacher-Student Comparison of Beliefs

The process of comparing the Class 2 teacher's beliefs with the beliefs of the interviewed student from her class indicated there was a medium degree of similarity between their beliefs overall. In terms of the different themes within the study, a comparison of the teacher's and the students' beliefs showed there was a high degree of similarity in their beliefs about most themes (Themes 1, 3 and 4), whereas a comparison of their beliefs

about the processes of teaching and learning (Theme 2) only indicated a medium degree of similarity.

The results of the degrees of belief similarity in terms of the beliefs within each of the four themes for the Class 2 teacher and one of her students are outlined in Table 67.

Table 67
Overall Class 2 Teacher-Student Belief Similarity

Beliefs about	Degree of Similarity
Theme 1: Teachers and students	High (41/59)
Theme 2: Process of teaching and learning	Medium (46/79)
Theme 3: Content taught and learnt	High (8/10)
Theme 4: Purposes of teaching and learning	High (7/9)
Overall	Medium

Class 3: Comparison of Teachers' and Students' Beliefs

The same comparative processes of comparing the beliefs that were held by the teachers and students in Classes 1 and 2 were applied to the beliefs held by the Class 3 teacher, Joseph, and three of his students, Anne, Trish and Tom. The summarised results are presented in Table 68.

Table 68

Class 3 Teacher-Student Belief Similarity about Themes 1-4

Beliefs about		Degree of Similarity
Theme 1: Teachers and students	Sub-theme 1.1: Knowledge	Medium (29/45)
	Sub-theme 1.2: Innate characteristics	High (42/60)
	Sub-theme 1.3: Learnt abilities	High (50/72)
	Theme 1: Teachers and students	High
Theme 2: The processes of teaching and learning	Sub-theme 2.1: Institution	Medium (6/12)
	Sub-theme 2.2: Knowledge	High (23/33)
	Sub-theme 2.3: Resources	Maximum (12/12)
	Sub-theme 2.4: Context	Medium (26/42)
	Sub-theme 2.5: Activity	High (49/60)
	Sub-theme 2.6: Student development	Medium (38/63)
	Sub-theme 2.7: Effort	Medium (10/15)
	Theme 2: Processes of teaching and learning	High
Theme 3: Content taught and learnt	Sub-theme 3.1: Simple nature of content	High (11/12)
	Sub-theme 3.2: Complex nature of content	Medium (11/18)
	Theme 3: Content taught and learnt	High
Theme 4: The purposes of teaching and learning	Sub-theme 4.1: Short term	Medium (5/12)
	Sub-theme 4.2: Long term	High (13/15)
	Theme 4: Purposes of teaching and learning	Medium

Summary of Class 3 Teacher-Student Comparison of Beliefs

The process of comparing the Class 3 teacher's beliefs with the beliefs of the three interviewed students from his class indicated there was a high degree of similarity between their beliefs overall. In terms of the different themes within the study, a comparison of the teacher's and the students' beliefs showed there was a high degree of similarity in their beliefs about most themes (Themes 1, 2 and 3), whereas the similarity of their beliefs

about the purposes of teaching and learning (Theme 4) only indicated a medium degree of similarity.

The results of the degrees of belief similarity in terms of the beliefs within each of the four themes for the Class 3 teacher and three of his students are outlined in Table 69.

Table 69
Overall Class 3 Teacher-Student Belief Similarity

Beliefs about	Degree of Similarity
Theme 1: Teachers and students	High (121/177)
Theme 2: Process of Teaching and Learning	High (164/237)
Theme 3: Content Taught and Learnt	High (22/30)
Theme 4: Purposes of Teaching and Learning	Medium (18/27)
Overall	High

Class 4: Comparison of Teachers' and Students' Beliefs

The same comparative processes of comparing the beliefs that were held by the teachers and students in Classes 1, 2 and 3 were applied to the beliefs held by the Class 4 teacher, Walter, and two of his students, Kiarn and Kent. The summarised results are presented in Table 70.

Table 70
Class 4 Teacher-Student Belief Similarity about Themes 1-4

Beliefs about		Degree of Similarity
Theme 1: Teachers and students	Sub-theme 1.1: Knowledge	Medium (14/30)
	Sub-theme 1.2: Innate characteristics	Medium (23/40)
	Sub-theme 1.3: Learnt abilities	High (37/48)
	Theme 1: Teachers and students	Medium
Theme 2: The processes of teaching and learning	Sub-theme 2.1: Institution	Medium (3/8)
	Sub-theme 2.2: Knowledge	High (17/22)
	Sub-theme 2.3: Resources	High (7/8)
	Sub-theme 2.4: Context	High (20/28)
	Sub-theme 2.5: Activity	High (31/40)
	Sub-theme 2.6: Student development	Medium (28/42)
	Sub-theme 2.7: Effort	High (7/10)
	Theme 2: Processes of teaching and learning	High
Theme 3: Content taught and learnt	Sub-theme 3.1: Simple nature of content	Low (2/8)
	Sub-theme 3.2: Complex nature of content	High (10/12)
	Theme 3: Content taught and learnt	Medium
Theme 4: The purposes of teaching and learning	Sub-theme 4.1: Short term	Medium (5/8)
	Sub-theme 4.2: Long term	Medium (6/10)
	Theme 4: Purposes of teaching and learning	Medium

Summary of Class 4 Teacher-Student Comparison of Beliefs

The process of comparing the Class 4 teacher's beliefs with the beliefs of the two interviewed students from his class indicated there was a medium degree of similarity between their beliefs overall. In terms of the different themes within the study, a comparison of the teacher's and the students' beliefs showed there was a medium degree of similarity in their beliefs about most themes (Themes 1, 3 and 4), whereas the similarity of

their beliefs about the processes of teaching and learning (Theme 2) indicated a high degree of similarity.

The results of the degrees of belief similarity in terms of the beliefs within each of the four themes for the Class 4 teacher and two of his students are outlined in Table 71.

Table 71
Overall Class 4 Teacher-Student Belief Similarity

Beliefs about	Degree of Similarity
Theme 1: Teachers and students	Medium (74/118)
Theme 2: Process of teaching and learning	High (113/158)
Theme 3: Content taught and learnt	Medium (12/20)
Theme 4: Purposes of teaching and learning	Medium (11/18)
Overall	Medium

Class 5: Comparison of Teachers' and Students' Beliefs

The same comparative processes of comparing the beliefs that were held by the teachers and students in Classes 1, 2, 3 and 4 were applied to the beliefs held by the Class 5 teacher, Dimitri, and three of his students, Marika, Therese and Zoe. The summarised results are presented in Table 72.

Table 72
Class 5 Teacher-Student Belief Similarity about Themes 1-4

Beliefs about		Degree of Similarity
Theme 1: Teachers and students	Sub-theme 1.1: Knowledge	High (32/45)
	Sub-theme 1.2: Innate characteristics	Medium (37/60)
	Sub-theme 1.3: Learnt abilities	Medium(44/72)
	Theme 1: Teachers and students	Medium
Theme 2: The processes of teaching and learning	Sub-theme 2.1: Institution	Medium (6/12)
	Sub-theme 2.2: Knowledge	High (28/33)
	Sub-theme 2.3: Resources	High (10/12)
	Sub-theme 2.4: Context	High (29/42)
	Sub-theme 2.5: Activity	High (49/60)
	Sub-theme 2.6: Student development	High (45/63)
	Sub-theme 2.7: Effort	High (12/15)
	Theme 2: Processes of teaching and learning	High
Theme 3: Content taught and learnt	Sub-theme 3.1: Simple nature of content	High (9/12)
	Sub-theme 3.2: Complex nature of content	Medium (12/18)
	Theme 3: Content taught and learnt	High
Theme 4: The purposes of teaching and learning	Sub-theme 4.1: Short term	Medium (6/12)
	Sub-theme 4.2: Long term	High (11/15)
	Theme 4: Purposes of teaching and learning	Medium

Summary of Class 5 Teacher-Student Comparison of Beliefs

The process of comparing the Class 5 teacher's beliefs with the beliefs of the three interviewed students from his class indicated there was a high degree of similarity between their beliefs overall. In terms of the different themes within the study, a comparison of the teacher's and the students' beliefs showed there was a high degree of similarity in their beliefs about two of the themes (Themes 2 and 3), whereas the similarity of their beliefs

about the other two themes (Themes 1 and 4) indicated a medium degree of similarity.

The results of the degrees of belief similarity in terms of the beliefs within each of the four themes for the Class 5 teacher and two of his students are outlined in Table 73.

Table 73
Overall Class 5 Teacher-Student Belief Similarity

Beliefs about	Degree of Similarity
Theme 1: Teachers and students	Medium (113/177)
Theme 2: Process of teaching and learning	High (179/237)
Theme 3: Content taught and learnt	High (21/30)
Theme 4: Purposes of teaching and learning	Medium (17/27)
Overall	High

Combined Analysis of Classes 1-5: Comparison of Teachers' and Students' Beliefs

The process of comparing the beliefs expressed by the teachers in the study with the beliefs expressed by the students enabled me to determine a measure of similarity for each of the sub-themes in the study for each class. Findings from these comparisons indicated that there was a high or medium degree of similarity between the teachers' and students' beliefs in most sub-themes across the five classes in the study. These results are summarised in Table 74.

Table 74
Classes 1-5 Teacher-Student Belief Similarity within each Sub-Theme

Theme	Sub-Theme	Beliefs about …	Classes with a Maximum DoS	Classes with a High DoS	Classes with a Medium DoS	Classes with a Low DoS	Classes with a Minimum DoS
1	1.1	Teachers' and students' knowledge		2,5	1, 3, 4		
	1.2	Teachers' and students' innate characteristics		1,3	2, 4, 5		
	1.3	Teachers' and students' learnt abilities		1, 2, 3, 4	5		
2	2.1	Institution focused beliefs about teaching and learning	1		2, 4, 5		
	2.2	Knowledge focused beliefs about teaching and learning		3, 4, 5	1, 2		
	2.3	Resources focused beliefs about teaching and learning	3	5	1, 2		
	2.4	Context focused beliefs about teaching and learning		1, 2, 4, 5	3		
	2.5	Activity focused beliefs about teaching and learning		2, 3, 4, 5	1		
	2.6	Student development focused beliefs about teaching and learning		1, 5	2, 3, 4		
	2.7	Effort focused beliefs about learning		1, 4, 5	2, 3		
3	3.1	Content taught and learnt as being simple, limited and unchanging		2, 3, 5	1	4	
	3.2	Content taught and learnt as being complex, linked and changeable		2, 4	1, 3, 5		
4	4.1	Short term purposes of teaching and learning		2	1, 3, 4, 5		
	4.2	Long term purposes of teaching and learning		2, 3, 5	4	1	

In terms of the comparison between the teachers' and students' beliefs according to the thematic structure, the similarity of their beliefs about Theme 2: Processes of teaching and learning were found to be high whereas their beliefs about the other three themes (Theme 1: Teachers and students, Theme 3: Content taught and learnt, and Theme 4: Purposes of Teaching and Learning) indicated a medium level of similarity. Their beliefs about the purposes of teaching and learning (Theme 4) were the least similar.

These findings were determined by analysing the specific degrees of similarity for each theme in each of the five classes. These findings are summarised in Table 75.

Table 75
Belief Similarity Categorised by Themes in All Five Classes

Classes	Theme 1: Teachers and Students	Theme 2: Processes of Teaching and Learning	Theme 3: Content Taught and Learnt	Theme 4: Purposes of Teaching and Learning	All Themes
Class 1	Medium	High	Medium	Medium	Medium
Class 2	High	Medium	High	High	Medium
Class 3	High	High	High	Medium	High
Class 4	Medium	High	Medium	Medium	Medium
Class 5	Medium	High	High	Medium	High
All classes	Medium	High	Medium	Medium	High

Second Analysis Framework: Thematic Comparisons

Within the second analysis framework, the beliefs held by the teachers and the students in the study were compared on a thematic basis. That is, the components of the thematic structure that emerged from coding the participants' beliefs in Chapter 4 were used to group each teacher-student belief comparison. As such, a degree of teacher-student belief similarity was determined for each sub-theme category, sub-theme and theme within the thematic structure.

The same process used to compare the beliefs held by the teacher and students within Sub-theme 1.1 just for Class 1 was used to compare the beliefs held by all the teachers and all the students in the study. The procedures used within this analysis process have been outlined within the first analysis framework above.

Analysis of Sub-Themes and Themes: Comparison of Teachers' and Students' Beliefs

Using the analysis method outlined above, measures of teacher-student belief similarity were determined for each of the sub-themes and themes in the study. These results are presented in Table 76.

Table 76

Similarity Between Teachers' and Students' Beliefs about All Sub-Themes and Themes

Beliefs about		Degree of Similarity
Theme 1: Teachers and Students	Sub-theme 1.1: Knowledge	Medium (106/165)
	Sub-theme 1.2: Innate characteristics	Medium (146/220)
	Sub-theme 1.3: Learnt abilities	Medium (175/264)
	Theme 1: Teachers and students	Medium
Theme 2: The processes of teaching and learning	Sub-theme 2.1: Institution	Medium (25/44)
	Sub-theme 2.2: Knowledge	High (85/121)
	Sub-theme 2.3: Resources	High (35/44)
	Sub-theme 2.4: Context	High (104/154)
	Sub-theme 2.5: Activity	High (169/220)
	Sub-theme 2.6: Student development	Medium (151/231)
	Sub-theme 2.7: Effort	High (39/55)
	Theme 2: Processes of teaching and learning	High
Theme 3: Content taught and learnt	Sub-theme 3.1: Simple nature of content	Medium (28/44)
	Sub-theme 3.2: Complex nature of content	High (46/66)
	Theme 3: Content taught and learnt	Medium
Theme 4: The purposes of teaching and learning	Sub-theme 4.1: Short term	Degree of Similarity
	Sub-theme 4.2: Long term	Medium (24/44)
	Theme 4: Purposes of teaching and learning	Medium

Combined Analysis of Themes 1-4: Comparison of Teachers' and Students' Beliefs

The process of comparing the beliefs expressed by all of the teachers in the study with the beliefs expressed by all of the students enabled me to determine a degree of similarity for each of the sub-themes in the study.

Considered collectively, these degrees of similarity for each of the sub-themes provided an overall degree of similarity for each theme. Findings from these comparisons indicated that there was a high or medium degree of similarity between the teachers' and students' beliefs within each of the four themes, as indicated in Table 77.

Table 77
Similarity Between Teachers' and Students' Beliefs about Themes 1-4: Participants' Educational Beliefs

Beliefs about	Degree of Similarity
Theme 1: Teachers and students	Medium (427/649)
Theme 2: Processes of teaching and learning	High (609/869)
Theme 3: Content taught and learnt	Medium (74/110)
Theme 4: Purposes of teaching and learning	Medium (61/99)
Educational beliefs overall	High

There were particularly high degrees of similarity between the teachers' and students' beliefs about teachers and students (Theme 1), especially in terms of their beliefs about teachers' and students' learnt abilities. The teachers' and students' beliefs about the processes of teaching and learning (Theme 2) also indicated mainly high degrees of similarity, especially in terms of their context focused and the activity focused beliefs.

Although not as similar as the beliefs coded into Themes 1 and 2, the beliefs expressed by the teachers and the students in the study about content (Theme 3) and the purposes of teaching and learning (Theme 4) were determined to be similar to a high or medium degree. Their beliefs about the simple nature of content were more similar than their beliefs about the complex nature of content. Furthermore, their beliefs about the long term purposes of teaching and learning were more similar than their beliefs about the short term purposes of teaching and learning.

These varying degrees of belief similarity indicated that there was more similarity than difference between the teachers' and the students' beliefs across all of the four themes in the study.

Third Analysis Framework: Teaching-Learning Comparisons

The teachers' and the students' beliefs about teachers and teaching were compared. Likewise, their beliefs about students and learning were also compared. Although the original intention of this study was not to include a comparison of these two areas, the similarity that became evident as the study progressed between the teachers' and students' beliefs about teachers and teaching, and students and learning, led me to generate the hypothesis that this analysis may be enlightening, especially since these two areas have traditionally been investigated separately in previous research. To investigate, I conducted the following analysis.

During the preliminary stages of coding the participants' beliefs, I observed that their beliefs about teaching and teachers were very similar to their beliefs about learning and students. In fact, as the coding process advanced, the similarities between their beliefs about these two areas appeared even more pronounced.

Beliefs about Teachers and Teaching

The degree of similarity between the teachers' and the students' beliefs about teachers and teaching was determined for each sub-theme and theme of the study. Table 78 illustrates the degrees of similarity that were determined by comparing the teachers' and the students' beliefs about teachers and teaching within Themes 1, 2, 3 and 4.

Table 78

Teacher-Student Belief Similarity of All Teachers and All Students about Teachers and Teaching in Themes 1-4

Beliefs about		Degree of Similarity
Theme 1: Teachers	Sub-theme 1.1: Teachers' knowledge	Medium (63/99)
	Sub-theme 1.2: Teachers' innate characteristics	Medium (77/121)
	Sub-theme 1.3: Teachers' learnt abilities	Medium (98/165)
	Theme 1: Teachers	Medium
Theme 2: The process of teaching	Sub-theme 2.1: Institution	Medium (18/33)
	Sub-theme 2.2: Knowledge	High (40/55)
	Sub-theme 2.3: Resources	High (16/22)
	Sub-theme 2.4: Context	High (56/77)
	Sub-theme 2.5: Activity	High (81/110)
	Sub-theme 2.6: Student development	Medium (68/121)
	Sub-theme 2.7: Effort	-
	Theme 2: Process of teaching	Medium
Theme 3: Content taught	Sub-theme 3.1: Simple nature of content	High (17/22)
	Sub-theme 3.2: Complex nature of content	High (23/33)
	Theme 3: Content taught	High
Theme 4: The purpose of teaching	Sub-theme 4.1: Short term	Medium (8/22)
	Sub-theme 4.2: Long term	High (15/22)
	Theme 4: Purpose of teaching	Medium

Beliefs about Students and Learning

The degree of similarity between the teachers' and the students' beliefs about students and learning was determined for each sub-theme and theme of the study. Table 79 illustrates the degrees of similarity that were determined by comparing the teachers' and students' beliefs about students and learning within Themes 1, 2, 3 and 4.

Table 79

Teacher-Student Belief Similarity of All Teachers and All Students about
Students' and Learning in Themes 1-4

Beliefs about		Degree of Similarity
Theme 1: Students	Sub-theme 1.1: Students' knowledge	Medium (43/66)
	Sub-theme 1.2: Students' innate characteristics	High (69/99)
	Sub-theme 1.3: Students' learnt abilities	High (77/99)
	Theme 1: Students	High
Theme 2: The process of learning	Sub-theme 2.1: Institution	Medium (7/11)
	Sub-theme 2.2: Knowledge	High (45/66)
	Sub-theme 2.3: Resources	High (19/22)
	Sub-theme 2.4: Context	Medium (48/77)
	Sub-theme 2.5: Activity	High (88/110)
	Sub-theme 2.6: Student development	High (83/110)
	Sub-theme 2.7: Effort	High (39/55)
	Theme 2: Process of learning	High
Theme 3: Content learnt	Sub-theme 3.1: Simple nature of content	Medium (11/22)
	Sub-theme 3.2: Complex nature of content	High (23/33)
	Theme 3: Content learnt	Medium
Theme 4: The purpose of learning	Sub-theme 4.1: Short term	High (16/22)
	Sub-theme 4.2: Long term	Medium (22/33)
	Theme 4: Purpose of learning	High

Combined Analysis of Teachers/Teaching and Students/Learning: Comparison of Teachers' and Students' Beliefs

In summary, degrees of similarity between the teachers' and students' beliefs about teachers and teaching, and students and learning, were determined for each of the sub-themes within each theme. Combined, these results provided degrees of similarity about each theme. In all of the

four themes, except Theme 3: Beliefs about content taught and learnt, the teachers' and the students' beliefs were more similar about students and learning, when compared to their beliefs about teachers and teaching. Overall, there was a "medium" degree of similarity indicated by comparing the teachers' and students' beliefs about teaching and teachers and a "high" degree of similarity indicated by comparing the teachers' and students' beliefs about students and learning.

Table 80 provides a summary of the degrees of similarity that were determined for each theme when the teachers' and students' beliefs about teachers and teaching, and students and learning, were compared.

Table 80
Similarity Between Teachers' and Students' Beliefs about Teachers/Teaching and Students/Learning

Theme	Beliefs about	Degree of Similarity	Beliefs about	Degree of Similarity
Theme 1	Teachers	Medium	Students	High
Theme 2	Process of Teaching	Medium	Process of Learning	High
Theme 3	Content Taught	High	Content Learnt	Medium
Theme 4	Purpose of Teaching	Medium	Purpose of Learning	High
Themes 1-4	Teachers and teaching	Medium	Students and learning	High

Overall, these analyses have provided evidence that the beliefs held by the teachers and students in this study were very similar. The findings of the few investigations that have compared teachers' and students' beliefs thus far in the belief literature have explored instances of when teachers' and students' beliefs are mismatched. Conversely, the belief literature to date has not investigated instances of teacher-student belief congruency. However, the findings presented in this chapter have presented a number of examples of congruence between teachers' and students' educational beliefs. These findings will be further considered in Chapter 8: Discussion.

Conclusion to this Chapter

The process of comparing the beliefs of the teachers and the students in the study produced a set of findings that indicated degrees of similarity between their beliefs which were analysed within three different frameworks. These comparisons were conducted by analysing the interview transcripts for instances of teacher-student belief similarity and these observations were systematically validated by using the Degree of Similarity Scale. This scale was constructed purposely for this study as a guide to interpret and report on the degree of teacher-student belief similarity. Degrees of teacher-student belief similarity were classified as being maximum, high, medium, low or minimum, depending on the frequency of instances where both the teacher and the student, or the teachers and students, expressed similar beliefs. Using this tool of comparison to supplement my observations of teacher-student belief similarity, the beliefs of the teachers and the students in the study were compared:

- on a class-by-class basis;

- within the thematic structure that emerged from coding the participants' beliefs that was outlined in Chapter 4; and

- according to their beliefs about teachers and teaching, and students and learning.

When the teachers' and students' beliefs were interpreted and compared within the class-by-class framework, the findings indicated that their beliefs were very similar in each of the five classes. This process of comparison showed that there was a "high" degree of similarity between the beliefs of the teachers and students in three out of the five classes, and a "medium" degree of similarity in the remaining two classes.

Likewise, when the teachers' and students' beliefs were interpreted and compared on a thematic basis, the findings indicated that their beliefs were very similar. This process of comparison showed that there was a "high" degree of similarity between the beliefs of the teachers and students

about the processes of teaching and learning (Theme 2) and a "medium" degree of similarity about teachers and students (Theme 1), course content taught and learnt (Theme 3) and the purposes of teaching and learning (Theme 4).

Lastly, when the teachers' and students' beliefs about teachers and teaching, and students and learning were compared, their beliefs were very similar. When the teachers' and students' beliefs about teachers and teaching were compared, their beliefs were found to be similar, signified by a "medium" degree of similarity. Their beliefs about students and learning were found to be even more similar than their beliefs about teachers and teaching, as evidenced by a "high" degree of similarity.

In terms of the beliefs held by all of the participants in all of the classes across all of the four major themes about topics incorporating teachers, teaching, students and learning, there was a "high" degree of similarity between the teachers' and the students' beliefs overall.

Link to the Next Chapter

This chapter examined the data provided by the participants in the study during their interviews throughout the semester. Their belief comments offered during these interviews were coded and compared within three analytical frameworks in order to determine degrees of similarity between the teachers' and the students' beliefs.

The findings presented in this chapter have contributed specifically to answering the second research question: How similar are the educational beliefs of university teachers and university students?

In order to provide another perspective on the similarity between the teachers' and students' beliefs in the study, the data represented by the participants' responses to the items on the EBI were also analysed and compared in order to discover how similar the teachers' responses were to the students' responses to the same set of 44 belief statements on the instrument. The findings from these statistical analyses are presented in the following chapter.

CHAPTER 7

SIMILARITY BETWEEN TEACHERS' AND STUDENTS' BELIEFS: FINDINGS FROM AN ANALYSIS OF THE QUANTITATIVE DATA

Introduction

The main purpose of this chapter is to present the findings from analyses of the quantitative data gathered throughout the study to assist in answering the same research question addressed in Chapter 6: How similar are the educational beliefs of university teachers and university students? To answer this question, the teachers' and the students' responses to the educational belief statements on the EBI were compared to determine the extent of the similarity or difference that existed between their beliefs.

Due to the low number of teachers compared to the number of students in the study, non parametric Mann-Whitney U tests were used to test for significant differences. Comparisons of the means of the teachers' and the students' responses on the Likert scale items were used as indicators of similarity. Where appropriate, the frequencies of the participants' responses to each of the Likert style options on the EBI are also presented.

To facilitate triangulation, the outcomes from the analyses of the qualitative data and the quantitative data were analysed within the same three frameworks that were outlined in the previous chapter. The participants' responses to the EBI items were firstly compared and interpreted on a class-by-class basis. From these class-by-class analyses, an overall understanding was gained of the similarity of the beliefs of the teachers and the students across the whole study, as well as within each of the five classes. Secondly, the teachers' beliefs about each theme were compared with the students' beliefs about the same themes. Lastly, both

teachers' and students' beliefs about teachers and teaching were compared, as were their beliefs about students and learning.

Because the actual EBI items have been explained and referred to in full detail elsewhere in this thesis (Chapter 3: Methodology, and Appendix Two), only the item numbers are cited in this chapter. The participants' responses to these items have been aggregated in numeric form to represent a summarised representation of belief agreement or disagreement levels. However, where the teachers' and students' beliefs differ markedly, these EBI items are listed in full detail.

First Analysis Framework: Class-by-Class Comparisons

Within this first analysis framework, the EBI responses of all of the teachers in the study were compared with the responses of all of the students in the study, firstly as a whole group and then on a class-by-class basis.

All Classes: Comparison of Teachers' and Students' Beliefs

To ascertain if there were any differences between the teachers' and the students' responses to the EBI items, the mean scores represented by all of the teachers' and all of the students' responses to these items were compared and tested for significant difference.

Table 81 shows the mean of the teachers' and students' responses to each EBI item and an interpretation of these means as indicating either strongly disagree, disagree, neither agree nor disagree, agree and strongly agree responses. If both teachers' and students beliefs' were similar (that is, where they both strongly agree or agree OR both strongly disagree or disagree OR both express neutrality), a tick in the final column is used. Otherwise a cross is used to indicate where their beliefs were different.

Table 81

Interpretation and Comparison of All Teachers' and All Students' Mean Responses to All EBI Items

Item No.	Teachers' Responses		Students' Responses		Similarity
	Mean	Interpretation	Mean	Interpretation	
1	3.00	Neutral	3.53	Agree	✗
2	4.80	Strongly agree	4.41	Agree	✓
3	4.80	Strongly agree	4.43	Agree	✓
4	3.80	Agree	3.37	Neutral	✗
5	4.40	Agree	4.47	Agree	✓
6	4.80	Strongly agree	4.36	Agree	✓
7	4.60	Strongly agree	4.47	Agree	✓
8	4.00	Agree	4.23	Agree	✓
9	4.00	Agree	3.96	Agree	✓
10	4.40	Agree	4.15	Agree	✓
11	4.20	Agree	4.11	Agree	✓
12	4.20	Agree	3.96	Agree	✓
13	4.20	Agree	4.15	Agree	✓
14	4.40	Agree	4.05	Agree	✓
15	3.80	Agree	3.35	Neutral	✗
16	4.40	Agree	4.36	Agree	✓
17	1.60	Disagree	2.25	Disagree	✓
18	4.40	Agree	4.15	Agree	✓
19	3.20	Neutral	3.65	Agree	✗
20	3.60	Agree	4.05	Agree	✓
21	2.80	Neutral	3.14	Neutral	✓
22	1.60	Disagree	2.60	Neutral	✗
23	4.40	Agree	4.12	Agree	✓
24	5.00	Strongly agree	4.44	Agree	✓
25	4.40	Agree	4.07	Agree	✓
26	4.40	Agree	4.11	Agree	✓
27	5.00	Strongly agree	4.44	Agree	✓
28	4.80	Strongly agree	4.36	Agree	✓
29	4.60	Strongly agree	4.44	Agree	✓

Table 81

Interpretation and Comparison of All Teachers' and All Students' Mean Responses to All EBI Items

Item No.	Teachers' Responses		Students' Responses		Similarity
	Mean	Interpretation	Mean	Interpretation	
30	4.60	Strongly agree	4.36	Agree	✓
31	4.20	Agree	4.07	Agree	✓
32	3.80	Agree	3.81	Agree	✓
33	4.60	Strongly agree	4.28	Agree	✓
34	1.40	Strongly disagree	1.84	Disagree	✓
35	4.20	Agree	3.97	Agree	✓
36	4.00	Agree	3.89	Agree	✓
37	2.80	Neutral	2.52	Neutral	✓
38	2.60	Neutral	2.75	Neutral	✓
39	4.00	Agree	3.65	Agree	✓
40	4.60	Strongly agree	4.01	Agree	✓
41	4.40	Agree	3.79	Agree	✓
42	4.40	Agree	3.81	Agree	✓
43	4.60	Strongly agree	4.12	Agree	✓
44	4.60	Strongly agree	3.97	Agree	✓

From the above table, it can be seen that all the teachers and all the students held similar beliefs for 39 out of the 44 items. This result indicates a high level of similarity between the teachers' and students' beliefs about these 44 items. For the five items where their beliefs were not similar (Items 1, 4, 15, 19 and 22), their responses to these items only differed by one division on the Likert scale.

However, four items (Items 22, 24, 27, 40) were significantly different statistically, using Mann-Whitney U tests (see Appendix Six). For these four items, teacher and student responses were at the same position of agreement or disagreement.

Table 82

EBI Items with Significant Differences between Teachers' and Students' Responses

Item	U	Z	p
Item 22: I believe truth is unchanging.	85.0	-2.091	.036
Item 24: I believe university teachers should be concerned about student learning.	87.5	-2.268	.023
Item 27: I believe that an effective university teacher reflects on how they teach.	95.0	-2.081	.037
Item 40: I believe that effective university students seek links between different activities, ideas and subjects.	98.0	-2.084	.037

These results from analyses of the quantitative data support the results from analyses of the qualitative data which indicated a high degree of agreement between the teachers' and students' beliefs overall.

Each of the four items for which the teachers' EBI responses were significantly different from the students' EBI responses, is now considered in conjunction with the results of the qualitative data analyses that were presented in the previous chapter.

Item 22: I believe that truth is unchanging

The result of the Mann-Whitney U test showed there was a significant difference between the teachers' and students' beliefs about Item 22 (Mann-Whitney U (4, 74) = 85, Z = -2.091, p = .036). The teachers' and students' means were 1.60 and 2.60 respectively. This showed that the teachers' responses were significantly stronger in disagreement compared to the students' responses. This result was also supported by an examination of the frequencies of the students' responses to this item which indicated that 29% of their responses indicated neutrality, whereas the majority of their responses (53%) indicated disagreement. Similarly, most of the teachers' responses (80%) indicated disagreement with this item. The difference indicated by these results signifies a range of views from neutrality through to disagreement, rather than being indicative of strongly opposing views.

Item 24: I believe university teachers should be concerned about student learning

The result of the Mann-Whitney U test showed there was a significant difference between the teachers' and students' beliefs about Item 24 (Mann-Whitney U (4, 74) = 87.5, Z = -2.268, p = .023). The teachers' and students' means were 5.00 and 4.44 respectively. This showed that the teachers' responses were significantly stronger in agreement compared to the students' responses. This result was also supported by an examination of the frequencies of the students' and teachers' responses to this item. Whereas all of the teachers strongly agreed with this item, the students' responses indicated strong agreement (47%) or weak agreement (51%) with the item. The difference indicated by these results signifies a variation in degrees of agreement, rather than being indicative of opposing views.

Item 27: I believe that an effective university teacher reflects on how they teach

The result of the Mann-Whitney U test showed there was a significant difference between the teachers' and students' beliefs about Item 27 (Mann-Whitney U (4, 74) = 95, Z = -2.081, p = .037). The teachers' and students' means were 5.00 and 4.44 respectively. This showed that the teachers' responses were significantly stronger in agreement compared to the students' responses. This result was also supported by an examination of the frequencies of the students' and teachers' responses to this item. Whereas all of the teachers strongly agreed with this item, 51% of the students' responses indicated strong agreement and 43% of their responses just indicated agreement. The difference indicated by these results signifies a variation in degrees of agreement, rather than being indicative of opposing views.

Item 40: I believe that effective university students seek links between different activities, ideas and subjects

The result of the Mann-Whitney U test showed there was a significant difference between the teachers' and students' beliefs about Item

40 (Mann-Whitney U (4, 74) = 98, Z = -2.084, p = .037). The teachers' and students' means were 4.60 and 4.01 respectively. This showed that the teachers' responses were significantly stronger in agreement compared to the students' responses. This result was supported by an examination of the frequencies of the students' and teachers' responses to this item. Most of the teachers (60%) strongly agreed with this item whereas the other teachers (40%) expressed agreement. Conversely, few (19%) of the students strongly agreed with the item, and most (65%) of their responses indicated weak agreement with the item. The difference indicated by these results signifies a variation in degrees of agreement, rather than being indicative of opposing views.

Class-by-Class: Comparison of Teachers' and Students' Beliefs

Each of the teacher's responses to the EBI items was compared to the responses to the EBI items provided by the students in each of their classes. In every case, the results of Mann-Whitney U tests indicated that there were no significant differences between the teacher's and the students' responses in Classes 1, 2, 3, 4 and 5 (see Appendices Seven to Eleven). These results from analyses of the quantitative data support the results from analyses of the qualitative data which indicated a high degree (Classes 3 and 5) or a medium (Classes 1, 2 and 4) degree of agreement between the teacher's and students' beliefs in each class.

Second Analysis Framework: Thematic Comparisons

Each EBI item was aligned with each of the four major themes in the study (as outlined in Chapter 4). This coding allowed me to ascertain if there were any significant differences between the teachers' and the students' responses to the EBI items in each of these themes.

Mann-Whitney U tests were conducted to determine if there were differences between the teachers' and the students' beliefs about these items. The differences between their mean scores for these items were also analysed. Lastly, results of these quantitative data analyses were

triangulated with the results of the qualitative data analyses that were presented in the previous chapter.

Theme 1: Comparison of Teachers' and Students' Beliefs

The EBI items that were related to beliefs about teachers and students (Theme 1 belief topics) included 31 belief statements: Items 1, 2, 4, 5, 11, 14, 15, 16, 18, 19, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43 and 44. The mean scores represented by the teachers' and the students' responses to these items were compared and tested for significant difference.

Table 83 shows the mean of the teachers' and students' responses and an interpretation of these means as indicating either strongly disagree, disagree, neither agree nor disagree, agree and strongly agree responses. If both teachers' and students' beliefs are similar (that is, where they both strongly agree or agree OR both strongly disagree or disagree OR both express neutrality), a tick in the final column is used. Otherwise a cross is used to indicate where their beliefs are different.

Table 83
Interpretation and Comparison of Teachers' and Students' Mean
Responses to EBI Items Related to Theme 1

Item No.	Teachers' Responses		Students' Responses		Similarity
	Mean	Interpretation	Mean	Interpretation	
1	3.00	Neutral	3.53	Agree	✖
2	4.80	Strongly agree	4.41	Agree	✓
4	3.80	Agree	3.37	Neutral	✖
5	4.40	Agree	4.47	Agree	✓
11	4.20	Agree	4.11	Agree	✓
14	4.40	Agree	4.05	Agree	✓
15	3.80	Agree	3.35	Neutral	✖
16	4.40	Agree	4.36	Agree	✓
18	4.40	Agree	4.15	Agree	✓
19	3.20	Neutral	3.65	Agree	✖
24	5.00	Strongly agree	4.44	Agree	✓
25	4.40	Agree	4.07	Agree	✓
26	4.40	Agree	4.11	Agree	✓
27	5.00	Strongly agree	4.44	Agree	✓
28	4.80	Strongly agree	4.36	Agree	✓
29	4.60	Strongly agree	4.44	Agree	✓
30	4.60	Strongly agree	4.36	Agree	✓
31	4.20	Agree	4.07	Agree	✓
32	3.80	Agree	3.81	Agree	✓
33	4.60	Strongly agree	4.28	Agree	✓
24	1.40	Strongly disagree	1.84	Disagree	✓
25	4.20	Agree	3.97	Agree	✓
36	4.00	Agree	3.89	Agree	✓
37	2.80	Neutral	2.52	Neutral	✓
38	2.60	Neutral	2.75	Neutral	✓
39	4.00	Agree	3.65	Agree	✓
40	4.60	Strongly agree	4.01	Agree	✓
41	4.40	Agree	3.79	Agree	✓
42	4.40	Agree	3.81	Agree	✓
43	4.60	Strongly agree	4.12	Agree	✓
44	4.60	Strongly agree	3.97	Agree	✓

From the above table, it can be seen that the teachers and students held similar beliefs for 27 out of the 31 items that were related to Theme 1. This result indicates a high level of similarity between the teachers' and students' beliefs about these items. For the four items where their beliefs were not similar (Items 1, 4, 15 and 19), their responses only differed by one division on the Likert scale.

However, three items (Items 24, 27, 40) were significantly different statistically, using Mann-Whitney U tests (see Appendix Six). For these three items, teacher and student responses were at the same position of agreement or disagreement.

These results from analyses of the quantitative data support the results from analyses of the qualitative data which indicated a medium degree of agreement between the teachers' and students' beliefs in Theme 1.

Theme 2: Comparison of Teachers' and Students' Beliefs

The EBI items that were related to the beliefs about the processes of teaching and learning (Theme 2 belief topics) included 34 belief statements: Items 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 23, 24, 25, 26, 28, 30, 31, 32, 33, 35, 36, 39, 41, 43 and 44. The mean scores represented by the teachers' and the students' responses to these items were compared and tested for significant difference.

Table 84 shows the mean of the teachers' and students' responses and an interpretation of these means as indicating either strongly disagree, disagree, neither agree nor disagree, agree and strongly agree responses. If both teachers' and students' beliefs are similar (that is, where they both strongly agree or agree OR both strongly disagree or disagree OR both express neutrality), a tick in the final column is used. Otherwise a cross is used to indicate where their beliefs are different.

Table 84
Interpretation and Comparison of Teachers' and Students' Mean Responses to EBI Items Related to Theme 2

Item No.	Teachers' Responses		Students' Responses		Similarity
	Mean	Interpretation	Mean	Interpretation	
3	4.80	Strongly agree	4.43	Agree	✓
4	3.80	Agree	3.37	Neutral	✗
5	4.40	Agree	4.47	Agree	✓
6	4.80	Strongly agree	4.36	Agree	✓
7	4.60	Strongly agree	4.47	Agree	✓
8	4.00	Agree	4.23	Agree	✓
9	4.00	Agree	3.96	Agree	✓
10	4.40	Agree	4.15	Agree	✓
11	4.20	Agree	4.11	Agree	✓
12	4.20	Agree	3.96	Agree	✓
13	4.20	Agree	4.15	Agree	✓
14	4.40	Agree	4.05	Agree	✓
15	3.80	Agree	3.35	Neutral	✗
16	4.40	Agree	4.36	Agree	✓
17	1.60	Disagree	2.25	Disagree	✓
18	4.40	Agree	4.15	Agree	✓
19	3.20	Neutral	3.65	Agree	✗
20	3.60	Agree	4.05	Agree	✓
21	2.80	Neutral	3.14	Neutral	✓
23	4.40	Agree	4.12	Agree	✓
24	5.00	Strongly agree	4.44	Agree	✓
25	4.40	Agree	4.07	Agree	✓
26	4.40	Agree	4.11	Agree	✓
28	4.80	Strongly agree	4.36	Agree	✓
30	4.60	Strongly agree	4.36	Agree	✓
31	4.20	Agree	4.07	Agree	✓
32	3.80	Agree	3.81	Agree	✓
33	4.60	Strongly agree	4.28	Agree	✓
35	4.20	Agree	3.97	Agree	✓
36	4.00	Agree	3.89	Agree	✓
39	4.00	Agree	3.65	Agree	✓
41	4.40	Agree	3.79	Agree	✓
43	4.60	Strongly agree	4.12	Agree	✓
44	4.60	Strongly agree	3.97	Agree	✓

From the above table, it can be seen that the teachers and students held similar beliefs for 31 out of the 34 items that were related to Theme 2. This result indicates a high level of similarity between the teachers' and students' beliefs about these items. For the three items where their beliefs are not similar (Items 4, 15 and 19), their responses to these items only differed by one division on the Likert scale.

However, one item (Items 24) was significantly different statistically, using Mann-Whitney U tests (see Appendix Six). For this item, teacher and student responses were at the same position of agreement or disagreement.

These results from analyses of the quantitative data support the results from analyses of the qualitative data which indicated a high degree of agreement between the teachers' and students' beliefs in Theme 2.

Theme 3: Comparison of Teachers' and Students' Beliefs

The EBI items that were related to the beliefs about the content taught and learning in university courses (Theme 3 belief topics) included 10 belief statements: Items 1, 5, 6, 16, 17, 22, 26, 34, 39 and 40. The mean scores represented by the teachers' and the students' responses to these items were compared and tested for significant difference.

Table 85 shows the mean of the teachers' and students' responses and an interpretation of these means as indicating either strongly disagree, disagree, neither agree nor disagree, agree and strongly agree responses. If both teachers and students beliefs are similar (that is, where they both strongly agree or agree OR both strongly disagree or disagree OR both express neutrality), a tick in the final column is used. Otherwise a cross is used to indicate where their beliefs are different.

Table 85
Interpretation and Comparison of Teachers' and Students' Mean Responses to EBI Items Related to Theme 3

Item No.	Teachers' Responses		Students' Responses		Similarity
	Mean	Interpretation	Mean	Interpretation	
1	3.00	Neutral	3.53	Agree	✘
5	4.40	Agree	4.47	Agree	✓
6	4.80	Strongly agree	4.36	Agree	✓
16	4.40	Agree	4.36	Agree	✓
17	1.60	Disagree	2.25	Disagree	✓
22	1.60	Disagree	2.60	Neutral	✘
26	4.40	Agree	4.11	Agree	✓
34	1.40	Strongly disagree	1.84	Disagree	✓
39	4.00	Agree	3.65	Agree	✓
40	4.60	Strongly agree	4.01	Agree	✓

From the above table, it can be seen that the teachers and students held similar beliefs for eight out of the ten items that were related to Theme 3. This result indicates a high level of similarity between the teachers' and students' beliefs about these items. For the two items where their beliefs were not similar (Items 1 and 22), their responses to these items only differed by one division on the Likert scale.

However, two items (Items 22 and 40) were significantly different statistically, using Mann-Whitney U tests (see Appendix Six). For these two items, teacher and student responses were at the same position of agreement or disagreement.

These results from analyses of the quantitative data support the results from analyses of the qualitative data which indicated a medium degree of agreement between the teachers' and students' beliefs in Theme 3.

Theme 4: Comparison of Teachers' and Students' Beliefs

The EBI items that were related to the beliefs about the purposes of teaching and learning (Theme 4 belief topics) included four belief statements: Items 4, 8, 13 and 42. The mean scores represented by the teachers' and the students' responses to these items were compared and tested for significant difference.

Table 86 shows the mean of the teachers' and students' responses and an interpretation of these means as indicating either strongly disagree, disagree, neither agree nor disagree, agree and strongly agree responses. If both teachers and students beliefs are similar (that is, where they both strongly agree or agree OR both strongly disagree or disagree OR both express neutrality), a tick in the final column is used. Otherwise a cross is used to indicate where their beliefs are different.

Table 86
Interpretation and Comparison of Teachers' and Students' Mean Responses to EBI Items Related to Theme 4

Item No.	Teachers' Responses		Students' Responses		Similarity
	Mean	Interpretation	Mean	Interpretation	
4	3.80	Agree	3.37	Agree	✓
8	4.00	Agree	4.23	Agree	✓
13	4.20	Agree	4.15	Agree	✓
42	4.40	Agree	3.81	Agree	✓

From the above table, it can be seen that the teachers and students held similar beliefs for all of the four items that were related to Theme 4. This result indicates a high level of similarity between the teachers' and students' beliefs about these items.

However, one item (Item 42) was significantly different statistically, using Mann-Whitney U tests (see Appendix Six). For this item, teacher and student responses were at the same position of agreement or disagreement.

These results from analyses of the quantitative data support the results from analyses of the qualitative data which indicated a medium degree of agreement between the teachers' and students' beliefs in Theme 4.

Third Analysis Framework: Teaching-Learning Comparisons

The teachers' and students' beliefs about teachers and teaching, and students and learning, were compared. These comparisons supported the belief comparisons of these two areas (teachers/ teaching and students/ learning) that were conducted in Chapter 6 using the qualitative data.

Each of the EBI items was coded as being related to the two broad areas of either teachers and teaching, or students and learning. This coding allowed me to ascertain if there were any significant differences between the teachers' and the students' responses to the EBI items related to each of these two areas.

To ascertain if there were any differences between the teachers' and the students' responses to the EBI items related to these two areas, the mean scores represented by all of the teachers' and all of the students' responses to these items were compared and tested for significant difference. Lastly, results of these quantitative data analyses were triangulated with the results of the qualitative data analyses that were presented in the previous chapter.

Teachers/Teaching: Comparison of Teachers' and Students' Beliefs

Of the 44 belief statements included in the EBI, 13 of these were coded as being related to teachers and teaching: Items 1, 2, 3, 4, 5, 24, 25, 26, 27, 28, 29, 30 and 31.

Table 87 shows the mean of the teachers' and students' responses, to the EBI items that were related to teachers and teaching, and an interpretation of these means as indicating either strongly disagree, disagree, neither agree nor disagree, agree and strongly agree responses. If both teachers' and students' beliefs are similar (that is, where they both strongly agree or agree OR both strongly disagree or disagree OR both

express neutrality), a tick in the final column is used. Otherwise a cross is used to indicate where their beliefs are different.

Table 87

Interpretation and Comparison of All Teachers' and All Students' Mean Responses to EBI Items Related to Teachers and Teaching

Item No.	Teachers' Responses		Students' Responses		Similarity
	Mean	Interpretation	Mean	Interpretation	
1	3.00	Neutral	3.53	Agree	✗
2	4.80	Strongly agree	4.41	Agree	✓
3	4.80	Strongly agree	4.43	Agree	✓
4	3.80	Agree	3.37	Neutral	✗
5	4.40	Agree	4.47	Agree	✓
24	5.00	Strongly agree	4.44	Agree	✓
25	4.40	Agree	4.07	Agree	✓
26	4.40	Agree	4.11	Agree	✓
27	5.00	Strongly agree	4.44	Agree	✓
28	4.80	Strongly agree	4.36	Agree	✓
29	4.60	Strongly agree	4.44	Agree	✓
30	4.60	Strongly agree	4.36	Agree	✓
31	4.20	Agree	4.07	Agree	✓

From the above table, it can be seen that the teachers and students held similar beliefs for 11 out of the 13 items that were related to teachers and teaching. This result indicates a high level of similarity between the teachers' and students' beliefs about these items. For the two items where their beliefs were not similar, their responses to these items only differed by one division on the Likert scale (for example, neutral and agree). This difference was not sufficient to be significant at the .05 level, unlike Items 24 and 27 which were significantly different in terms of the teachers' and students' responses.

The items that were coded as being related to teachers and teaching were tested for significant difference using Mann-Whitney U tests. Results

of these tests indicated a significant difference between the teachers' and the students' responses to only two of these 13 items (Items 24 and 27), thus indicating a high level of similarity overall between the teachers' and students' beliefs about the items on the EBI that were related to teachers and teaching. Statistical details of the differences between the teachers' and students' responses to these items were provided earlier in the first analysis framework (see Table 82). Even though the scores for these two items appeared to be statistically significantly different, they were only different in terms of the strength of agreement they represented.

These results from analyses of the quantitative data support the results from analyses of the qualitative data which indicated a medium degree of agreement between the teachers' and students' beliefs about teachers and teaching.

Students/Learning: Comparison of Teachers' and Students' Beliefs

Of the 44 belief statements included in the EBI, 29 of these were coded as being related to students and learning: Items 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 23, 32, 33, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44.

Table 88 shows the mean of the teachers' and students' responses, to the EBI items that were related to students and learning, and an interpretation of these means as indicating either strongly disagree, disagree, neither agree nor disagree, agree and strongly agree responses. If both teachers' and students' beliefs are similar (that is, where they both strongly agree or agree OR both strongly disagree or disagree OR both express neutrality), a tick in the final column is used. Otherwise a cross is used to indicate where their beliefs are different.

Table 88

Interpretation and Comparison of All Teachers' and All Students' Mean Responses to EBI Items Related to Students and Learning

Item No.	Teachers' Responses		Students' Responses		Similarity
	Mean	Interpretation	Mean	Interpretation	
6	4.80	Strongly agree	4.36	Agree	✓
7	4.60	Strongly agree	4.47	Agree	✓
8	4.00	Agree	4.23	Agree	✓
9	4.00	Agree	3.96	Agree	✓
10	4.40	Agree	4.15	Agree	✓
11	4.20	Agree	4.11	Agree	✓
12	4.20	Agree	3.96	Agree	✓
13	4.20	Agree	4.15	Agree	✓
14	4.40	Agree	4.05	Agree	✓
15	3.80	Agree	3.35	Neutral	✗
16	4.40	Agree	4.36	Agree	✓
17	1.60	Disagree	2.25	Disagree	✓
18	4.40	Agree	4.15	Agree	✓
19	3.20	Neutral	3.65	Agree	✗
20	3.60	Agree	4.05	Agree	✓
21	2.80	Neutral	3.14	Neutral	✓
23	4.40	Agree	4.12	Agree	✓
32	3.80	Agree	3.81	Agree	✓
33	4.60	Strongly agree	4.28	Agree	✓
35	4.20	Agree	3.97	Agree	✓
36	4.00	Agree	3.89	Agree	✓
37	2.80	Neutral	2.52	Neutral	✓
38	2.60	Neutral	2.75	Neutral	✓
39	4.00	Agree	3.65	Agree	✓
40	4.60	Strongly agree	4.01	Agree	✓
41	4.40	Agree	3.79	Agree	✓
42	4.40	Agree	3.81	Agree	✓
43	4.60	Strongly agree	4.12	Agree	✓
44	4.60	Strongly agree	3.97	Agree	✓

From the above table, it can be seen that the teachers and students held similar beliefs for 27 out of the 29 items that were related to students and learning. This result indicates a high level of similarity between the teachers' and students' beliefs about these items. For the two items where their beliefs were not similar, their responses to these items only differed by one division on the Likert scale (for example, neutral and agree). This difference was not sufficient to be significant at the .05 level, unlike Items 24 and 27 which were significantly different in terms of the teachers' and students' responses.

The items that were coded as being related to students and learning were tested for significant difference using Mann-Whitney U tests. Results of these tests indicated a significant difference between the teachers' and the students' responses to only one of these 29 items (Item 40), thus indicating a high level of similarity overall between the teachers' and students' beliefs about the items on the EBI that were related to students and learning. Statistical details of the differences between the teachers' and students' responses to these items were provided earlier in the first analysis framework (see Table 82). Even though the scores for this item appeared to be statistically significantly different, it was only different in terms of the strength of agreement it represented.

These results from analyses of the quantitative data support the results from analyses of the qualitative data which indicated a high degree of agreement between the teachers' and students' beliefs about students and learning.

Conclusion to this Chapter

The teachers' and students' responses to the 44 EBI belief statements were compared and analysed by interpreting the participants' responses within three different analysis frameworks: according to a class-by-class comparison; a thematic comparison; and a comparison of the responses to items that were focused on teachers and teaching with items that were focused on students and learning. The methods of comparative analysis incorporated the use of Mann Whitney-U tests to compare the teachers'

responses to the EBI items with the students' responses to the same items, a comparison of differences between teachers' and students' mean scores, and, in some cases, analyses of the frequencies of the participants' responses.

Results of these analyses of the quantitative data indicated there were either no differences or very few significant differences when the teachers' and students' responses were compared within these three different analysis frameworks. These results of the quantitative analyses were corroborated by the results of the qualitative analyses, presented in the previous chapter, which indicated either medium or high degrees of similarity between the teachers' and students' beliefs when viewed within each of these three analysis frameworks. Overall, based on these analyses of the quantitative and qualitative data represented by the participants' responses to the 44 EBI belief statements, the teachers' responses were found to be very similar to the students' responses.

The findings presented in this chapter have contributed specifically to answering the second research question: How similar are the educational beliefs of university teachers and university students?

CHAPTER 8

ANSWERS TO, AND DISCUSSION OF, RESEARCH QUESTIONS

Introduction

This chapter draw together the results of analyses and findings from the previous four chapters in order to answer the research questions. The findings and answers to these questions are then discussed and compared to relevant findings from previous research, especially in terms of how these findings confirm, extend or cause us to question our current understandings about teachers' and students' beliefs. The chapter concludes with a discussion of the implications of these findings for higher education teaching and learning practices.

Answers to the Research Questions

The two research questions of the study focused on identifying the educational beliefs held by the teachers and the students in the study (Research Question 1) and on the similarity between the teachers' and students' beliefs (Research Question 2). The data gathered throughout the study provided answers to these questions and also revealed some other information. The answers to these two research questions and these other outcomes of the study are now presented.

Answers to Research Question 1: Belief Identification

The first research question of the study was: What are the educational beliefs of university teachers and university students? Interpretations and analyses of the qualitative and quantitative data were presented in Chapters 4 and 5. The outcomes of these processes were grouped into four major themes:

- university teachers and university students;

- the processes of teaching and learning at university;

- the content taught and learnt in university courses; and

- the purposes of teaching and learning at university.

Within these four major themes, beliefs were identified. From this collection of beliefs, some trends were observed which further revealed the nature and structure of the participants' beliefs. The participants' beliefs are now outlined, followed by a set of observations about these beliefs.

The Participants' Beliefs

The four major themes that emerged from the data analyses provided an organising structure which has been used to present the participants' beliefs. The beliefs expressed by the participants during the data gathering period represent the beliefs that the participants focused on during this period. However, an absence of particular beliefs did not necessarily mean that the participants did not hold these beliefs.

In order to differentiate between the beliefs within each theme that were expressed more frequently, and with more emphasis, from the beliefs that were expressed less often, or with less emphasis, only those beliefs that were expressed by all or most of the participants, or most strongly, are listed in Table 89 with the more strongly held beliefs listed at the beginning of the list. All other beliefs held by "many", "some" or "few" of the participants are listed in Appendix Twelve.

Table 89
Educational Beliefs Held by All or Most of the Participants

Learning involves dealing with difficulties and rectifying mistakes and misunderstandings.

Learning involves each student developing their level of understanding.

Students use and interact with resources in the learning process (texts, other material, teacher as resource, other students, experts, computerised resources).

Teaching involves designing activities that encourage students to actively complete tasks (including online, individual, open-ended, structured and problem solving activities).

Teaching involves facilitating tasks that are specifically hands-on and practical activities.

Teaching involves providing students with information.

Teaching involves structuring knowledge for students.

Content learnt is made up of linked concepts.

Content taught is made up of linked concepts.

Effective learners are responsible for their own learning.

Effective teachers are skilled, entertaining, timely and appropriate presenters.

Learning involves completing activities that are specifically hands-on and practical activities.

Learning involves completing assessment tasks.

Learning involves creating knowledge.

Learning involves each student developing their abilities to be aware of, monitor and reflect on their own learning.

Learning involves interaction between students.

Learning involves receiving information and gaining knowledge.

Learning involves students actively completing tasks (including online, repetitive, and example-based activities).

Learning involves students completing course requirements and gaining qualifications.

Learning involves students in a complex process that involves a high level of effort.

Learning involves working with and selecting knowledge.

Learning is difficult and challenging.

Teaching involves providing students with skills and abilities to use and apply in the community, society and everyday life.

Content learnt is complex and authentic.

Table 89
Educational Beliefs Held by All or Most of the Participants

Effective teachers adapt their teaching strategies to suit different learners and learning situations.

Learning involves developing skills and abilities to use and apply in the community, society and everyday life.

Learning involves each student developing their abilities to become an independent learner.

Learning involves each student extending their knowledge.

Learning involves each student progressing at their own rate.

Students should enjoy, be motivated about, committed to and involved in learning.

Teachers know that all learners are different.

Teachers should be available to assist students.

Teachers should be empathetic, personable, approachable, modest, patient and calm.

Teaching involves explaining information to students.

Teaching involves extending each student's level of understanding.

Teaching involves providing students with examples.

Teaching involves the facilitation of interaction between students to encourage learning.

Effective students are aware of their own qualities as a learner.

Effective students reflect on their own learning, and how they are taught.

Effective teachers' teaching strategies are clear and rational.

Learning involves developing employment-related professional skills and abilities.

Learning involves receiving feedback about assessment tasks.

Students should be aware of themselves as learners.

Teachers should be able to communicate with groups of students and individual students.

Teaching involves balancing course requirements and workload within institutional time constraints.

Teaching involves providing appropriate assessment tasks.

Teaching involves providing students with resources for learning (texts, other material, teacher as resource, computerised resources).

Teaching involves using assessment to evaluate learning and to provide teaching direction.

Learning involves building upon students' current knowledge.

Table 89
Educational Beliefs Held by All or Most of the Participants

Learning involves getting through course material within time limits.

Learning involves students asking questions.

Students should reflect on their own learning.

Students use various learning strategies.

Teachers should be the source of subject knowledge.

Teachers should enjoy, be enthusiastic about and be committed to teaching.

Teaching involves asking and encouraging students to ask questions.

Teaching involves using communication and presentation resources for teaching.

Effective teachers are interested in students and treat them with respect.

Effective teachers use appropriate presentation resources.

Learning involves dealing with academic challenge and workload issues.

Learning involves each student developing their general learning and IT skills.

Learning is influenced by students' learning experiences which can be positive.

Students already possess some subject knowledge.

Students create documents, notes, electronic files and resources in the learning process.

Teaching involves allowing each student to progress at their own rate.

Teaching involves encouraging each student to be an independent learner who can make their own learning choices.

Teaching involves facilitating each student to develop or change their point of view.

Teaching involves the facilitation of student-teacher interaction.

Effective teachers reflect on and incorporate feedback from others in order to improve their teaching.

Learning involves remembering information.

Teaching involves encouraging and expecting students to do well.

Teaching involves facilitating each student's development of personal values and attitudes.

Observations about the Participants' Beliefs

A number of observations were noted about these beliefs. The participants' beliefs were found to:

- be diverse in nature, encompassing beliefs about a range of educational topics, contexts, processes, individuals and timeframes;

- reflect perceptions about the parallel nature of teaching and learning;

- be quite interconnected, with particular links between their beliefs about the role of knowledge in teaching and learning processes;

- be both hierarchical and non-hierarchical in nature; and

- be more focused on the people and processes associated with teaching and learning, than the content of university courses.

The participants' identified beliefs and the observations about the nature and structure of these beliefs were used as the basis for answering the second research question.

Answers to Research Question 2: Belief Similarity

The second research question of the study was: How similar are the educational beliefs of university teachers and university students? Interpretations and analyses of the qualitative and quantitative data provided answers to this question in Chapters 6 and 7. Outcomes of these analyses consistently revealed degrees of teacher-student belief similarity within three different analysis frameworks, based on comparisons of teachers' and students' beliefs:

- within each of the five classes;

- according to each of the four themes; and

- about teachers and teaching, and students and learning.

Within these three frameworks, the teachers' and students' beliefs that were found to be most similar, as well as the beliefs that were most different, were identified. Degrees of teacher-student belief similarity that were determined within the three analysis frameworks above are now outlined, followed by a set of observations about these measures.

Teacher-Student Belief Similarity

When compared on a class-by-class basis, the beliefs held by the teacher and his/her students in Classes 1 to 5 were similar to either a medium or high degree, as outlined in Table 90.

Table 90
Class-by-Class Teacher-Student Belief Similarity

Class	Degree of Similarity
1	Medium
2	Medium
3	High
4	Medium
5	High

When compared on a thematic basis, the beliefs held by the teachers and students were similar to either a medium or high degree with their beliefs about the processes of teaching and learning (Theme 2) being particularly similar, as outlined in Table 91.

Table 91
Theme-by-Theme Teacher-Student Belief Similarity

Theme	Degree of Similarity
1	Medium
2	High
3	Medium
4	Medium

When the teachers' and students' beliefs about teachers and teaching were compared, the comparison showed a medium degree of similarity. Furthermore, when the teachers' and students' beliefs about students and learning were compared, the comparison showed a high degree of similarity. These results are summarised in Table 92.

Table 92
Teaching/Learning Teacher-Student Belief Similarity

Area	Degree of Similarity
Teachers and teaching	Medium
Students and learning	High

Overall, when the beliefs held by the teachers and students as a whole group were compared, the degree of teacher-student belief similarity was found to be high. Table 93 lists the separate beliefs where all the teachers and all the interviewed students held the same beliefs: that is, where a maximum degree of similarity was shown. See Appendix Thirteen for the beliefs which showed high and medium degrees of similarity.

Table 93
Beliefs with Maximum Degrees of Teacher-Student Belief Similarity

Content taught should be accurate.

Effective students communicate with other students.

Effective students reflect on their own learning, and how they are taught.

Learning involves dealing with difficulties and rectifying mistakes and misunderstandings.

Learning involves each student developing their level of understanding.

Learning involves students answering questions.

Students use and interact with resources in the learning process (texts, other material, teacher as resource, other students, experts, computerised resources).

Teaching involves creating a positive learning environment.

Teaching involves designing activities that encourage students to actively complete tasks (including online, individual, open-ended, structured and problem solving activities).

Teaching involves facilitating tasks that are specifically hands-on and practical activities.

Teaching involves providing students with information.

Teaching involves structuring knowledge for students.

Observations about the Degrees of Teacher-Student Belief Similarity

When the beliefs that were expressed by the teachers in the study were compared to the beliefs expressed by the students in the study, their beliefs about most topics were similar, with a high degree of similarity indicated overall. This finding was substantiated by analyses of the qualitative and quantitative data within each of the three analysis frameworks outlined above. There were a few noticeable trends within these degrees of similarity.

- Overall, the students in the study expressed similar beliefs to the teachers in the study, even on issues that were traditionally considered to be the domain of the teacher (such as beliefs about teachers' pedagogical knowledge).

- Across the four major themes of the study, the highest degree of similarity was found between the teachers' and students' beliefs about the processes of teaching and learning (Theme 2). This theme was also the most significant of the themes that emerged from the study in terms of the variety, complexity and the number of beliefs.

- Higher degrees of similarity were found between the teachers' and students' beliefs about the more outward or public nature of teaching and learning processes.

- The teachers' and students' beliefs about complex issues were more similar than their beliefs about issues that were less complex.

- The teachers' and students' beliefs about students and learning were more similar than their beliefs about teachers and teaching.

- The few areas of difference that were noted between the teachers' and students' beliefs were usually associated with typically teacher centred or typically student centred issues. Teachers tended to hold stronger, more complex or more varied beliefs about teacher centred topics than their students. Likewise, students tended to hold stronger, more complex or more varied beliefs about student centred topics than their teachers.

The similarity between teachers' and students' beliefs is a particularly under researched area in the field of educational beliefs. However, the findings from this study, along with the methods devised to establish teacher-student belief comparisons utilised in the study, represent the beginning of a fruitful research direction.

Teacher-Student Belief Difference

Very few areas of teacher-student belief difference were detected, despite how the data were grouped and analysed. When the beliefs of all of the teachers and students were compared using the qualitative data, the following small collection of beliefs were found to have a low degree of similarity, as outlined in Table 94.

Table 94
Beliefs with Low Degrees of Teacher-Student Belief Similarity

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Being an effective teacher involves interacting with your colleagues.

Content can be memorised.

Learning is time-consuming.

Teaching is influenced by course design and organisation.

Learning involves remembering information.

Teachers' beliefs change.

Teaching involves providing students with choice, while facilitating knowledge construction.

Teaching involves encouraging each student to develop their general learning and IT skills.

Teaching involves providing feedback about assessment tasks.

Teaching involves enabling each student to develop academically and to think critically.

Learning is influenced by students' learning experiences which can be negative.

Similarly, when the teachers' and students' beliefs were compared overall using the quantitative data, only four of the 44 EBI items were found to show significant difference, as outlined in Table 95.

Table 95
EBI Items with Significant Teacher-Student Belief Difference

I believe truth is unchanging.

I believe university teachers should be concerned about student learning.

I believe that an effective university teacher reflects on how they teach.

I believe that effective university students seek links between different activities, ideas and subjects.

Observations about the Degrees of Teacher-Student Belief Difference

Very little teacher-student belief difference was detected among the qualitative or quantitative data that were gathered throughout the study. However, the few areas of difference suggest that the teachers and students did not necessarily express similar beliefs about the following topics.

- The nature of content, especially in relation to issues relating to the simplistic nature of content such as memorisation of content and the perceived unchanging nature of truth.

- The linked nature of knowledge.

- Topics that emerged as newer areas of belief research, such as metabeliefs, the effort involved in learning and the less public nature of teaching.

The findings of belief difference that were detected primarily within the qualitative data were associated with some of the beliefs that fewer numbers of participants held. As such, instead of definite belief difference, these findings may indicate that some of the teachers expressed these beliefs but some of the students did not, or that some of the students expressed these beliefs but some of the teachers did not.

Other Outcomes

Although the data gathered during the study provided answers to the two intended research questions upon which the study was based, the exploratory nature of the study also revealed other outcomes which did not fit neatly into the research questions. The use of semi-structured interviews during the data gathering period and the use of open-coding data analysis methods enabled such outcomes to emerge. Consequently, rather than remaining restricted by predetermined constructs, categories or questions, the wording evident in the participants' belief statements was used to label coding categories during the open-coding data analysis processes. As such, the emic views of the participants were viewed as being more significant than those held by the researcher or those represented in the literature, reflecting Kelly's (1955) notions of emic constructs.

The other outcomes of the study included:

- newly devised data analyses methods used to triangulate the data when identifying the participants' beliefs, and to compare teachers' and students' beliefs;

- a greater metacognitive ability by the participants to be aware of and express their own educational beliefs as the study progressed;

- some evidence to suggest that the context academic discipline may not be as influential on educational beliefs as previously thought; and

- consistent evidence to suggest congruence between the participants' beliefs about teachers and teaching and their beliefs about students and learning.

Discussion of the Research Questions

These answers to the research questions, as well as the additional outcomes of the study, are now discussed by considering how these answers confirm, extend or question current understandings about teachers' and students' beliefs, as outlined in previous literature.

Discussion of Answers to Research Question 1: Belief Identification

The answers to Research Question 1 (What are the educational beliefs of university teachers and university students?), outlined above, provide evidence about the nature and structure of the participants' educational beliefs. These issues are now discussed.

Broad-Ranging Nature of Beliefs

The participants held beliefs about teachers and students (Theme 1), the processes (Theme 2) and purposes (Theme 4) of teaching and learning, and content (Theme 3). Some elements of these four categories were similar to categories evident in previous research such as Ford's (1992) context beliefs about teaching and learning environments, and capability beliefs related to teachers' and students' abilities. The participants expressed their beliefs about effective teachers in terms of them being caring, motivating, flexible, empathetic, committed, available, approachable and enthusiastic. Such qualities have also been mentioned by other researchers (Fives & Buehl, 2004; Forrester-Jones, 2003; Hativa et al., 1999; Minor, Onwuegbuzie, Witcher, & James, 2002; Young & Shaw, 1999).

Also, many of the epistemologically related beliefs were similar to those reported in Schommer's (for example, Schommer, 1990), Brownlee's (for example, Brownlee, 1998) and Hofer's (for example, Hofer, 2000) research. Additionally, evidence of a communal conception of learning, reported in some recent literature (Cliff, 1998; Meyer & Boulton-Lewis, 1999; Pratt, 1992; Purdie et al., 1996), was revealed during this study, as well as evidence to suggest the existence of an additional communal conception of teaching which has only been reported sporadically in recent literature thus far (Åkerlind, 2004).

The study has also provided evidence that the participants held beliefs that have not been revealed in previous literature. These beliefs are related to the following issues:

- Learning as a productive process as well as an active process.

- Teachers' self knowledge.

- The existence of beliefs about beliefs, or *metabeliefs*.

- The use and creation of resources by students during learning.

- Students' metacognitive development.

- Behaviour management aspects of teaching and learning.

- The role of questions used by teachers and students.

- The short term purposes of teaching and learning.

Despite the similarities with some previously reported educational beliefs, the participants' beliefs in general reflected a broader awareness of educational issues than has traditionally been evident in studies about teachers' and students' educational beliefs. Although their beliefs demonstrated an awareness of many cognitive aspects of teaching and learning, such as intellectual understanding and logical thinking processes, their beliefs also revealed varied concerns associated with emotional and attitudinal learning issues, such as student-teacher relationships, attitudes to learning and enjoyment of teaching and learning. Furthermore, the students in the study appeared to have a heightened awareness of issues that have been traditionally the domain of teachers, such as assessment design, teachers' less public responsibilities and institutional policies. Both the teachers and students in the study expressed beliefs about issues that incorporated diverse timeframes, incorporating beliefs about past and present educational experiences, as well as beliefs about predicted future events.

Proportional Structure of Beliefs

Although the four major themes that emerged from the process of coding the participants' belief comments were partially reminiscent of

themes identified in some previous research, the dominance of some themes in previous research was not necessarily reflected in this research. For example, the beliefs expressed by the participants about beliefs, or *metabeliefs*, and the beliefs expressed by participants about the value of students creating learning resources have not featured highly in recent belief literature.

Whether or not to include the final two themes (Theme 3: Beliefs about content and Theme 4: Beliefs about the purposes of teaching and learning) that emerged as the two least significant themes of the overall coded schematic structure was a problematic area due to the lowered concern placed in this area by the participants. Bain et al. (1997), in their research about academics' educational beliefs and conceptions, were faced with a similar decision about whether or not to include two dimensions that seemed to be evident in previous research, but that were not evident in their own investigations. As such, Themes 3 and 4, despite their lesser significance when compared to the more dominant Themes 1 and 2, were included in this study's findings as a baseline of comparison with previous research, despite their lesser significance in the context of this study. Theme 3 was divergent from previous belief studies and Theme 4 was included due to the fact that it suggested new areas of understanding which discriminated between the short and long term purposes of teaching and learning.

Complex Nature of Beliefs

As well as being more broad ranging than the beliefs reported in previous literature, the participants' educational beliefs were also more complex. Previous studies have outlined teaching beliefs as ranging from transmissive, teacher centred, content oriented beliefs through to facilitative, student centred, learning oriented beliefs (Kember, 1997; Åkerlind, 2004; Samuelowicz & Bain, 2001, 2002; Maor & Taylor, 1995; Kember & Wong, 2000). The beliefs expressed by the participants in this study typically reflected a facilitative understanding of teaching, representing the more complex end of this belief continuum. Such an

understanding of teaching is based on the idea of teaching as a process of guiding students' learning instead of teaching as transmitting information. Likewise, the literature about learning beliefs outlines a range of views about learning ranging from a qualitative, complex process based on the transformation of knowledge through to beliefs which reflected more quantitative, simplified views that focused on the process of knowledge reproduction (Barrett & Rasmussen, 1996; Boulton-Lewis et al., 1996; Brownlee, 1998; Bruce & Gerber, 1995; Cliff, 1998; Cliff, 1999; Marton et al., 1993; Meyer, 2000a, 2000b; Meyer & Boulton-Lewis, 1999; Orton, 1996; Steketee, 1997). The participants' learning beliefs reported in this study tended to be more transformative in nature, in that the participants viewed learning as a process that involves change and growth. These findings match the findings reported by Brownlee (2001) but are somewhat opposite to the findings of some recent research which suggests that the learning beliefs held by higher education students are typically quantitative or reproductive (Boulton-Lewis et al., 1996; Cliff, 1998; Styles, Beltman, & Radloff, 1999).

The way in which the participants' educational beliefs in this study were more complex than the beliefs reported in previous literature may be accounted for by the phenomenon described by some researchers in which individuals' beliefs become more complex as their experience increases (Andrews et al., 1996; Cliff, 1998; Dunkin & Precians, 1992; Jehng et al., 1993; Kember et al., 2001; Kember & Wong, 2000). Since all of the teachers and students in the study were studying at the tertiary level, the complexity of their beliefs may have been partially due to this factor.

Affective Nature of Beliefs

Overall, the participants' beliefs emphasised the affective, social and community, over the cognitive, aspects of teaching and learning, thus reflecting a movement towards focusing on the personal domain of educational systems (McCombs, 2001) and the value of student-teacher relationships (Adalsteindottir, 2004). This trend to focus on affective issues, especially in conjunction with their beliefs about teachers and teaching, is

also evident in the recent work of some researchers who have focused on the affective nature of learning and the value of relationships in teaching (Adalsteindottir, 2004; Alcock, 1995; Boulton-Lewis et al., 1996; Cliff, 1999; Entwistle, 1998; McCombs, 2000, 2001; Rickards et al., 2001).

These findings, in conjunction with some contemporary research, thus reflect the recent readjustment of the focus of educational research from the cognitive to the personal aspects of teaching and learning, and is supported by Adalsteindottir's recent claim (2004) that "successful teacher-pupil interaction in the classroom is essential to the educational and social development of pupils" (p. 95).

Idealistic and Pragmatic Nature of Beliefs

The participants in this study expressed beliefs that were, by their own admission, both idealistic and non-idealistic. Past studies have recognised both levels of idealism, especially within teachers' beliefs systems, and have labelled them as ideal and working beliefs, or espoused and enacted beliefs (Leonard & Leonard, 2001; Raymond, 1997; Samuelowicz & Bain, 2002). The participants in this study also expressed ideal beliefs about students, which represents an extension of past research.

The majority of the participants' idealistic beliefs were expressed in conjunction with their beliefs about teachers, suggesting that teachers are expected to act in more ideal ways that are students. This could be due to the fact that most of the participants' beliefs were expressed in student centred terms, suggesting that the participants were naturally more empathetic to the plight of students than teachers, of whom they had higher expectations. Cliff (1999) also acknowledged this tendency for students to have high expectations of their teachers: "They appear to expect highly structured, meticulously prepared, clearly articulated course design" (p. 61).

Instead of viewing the co-existence of both ideal and non-ideal educational beliefs as a belief-practice inconsistency due to "conflictual circumstances" (Leonard & Leonard, 2001, p. 4), the participants in this study viewed the co-existence of ideal and working beliefs as quite pragmatic and realistic, rather than problematic. In this light, ideal beliefs

were sometimes described as espoused beliefs that were not put into practice due to obstacles such as time limits and institutional policies.

Epistemological Nature of Beliefs

As was evident in much of the literature reviewed in preparation for this research study, many aspects of the participants' educational beliefs incorporated views about epistemological issues. The participants continually provided unprompted belief comments about their views about the nature of knowledge throughout their belief comments about teaching and learning. This epistemological nature of the participants' beliefs was reminiscent of the work by Perry (1970), Brownlee (1998, 2001, 2002; Brownlee, 2003), Hofer and Pintrich (1997, 2002), Schommer-Aikins (2002) and Kelly's (1955) principle of Personal Construct Psychology that recognises how an individual's epistemological beliefs are also integral to their entire belief system.

The participants' epistemological beliefs also incorporated many views about self knowledge and these beliefs were often perceived by the study's participants as more important that content or subject knowledge. Such findings suggest that epistemological beliefs may extend beyond the area of knowledge and learning, into the area of self reflection.

The fact that the participants' educational beliefs were threaded so consistently with epistemological references may be due to the fact that the methodology of the study allowed for interlinked concepts to be discussed. Such findings have extended our current understanding of how teachers' and students' epistemological beliefs are integrated with their educational beliefs about teaching *and* learning. Whereas previous research has defined epistemological beliefs as including beliefs about teaching and learning, the results of this study suggests that beliefs about teaching and learning incorporate epistemological aspects. The findings also suggest that an individual's educational beliefs are not separate from their epistemological beliefs, a view parallel to that espoused by Hofer and Pintrich (2002) in relation to views about learning.

So, instead of just showing how an individual's epistemological beliefs were just a component of their belief system, the evidence presented in this thesis shows that an individual's beliefs about the trinity of teaching, learning and knowledge (Kember, 2001) are intimately related. Whereas the majority of belief studies thus far have treated the three constructs of teaching, learning and knowledge separately, this thesis shows how the three are consistently related and interdependent on each other. This is a significant finding in relation to previous research in this area.

Beliefs about the Role of Technology

Many of the participants' educational beliefs across the four major themes in the study incorporated views about technology. Previous researchers who have investigated teachers' and students' technologically related educational beliefs have either specifically selected technology rich environments in which to conduct their research (Greene & Zimmerman, 2000; Jonassen, Mayes & McAleese, 1992; McCombs, 2000, 2001) or they have particularly sought beliefs about technology held by their participants from more general contexts (Bain & McNaught, 1996; Bain et al., 1997; Bain, Mills, McNaught, & Lueckenhausen, 2000; Riel & Becker, 2000).

Instead of focusing solely and intentionally on their technologically related educational beliefs, this study provided a context in which higher education teachers' and students' beliefs about technology could be expressed and investigated in conjunction with their beliefs about teaching and learning in a natural way. This integration of technology related beliefs throughout their educational belief comments indicates that the teachers and students in this study no longer viewed the use of technology and computerised resources just as an adjunct but as an integral and normal component of various teaching and learning processes.

Indistinct Thematic Structure

This indistinct nature of the study's thematic structure resonates with the caution by Meyer and Boulton-Lewis (1999) and Taylor (1996) about placing labelling systems that are too rigid upon such educational constructs, and the warning by Cliff (1998) "for caution in the categorisation

of conceptions of learning in terms of their apparent simplicity" (p. 54). Taking heed of these warnings, I was cautious about over categorising the participants' beliefs. Although the final thematic structure suggested that the participants' beliefs conveniently fitted into a collection of educational categories, the actual process of classifying the participants' belief comments was less clear cut. Many of the participants' beliefs were coded as being related to more than one theme or sub-theme, thus suggesting indirect and direct links within the thematic structure. Furthermore, some belief statements could not be linked to any of the four themes. The messiness that underlies much of the structure of the final thematic arrangement reflects the complexity associated with, and the interconnections between, the perceived constructs of teachers, learners, teaching, learning and knowledge.

Non-Hierarchical Nature and Structure of Beliefs

Despite the warning from these researchers to refrain from over categorising individuals' beliefs, much of the previously reported literature about the beliefs about teaching and learning held by university teachers and students suggests that such beliefs about both teaching and learning are frequently and clearly hierarchical in structure. Such structures categorise individuals as holding either hierarchically low or simple beliefs through to hierarchically high or complex beliefs, without the option of holding beliefs at varied levels of complexity.

In contrast to the mainly hierarchical structure of beliefs cited in the literature to date (Biggs & Moore, 1993; Marton et al., 1993; Meyer & Boulton-Lewis, 1999), examples abound throughout the findings of this study of participants who simultaneously hold both complex and simple beliefs about the same issue. Such findings suggest that individuals' beliefs about teachers, students, teaching, learning and knowledge may not always be hierarchical. Such a finding is resonant with Cliff's work (1999), which acknowledges how individuals tend to express their beliefs in non-hierarchical ways, and Brownlee's work (2002), which notes "that it is possible for individuals to have epistemological beliefs that are both

sophisticated (more relativistic) and naïve (more dualistic)" (p. 8). As mentioned earlier, other researchers have cautioned against the classification of beliefs, suggesting that "at best ordering is a simplification of the complex patterns of beliefs and practices constituting the differences between categories" (Bain et al., 1997, p. 12).

The non-hierarchical nature and structure of the beliefs expressed by the participants in this study may reflect the phenomenon of holding non-hierarchical or inconsistent beliefs which has been noted as belief non-consensuality (Nespor, 1987) or belief inconsistency (Samuelowicz, 1999). Schommer-Aikins (2002) also recognises that complex and simple beliefs can exist within an individual's belief system (p. 106), thus suggesting that their beliefs may not always be hierarchical. For example, this study provides examples of individual participants simultaneously holding beliefs about the simple and the complex nature of knowledge.

So, the findings from this study, although not totally refuting those from previous research, indicate that, instead of holding simple *or* complex educational beliefs, individuals are capable of holding both simple *and* complex educational views concurrently (or multiple beliefs at varying levels of complexity) which are not necessarily in conflict. For example, although some of the participants held beliefs that knowledge can be memorised, the same participants also expressed beliefs that knowledge cannot always be memorised. In this way, this research has extended our understanding of the nature of teachers' and students' educational beliefs, illustrating that it is possible to hold both complex and simple beliefs.

Discussion of Answers to Research Question 2: Belief Similarity

The answers to Research Question 2 (How similar are the educational beliefs of university teachers and university students?), outlined earlier in this chapter, provide evidence about the degree of similarity or difference found between the teachers' and students' educational beliefs. Although, overall, their beliefs were found to be highly similar, the teachers' and students' beliefs were compared from within three analysis frameworks: according to each class; according to each theme; and according to beliefs

about teachers and teaching, and students and learning. From these analyses, the teachers' and students' beliefs were found to be similar at a medium or high degree of similarity. Some areas of similarity were more noticeable than others and very few areas of belief difference were noticed.

Although the literature does not offer many examples where the educational beliefs of teachers and students have been compared, some links to the literature available are made throughout the discussion of the answers to the second research question: How similar are the educational beliefs of university teachers and university students?

Belief Similarity: According to Each Class

Since the data from this study were gathered from the teachers and students within five different university classes, the findings from this research have provided evidence of belief comparisons that were conducted within the same context in five different cases. In each case, the degree of belief similarity was found to be either medium or high. This finding brings into doubt the influence of context on beliefs.

Belief Similarity: According to Each Theme

Degrees of teacher-student belief similarity were also determined for each of the four major themes in the study. The areas of particularly high belief similarity were associated with the teachers' and students' beliefs about teachers and students (Theme 1) and the processes of teaching and learning (Theme 2) which were the two areas represented by the two most substantial themes of the study.

This finding associated with the participants' Theme 1 beliefs may be due to the fact the qualities of both effective teachers and effective students alike are often the focus of attention for both groups. Furthermore, such qualities are often the focus of academic literature, university publications and media coverage. The high degrees of similarity within five of the seven sub-themes within Theme 2 suggest that the teachers and students in the study held very similar beliefs about the processes of teaching and learning, especially in relation to knowledge, resources, learning contexts, activities and effort. These particularly high areas of belief similarity within this

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theme reflect the issues with which the teachers and students are most familiar, as well as being issues that tend to be routinely referred to in lectures and tutorials.

The teachers in the study also held similar beliefs to the students in the study about the two least significant themes, which incorporated their beliefs about content taught and learnt (Theme 3) and the purposes of teaching and learning (Theme 4). However, because of the less significant and less varied nature of these two themes, the degrees of similarity determined between the beliefs of the teachers and students who took part in the study were not as representative of all of the participants in the study as were the degrees of similarities determined from the participants' beliefs within Themes 1 and 2.

The teachers' and students' beliefs about the complex nature of content within Theme 3 were found to be highly similar which was also evident in other areas of belief similarity within the study associated with particularly complex beliefs. This may be due to the fact that beliefs about the complex nature of content are diverse and wide-ranging and thus provide more opportunities for teachers and students to agree than the more limited set of beliefs about the simple nature of content.

Lastly, the teachers' and students' beliefs about the purposes of teaching (Theme 4) were quite similar in terms of their beliefs about the short term and the long term purposes of teaching and learning. This similarity may be due to the tertiary context within which this study was conducted which, by its very nature, may be construed by the perspective of both teachers and students to be more future focused than earlier levels of education.

Belief Similarity: According to Beliefs about Teachers/Teaching and Students/Learning

The findings from this study indicate that the teachers' and students' beliefs about students and learning were even more similar than their beliefs about teachers and teaching. This may be due to the fact that teachers typically hold a combined concern both for their own teaching as

well as the learning of the students. On the other hand, students are naturally more concerned about themselves as learners and the learning process in which they are involved. Other reasons that the degree of teacher-student similarity was higher in conjunction with the participants' learning beliefs may also have been due to the fact that recent academic literature has tended to be more focused on student learning than teaching, thus providing a more commonly understood premise for beliefs about effective learning than beliefs about effective teaching.

Despite the reasons behind this imbalance in the teachers' and students' beliefs about students and learning compared to their beliefs about teachers and teaching, and in light of the fact that no previous research has been conducted in this area, further research is required to explore the possibility that such a finding may be evident in other contexts.

Belief Similarity: Additional Topics

In addition to the areas of belief similarity that were noted within the three analysis frameworks, there were two other patterns that indicated particularly high degrees of similarity in terms of the teachers' and students' beliefs about the public nature of teaching and learning, and in terms of their epistemologically related beliefs. For example, the similarity of teachers' and students' beliefs was particularly high in terms of their beliefs about the more observable aspects of teaching and learning processes such as the use of resources (Sub-theme 2.3), the actual learning context (Sub-theme 2.4) and the use of learning activities (Sub-theme 2.5). The high degree of teacher-student belief similarity within these areas may be accounted for by the fact that these three sub-themes are all focused on areas of teaching and learning that are very familiar to both teachers and students, and are often the focus of teaching and course evaluation instruments that are now quite familiar to most teachers and students within university contexts.

Particularly high degrees of similarity were also found when the teachers' and students' beliefs with epistemological references to course content or knowledge were compared. For example, high degrees of belief

similarity were found in terms of the teachers' and students' knowledge focused beliefs about teaching and learning (Sub-theme 2.2) and their beliefs about the complex nature of knowledge (Sub-theme 3.2). These sub-themes, which are characterised by both their high degrees of belief similarity and their epistemological focus, also frequently incorporate learning beliefs which have been described by previous research as complex, constructivist, facilitative and transformative. Thus, there may be some connection between the high levels of belief similarity that appear to exist between the beliefs expressed by the teachers and students who participated in this study in terms of their epistemologically related beliefs as well as their beliefs which reflect more complex views of learning.

Belief Difference

When compared thematically, a comparison of the teachers' and students' beliefs were found to reflect a medium or high degree of similarity but, when compared at the sub-theme category level, a few minor differences in their beliefs were revealed. However, such differences were considered to be less significant than if they had been found to exist at the higher sub-theme or thematic levels.

The differences identified at the sub-theme category level were associated with beliefs that were mainly focused upon either teacher centred or student centred issues. In the case of beliefs that were typically teacher centred or teaching focused, the teachers tended to have stronger beliefs about these issues than the students. Likewise, where beliefs were typically student centred or learning focused, the students tended to have stronger beliefs about these issues than the teachers in the study. Such differences could be accounted for by the assumed natural interests of both groups about their own teacher or learner centred concerns, based on their own domains of influence and responsibility.

Another area of difference was related to the participants' beliefs about the learning environment. The teachers' beliefs about how learning was influenced by the learning environment were more focused on the academic aspects of the learning environment whereas the students were

more concerned with the affective and social aspects of the learning environment. This difference may be accounted for by the students' concerns about the need to feel comfortable in learning contexts and the teachers' concerns with students' progress.

Belief Similarity and Difference: Compared with Previous Literature

There have not been extensive studies to date that have specifically compared teachers' and students' educational or epistemological beliefs. The research that has been reported thus far has tended to mention teacher-student belief comparison in incidental ways, in terms of future research possibilities (Peterson, 1988) or in terms of how teachers' beliefs impact students' beliefs, or vice versa (Carter & Norwood, 1997; Wing, 1989).

Although the phenomenon of teacher-student belief similarity is an under researched component of the belief literature, a small number of research studies have been located that focus specifically on teachers' and students' beliefs within the same educational context (Baker & Moroz, 1996; Tavares et al., 2000). The few studies that have focused on comparing teachers' and students' beliefs tend to suggest that teachers' and students' beliefs are not typically similar.

Surprisingly, however, when the findings from studies that specifically investigate teachers' beliefs are compared with findings from studies that specifically investigate students' beliefs, a comparison of the findings suggest that the beliefs reported to be held by teachers are similar to the beliefs that are reported to be held by students. Although the findings of these discrete studies are reported in isolation and focus on either the beliefs held by teachers or the beliefs held by students, these findings can be viewed collectively in order to compare the findings about teachers' beliefs with the findings about students' beliefs.

When compared, the findings of such studies indicate that teachers' beliefs are quite similar to students' beliefs. Teachers' beliefs about teaching are described as being either constructivist or transmissive (Entwistle, 1998; Roche, 2000) whereas the students' beliefs about teaching are described as being non-traditional or transmissive (Kember & Wong, 2000).

University teachers' beliefs about learning reflect reproductive through to transformative conceptions of learning (Barrett & Rasmussen, 1996; Brownlee, 1998; Bruce & Gerber, 1995; Orton, 1996) and university students' beliefs about learning are reported as ranging from quantitative, focused on the reproduction of knowledge, through to qualitative, based on conceptual change, knowledge construction and personal growth (Purdie et al., 1996; Steketee, 1997; Van Rossum et al., 1985). Thus, the pattern of belief similarity that is indicated consistently throughout the findings from this study has also been reflected when these separate studies are compared.

Notwithstanding this observed but so far unlinked similarity between teachers' and students' beliefs based on an outsider's comparison of the findings of a number of separate studies, there is a shortage of research to date that has intentionally focused on teacher-student belief comparison within the same context at the same time, with a noticeable gap within the higher education context. Despite the lack of research in this area, the findings of this study provide evidence that the educational beliefs of the teachers and students who participated in this study were generally very similar.

This study has also provided evidence about degree of similarity between the teachers' and students' epistemologically related beliefs. Just as teachers' and students' beliefs about teaching and learning have been investigated within separate contexts, so too the epistemological beliefs of teachers and students have been investigated. However, their epistemological beliefs have not been typically explored within the same context. Instead, teachers' epistemological beliefs have been usually considered in association with their beliefs about teaching (Brownlee, 2003; Maor & Taylor, 1995; Howard et al., 2000; Archer, 1999) whereas students' epistemological beliefs have often been linked to their beliefs about learning (Brownlee, 2002; Schommer, 1993b).

Despite the separate contexts in which such research has been conducted, teachers' and students' epistemological beliefs are often

described using the same terminology. Researchers of teachers' and students' epistemological beliefs such as Archer (1999), Brownlee (2002), Howard et al. (2000), Perry (1970), Pintrich (2002) and Schommer (1993b) tend to describe individuals' epistemological beliefs in terms that range from objectivist through to relativistic, from simple to complex or from naïve to sophisticated. With these classifications in mind, this study has presented evidence that teachers' and students' epistemological beliefs, when identified within the same context, can be typically described as ranging from naïve through to sophisticated.

So, in the light of the research findings to date that have reported on direct examples of teacher-student belief comparisons, the findings of this study challenge these previous findings by providing evidence that the teachers in this study held very similar beliefs to the students in their classes.

Discussion of Other Outcomes

During the process of analysing the data in order to answer the two major research questions of the study, some findings emerged from this process that provided additional information about the educational beliefs held by the teachers and students who participated in this study.

Methods Devised to Analyse the Data

In terms of how the data were gathered, analysed and reported, some aspects of the methodological design of the study itself emerged as additional, though somewhat unintentional, findings of the study.

As previous researchers (Levi-Strauss, 1966; Lincoln, 2004; Lincoln & Guba, 2000) have noted, the researcher-as-bricoleur sometimes needs to create new processes or adapt existing ones during the research process. So, as well as using a selection of conventional data analysis and data comparison techniques, two particular data analysis processes were devised specifically to conduct the data analyses within this study.

Initially, the quantitative data, which represented the participants' responses to items on the EBI, were analysed using conventional statistical

comparative methods including Mann Whitney U tests, comparisons of mean scores and frequencies. However, to strengthen the link between the analyses of the qualitative and quantitative data, each of the items on the EBI was coded according to the thematic structure that emerged from coding the qualitative data. From this secondary coding, the EBI items were then considered in light of the qualitative data. This particular method of applying a typically qualitative coding technique to items in a quantitative data collection instrument is unusual but was found to be a useful research method in this study. This process enabled me to more easily substantiate and triangulate the findings which emerged from the quantitative and qualitative data analyses when the participants' beliefs were being identified for the purposes of answering the first research question.

When analysing the data to determine the degrees of similarity between the teachers' and students' beliefs, and to subsequently answer the second research question, a customised data analysis tool was devised. Statistical methods of comparison that have traditionally been used to determine differences between groups of statistical data were applied to the quantitative data to ascertain degrees of teacher-student belief difference or similarity. However, previous research in this area presented no examples of methods that had been used to purposely compare qualitative data that represented the beliefs of university teachers and students. As such, a method of comparing sets of belief comments was required.

The method conceived to compare these two sets of beliefs involved the development and application of the Degree of Similarity Scale, as described in Chapter 2 and applied in Chapter 6. This scale enabled the qualitative data, which represented the teachers' and students' beliefs, to be interpreted, compared and allocated a specific degree of similarity, ranging from minimum through to low, medium, high and maximum. This method of comparing the beliefs of two groups of research participants may be applied to other contexts where the beliefs of varied groups require comparison.

Thus, these two novel ways of analysing both qualitative and qualitative data enabled both the quantitative and qualitative data within

this study to be analysed, compared and triangulated. As well as this methodologically related outcome that emerged from the study, a further outcome became evident as the study progressed. This additional outcome was associated with how the reflection process impacted upon the participants in the study.

Participant Reflection

When this study was being designed, various research processes were considered and evaluated in terms of their suitability to access teachers' and students' individual beliefs. So, it was expected that the act of reflection would at least play an incidental role during the data collection stages as participants were requested to record responses to belief statements on the EBI and to discuss their educational beliefs during interviews with the researcher. Furthermore, reflection has also been identified by a number of researchers as an appropriate process by which to access individuals' beliefs and as a process used by teachers and students to identify their own beliefs (Entwistle & Walker, 2000; Hativa, 2000b; Hativa & Goodyear, 2000; McAlpine & Weston, 2000; Nasr et al., 1996; Oberg, 1989; Schuh et al., 2001).

However, it was not until the study was well underway that the more beneficial consequences of using reflection as a research tool began to surface. During the early stages of data collection, many of the participants experienced difficulty expressing their beliefs. In fact, some of the participants, despite studying education courses, judging by their discomfort about expressing their own beliefs, appeared to only be thinking about certain educational issues for the first time. Other participants even announced that they did not actually have any beliefs: "You know, I don't actually have any beliefs, I just get here and do it" (Lionel, Class 1 Student).

As the data collection process continued throughout the semester, the participants were provided with a number of opportunities to reflect upon and identify their own ideas about teaching and learning. Parallel to the increasing opportunities for reflection was the participants' increasing ability to express their beliefs and to be aware of this change in their ability.

By the end of the study, participants who had demonstrated difficulty when expressing their educational beliefs at the beginning of the semester appeared much more comfortable about expressing belief comments.

Towards the end of the semester, many of the teachers and students in the study provided unprompted comments about how the process of reflecting on teaching and learning issues had assisted them to identify their own beliefs and had also assisted them with their own teaching and learning practices.

Contextual Issues: Does Context Influence Beliefs?

Although the issue of contextual influence was not a specific area of investigation at the outset of this study, many of the findings indicate that the academic context did not seem to be an overwhelming influence on the beliefs held by the participants. That is, similar patterns were identified across the beliefs expressed by the participants from each of the five classes which represented a range of academic domains from education through to multimedia and computer science. Although this finding confirms *some* of the reported findings of similar educational and epistemological belief studies that have been reported in the literature to date, this type of research on the whole has not fully established the extent to which context is or is not an influential factor on individuals' beliefs.

Whereas some authors have suggested that individuals' beliefs are context dependent (Cannon, 1983; Chapple, 1999; Eklund-Myrskog, 1998; File & Gullo, 2002; Freedman, 1979; Johnston, 2001; Quinlan, 1999), others have reported that individuals' beliefs are not dependent on academic domain (Brousseau et al., 1988; Curtner-Smith, 1997; Schommer & Walker, 1995; Tatto, 1996). Rather than taking an absolutist stance about the influence of academic context on individuals' beliefs, another group of researchers who have investigated the influence of academic domain on individuals' epistemological beliefs propose a more comprehensive even-handed approach. Instead of definitively claiming that context is or is not influential on individuals' beliefs, these researchers (Gill et al., 2004; with the support of Calderhead, 1996; Hofer, 2000; Schommer & Walker, 1995)

suggest that epistemological beliefs may be both specific (and discipline dependent), and general (and not necessarily related to academic discipline).

So, although the findings from this study appear to be inconclusive about the impact of context on individuals' educational beliefs, there is a possibility that these findings illustrate how such beliefs may also be categorised as being either specifically discipline dependent and general (not related to academic domain), like the two types of epistemological beliefs suggested by Gill et al. (2004). The findings from this study illustrate that more research is required in this area, a suggestion endorsed by Schommer-Aikens, Mau, Brookhart and Hutter (2000) and Pintrich (2002) who also recommend that further research is required to ascertain if students' epistemological beliefs are influenced by their educational context.

Structural Issues: Parallels between Teaching and Learning Beliefs

Just as the other outcomes outlined above were not intentional foci of this research at the start of the study, the findings from this study revealed another outcome of the study indicated a consistent correspondence between the structure of the participants' beliefs about teachers and teaching compared to the structure of their beliefs about students and learning.

The openness of the methodological design of the study enabled this outcome, one of the most significant of the study, to be recognised during both the data gathering and the data analysis processes. Although much of the previous belief research has been conducted in terms of either teaching or learning, this research provided many opportunities for these two areas to overlap. Instead of just being asked about issues such as teaching and learning in isolation, the participants were asked throughout the study to express their beliefs about these two processes together and in relation to a range of other educational issues.

Although this structural link has not been the major focus of any previous belief research, such a connection has been mentioned in peripheral or incidental ways thus far (Åkerlind, 2004; Kember & Wong, 2000; Prosser & Trigwell, 1997; Trigwell & Prosser, 1996; Trigwell et al., 1994). Like Koschmann's work (1999), this study is based on the view that

learning is an intricate part of the educational context: "it effects a shift from viewing learning as a discrete achievement or event to a more dynamic and process-based account" (p. 3). This theoretical framework ensured that the processes of teaching and learning were viewed concurrently, a theme that is becoming more prevalent in the belief literature: "Teaching and learning are seamless activities that occur in the streams of human experience and interaction … The events we would call 'teaching' and 'learning' do not have neat boundaries around them" (Ball & Lampert, 1999, p. 381).

As such, the research design of this study and the theoretical framework upon which the study was based both contributed to providing a context for such an outcome to be generated and recognised. The finding also confirms the findings of some previous researchers who have suggested some similarities between the concepts of teaching and learning (Åkerlind, 2004; Kember & Wong, 2000; Prosser & Trigwell, 1997; Trigwell & Prosser, 1996; Trigwell et al., 1994) and supports the recommendations from other researchers who have called for more research to confirm the existence of such similarities (Bruce & Gerber, 1995).

Implications for Teaching and Learning in Higher Education

From the discussion of the findings that have contributed answers to the two major research questions, as well as an account of some other research outcomes, a number of implications for university teaching and learning have been identified.

Belief transparency: Since this study has shown that some university students' educational beliefs are just as diverse and complex as their teachers' educational beliefs, university teachers may find that teacher-student relationships improve when practices which encourage each group to make their educational beliefs transparent are implemented. Such results indicate that university teachers should not assume that their students hold naïve or less sophisticated educational or epistemological beliefs than their own. Practices, such as reflection, which allow for the recognition of both teachers' and students' educational and epistemological

beliefs within the same context, may reveal and emphasise the similarities, rather than the differences, between the two groups' beliefs.

Assessment design: The beliefs expressed by the participants in this study that were directly related to assessment issues were typically quite similar. Other issues that were indirectly related to assessment design and completion, such as epistemological beliefs and beliefs about learning activities, were also shown to be very similar. Despite being perceived as an area that is typified by differences in opinion between teachers and students, discussion of assessment issues (including the purpose of assessment, especially in terms of knowledge construction) may alleviate some of the areas of contention that are often associated with setting assignments and examinations in university courses.

Belief idealism: Because the study has found that both university teachers and students hold quite idealistic beliefs about teachers and teaching, compared to their more pragmatic, realistic beliefs about students and learning, educators and students alike may benefit by considering ways in which the unevenly high expectations about university teachers can be balanced with more realistic expectations about university students. This finding also indicates that teachers should understand that students may in fact have more idealistic beliefs about learning than may be obvious in their learning and study practices. Likewise, students should also keep in mind that teachers may hold more idealistic beliefs about teaching than are evident in their teaching practices. Processes which encourage each group to communicate their expectations with each other may encourage both teachers and students to be less absolutist in their judgements about the level of idealism they expect to be enacted by their teachers. Such considerations may prevent or reduce teacher-student conflict based on a mismatch of educational beliefs.

Epistemological issues: Throughout all examples of teacher-student belief similarity analyses, the beliefs that were associated directly or indirectly with beliefs about knowledge or content consistently revealed high degrees of teacher-student beliefs similarity. These degrees of

similarity were especially high when associated with beliefs about complex epistemological issues. Such a finding may suggest that discussions about the complex nature of knowledge associated with particular academic disciplines may be worthwhile to incorporate into university courses of study in order to enhance the quality of learning

Focus on affective and cognitive issues: The beliefs expressed by participants in this study about teachers and the learning context were strongly focused on affective and social issues, whereas their beliefs about students and student development were more focused on cognitive and intellectual issues. These foci suggest that the participants believed that students' emotional well being is a precursor for academic progress. Furthermore, such beliefs may indicate that university teachers and students perceive affective and social dimensions of teaching and learning to be just as significant (and sometimes more so) than cognitive and intellectual dimensions of teaching and learning.

Use of resources: The participants' beliefs about the use and nature of educational resources have implications for both teachers and students in future higher education contexts. Instead of presenting technological resources as extraordinary items within teaching and learning processes, teachers may be well advised to consider using such resources in more incidental, integrated ways. Furthermore, higher education students may well benefit by accepting the use of electronic and technological learning resources and tools as integral components of their university learning experience.

Blurred distinction between teaching and learning processes: Since the participants' beliefs about teachers and students, and teaching and learning, proved to be so similar in nature and structure, the processes as they are enacted in higher education contexts may also become less distinct from one another. Since many of the beliefs expressed by the teachers and the students in the study were student centred, even their beliefs about teachers and teaching, teaching methods at university may become more focused on student learning than the more traditionally

content focused processes. Furthermore, students enrolled in university courses may take on roles, such as peer tutoring or guest lecturing, which allow them to be more involved in activities which have traditionally been associated with the teacher's domain.

Conclusion to this Chapter

This research study generated findings that provided answers to the two main research questions which enabled information about the identification and similarity of the participants' beliefs to be generated. Furthermore, because of the open structure afforded by the methodological design of the study, some unintended outcomes were also identified. These answers, findings and outcomes of the study have been summarised and discussed in this chapter. This chapter has thus provided various examples of evidence, based on viewing the data through a range of frameworks, which indicates that the teachers and students who participated in this study held a range of diverse, complex educational and epistemological beliefs which were very similar to each other's beliefs.

The most significant elements of these discussions and summaries have been extracted from this chapter and are included in the following chapter as the study's major conclusions. These conclusions are presented in conjunction with some of the study's limitations and a selection of areas that were revealed throughout the study as worthwhile directions for future research.

CHAPTER 9

CONCLUSIONS

This chapter concludes the thesis and begins by presenting the major conclusions arising from the study. Following these conclusions, limitations of the study are documented. The chapter closes by suggesting directions for future research.

Major Conclusions

Despite the structured appearance of the following conclusions, the data gathered were typically messy in nature and overlapping in scope. The major conclusions of the study are offered in relation only to the group of university teachers and students who constituted the participants in this study. Transference of these conclusions to similar situations is entrusted to the reader of this thesis. By providing rich description, this generalisation process can be assisted.

Robust Conclusions

The most robust conclusions of the study were those that related to unmistakable levels of similarity in the structure and nature of the educational beliefs expressed by the teachers and students in the study.

Comparable levels of similarity between the teachers' and the students' beliefs were detected throughout these classifications across all of the five classes in the study. Differences were not evident until the analysis delved into the sub-theme categories and such differences were found to be minimal. This analysis leads to the conclusion that the teachers' and students' beliefs about learning and students were even more similar than their beliefs about teaching and teachers. Additionally, I can conclude that the beliefs of both groups were found to be similarly complex and diverse in nature, reflecting more detail and breadth than was originally anticipated.

Distributed throughout many of the participants' educational beliefs were a range of references to the nature and role of knowledge in teaching and learning processes. A further conclusion is that the participants' epistemological beliefs were integrated components of their educational beliefs rather than being especially distinct from their beliefs about teaching, learning, teachers or students.

Thus, rather than being separate from their beliefs about teaching or their beliefs about learning, the participants' educational beliefs clearly incorporated beliefs about teaching, learning *and* knowledge. This entwinement of beliefs about the trinity of teaching, learning and knowledge (Kember, 2001) is an important development in belief research, one that is supported by significant evidence in this study. Whereas much of the literature has examined beliefs about teaching, learning and knowledge separately, this study has provided evidence that they are better seen as a trinity.

As well as being clearly cognisant of epistemological issues, the participants' belief comments also suggested that they were very aware of the social and emotional, as well as the cognitive, aspects of teaching and learning. These levels of awareness were noted in both the teachers' and the students' educational belief comments, and I concluded that the participants in this study were aware of the roles of knowledge, emotions and social interaction within teaching and learning processes.

This research also presents evidence that the participants in this study held some similar educational beliefs to those reported in previous studies, especially those beliefs related to knowledge, teachers' and students' abilities, knowledge and qualities, the role of understanding, learning activities and the importance of recognising difference among students. However, findings from this research also suggest that the group of teachers and students who participated in this study expressed some educational beliefs that have not been consistently reported in previous research. For example, while the participants in this study viewed teaching

and learning from an individualistic perspective, they also believed in communalistic conceptions of both teaching and learning.

Other additional beliefs were also expressed by the participants in this study. Their educational beliefs indicated their thorough understanding of the role of technology as a supplementary influence on teaching and learning processes. They also expressed metabeliefs, beliefs about beliefs, which represents a new area of belief research. This awareness of the beliefs of themselves and others was characterised by their beliefs about metacognition which they notably referred to when expressing their beliefs about effective students and effective teaching and learning processes. Although metacognition is a contemporary educational issue, beliefs about metacognition have not yet been investigated at length. From this evidence, I concluded that some of the beliefs expressed by the participants in this study represent areas that have yet to be fully explored in the literature.

Lastly, the study presents evidence to support the conclusion that the beliefs about teaching expressed by the participants, including both teachers and students, were remarkably parallel to the structure and topic of their beliefs about learning. This lead to that conclusion that both the teachers and the students in the study viewed teaching and learning processes in similar ways, and that they did not see their roles as divided as traditional literature may suggest.

Contradictory Conclusions

An analysis of both the qualitative and quantitative data gathered during the study led to the conclusion that individual participants frequently held opposing beliefs. This contradiction is illustrated in examples where participants sometimes expressed different beliefs about the same issue on different occasions. Belief incongruities may be explained by the influence of context or the developmental nature of beliefs.

Another contradictory conclusion was noted in relation to the participants' espoused (or ideal) and enacted (or working) beliefs. Participants who expressed ideal beliefs about particular topics would, at other times, express more realistic views about the same topic which

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represented modifications of their ideal beliefs. This idea of opposing beliefs or belief anomalies may be related to Nespor's (1987) supposition of the difference between individuals' belief and knowledge systems. Nespor suggested that belief systems are based on episodic storage (p. 320) where a person's episodic experiences are the basis for their belief systems, as opposed to knowledge construction which is often based on semantic networking. Thus, holding opposing beliefs may indicate that beliefs are stored rather than constructed.

Controversial Conclusions

Whereas many previous belief studies present evidence to suggest that individuals' educational beliefs are dependent on either context or an individual's characteristics, the analysis of the participants' beliefs in this study did not reinforce such findings. Instead, the findings from this study led me to conclude that contextual factors such as academic discipline and level of educational study did not impact greatly on the teachers' or students' educational beliefs from these varied groups. However, other contextual influences may have been operational.

As well as placing some doubt upon the role of context in relation to educational beliefs, the findings from this study also led me to conclude that teachers' and students' educational beliefs are not hierarchical in nature. For example, some participants believed that knowledge was both simple and complex. This propensity to express beliefs about an educational issue from a range of hierarchical positions was consistently reflected in both the comments of teachers and students in the study.

Limitations of the Study

Just as the process used to judge this research study as a whole was aligned to relevant criteria for evaluating qualitative research, so too the limitations of the study were considered against these criteria. Because the study documents an investigation into the educational beliefs of five classes of teachers and students within one particular higher education context, the participants involved in the study were perceived as not being generally representative of the population of university teachers and students and,

consequently, the findings may not reasonably be generalised to such a population. Despite taking measures to ensure that the qualitative research processes were as "good" as possible, the following limitations of this study's design and processes have been noted.

Design Issues

Interpretation of Main Terms

The design of this study was based upon particular definitions of well used terms such as teaching, learning, teacher, student and educational belief. Like many issues addressed in educational research, these terms are definable in many ways. So, although these terms were defined in an earlier chapter, some readers may still attach other interpretations of these terms which will no doubt act as filters through which this thesis is interpreted.

Participants' Background Details

Because the research questions were not focused on the participants' background details, such as their cultural background, age, gender, previous levels of education or previous experience as students with their current university teachers, the study's findings were not able to take claims involving such details into account. However, in retrospect, the participants' background details could have been used to provide a more detailed description of their educational histories which may have been useful when considering the impact of context on the participants' educational beliefs.

Size of Compared Groups

The study focused on the beliefs of both university teachers and students, resulting in the over representation of student beliefs compared to that of teachers due to the uneven numbers of teachers and students. This design decision regarding the proportional ratio of each group of participants was determined by the research intention to ground the inquiry in a natural setting that was familiar to both teachers and students in order to collect their beliefs within the same context. Due to this requirement, only one teacher per class of students was involved in the study. The size of the group of teachers in the study may have been expanded if the students

involved all had similar teachers for the other units in which they were enrolled. Because this was not the case, the small group of teachers and the larger group of students was used. These different sized groups were taken into account in the quantitative data analyses through use of non parametric methods.

Length of the Study

This study accessed the beliefs of a group of teachers and students over a one semester period. Future research opportunities may include the exploration and tracking of data which are more longitudinal in nature. In this way, students' and teachers' educational beliefs may be examined from a developmental perspective across a number of units of study, a number of years or an entire course of study. However, it would be difficult to ascertain the effect that particular teachers have on particular students, and vice versa, and the effect on students' achievement levels, if matched groups of students and teachers were not encapsulated in the same study.

Range of Disciplines

Patton (1990) describes various types of errors in qualitative research based on the distortion of sampled situations, time periods and participant selection. These errors or distortions can be mainly overcome if the results of the study are not generalised to a variety of situations that are not applicable to the initial research questions. Since this study did not aim to present findings to be generalised across many different educational contexts, such a distortion in the sampled groups was not so relevant.

However, for future research situations where teachers' and students' educational beliefs are investigated, especially if contextual issues are under focus, the study may benefit either by limiting the range of disciplines to one particular field or educational level, or, on the other hand, by broadening the base of inquiry to incorporate a wider range of disciplines than were accessed for this study. The findings of such studies may indicate if the similarity between the teachers' and students' beliefs found in this study was parallel to comparisons in other similar or related situations.

The one area of commonality that existed among the teachers in the study was their interest in effective teaching and the perception by many of their colleagues and students that they were "good" teachers. For these reasons, the teacher-participants' interests in teaching and learning, in addition to their abilities, may have influenced the findings of this study which was largely focused upon effective teaching and learning.

Process Issues

Links to Practice

Although the participants in this study were encouraged to link their beliefs about teaching and learning to actual teaching and learning events or examples, this did not always occur during the interviews. To further encourage the participants to ground their self-reported beliefs in practice, further studies of this type may benefit by video recording a selection of teaching and learning events that the teachers and students in the study could examine and discuss together. Such examples could then be used as catalysts in interview discussions to link beliefs with authentic practical situations and may provide a common ground for comparing the teacher's educational beliefs with their students' beliefs about issues reflected in the recorded events.

Relationships between Themes

The software used to assist in the analysis of the qualitative data, QSR NUDIST 6.0, easily facilitated the management of large sets of textual data and also had the capacity to recode, re-categorise and rename codes that had been initially assigned to data examples. Despite these affordances, the software did not easily facilitate the systematic detection of the relationships that existed between the participants' belief comments and the coded data. Other software programs such as Zucchini or HyperRESEARCH may have been more suitable to use in this study.

Espoused and Enacted Beliefs

As the study progressed, some of the participants, especially the teachers, tended to qualify their beliefs statements by explaining how their

beliefs were not always enacted due to circumstances. This phenomenon especially became relevant when the participants explained their beliefs in conjunction with practical examples. In this way, some of the participants' beliefs were interpreted as being their espoused or ideal beliefs whereas other beliefs were more indicative of their enacted or working beliefs. In retrospect, the disparity between these two types of beliefs could have become a focus for examination during the gathering of the data. Such a direction may have provided the grounds for investigating the typical circumstances that may cause the teachers or students in the study to modify their espoused beliefs due to contextual circumstances.

Interpretation of Data and Causal Effects

As Berg (1998) suggests, the results of inductive analysis cannot be used to explain causal relationships and the interpretation of the themes that emerge from such analysis "is only appropriate to indicate the magnitude of certain responses; however, it is not appropriate to attach cause to these presentations" (p. 244). With this advice at hand, the findings of the study can only provide evidence of the intensity, variety and nature of the themes that were indicated among the participants' belief statements. For this reason, the study was not able to attribute the source of such beliefs or the cause of their development.

Suggested Directions for Future Research

The conclusions of this study reflect findings relevant to the higher education teachers and students who took part in this study. Nonetheless, further research is required to investigate if similar issues to those noted from this study surface in other contexts where higher education teachers and students teach and learn together. Such research will enable the claims within this thesis to be further investigated, confirmed or questioned. In addition to this general call to further explore the research conclusions presented in this thesis, the following specific suggestions are offered as recommended directions for future research.

Academic Context

Although this research did not intend to study the influence of academic context on the participants' educational beliefs, the data was gathered across a range of disciplines. However, when analysed on the basis of their academic context, the data indicated that there were no great differences between the beliefs held by the participants in the study across the various discipline areas. This finding contradicts much of the literature which points to the fact that academic context does make a difference to individuals' beliefs. Thus, further investigation is required into how academic contexts or disciplinary fields influence the nature of teachers' and learners' beliefs and the development of such beliefs. Such research would ideally be conducted across varied academic contexts and disciplines or, as suggested by Quinlan (1999), within them.

Relationships between Teachers' and Students' Beliefs

The conclusions from this study present evidence to demonstrate the similarity between the educational beliefs held by the teachers and students who participated in this study. In addition to the degree of similarity or difference that exists between the beliefs of these two groups, further investigation is required to determine if other links exist between their beliefs. Areas for future research include: the manner in which teachers and students construe each others' beliefs; the impact of teachers' beliefs on the beliefs of their students (and vice versa); situations where teachers' and students' beliefs are particularly incongruent; and the impact that transparent discussions between teachers and students may have on each group's educational beliefs.

The Impact of Educational Beliefs on Learning Outcomes

Although this study investigated the beliefs and the relationship between the beliefs of teachers and students, the impact of such belief relationships were not correlated with student learning outcomes. However, future research may advance this topic by delving into the causal relationships between degrees of teacher-student belief similarity and learning outcomes as reported in students' academic records. While such

records tend to report on students' cognitive achievements, the conclusions from this study also point towards the significance of the social and emotional aspects and outcomes of teaching and learning. With this in mind, future research studies into the impact of educational beliefs on students' learning outcomes may consider the use of methods that allow for the analysis of students' social and emotional learning outcomes, in addition to their cognitive learning outcomes. Such methods may include the use self-reported data provided by students about their own perceptions of their learning via quantitative or qualitative self evaluation processes.

The Nature of Educational Beliefs

The findings from this study suggest that more research is required into the nature of the educational beliefs of higher education teachers and students, especially in relation to their intensity, their hierarchical nature and their embedded contradictions.

Although the findings of this study present a list of the beliefs held by a certain group of participants, the intensity associated with each of these beliefs has only been partially investigated and documented. Even so, incidental records that were kept during the duration of the study suggest that the participants expressed their beliefs with varying degrees of intensity.

Strong levels of intensity may be associated with the participants' dominant beliefs whereas the beliefs expressed with lesser degrees of intensity may signify that such beliefs are incidental rather than fundamental. These dominant and incidental beliefs may be similar to what Kaplan (1991) termed deep or surface beliefs and Greene's (1971) description of primary and periphery beliefs. Furthermore, the co-existence of dominant and incidental beliefs may provide some explanation into the phenomenon of contradictory beliefs that were reported in association with the belief systems of some of the participants in this study.

Lastly, in terms of the nature of educational beliefs held by teachers and students within universities, more research is recommended to ascertain whether or not the educational beliefs held by other groups of

higher education teachers and students represent hierarchical structures. Additional research into this area with groups of teachers and students may reveal whether or not educational beliefs are constructed gradually or formed arbitrarily.

Change and Development of Educational Beliefs

The manner in which teachers' and students' educational beliefs change, develop over a period of time or are influenced by others' beliefs represent additional areas that are recommended for future research. Although no strong evidence of belief change was detected within the confines of this study, a longitudinal study which investigates belief development over a longer period of time may reveal new information about how teachers' and students' beliefs change. Alternatively, a study with some form of intervention may provide a baseline for evaluating and identifying belief change as a result of a particular catalyst. Such studies may also further our understanding about how beliefs are influenced by contextual factors such as academic discipline, personal commitment, interaction with other students and teachers, and the level of education (that is, undergraduate or postgraduate).

Shared Context

Rather than suggesting a particular topic to investigate further, the final, and probably the most crucial of all of the future research recommendations offered within this thesis, is associated with research method. Based on the main findings of this study, as well as being informed by the noticeable gaps evident in the literature of belief studies to date, future researchers into educational beliefs are recommended to continue exploring the beliefs of both teachers and students *within the same context*. An investigation into the beliefs of one group without attending to the beliefs of the other may reduce the richness and authenticity of the data gathered or may over represent the beliefs of one group at the expense of the other. By adopting such a methodology founded on the concurrent investigation of both teachers' and students' beliefs, the contribution of both

groups to our understanding of the process of education may be acknowledged.

Conclusion to the Study

This study has presented evidence to enable the identification and comparison of the educational beliefs held by a selection of university teachers and students. In conclusion, this synergistic relationship between the beliefs of the teachers and the beliefs of the students may be more significant, and may have more impact on the quality of university education, than the beliefs held by only one of these groups; that is, the combined beliefs of both groups represent more than the sum of their parts:

> Well, if you have a teacher who cares about what they're teaching and cares about actually imparting the knowledge to a student (they're not here because they're being paid, they're here to actually impart the knowledge) and a student who wants to get the knowledge, then, obviously if those two come together, it's the best possible scenario. If you had a teacher that really didn't care and a student that really didn't care, you wouldn't get very far.
> (Kent, Class 4 Student)

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LIST OF APPENDICES

Appendix One: Interview Questions

First Interview Questions

Can you tell me why you became a teacher? How did you come to be enrolled as a student in this course?

Ideally, how would you like to teach or learn?

What is your view of effective teaching and/or effective learning?

How would you describe the qualities of a good teacher or a good learner?

How would you describe yourself as a teacher and/or as a learner?

What sort of things do you focus on when you are learning or teaching something new?

If your students were watching you teach, what do you think they would pick up about your teaching beliefs? How would they describe you as a teacher?

If your teacher was watching you learn, what do you think they would pick up about your learning beliefs? How would they describe you as a learner?

How do you believe students learn best?

What would be the three things you would expect from ideal learners? What do you expect from ideal teachers?

Can you give an example of when teachers should intervene to assist with student learning?

How do you believe learning takes place? What is learning?

What is happening during the process of teaching?

What's the difference, in your mind, between teaching and learning? Is there a difference? Is it a large or small difference?

Can you provide an example where your ideas about teaching or learning were compromised by a teacher or student at university?

What would be your strongest belief about the teaching or learning process?

Can you describe the way you teach or learn in this unit?

How much guidance do you think students need to complete their university assignments?

How important do you think it is for teachers and students to work together to achieve learning results?

Second Interview Questions

How has this process (this research study) affected your beliefs about teaching and learning? Has it made you more aware of yourself as a teacher/as a learner?

Has anything happened since our last interview that changed your ideas about teaching and learning? Has anything happened since our last interview that changed your ideas about yourself as a learner/ teacher?

Can you describe an activity during the semester where you felt like you were really learning/teaching something well? What was it about this activity that led to this feeling?

What knowledge have you learned about or taught this semester?

What are the most important aspects of teaching university students? What are the most important aspects of learning at university?

What does your teacher/your students think about teaching/learning?

Have your students/ your teacher taught you anything about teaching and learning this semester?

What have you found out about your teacher's (or your students') beliefs about teaching and learning?

Can you think of an example when your ideas about teaching or learning have been similar to your teacher's (or your students')? What was the result? Did it matter?

Can you think of an example when your ideas about teaching or learning didn't match your teacher's (or your students')? What was the result? Did it matter?

How has using computer or communications technology affected your learning or teaching this semester?

How have the assessment processes in this unit enhanced your learning or your students' learning this semester?

Third Interview Questions

For you, this semester, what were the important aspects of your teaching or your learning?

For you, this semester, what were the important aspects of your lecturer's teaching?

What did you do this semester to assist your students' learning or your own learning?

From what you could observe this semester, what did the students do to assist their learning? How did this affect your teaching?

What did your lecturer do this semester to assist your learning?

What assists you to learn?

Did the students in this unit do anything this semester that limited their learning?

What do you think about the use of technology (online and offline) in university teaching and learning?

Now that we are at the end of the semester, can you describe how you teach, or how your teacher teaches? How do students learn?

Do you have the sense that any of your beliefs have changed over this semester? Can you tell me if things have changed? Do you have any new beliefs?

How do you view yourself as a teacher? How do you view yourself as a learner?

Are you interested to know what your teacher or your students think about teaching and learning?

Did you find out more about your teacher's or your students' ideas about teaching and learning as the semester progressed?

What are your strongest beliefs about teaching (or teachers) at university? What are your strongest beliefs about learning (or learners) at university?

Appendix Two: Educational Belief Inventory (EBI)

Identifying label or your name:	Unit code:
What is the main subject you study or teach?	
Are you completing this questionnaire as a student or a teacher?	

I believe effective teaching is

I believe effective learning is

Please tell me how you feel about the following statements.

	I believe …	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
1	the content chosen for courses should be based mostly on student and teacher interests.					
2	that university teachers should act as resource persons by giving and sharing information.					
3	teaching is concerned with supporting student learning.					
4	teaching is an activity aimed at changing students' understanding of the world.					
5	teaching is concerned with increasing students' understanding of a topic.					
6	learning is about developing concepts.					
7	learning is about understanding.					
8	learning is about applying principles.					
9	learning is seeing something in a different way.					
10	learning is about problem solving.					
11	learning is about developing knowledge of myself.					
12	learning is about developing knowledge of others.					
13	when you learn something, this enables you to help others.					
14	that university students learn by participating.					
15	that university students learn better in groups than when they work alone.					
16	learning is about increasing my own knowledge.					

	I believe …	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
17	learning is only about memorising facts.					
18	learning is about me developing as a person.					
19	the knowledge of how to study is usually learned as we grow older.					
20	that everyone needs to learn how to learn.					
21	that it takes a long time to learn something well.					
22	that truth is unchanging.					
23	that thinking about what a reading says is more important that memorising what a reading says.					
24	university teachers should be concerned about student learning.					
25	effective university teachers have an understanding of how social problems affect students in their class.					
26	that effective university teachers understand how they, themselves, learned the subject they are teaching.					
27	that an effective university teacher reflects on how they teach.					
28	that effective university teachers guide their students in the process of learning.					
29	effective university teachers incorporate feedback from their students into their teaching.					
30	effective university teachers are able to motivate their students.					
31	effective university teachers find out about the way their students like to learn, and teach accordingly.					
32	that university students learn better when their teachers have similar ideas about learning and teaching to their students.					
33	achieving success in learning can influence a university student's feeling of self worth.					
34	an expert is usually someone who was born to be an expert.					
35	effective university students inform their teachers when they experience difficulties in learning.					
36	the way a university student learns is affected by the way they are taught.					
37	that effective university students don't usually have to work as hard as other students in their course.					
38	that effective university students understand things quickly.					
39	that effective university students aim to get the big ideas from a reading rather than just the details.					
40	that effective university students seek links between different activities, ideas and subjects.					
41	that effective university students ask inquisitive questions.					
42	that effective university students try to connect their course work with their everyday life.					
43	that effective university students check their own understanding.					
44	that effective university students challenge what they read.					

Appendix Three: Source of Educational Belief Inventory (EBI) Items

Appreciation and thanks goes to the following authors who granted permission for me to use of a selection of items from their research instruments: Marlene Schommer, David Kember, Michael Prosser, Chad Ellett, Suzanne Young, Katharyn Nottis, Abe Feuerstein, Joseph Murray and Don Adams.

	I believe …	Source of Item
1	the content chosen for courses should be based mostly on student and teacher interests.	Nottis et al. (2000): Teacher Belief Inventory
2	that university teachers should act as resource persons by giving and sharing information.	Gow and Kember (1993), Kember and Gow (1994): Teaching Orientation Questionnaire, Lecturer's Conceptions of Teaching and Learning
3	teaching is concerned with supporting student learning.	Gow and Kember (1993), Kember and Gow (1994): Teaching Orientation Questionnaire, Lecturer's Conceptions of Teaching and Learning Constructed item to reflect issues reported in Samuelowicz & Bain (1992, 2001)
4	teaching is an activity aimed at changing students' understanding of the world.	Constructed item to reflect issues reported in Samuelowicz & Bain (1992, 2001)
5	teaching is concerned with increasing students' understanding of a topic.	Constructed item to reflect issues reported in Samuelowicz & Bain (1992, 2001)
6	learning is about developing concepts.	Evans et al. (1993): Student Assessment of Teaching and Learning (SATL)
7	learning is about understanding.	Evans et al. (1993): Student Assessment of Teaching and Learning (SATL) Constructed item to reflect issues reported in Samuelowicz & Bain (1992, 2001) Constructed item to reflect issues reported in Marton, Dall'Alba and Beaty (1993)
8	learning is about applying principles.	Evans et al. (1993): Student Assessment of Teaching and Learning (SATL) Constructed item to reflect issues reported in Marton, Dall'Alba and Beaty (1993)
9	learning is seeing something in a different way.	Constructed item to reflect issues reported in Marton, Dall'Alba and Beaty (1993)
10	learning is about problem solving.	Evans et al. (1993): Student Assessment of Teaching and Learning (SATL)
11	learning is about developing knowledge of myself.	Evans et al. (1993): Student Assessment of Teaching and Learning (SATL)
12	learning is about developing knowledge of others.	Evans et al. (1993): Student Assessment of Teaching and Learning (SATL)
13	when you learn something, this enables you to help others.	Cliff (1998): Inventory of Conceptions of Learning, Reflections on Learning Inventory (RoLI)
14	that university students learn by participating.	Gow and Kember (1993), Kember and Gow (1994): Teaching Orientation Questionnaire, Lecturer's Conceptions of Teaching and Learning
15	that university students learn better in groups than when they work alone.	Constructed for this EBI to reflect current issues in the belief literature
16	learning is about increasing my own knowledge.	Constructed item to reflect issues reported in Marton, Dall'Alba and Beaty (1993)
17	learning is only about memorising facts.	Constructed item to reflect issues reported in Marton, Dall'Alba and Beaty (1993)
18	learning is about me developing as a person.	Constructed item to reflect issues reported in Marton, Dall'Alba and Beaty (1993)
19	the knowledge of how to study is usually learned as we grow older.	Schommer (1990), Schommer-Aikens et al. (2000): Schommer Epistemological Questionnaire
20	that everyone needs to learn how to learn.	Schommer (1990), Schommer-Aikens et al. (2000): Schommer Epistemological Questionnaire

	I believe …	Source of Item
21	that it takes a long time to learn something well.	Schommer (1990), Schommer-Aikens et al. (2000): Schommer Epistemological Questionnaire
22	that truth is unchanging.	Schommer (1990), Schommer-Aikens et al. (2000): Schommer Epistemological Questionnaire
23	that thinking about what a reading says is more important that memorising what a reading says.	Schommer (1990), Schommer-Aikens et al. (2000): Schommer Epistemological Questionnaire
24	university teachers should be concerned about student learning.	Young and Shaw (1999): questionnaire which asked students to evaluate their lecturers in terms of effective teaching
25	effective university teachers have an understanding of how social problems affect students in their class.	Nottis et al. (2000): Teacher Belief Inventory Gow and Kember (1993), Kember and Gow (1994): Teaching Orientation Questionnaire, Lecturer's Conceptions of Teaching and Learning
26	that effective university teachers understand how they, themselves, learned the subject they are teaching.	Brousseau et al. (1988): Educational Belief Inventory
27	that an effective university teacher reflects on how they teach.	Brousseau et al. (1988): Educational Belief Inventory
28	that effective university teachers guide their students in the process of learning.	Gow and Kember (1993), Kember and Gow (1994): Teaching Orientation Questionnaire, Lecturer's Conceptions of Teaching and Learning
29	effective university teachers incorporate feedback from their students into their teaching.	(Prosser & Trigwell, 1997) Modified from Prosser, 1997: Made up by MN
30	effective university teachers are able to motivate their students.	Gow and Kember (1993), Kember and Gow (1994): Teaching Orientation Questionnaire, Lecturer's Conceptions of Teaching and Learning
31	effective university teachers find out about the way their students like to learn, and teach accordingly.	Constructed for this EBI to reflect current issues in the belief literature
32	that university students learn better when their teachers have similar ideas about learning and teaching to their students.	Constructed for this EBI to reflect current issues in the belief literature
33	achieving success in learning can influence a university student's feeling of self worth.	Constructed for this EBI to reflect current issues in the belief literature
34	an expert is usually someone who was born to be an expert.	Schommer (1990), Schommer-Aikens et al. (2000): Schommer Epistemological Questionnaire
35	effective university students inform their teachers when they experience difficulties in learning.	Constructed for this EBI to reflect current issues in the belief literature
36	the way a university student learns is affected by the way they are taught.	Constructed for this EBI to reflect current issues in the belief literature
37	that effective university students don't usually have to work as hard as other students in their course.	Schommer (1990), Schommer-Aikens et al. (2000): Schommer Epistemological Questionnaire
38	that effective university students understand things quickly.	Schommer (1990), Schommer-Aikens et al. (2000): Schommer Epistemological Questionnaire
39	that effective university students aim to get the big ideas from a reading rather than just the details.	Schommer (1990), Schommer-Aikens et al. (2000): Schommer Epistemological Questionnaire
40	that effective university students seek links between different activities, ideas and subjects.	Constructed for this EBI to reflect current issues in the belief literature
41	that effective university students ask inquisitive questions.	Gow and Kember (1993), Kember and Gow (1994): Teaching Orientation Questionnaire, Lecturer's Conceptions of Teaching and Learning
42	that effective university students try to connect their course work with their everyday life.	Gow and Kember (1993), Kember and Gow (1994): Teaching Orientation Questionnaire, Lecturer's Conceptions of Teaching and Learning
43	that effective university students check their own understanding.	Constructed for this EBI to reflect current issues in the belief literature
44	that effective university students challenge what they read.	Schommer (1990), Schommer-Aikens et al. (2000): Schommer Epistemological Questionnaire

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Appendix Four: Thematic Structure

Themes, Sub-themes and Sub-theme Categories that Emerged from an Analysis of the Qualitative Data

Theme	Sub-Theme	Sub-Theme Category	Nature of Belief	Belief about Teachers and Teaching	Belief about Students and Learning
1 Beliefs about teachers and students	1.1 Beliefs about teachers' and students' knowledge	1.1.1: Beliefs about teachers' and students' subject knowledge	Source of subject knowledge	Teachers should be the source of subject knowledge.	Students gain subject knowledge from the course, teacher and other students.
			Currency of subject knowledge	Teachers' subject knowledge should be current.	Students' subject knowledge should be current.
			Existing and developing depths of subject knowledge	Teachers continue to learn about their subject.	Students already possess some subject knowledge.
		1.1.2: Beliefs about teachers' and students' self knowledge	Personal knowledge	Teachers should know themselves.	Students should be aware of themselves as learners.
			Reflection on own learning	Teachers should reflect on their own learning.	Students should reflect on their own learning.
			Reflection on teaching	Teachers should reflect on their own teaching.	Students should reflect on how they are taught.
		1.1.3: Beliefs about teachers' pedagogical knowledge	Differences between students	Teachers know that all learners are different.	-
			Students are multi-faceted	Teachers know how to treat students holistically.	-
			Role of mistakes and misunderstandings	Teachers know that learning involves making mistakes and rectifying misunderstandings.	-
	1.2: Beliefs about teachers' and students' innate characteristics	1.2.1: Beliefs about teachers' and students' likes, dislikes and attitudes towards students, teachers and learning	Positive attitude to teaching or learning and the subject	Teachers should enjoy, be enthusiastic about and be committed to teaching.	Students should enjoy, be motivated about, committed to and involved in learning.
			Positive attitude to students or teachers	Effective teachers are interested in students and treat them with respect.	Students learn best when they like and respect their teacher.
			Acknowledgement of difficulties in teaching or learning	Teaching is challenging.	Learning is challenging.
		1.2.2: Beliefs about teachers' and students' personality traits	Natural qualities	Effective teachers are born teachers.	Some students are born good learners.
			Cognitive personality traits	Teachers should be open-minded and intelligent.	Students should be creative, open-minded and have common sense.
			Emotional personality traits	Teachers should be empathetic, personable, approachable, modest, patient and calm.	-
			Self-confidence	Teachers should be confident.	Students should be confident.

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Themes, Sub-themes and Sub-theme Categories that Emerged from an Analysis of the Qualitative Data

Theme	Sub-Theme	Sub-Theme Category	Nature of Belief	Belief about Teachers and Teaching	Belief about Students and Learning
			Evidence of personality	Teachers should let their personality be evident in their teaching.	-
		1.2.3: Beliefs about teachers' and students' beliefs	Possession of beliefs	Teachers have beliefs and these are sometimes different from other teachers.	Students have beliefs.
			Instability of beliefs	Teachers' beliefs change.	Students' beliefs change.
			Stability of beliefs	Teachers' beliefs don't change.	Students' beliefs don't change.
	1.3: Beliefs about teachers' and students' learnt abilities	1.3.1: Beliefs about teachers' and students' abilities to use various teaching/ learning strategies	Possession of strategies	-	Students should possess learning strategies.
			Adaptability of different strategies	Effective teachers adapt their teaching strategies to suit different learners and learning situations.	Students use various learning strategies.
			Naturally held strategies	-	Some students have natural learning strategies.
			Strategies which identify the teachable moment.	Effective teachers' awareness of the learning environment enables them to determine the teachable moment.	-
			Clear teaching strategies	Effective teachers' teaching strategies are clear and rational.	-
			Use of self-motivating strategies	Teachers use teaching strategies which motivate them as teachers.	-
		1.3.2: Beliefs about teachers' and students' abilities to deal with students	Dealing with differences among students	Teachers should be able to deal with various students' needs.	-
			Communication with students	Teachers should be able to communicate with groups of students and individual students.	Effective students communicate with other students.
			Assisting students	Teachers should be available to assist students.	Learners assist and encourage each other to learn, especially by forming their own study groups.
			Managing student behaviour	Teachers should be able to manage students' behaviour.	-
		1.3.3: Beliefs about teachers' and students' abilities to act as independent professionals/ learners	Professionalism, formal accreditation	Teachers should be professional and qualified.	-
			Responsibility for own teaching or learning	Effective teachers reflect on and incorporate feedback from others in order to improve their teaching.	Effective learners are responsible for their own learning.
			Organisation	Effective teachers are organised and prepared.	Effective learners are organised.

Themes, Sub-themes and Sub-theme Categories that Emerged from an Analysis of the Qualitative Data

Theme	Sub-Theme	Sub-Theme Category	Nature of Belief	Belief about Teachers and Teaching	Belief about Students and Learning
			Technological skills	Effective teachers have appropriate technological skills.	-
			Interacting with colleagues	Being an effective teacher involves interacting with your colleagues.	-
		1.3.4: Beliefs about teachers' abilities to abilities to present material	Presentation style	Effective teachers are skilled, entertaining, timely and appropriate presenters.	-
			Use of presentation resources	Effective teachers use appropriate presentation resources.	-
		1.3.5: Beliefs about students' abilities to abilities to think metacognitively	Awareness of self as learner	-	Effective students are aware of their own qualities as a learner.
			Reflection	-	Effective students reflect on their own learning, and how they are taught.
2 Beliefs about the teaching and learning processes	2.1 Institution focused beliefs about the processes of teaching and learning	[No sub-theme categories]	Course requirements and time constraints	Teaching involves balancing course requirements and workload within institutional time constraints.	Learning involves getting through course material within time limits.
			Institutional rules and policies	Teaching involves adhering to institutional rules and policies.	-
			Course design and organisation	Teaching is influenced by course design and organisation.	-
	2.2 Knowledge focused beliefs about the processes of teaching and learning	2.2.1: Beliefs about teaching as the process of providing knowledge, and learning is the process of receiving knowledge	Provision of and receiving information	Teaching involves providing students with information.	Learning involves receiving information and gaining knowledge.
			Explanation of information	Teaching involves explaining information to students.	-
			Provision of and observing examples	Teaching involves providing students with examples.	Learning involves observing demonstrations of examples.
			Retaining information	-	Learning involves remembering information.
		2.2.2: Beliefs about teaching as the process of facilitating the construction of knowledge, and learning is the process of constructing knowledge	Structuring information and building upon existing knowledge	Teaching involves structuring knowledge for students.	Learning involves building upon students' current knowledge.
			Selecting and working with information	Teaching involves providing students with choice, while facilitating knowledge construction.	Learning involves working with and selecting knowledge.
			New knowledge	-	Learning involves creating knowledge.

Themes, Sub-themes and Sub-theme Categories that Emerged from an Analysis of the Qualitative Data

Theme	Sub-Theme	Sub-Theme Category	Nature of Belief	Belief about Teachers and Teaching	Belief about Students and Learning
	2.3 Resource focused beliefs about the processes of teaching and learning	[No sub-theme categories]	Provision/Use of resources for learning	Teaching involves providing students with resources for learning (texts, other material, teacher as resource, computerised resources).	Students use and interact with resources in the learning process (texts, other material, teacher as resource, other students, experts, computerised resources).
			Using teaching resources	Teaching involves using communication and presentation resources for teaching.	-
			Students create resources	-	Students create documents, notes, electronic files and resources in the learning process.
	2.4: Context focused beliefs about the processes of teaching and learning	2.4.1: Beliefs about the affective and social aspects of teaching and learning environments	Positive attitudes/ Acknowledgement of affective and social influences	Teaching involves modelling positive attitudes.	Learning is influenced by students' emotions, feelings, likes and dislikes.
			Negative influences on the learning environment	-	Learning is influenced by students' learning experiences which can be negative.
			Positive learning environment/ Positive influences on the learning environment	Teaching involves creating a positive learning environment.	Learning is influenced by students' learning experiences which can be positive.
			Positive relationship environment	Teaching involves creating positive relationships with students.	Learning is influenced by students' relationships with the teacher and other students.
		2.4.2: Beliefs about the academic aspects of teaching and learning environments	Provision of academic challenge/ Meeting academic challenge	Teaching involves providing students with an appropriate level of academic challenge and workload.	Learning involves dealing with academic challenge and workload issues.
			Dealing with difficulties	-	Learning involves dealing with difficulties and rectifying mistakes and misunderstandings.
		2.4.3: Beliefs about the behaviour management aspects of teaching and learning environments	Student misbehaviour	Teaching involves managing students' behaviour.	Disruptive, unmotivated students negatively influence the learning environment.
			Preventative classroom management	Teaching involves implementing preventative management strategies.	-

Themes, Sub-themes and Sub-theme Categories that Emerged from an Analysis of the Qualitative Data

Theme	Sub-Theme	Sub-Theme Category	Nature of Belief	Belief about Teachers and Teaching	Belief about Students and Learning
		2.4.4: Beliefs about the physical aspects of teaching and learning environments	Physical space	Teaching involves being aware of and structuring the physical learning environment.	-
	2.5 Activity focused beliefs about the processes of teaching and learning	2.5.1: Beliefs about completing task-focused activities in teaching and learning	Active learning	Teaching involves designing activities that encourage students to actively complete tasks (including online, individual, open-ended, structured and problem solving activities).	Learning involves students actively completing tasks (including online, repetitive, and example-based activities).
			Hands-on, practical activities	Teaching involves facilitating tasks that are specifically hands-on and practical activities.	Learning involves completing activities that are specifically hands-on and practical activities.
		2.5.2: Beliefs about assessment activities in teaching and learning	Provision of and contribution to assessment tasks	Teaching involves providing appropriate assessment tasks.	Learning involves completing assessment tasks.
			Provision of and learning from feedback	Teaching involves providing feedback about assessment tasks.	Learning involves receiving feedback about assessment tasks.
			Assessment for evaluation of learning	Teaching involves using assessment to evaluate learning and to provide teaching direction.	-
			Examinations are negative	-	Examinations are not a good measure of learning.
		2.5.3: Beliefs about interactive activities in teaching and learning	Interaction between students	Teaching involves the facilitation of interaction between students to encourage learning.	Learning involves interaction between students.
			Students assist each other to learn	Teaching involves the facilitation of interaction between students to encourage students to assist each other to learn.	Learning involves students assisting each other to learn.
			Interaction between teacher and student	Teaching involves the facilitation of student-teacher interaction.	Learning involves student-teacher interaction.
		2.5.4: Beliefs about questions in teaching and learning	Responding to and asking questions	Teaching involves responding to students' questions.	Learning involves students asking questions.
			Encouraging and answering questions	Teaching involves asking and encouraging students to ask questions.	Learning involves students answering questions.
	2.6 Student development focused beliefs about the processes of	2.6.1: Beliefs about students' academic development in teaching and learning	Extending students' knowledge	Teaching involves extending each student's knowledge.	Learning involves each student extending their knowledge.
			Understanding	Teaching involves extending each student's level of understanding.	Learning involves each student developing their level of understanding.

Themes, Sub-themes and Sub-theme Categories that Emerged from an Analysis of the Qualitative Data

Theme	Sub-Theme	Sub-Theme Category	Nature of Belief	Belief about Teachers and Teaching	Belief about Students and Learning
	teaching and learning		Development of thinking skills and intelligence	Teaching involves enabling each student to develop academically and to think critically.	Learning involves each student developing their intelligence.
		2.6.2: Beliefs about students' metacognitive development in teaching and learning	Learning responsibility	Teaching involves encouraging each student to be responsible for their own learning.	-
			Learning awareness and reflection	Teaching involves encouraging each student to be aware of, monitor and reflect on their own learning.	Learning involves each student developing their abilities to be aware of, monitor and reflect on their own learning.
		2.6.3: Beliefs about students' skill development in teaching and learning	Learning skills and IT skills	Teaching involves encouraging each student to develop their general learning and IT skills.	Learning involves each student developing their general learning and IT skills.
			Professional skills	Teaching involves encouraging each student to develop professionally.	Learning involves each student developing professionally.
		2.6.4: Beliefs about students' personal development in teaching and learning	Development of personal values and attitudes	Teaching involves facilitating each student's development of personal values and attitudes.	Learning involves each student developing personal values and attitudes.
			Development of views	Teaching involves facilitating each student to develop or change their point of view.	Learning involves growth and change for each student.
		2.6.5: Beliefs about students developing at their own rate in teaching and learning	Individual rates of progress	Teaching involves allowing each student to progress at their own rate.	Learning involves each student progressing at their own rate.
			Independence	Teaching involves encouraging each student to be an independent learner who can make their own learning choices.	Learning involves each student developing their abilities to become an independent learner.
	2.7 Effort focused beliefs about the process and learning	2.7.1: Beliefs about learning as a process that involves low levels of effort	Simplicity of learning	-	Learning is easy and simple, and requires a low level of effort.
			Automaticity of learning	-	Learning is almost automatic and involves a low level of effort.
		2.7.2: Beliefs about learning as a process that involves high levels of effort	Difficulty of learning	-	Learning is difficult and challenging.
			Complexity of learning	-	Learning involves students in a complex process that involves a high level of effort.
			Time needed for learning	-	Learning is time-consuming
3: Beliefs about content	3.1: Beliefs about content taught	[No sub-theme categories]	Completeness of content	Content taught should be complete and fully detailed.	Content learnt should be complete and fully detailed.

Themes, Sub-themes and Sub-theme Categories that Emerged from an Analysis of the Qualitative Data

Theme	Sub-Theme	Sub-Theme Category	Nature of Belief	Belief about Teachers and Teaching	Belief about Students and Learning
being taught and learnt	and learnt as being simple, limited and unchanging		Accuracy of content	Content taught should be accurate.	-
			Memorisation of content	-	Content can be memorised.
	3.2: Beliefs about content taught and learnt as being complex, linked and changeable	[No sub-theme categories]	Complexity of content	Content taught is complex and authentic.	Content learnt is complex and authentic.
			Linked concepts of content	Content taught is made up of linked concepts.	Content learnt is made up of linked concepts.
			Changing nature of content	Content taught is continually changing, extending and improving.	Content learnt is continually changing, extending and improving.
	3.3: Descriptive comments about content taught and learnt	These comments are not included in this sub-theme	-	-	-
4: Beliefs about the purposes of teaching and learning	4.1: Beliefs about the short-term purposes of teaching and learning	[No sub-theme categories]	Students' academic progress	Teaching involves encouraging and expecting students to do well.	Learning involves students doing well academically at university.
			Course completion by students	Teaching involves enabling students to complete course requirements.	Learning involves students completing course requirements and gaining qualifications.
	4.2: Beliefs about the long term purposes of teaching and learning	[No sub-theme categories]	Employment and professional life	Teaching involves providing students with employment-related, professional skills and abilities.	Learning involves developing employment-related professional skills and abilities.
			Everyday life	Teaching involves providing students with skills and abilities to use and apply in the community, society and everyday life.	Learning involves developing skills and abilities to use and apply in the community, society and everyday life.
			Life-long learning	-	The purpose of learning is to continue learning.

Theme 1: Beliefs about Teachers and Students

Sub-Theme 1.1: Beliefs about Teachers' and Students' Knowledge

Fourteen of the EBI items (Items 2, 4, 5, 11, 16, 18, 19, 26, 27, 34, 38, 39, 40 and 43) were aligned with this sub-theme. Participants agreed with 11 of these items, disagreed with one of them and neither agreed nor disagreed with another two of these items.

Agreement with sub-theme 1.1 items.

An analysis of the mean scores of the participants' responses to the EBI items indicated that they agreed with the 11 items listed in Table 96.

Table 96
Mean Agreement Responses to Sub-Theme 1.1 EBI Items (n=80)

Item No.	I believe …	Mean	S.D.*
2	that university teachers should act as resource persons by giving and sharing information.	4.44	.52
5	teaching is concerned with increasing students' understanding of a topic.	4.46	.53
11	learning is about developing knowledge of myself.	4.11	.71
16	learning is about increasing my own knowledge.	4.37	.49
18	learning is about me developing as a person.	4.16	.67
19	the knowledge of how to study is usually learned as we grow older.	3.63	.83
26	that effective university teachers understand how they, themselves, learned the subject they are teaching.	4.13	.68
27	that an effective university teacher reflects on how they teach.	4.47	.62
39	that effective university students aim to get the big ideas from a reading rather than just the details.	3.68	.79
40	that effective university students seek links between different activities, ideas and subjects.	4.05	.63

Table 96
Mean Agreement Responses to Sub-Theme 1.1 EBI Items (n=80)

Item No.	I believe …	Mean	S.D.*
43	that effective university students check their own understanding.	4.15	.62

*S.D. = Standard deviation

These items represent the beliefs with which the participants in the study generally agreed, some of which aligned directly with the beliefs which emerged from an analysis of the qualitative data. A selection of these aligned items and beliefs are cited in Table 97.

Table 97
Comparison of EBI Items and Beliefs Coded in Sub-Theme 1.1

EBI No.	EBI Item: Belief Statement	Belief Emerged from Coding
5	I believe teaching is concerned with increasing students' understanding of a topic.	Students gain subject knowledge from the course, teacher and other students.
11	I believe learning is about developing knowledge of myself.	Students should be aware of themselves as learners.
27	I believe that an effective university teacher reflects on how they teach.	Teachers should reflect on their own teaching.

Disagreement with sub-theme 1.1 items.

An analysis of the mean scores of the participants' responses to the EBI items indicated that they disagreed with the item in Table 98.

Table 98
Mean Disagreement Responses to Sub-Theme 1.1 EBI Items (n=80)

Item No.	I believe …	Mean	S.D.
34	an expert is usually someone who was born to be an expert.	1.81	.78

This item represents a belief with which the participants in the study generally disagreed. From the qualitative data, there was no evidence that the participants expressed the belief that an expert is usually someone who is born to be an expert.

Neutrality about sub-theme 1.1 items.

An analysis of the mean scores of the participants' responses to the EBI items indicated that they neither agreed nor disagreed with the two items outlined in Table 99.

Table 99
Mean Neutral Responses to Sub-Theme 1.1 EBI Items (n=80)

Item No.	I believe …	Mean	S.D.
4	teaching is an activity aimed at changing students' understanding of the world.	3.40	.98
38	that effective university students understand things quickly.	2.74	.99

These items represent two of the beliefs with which the participants in the study neither agreed nor disagreed. From an examination of the belief statements offered by the participants during their interviews, there is evidence that some of the participants held a similar belief to that represented by EBI item number 4: I believe teaching is an activity aimed at changing students' understanding of the world. All of the five teachers and six out of the 11 interviewed students in the study expressed the belief that teaching involves facilitating the development of students' viewpoints. This

finding indicates that, although the belief was not held by all participants, some participants did hold this belief.

On the other hand, no evidence of the belief that effective university students understand things quickly (Item no. 38) was found from an examination of the belief statements offered by the participants either during their interviews with the researcher or as written comments in response to open-ended items on the EBI. On the contrary, the evidence found in the analysis of the qualitative data in the study indicates that some of the participants (three teachers and four students) believed that, instead of learning things quickly, students naturally experience many mistakes and misunderstandings in the learning process. Such beliefs would appear to suggest that learning can be a slow process. These examples both support and oppose this belief to some extent, thus, suggesting mixed agreement and disagreement, or overall neutrality, across the group of participants in the study.

Sub-Theme 1.2: Beliefs about Teachers' and Students' Innate Characteristics

Five of the EBI items (Items 1, 24, 30, 33 and 37) were aligned with this sub-theme. Participants agreed with four of these items and neither agreed nor disagreed with one of these items. There were no items aligned with this sub-theme with which the participants disagreed.

Agreement with sub-theme 1.2 items.

An analysis of the mean scores of the participants' responses to the EBI items indicated that they agreed with the four items listed in Table 100.

Table 100
Mean Agreement Responses to Sub-Theme 1.2 EBI Items (n=80)

Item No.	I believe …	Mean	S.D.
1	the content chosen for courses should be based mostly on student and teacher interests.	3.50	.90
24	university teachers should be concerned about student learning.	4.47	.55
30	effective university teachers are able to motivate their students.	4.37	.66
33	achieving success in learning can influence a university student's feeling of self worth.	4.30	.58

These items represent the beliefs with which the participants in the study generally agreed, some of which aligned directly with the beliefs which emerged from an analysis of the qualitative data. A selection of the most typical of these aligned items and beliefs are cited in Table 101.

Table 101
Comparison of EBI Items and Beliefs Coded in Sub-Theme 1.2

EBI No.	EBI Item: Belief Statement	Belief Emerged from Coding
24	I believe university teachers should be concerned about student learning.	Effective teachers are interested in students and treat them with respect.
30	I believe effective university teachers are able to motivate their students.	Teachers should enjoy, be enthusiastic about and be committed to teaching.
		Students should enjoy, be motivated about, committed to and involved in learning.

Neutrality about sub-theme 1.2 items.

An analysis of the mean scores of the participants' responses to the EBI items indicated that they neither agreed nor disagreed with the item in Table 102.

Table 102
Mean Neutral Responses to Sub-Theme 1.2 EBI Items (n=80)

Item No.	I believe …	Mean	S.D.
37	that effective university students don't usually have to work as hard as other students in their course.	2.54	.97

This item represents one of the beliefs with which the participants in the study neither agreed nor disagreed, an item which can be aligned directly with one of the beliefs that emerged from coding the qualitative data. From an examination of the belief statements offered by the participants during their interviews, there is evidence that some of the participants held a belief that was related to EBI item number 37: I believe that effective university students don't usually have to work as hard as other students in their course. Instead of expressing the belief that learning was not difficult, some of the participants (two of the teachers and three of the students) suggested that learning was challenging. Although not held by all participants, this belief was expressed by some of the participants in the study.

Sub-Theme 1.3: Beliefs about Teachers' and Students' Learnt Abilities

Thirteen of the EBI items (Items 14, 15, 19, 25, 28, 29, 31, 32, 35, 36, 41, 42 and 44) were aligned with this sub-theme. Participants agreed with 12 of these items and neither agreed nor disagreed with one of these items. They did not disagree with any of these items.

Agreement with sub-theme 1.3 items.

An analysis of the mean scores of the participants' responses to the EBI items indicated that they agreed with the 12 items listed in Table 103.

Table 103
Mean Agreement Responses to Sub-Theme 1.3 EBI Items (n=80)

Item No.	I believe …	Mean	S.D.
14	that university students learn by participating.	4.07	.85
19	the knowledge of how to study is usually learned as we grow older.	3.63	.83
25	effective university teachers have an understanding of how social problems affect students in their class.	4.09	.80
28	that effective university teachers guide their students in the process of learning.	4.39	.58
29	effective university teachers incorporate feedback from their students into their teaching.	4.45	.59
31	effective university teachers find out about the way their students like to learn, and teach accordingly.	4.08	.66
32	that university students learn better when their teachers have similar ideas about learning and teaching to their students.	3.81	.90
35	effective university students inform their teachers when they experience difficulties in learning.	3.99	.68
36	the way a university student learns is affected by the way they are taught.	3.90	.77
41	that effective university students ask inquisitive questions.	3.83	.78
42	that effective university students try to connect their course work with their everyday life.	3.85	.80
44	that effective university students challenge what they read.	4.01	.72

These items represent the beliefs with which the participants in the study generally agreed, some of which aligned directly with the beliefs which emerged from an analysis of the qualitative data. A selection of the most typical of these aligned items and beliefs are cited in Table 104.

Table 104

Comparison of EBI Items and Beliefs Coded in Sub-Theme 1.3

EBI No.	EBI Item: Belief Statement	Belief Emerged from Coding
29	I believe effective university teachers incorporate feedback from their students into their teaching.	Effective teachers reflect on and incorporate feedback from others in order to improve their teaching.
31	I believe effective university teachers find out about the way their students like to learn, and teach accordingly.	Effective teachers adapt their teaching strategies to suit different learners and learning situations.

Neutrality about sub-theme 1.3 items.

An analysis of the mean scores of the participants' responses to the EBI items indicated that they neither agreed nor disagreed with the item in Table 105.

Table 105

Mean Neutral Responses to Sub-theme 1.3 EBI Items (n=79)

Item No.	I believe …	Mean	S.D.
15	that university students learn better in groups than when they work alone.	3.38	.94

This item represents one of the beliefs with which the participants in the study neither agreed nor disagreed, an item which can be aligned directly with one of the beliefs that emerged from coding the qualitative data. From an examination of the belief statements offered by the participants during their interviews, there is evidence that some of the participants held a similar belief to that represented by EBI item number 15: I believe that university students learn better in groups than when they work alone. During interviews during the semester, one of the five teachers and two of the eleven students in the study expressed the belief that students can assist and encourage each other to learn when they work in study groups. This

finding indicates that some participants did hold this belief. However, the fact that some participants held the belief, and others did not, suggests neutrality on the whole about this belief.

Summary of Theme 1: Beliefs about Teachers and Students

This qualitative-quantitative triangulation indicated that the participants agreed with:

- 11 of the 14 EBI items that were related to the participants' beliefs about teachers' and students' knowledge (Sub-theme 1.1);

- four of the five EBI items that were related to the participants' beliefs about teachers' and students' innate characteristics (Sub-theme 1.2); and

- 12 of the 13 EBI items that were related to the participants' beliefs about teachers' and students' learnt abilities (Sub-theme 1.3).

These analyses also showed that the participants disagreed with:

- one of the 14 EBI items that were related to the participants' beliefs about teachers' and students' knowledge (Sub-theme 1.1).

These analyses also showed that the participants expressed neutrality about:

- two of the 14 EBI items that were related to the participants' beliefs about teachers' and students' knowledge (Sub-theme 1.1);

- one of the five EBI items that were related to the participants' beliefs about teachers' and students' innate characteristics (Sub-theme 1.2); and

- one of the 13 EBI items that were related to the participants' beliefs about teachers' and students' learnt abilities (Sub-theme 1.3).

Combined, these findings suggest that the participants' responses to the EBI items generally supported the findings that emerged when the qualitative data were coded and analysed.

Theme 2: Beliefs about the Processes of Teaching and Learning

Sub-Theme 2.1: Institution Focused Beliefs about the Processes of Teaching and Learning

There were no items on the EBI that were coded aligned with this sub-theme.

Sub-Theme 2.2: Knowledge Focused Beliefs about the Processes of Teaching and Learning

Six of the EBI items (Items 6, 16, 17, 23, 26 and 39) were aligned with this sub-theme. Participants agreed with five of these items and disagreed with one of them. There were no items with which the participants neither agreed nor disagreed that were aligned with this sub-theme.

Agreement with sub-theme 2.2 items.

An analysis of the mean scores of the participants' responses to the EBI items indicated that they agreed with the five items listed in Table 106.

Table 106
Mean Agreement Responses to Sub-Theme 2.2 EBI Items (n=80)

Item No.	I believe …	Mean	S.D.
6	learning is about developing concepts.	4.39	.63
16	learning is about increasing my own knowledge.	4.37	.49
23	that thinking about what a reading says is more important that memorising what a reading says.	4.14	.78
26	that effective university teachers understand how they, themselves, learned the subject they are teaching.	4.13	.68
29	effective university teachers incorporate feedback from their students into their teaching.	4.45	.59

These items represent the beliefs with which the participants in the study generally agreed, some of which aligned directly with the beliefs which emerged from an analysis of the qualitative data. A selection of the most typical of these aligned items and beliefs are cited in Table 107.

Table 107
Comparison of EBI Items and Beliefs Coded in Sub-Theme 2.2

EBI No.	EBI Item: Belief Statement	Belief Emerged from Coding
6	I believe learning is about developing concepts.	Content taught and learnt is made up of linked concepts.
16	I believe learning is about increasing my own knowledge.	Learning involves each student extending their knowledge.

Disagreement with sub-theme 2.2 items.

An analysis of the mean scores of the participants' responses to the EBI items indicated that they disagreed with the item in Table 108.

Table 108
Mean Disagreement Responses to Sub-Theme 2.2 EBI Items (n=80)

Item No.	I believe …	Mean	S.D.
17	learning is only about memorising facts.	2.21	.98

There was no evidence that the participants expressed the belief that learning is only about memorising facts. However, from the qualitative data, there was evidence that some participants (one teacher and nine students) believed that content can be memorised and that learning involves remembering information.

Sub-theme 2.3: Resource Focused Beliefs about the Processes of Teaching and Learning

There was only one of the EBI items (Item 2) that was aligned with this sub-theme. Participants agreed with this item.

Agreement with sub-theme 2.3 items.

An analysis of the mean scores of the participants' responses to the EBI items indicated that they agreed with the item in Table 109.

Table 109

Mean Agreement Responses to Sub-Theme 2.3 EBI Items (n=80)

Item No.	I believe …	Mean	S.D.
2	that university teachers should act as resource persons by giving and sharing information.	4.44	.52

These items represent the beliefs with which the participants in the study generally agreed, some of which aligned directly with the beliefs which emerged from an analysis of the qualitative data. This aligned item and belief are cited in Table 110.

Table 110

Comparison of EBI Items and Beliefs Coded in Sub-Theme 2.3

EBI No.	EBI Item: Belief Statement	Belief Emerged from Coding
2	I believe that university teachers should act as resource persons by giving and sharing information.	Teachers should be the source of subject knowledge.

Sub-Theme 2.4: Context Focused Beliefs about the Processes of Teaching and Learning

Ten of the EBI items (Items 3, 14, 15, 24, 25, 28, 30, 31, 32 and 36) were aligned with this sub-theme. Participants agreed with nine of these items and neither agreed nor disagreed with one of these items. They did not disagree with any items that were aligned with this sub-theme.

Agreement with sub-theme 2.4 items.

An analysis of the mean scores of the participants' responses to the EBI items indicated that they agreed with the nine items listed in Table 111.

Table 111

Mean Agreement Responses to Sub-Theme 2.4 EBI Items (n=80)

Item No.	I believe …	Mean	S.D.
3	teaching is concerned with supporting student learning.	4.45	.65
14	that university students learn by participating.	4.07	.85
24	university teachers should be concerned about student learning.	4.47	.55
25	effective university teachers have an understanding of how social problems affect students in their class.	4.09	.80
28	that effective university teachers guide their students in the process of learning.	4.39	.58
30	effective university teachers are able to motivate their students.	4.37	.66
31	effective university teachers find out about the way their students like to learn, and teach accordingly.	4.08	.66
32	that university students learn better when their teachers have similar ideas about learning and teaching to their students.	3.81	.90
36	the way a university student learns is affected by the way they are taught.	3.90	.77

These items represent the beliefs with which the participants in the study generally agreed, some of which aligned directly with the beliefs which emerged from an analysis of the qualitative data. A selection of the most typical of these aligned items and beliefs are cited in Table 112.

Table 112

Comparison of EBI Items and Beliefs Coded in Sub-Theme 2.4

EBI No.	EBI Item: Belief Statement	Belief Emerged from Coding
14	I believe that university students learn by participating.	Learning involves students actively completing tasks.
		Learning involves interaction between students.
28	I believe that effective university teachers guide their students in the process of learning.	Teachers should be available to assist students.
36	I believe the way a university student learns is affected by the way they are taught.	Students learn best when they like and respect their teacher.

Disagreement with sub-theme 2.4 items.

There were no items that were coded as being related to this sub-theme with which the participants disagreed.

Neutrality about sub-theme 2.4 items.

An analysis of the mean scores of the participants' responses to the EBI items indicated that they neither agreed nor disagreed with the item in Table 113.

Table 113

Mean Neutral Responses to Sub-Theme 2.4 EBI Items (n=80)

Item No.	I believe …	Mean	S.D.
15	that university students learn better in groups than when they work alone.	3.38	.94

This item represents a belief with which the participants in the study neither agreed nor disagreed. Since this EBI item was dual coded across more than one sub-theme, the way in which this item was similar to the beliefs which emerged from analysing the qualitative data has been explained earlier in Sub-theme 1.3.

Sub-Theme 2.5: Activity Focused Beliefs about the Processes of Teaching and Learning

Four of the EBI items (Items 8, 10, 35 and 41) were aligned with this sub-theme. Participants agreed with these four items. There were no items within this sub-theme with which the participants disagreed or that they neither agreed nor disagreed with.

Agreement with sub-theme 2.5 items.

An analysis of the mean scores of the participants' responses to the EBI items indicated that they agreed with the four items listed in Table 114.

Table 114
Mean Agreement Responses to Sub-Theme 2.5 EBI Items (n=80)

Item No.	I believe …	Mean	S.D.
8	learning is about applying principles.	4.21	.76
10	learning is about problem solving.	4.16	.56
35	effective university students inform their teachers when they experience difficulties in learning.	3.99	.68
41	that effective university students ask inquisitive questions.	3.83	.78

These items represent the beliefs with which the participants in the study generally agreed, some of which aligned directly with the beliefs which emerged from an analysis of the qualitative data. A selection of the most typical of these aligned items and beliefs are cited in Table 115.

Table 115

Comparison of EBI Items and Beliefs Coded in Sub-Theme 2.5

EBI No.	EBI Item: Belief Statement	Belief Emerged from Coding
8	I believe learning is about applying principles.	Learning involves developing skills and abilities to use and apply in the community, society and everyday life.
10	I believe learning is about problem solving.	Teaching involves designing activities that encourage students to actively complete tasks (including online, individual, open-ended, structured and problem solving activities).
35	I believe effective university students inform their teachers when they experience difficulties in learning.	Learning involves dealing with difficulties and rectifying mistakes and misunderstandings.
41	I believe that effective university students ask inquisitive questions.	Learning involves students asking questions.

Sub-Theme 2.6: Student Development Focused Beliefs about the Processes of Teaching and Learning

Eighteen of the EBI items (Items 3, 4, 5, 7, 9, 11, 12, 13, 16, 18, 19, 20, 24, 28, 33, 35, 43 and 44) were aligned with this sub-theme. Participants agreed with 17 of these items and neither agreed nor disagreed with another one of these items. There were no items in this sub-theme with which the participants disagreed.

Agreement with sub-theme 2.6 items.

An analysis of the mean scores of the participants' responses to the EBI items indicated that they agreed with the 17 items listed in Table 116.

Table 116
Mean Agreement Responses to Sub-Theme 2.6 EBI Items (n=80)

Item No.	I believe …	Mean	S.D.
3	teaching is concerned with supporting student learning.	4.45	.65
5	teaching is concerned with increasing students' understanding of a topic.	4.46	.53
7	learning is about understanding.	4.48	.57
9	learning is seeing something in a different way.	3.96	.83
11	learning is about developing knowledge of myself.	4.11	.71
12	learning is about developing knowledge of others.	3.97	.76
13	when you learn something, this enables you to help others.	4.15	.60
16	learning is about increasing my own knowledge.	4.37	.49
18	learning is about me developing as a person.	4.16	.67
19	the knowledge of how to study is usually learned as we grow older.	3.63	.67
20	that everyone needs to learn how to learn.	4.03	.83
24	university teachers should be concerned about student learning.	4.47	.55
28	that effective university teachers guide their students in the process of learning.	4.39	.58
33	achieving success in learning can influence a university student's feeling of self worth.	4.30	.58
35	effective university students inform their teachers when they experience difficulties in learning.	3.99	.68
43	that effective university students check their own understanding.	4.15	.62
44	that effective university students challenge what they read.	4.01	.72

These items represent the beliefs with which the participants in the study generally agreed, some of which aligned directly with the beliefs which emerged from an analysis of the qualitative data. A selection of the most typical of these aligned items and beliefs are cited in Table 117.

Table 117

Comparison of EBI Items and Beliefs Coded in Sub-Theme 2.6

EBI No.	EBI Item: Belief Statement	Belief Emerged from Coding
7	I believe learning is about understanding.	Learning involves each student developing their level of understanding.
9	I believe learning is seeing something in a different way.	Teaching involves facilitating each student to develop or change their point of view.
20	I believe that everyone needs to learn how to learn.	Students should possess learning strategies.
44	I believe that effective university students challenge what they read.	Teaching involves enabling each student to develop academically and to think critically.

Neutrality about sub-theme 2.6 items.

An analysis of the mean scores of the participants' responses to the EBI items indicated that they neither agreed nor disagreed with the item in Table 118.

Table 118

Mean Neutral Responses to Sub-Theme 2.6 EBI Items (n=80)

Item No.	I believe …	Mean	S.D.
4	teaching is an activity aimed at changing students' understanding of the world.	3.40	.98

This item represents a belief with which the participants in the study neither agreed nor disagreed, which aligned directly with one of the beliefs which emerged from an analysis of the qualitative data. Since this EBI item was dual coded across two sub-themes, the way in which this EBI item was similar to one of the beliefs found in the qualitative data has been explained earlier in Sub-theme 1.1.

Sub-Theme 2.7: Effort Focused Beliefs about the Process of Learning

There was only one item (Item 21) that was aligned with this sub-theme. Participants neither agreed nor disagreed with this item.

Neutrality about sub-theme 2.7 items.

An analysis of the mean scores of the participants' responses to the EBI items indicated that they neither agreed nor disagreed with the item in Table 119.

Table 119
Mean Neutral Responses to Sub-Theme 2.7 EBI Items (n=79)

Item No.	I believe …	Mean	S.D.
21	that it takes a long time to learn something well.	3.11	1.07

During interviews during the semester, two of the five teachers and six of the students in the study expressed the belief that learning is time consuming. This finding indicates that, although the belief was not held by all participants, some participants did hold this belief which supports the spread of agreement and disagreement responses in the analyses above.

Summary of Theme 2: Beliefs about the Processes of Teaching and Learning

Analyses and the subsequent triangulation of findings indicated that the participants agreed with:

- five of the six EBI items that were related to the participants' knowledge focused beliefs about teaching and learning (Sub-theme 2.2);

- the one EBI that was related to the participants' resource focused beliefs about teaching and learning (Sub-theme 2.3);

- nine of the 10 EBI items that were related to the participants' context focused beliefs about teaching and learning (Sub-theme 2.4);

- all four of the EBI items that were related to the participants' activity focused beliefs about teaching and learning (Sub-theme 2.5); and

- 17 of the 18 EBI items that were related to the participants' student development focused beliefs about teaching and learning (Sub-theme 2.6).

Analysis also showed that the participants disagreed with only:

- one of the six EBI items that were related to the participants' knowledge focused beliefs about teaching and learning (Sub-theme 2.2).

These analyses also showed that the participants expressed neutrality about:

- one of the 10 EBI items that were related to the participants' context focused beliefs about teaching and learning (Sub-theme 2.4);

- one of the 18 EBI items that were related to the participants' student development focused beliefs about teaching and learning (Sub-theme 2.6); and

- the only EBI that was related to the participants' effort focused beliefs about learning (Sub-theme 2.7).

Combined, these findings suggest that the participants' responses to the EBI items generally supported the findings that emerged when the qualitative data were coded and analysed.

Theme 3: Beliefs about Content Taught and Learnt

Sub-Theme 3.1: Beliefs about Content Taught and Learnt as Being Simple, Limited and Unchanging

Four of the EBI items (Items 16, 17, 22 and 34) were aligned with this sub-theme. Participants agreed with one of these items, disagreed with two of them and neither agreed nor disagreed with another one of these items.

Agreement with sub-theme 3.1 items.

An analysis of the mean scores of the participants' responses to the EBI items indicated that they agreed with the item in Table 120.

Table 120
Mean Agreement Responses to Sub-Theme 3.1 EBI Items (n=79)

Item No.	I believe …	Mean	S.D.
16	learning is about increasing my own knowledge.	4.37	.49

This item represents one of the beliefs with which the participants in the study generally agreed, which can be aligned directly with one of the beliefs which emerged from an analysis of the coded data. Since this EBI item was aligned with more than one sub-theme, the way in which this EBI item was similar to the beliefs found in the coding process has been explained earlier in Sub-themes 2.2.

Disagreement with sub-theme 3.1 items.

An analysis of the mean scores of the participants' responses to the EBI items indicated that they disagreed with the items in Table 121.

Table 121
Mean Disagreement Responses to Sub-Theme 3.1 EBI Items (n=80)

Item No.	I believe …	Mean	S.D.
17	learning is only about memorising facts.	2.21	.98
34	an expert is usually someone who was born to be an expert.	1.81	.78

These items represent the beliefs with which the participants in the study disagreed, which aligned directly with some of the beliefs which emerged from an analysis of the qualitative data. Since each of these EBI items were aligned with two sub-themes, the way in which these items were similar to the beliefs found in the qualitative data has been explained earlier in Sub-theme 1.1 (Item 34) and Sub-theme 2.2 (Item 17).

Neutrality about sub-theme 3.1 items.

An analysis of the mean scores of the participants' responses to the EBI items indicated that they neither agreed nor disagreed with the item in Table 122.

Table 122
Mean Neutral Responses to Sub-Theme 3.1 EBI Items (n=78)

Item No.	I believe …	Mean	S.D.
22	that truth is unchanging.	2.54	1.07

This item represents one of the beliefs with which the participants in the study neither agreed nor disagreed. During interviews during the semester, all of the five teachers and five of the students in the study expressed the belief that the content taught in university courses is continually changing, extending and improving. This finding indicates that, although the belief was not held by all participants, some participants did hold this belief.

Sub-Theme 3.2: Beliefs about Content Taught and Learnt as Being Complex, Linked and Changeable

Six of the EBI items (Items 1, 5, 6, 26, 39 and 40) were aligned with this sub-theme. Participants agreed with all six of these items. There were no items in this sub-theme with which the participants disagreed or were neutral about.

Agreement with sub-theme 3.2 items.

An analysis of the mean scores of the participants' responses to the EBI items indicated that they agreed with the six items listed in Table 123.

Table 123
Mean Agreement Responses to Sub-Theme 3.2 EBI Items (n=80)

Item No.	I believe …	Mean	S.D.
1	the content chosen for courses should be based mostly on student and teacher interests.	3.50	.90
5	teaching is concerned with increasing students' understanding of a topic.	4.46	.53
6	learning is about developing concepts.	4.39	.63
26	that effective university teachers understand how they, themselves, learned the subject they are teaching.	4.13	.68
39	that effective university students aim to get the big ideas from a reading rather than just the details.	3.68	.79
40	that effective university students seek links between different activities, ideas and subjects.	4.05	.63

These items represent the beliefs with which the participants in the study generally agreed, some of which aligned directly with the beliefs which emerged from an analysis of the qualitative data. A selection of the most typical of these aligned items and beliefs are cited in Table 124.

Table 124
Comparison of EBI Items and Beliefs Coded in Sub-Theme 3.2

EBI No.	EBI Item: Belief Statement	Belief Emerged from Coding
26	I believe that effective university teachers understand how they, themselves, learned the subject they are teaching.	Teachers should reflect on their own learning.
40	I believe that effective university students seek links between different activities, ideas and subjects.	Content learnt is made up of linked concepts.

Summary of Theme 3: Beliefs about Content Taught and Learnt

Analyses and the subsequent triangulation of findings indicated that the participants agreed with:

- one of the four EBI items that were related to the participants' beliefs about the simple nature of content (Sub-theme 3.1); and

- all six of the EBI items that were related to the participants' beliefs about the complex nature of content (Sub-theme 3.2).

These analyses also showed that the participants disagreed with:

- two of the four EBI items that were related to the participants' beliefs about the simple nature of content (Sub-theme 3.1).

Analysis showed that the participants expressed neutrality about:

- one of the four EBI items that were related to the participants' beliefs about the simple nature of content (Sub-theme 3.1).

Combined, these findings suggest that the participants' responses to the EBI items generally supported the findings that emerged when the qualitative data were coded and analysed.

Theme 4: Beliefs about the Purposes of Teaching and Learning

Sub-Theme 4.1: Beliefs about the Short Term Purposes of Teaching and Learning

There were no items on the EBI that were aligned with this sub-theme.

Sub-Theme 4.2: Beliefs about the Long Term Purposes of Teaching and Learning

Four of the EBI items (Items 4, 8, 13 and 42) were aligned with this sub-theme. Participants agreed with three of these items and neither agreed nor disagreed with one of these items. There were no items in this sub-theme with which the participants disagreed.

Agreement with sub-theme 4.2 items.

An analysis of the mean scores of the participants' responses to the EBI items indicated that they agreed with the three items listed in Table 125.

Table 125
Mean Agreement Responses to Sub-Theme 4.2 EBI Items (n=80)

Item No.	I believe …	Mean	S.D.
8	learning is about applying principles.	4.21	.76
13	when you learn something, this enables you to help others.	4.15	.60
42	that effective university students try to connect their course work with their everyday life.	3.85	.80

These items represent the beliefs with which the participants in the study generally agreed, some of which aligned directly with the beliefs which emerged from an analysis of the qualitative data. A selection of the most typical of these aligned items and beliefs are cited in Table 126.

Table 126
Comparison of EBI Items and Beliefs Coded in Sub-Theme 4.2

EBI No.	EBI Item: Belief Statement	Belief Emerged from Coding
13	I believe when you learn something, this enables you to help others.	Learning involves students assisting each other to learn.
42	I believe that effective university students try to connect their course work with their everyday life.	Learning involves developing skills and abilities to use and apply in the community, society and everyday life.

Neutrality about sub-theme 4.2 items.

An analysis of the mean scores of the participants' responses to the EBI items indicated that they neither agreed nor disagreed with the item in Table 127.

Table 127
Mean Neutral Responses to Sub-Theme 4.2 EBI Items (n=80)

Item No.	I believe …	Mean	S.D.
4	teaching is an activity aimed at changing students' understanding of the world.	3.40	.98

This EBI item was dual coded across more than one sub-theme, the way in which this item was similar to the beliefs which emerged from the coding process has been explained earlier in Sub-themes 1.1 and 2.6.

Summary of Theme 4: Beliefs about the Purposes of Teaching and Learning

Analyses and the subsequent triangulation of findings indicated that the participants agreed with:

- three of the four EBI items that were related to the participants' beliefs about the complex nature of content (Sub-theme 4.2).

These analyses also showed there were no items with which the participants disagreed that were coded as relating to this sub-theme.

These analyses also showed that the participants expressed neutrality about:

- one of the three EBI items that were related to the participants' beliefs about the complex nature of content (Sub-theme 4.2).

Combined, these findings suggest that the participants' responses to the EBI items generally supported the findings that emerged when the qualitative data were coded and analysed.

Appendix Six: Class Teacher-Student Belief Comparisons (Mann Whitney-U tests): All Classes

	ITEM_1	ITEM_2	ITEM_3	ITEM_4	ITEM_5	ITEM_6	ITEM_7	ITEM_8	ITEM_9	ITEM_10	ITEM_11	ITEM_12	ITEM_13	ITEM_14	ITEM_15	ITEM_16
Mann-Whitney U	130.500	117.000	128.500	137.000	174.000	115.500	166.500	140.000	167.000	147.000	178.000	157.500	182.000	151.000	142.000	178.500
Wilcoxon W	145.500	2967.000	2978.500	2987.000	189.000	2965.500	3016.500	155.000	3017.000	2997.000	3028.000	3007.500	3032.000	3001.000	2917.000	2953.500
Z	-1.225	-1.614	-1.333	-1.055	-.308	-1.616	-.479	-1.029	-.446	-.967	-.205	-.647	-.127	-.782	-.917	-.157
Asymp. Sig. (2-tailed)	.221	.107	.183	.292	.758	.106	.632	.303	.656	.334	.837	.517	.899	.434	.359	.875
Exact Sig. [2*(1-tailed Sig.)]	.266(a)	.169(a)	.249(a)	.331(a)	.802(a)	.157(a)	.685(a)	.361(a)	.700(a)	.438(a)	.862(a)	.562(a)	.923(a)	.486(a)	.403(a)	.899(a)

	ITEM_17	ITEM_18	ITEM_19	ITEM_20	ITEM_21	ITEM_22	ITEM_23	ITEM_24	ITEM_25	ITEM_26	ITEM_27	ITEM_28	ITEM_29	ITEM_30	ITEM_31	ITEM_32
Mann-Whitney U	117.500	152.000	131.500	116.000	152.000	85.000	154.500	87.500	148.500	147.500	95.000	113.000	163.500	154.000	167.500	172.500
Wilcoxon W	132.500	3002.000	146.500	131.000	167.000	100.000	3004.500	2937.500	2998.500	2997.500	2945.000	2963.000	3013.500	3004.000	2942.500	187.500
Z	-1.477	-.784	-1.210	-1.579	-.693	-2.091	-.725	-2.268	-.839	-.911	-2.081	-1.675	-.539	-.744	-.396	-.220
Asymp. Sig. (2-tailed)	.140	.433	.226	.114	.489	.036	.469	.023	.402	.363	.037	.094	.590	.457	.692	.826
Exact Sig. [2*(1-tailed Sig.)]	.169(a)	.498(a)	.275(a)	.173(a)	.524(a)	.045(a)	.523(a)	.044(a)	.450(a)	.438(a)	.066(a)	.145(a)	.643(a)	.523(a)	.732(a)	.843(a)

	ITEM_33	ITEM_34	ITEM_35	ITEM_36	ITEM_37	ITEM_38	ITEM_39	ITEM_40	ITEM_41	ITEM_42	ITEM_43	ITEM_44
Mann-Whitney U	135.000	129.500	157.500	176.500	152.500	177.000	146.000	98.000	105.500	111.000	112.500	100.000
Wilcoxon W	2985.000	144.500	3007.500	3026.500	3002.500	192.000	2996.000	2948.000	2955.500	2961.000	2962.500	2950.000
Z	-1.195	-1.254	-.685	-.241	-.737	-.219	-.908	-2.084	-1.751	-1.632	-1.708	-1.886
Asymp. Sig. (2-tailed)	.232	.210	.493	.810	.461	.826	.364	.037	.080	.103	.088	.059
Exact Sig. [2*(1-tailed Sig.)]	.311(a)	.258(a)	.562(a)	.832(a)	.498(a)	.847(a)	.427(a)	.077(a)	.105(a)	.134(a)	.140(a)	.084(a)

a Not corrected for ties. b Grouping Variable: Student or teacher

Appendix Seven: Class Teacher-Student Belief Comparisons (Mann Whitney-U tests): Class 1

	ITEM_1	ITEM_2	ITEM_3	ITEM_4	ITEM_5	ITEM_6	ITEM_7	ITEM_8	ITEM_9	ITEM_10	ITEM_11	ITEM_12	ITEM_13	ITEM_14	ITEM_15	ITEM_16
Mann-Whitney U	4.000	3.500	4.000	1.000	5.000	2.500	3.500	5.500	.500	1.500	6.500	5.500	1.500	7.000	5.000	4.000
Wilcoxon W	157.000	156.500	157.000	154.000	158.000	155.500	156.500	6.500	153.500	154.500	159.500	158.500	154.500	8.000	6.000	157.000
Z	-.909	-1.085	-.959	-1.523	-.786	-1.299	-1.118	-.636	-1.955	-1.722	-.418	-.658	-1.549	-.334	-.651	-1.000
Asymp. Sig. (2-tailed)	.363	.278	.338	.128	.432	.194	.264	.525	.051	.085	.676	.510	.121	.739	.515	.317
Exact Sig. [2*(1-tailed Sig.)]	.556(a)	.444(a)	.556(a)	.222(a)	.667(a)	.333(a)	.444(a)	.667(a)	.111(a)	.222(a)	.778(a)	.667(a)	.222(a)	.889(a)	.706(a)	.556(a)

	ITEM_17	ITEM_18	ITEM_19	ITEM_20	ITEM_21	ITEM_22	ITEM_23	ITEM_24	ITEM_25	ITEM_26	ITEM_27	ITEM_28	ITEM_29	ITEM_30	ITEM_31	ITEM_32
Mann-Whitney U	.500	1.000	2.500	7.500	5.000	.500	3.000	3.500	1.000	8.000	2.500	2.500	2.500	3.500	7.000	8.000
Wilcoxon W	1.500	154.000	3.500	8.500	141.000	1.500	156.000	156.500	154.000	161.000	155.500	155.500	155.500	156.500	8.000	9.000
Z	-1.625	-1.567	-1.281	-.127	-.668	-1.597	-1.147	-1.118	-1.567	-.122	-1.299	-1.347	-1.265	-1.061	-.316	-.122
Asymp. Sig. (2-tailed)	.104	.117	.200	.899	.504	.110	.251	.264	.117	.903	.194	.178	.206	.289	.752	.903
Exact Sig. [2*(1-tailed Sig.)]	.111(a)	.222(a)	.333(a)	.941(a)	.706(a)	.118(a)	.444(a)	.444(a)	.222(a)	1.000(a)	.333(a)	.333(a)	.333(a)	.444(a)	.889(a)	1.000(a)

	ITEM_33	ITEM_34	ITEM_35	ITEM_36	ITEM_37	ITEM_38	ITEM_39	ITEM_40	ITEM_41	ITEM_42	ITEM_43	ITEM_44
Mann-Whitney U	1.500	2.000	1.000	1.000	5.500	2.500	.000	1.000	2.000	.000	1.000	.500
Wilcoxon W	154.500	3.000	154.000	154.000	6.500	3.500	153.000	154.000	155.000	153.000	154.000	153.500
Z	-1.620	-1.363	-1.660	-1.611	-.649	-1.229	-1.877	-1.611	-1.342	-1.889	-1.660	-1.697
Asymp. Sig. (2-tailed)	.105	.173	.097	.107	.516	.219	.060	.107	.180	.059	.097	.090
Exact Sig. [2*(1-tailed Sig.)]	.222(a)	.333(a)	.222(a)	.222(a)	.667(a)	.333(a)	.111(a)	.222(a)	.333(a)	.111(a)	.222(a)	.111(a)

a Not corrected for ties. b Grouping Variable: Student or teacher

Appendix Eight: Class Teacher-Student Belief Comparisons (Mann Whitney-U tests): Class 2

	ITEM_1	ITEM_2	ITEM_3	ITEM_4	ITEM_5	ITEM_6	ITEM_7	ITEM_8	ITEM_9	ITEM_10	ITEM_11	ITEM_12	ITEM_13	ITEM_14	ITEM_15	ITEM_16
Mann-Whitney U	3.500	3.500	4.000	5.000	2.000	3.500	3.000	1.500	2.500	2.500	2.500	2.500	4.000	4.000	1.000	2.500
Wilcoxon W	69.500	69.500	70.000	71.000	3.000	69.500	69.000	2.500	68.500	68.500	68.500	68.500	5.000	5.000	67.000	68.500
Z	-.631	-.707	-.577	-.154	-1.183	-.707	-.845	-1.414	-.967	-1.000	-.967	-.967	-.495	-.469	-1.349	-1.000
Asymp. Sig. (2-tailed)	.528	.480	.564	.877	.237	.480	.398	.157	.334	.317	.334	.334	.620	.639	.177	.317
Exact Sig. [2*(1-tailed Sig.)]	.667(a)	.667(a)	.833(a)	1.000(a)	.500(a)	.667(a)	.667(a)	.333(a)	.500(a)	.500(a)	.500(a)	.500(a)	.833(a)	.833(a)	.333(a)	.500(a)

	ITEM_17	ITEM_18	ITEM_19	ITEM_20	ITEM_21	ITEM_22	ITEM_23	ITEM_24	ITEM_25	ITEM_26	ITEM_27	ITEM_28	ITEM_29	ITEM_30	ITEM_31	ITEM_32
Mann-Whitney U	3.000	2.500	.500	4.500	3.000	1.000	3.500	2.500	2.000	1.500	4.000	3.500	4.000	2.500	1.500	.000
Wilcoxon W	4.000	68.500	1.500	5.500	4.000	2.000	4.500	68.500	68.000	67.500	70.000	69.500	70.000	68.500	56.500	55.000
Z	-.845	-.967	-1.732	-.316	-.755	-1.320	-.645	-1.000	-1.080	-1.321	-.572	-.696	-.577	-.947	-1.173	-1.734
Asymp. Sig. (2-tailed)	.398	.334	.083	.752	.450	.187	.519	.317	.280	.186	.567	.486	.564	.344	.241	.083
Exact Sig. [2*(1-tailed Sig.)]	.667(a)	.500(a)	.167(a)	.833(a)	.667(a)	.364(a)	.667(a)	.500(a)	.500(a)	.333(a)	.833(a)	.667(a)	.833(a)	.500(a)	.364(a)	.182(a)

	ITEM_33	ITEM_34	ITEM_35	ITEM_36	ITEM_37	ITEM_38	ITEM_39	ITEM_40	ITEM_41	ITEM_42	ITEM_43	ITEM_44
Mann-Whitney U	1.000	3.500	4.500	4.500	.500	5.000	5.500	.500	1.000	1.500	1.500	1.500
Wilcoxon W	67.000	4.500	5.500	70.500	66.500	6.000	6.500	66.500	67.000	67.500	67.500	67.500
Z	-1.567	-.707	-.316	-.312	-1.555	-.162	.000	-1.907	-1.414	-1.265	-1.321	-1.321
Asymp. Sig. (2-tailed)	.117	.480	.752	.755	.120	.871	1.000	.057	.157	.206	.186	.186
Exact Sig. [2*(1-tailed Sig.)]	.333(a)	.667(a)	.833(a)	.833(a)	.167(a)	1.000(a)	1.000(a)	.167(a)	.333(a)	.333(a)	.333(a)	.333(a)

a Not corrected for ties. b Grouping Variable: Student or teacher

Appendix Nine: Class Teacher-Student Belief Comparisons (Mann Whitney-U tests): Class 3

	ITEM_1	ITEM_2	ITEM_3	ITEM_4	ITEM_5	ITEM_6	ITEM_7	ITEM_8	ITEM_9	ITEM_10	ITEM_11	ITEM_12	ITEM_13	ITEM_14	ITEM_15	ITEM_16
Mann-Whitney U	.500	3.500	1.500	1.000	3.000	3.000	1.500	4.000	4.000	4.500	4.000	3.500	3.000	4.500	1.500	4.000
Wilcoxon W	1.500	4.500	2.500	46.000	4.000	4.000	2.500	5.000	49.000	5.500	49.000	48.500	4.000	5.500	2.500	5.000
Z	-1.721	-.500	-1.225	-1.291	-.655	-.577	-1.225	-.333	-.189	.000	-.189	-.394	-.567	.000	-1.118	-.333
Asymp. Sig. (2-tailed)	.085	.617	.221	.197	.513	.564	.221	.739	.850	1.000	.850	.694	.571	1.000	.264	.739
Exact Sig. [2*(1-tailed Sig.)]	.200(a)	.800(a)	.400(a)	.400(a)	.800(a)	.800(a)	.400(a)	1.000(a)	1.000(a)	1.000(a)	1.000(a)	.800(a)	.800(a)	1.000(a)	.400(a)	1.000(a)

	ITEM_17	ITEM_18	ITEM_19	ITEM_20	ITEM_21	ITEM_22	ITEM_23	ITEM_24	ITEM_25	ITEM_26	ITEM_27	ITEM_28	ITEM_29	ITEM_30	ITEM_31	ITEM_32
Mann-Whitney U	4.000	3.000	2.500	4.000	1.000	.000	1.500	3.500	2.500	2.500	3.500	1.500	2.000	2.000	4.500	3.000
Wilcoxon W	49.000	4.000	47.500	5.000	2.000	1.000	46.500	48.500	3.500	47.500	48.500	2.500	3.000	3.000	5.500	4.000
Z	-.189	-.577	-.730	-.189	-1.257	-1.683	-1.155	-.500	-.816	-.816	-.500	-1.225	-1.000	-1.000	.000	-.539
Asymp. Sig. (2-tailed)	.850	.564	.465	.850	.209	.092	.248	.617	.414	.414	.617	.221	.317	.317	1.000	.590
Exact Sig. [2*(1-tailed Sig.)]	1.000(a)	.800(a)	.600(a)	1.000(a)	.400(a)	.200(a)	.400(a)	.800(a)	.600(a)	.600(a)	.800(a)	.400(a)	.600(a)	.600(a)	1.000(a)	.800(a)

	ITEM_33	ITEM_34	ITEM_35	ITEM_36	ITEM_37	ITEM_38	ITEM_39	ITEM_40	ITEM_41	ITEM_42	ITEM_43	ITEM_44
Mann-Whitney U	2.500	2.000	4.000	4.000	2.000	2.000	1.500	4.000	4.000	3.500	3.000	3.500
Wilcoxon W	3.500	3.000	5.000	49.000	3.000	47.000	46.500	5.000	49.000	48.500	4.000	4.500
Z	-.816	-.945	-.189	-.187	-.913	-.913	-1.155	-.189	-.215	-.373	-.577	-.398
Asymp. Sig. (2-tailed)	.414	.345	.850	.852	.361	.361	.248	.850	.830	.709	.564	.690
Exact Sig. [2*(1-tailed Sig.)]	.600(a)	.600(a)	1.000(a)	1.000(a)	.600(a)	.600(a)	.400(a)	1.000(a)	1.000(a)	.800(a)	.800(a)	.800(a)

a Not corrected for ties. b Grouping Variable: Student or teacher

Appendix Ten: Class Teacher-Student Belief Comparisons (Mann Whitney-U tests): Class 4

	ITEM_1	ITEM_2	ITEM_3	ITEM_4	ITEM_5	ITEM_6	ITEM_7	ITEM_8	ITEM_9	ITEM_10	ITEM_11	ITEM_12	ITEM_13	ITEM_14	ITEM_15	ITEM_16
Mann-Whitney U	4.500	3.500	3.500	7.500	6.000	2.000	4.500	8.000	7.000	8.500	7.500	8.500	7.500	2.000	3.000	5.500
Wilcoxon W	5.500	174.500	174.500	178.500	7.000	173.000	5.500	9.000	8.000	179.500	8.500	179.500	8.500	173.000	174.000	6.500
Z	-.894	-1.173	-1.173	-.302	-.679	-1.673	-.949	-.197	-.448	-.118	-.320	-.106	-.356	-1.398	-1.199	-.707
Asymp. Sig. (2-tailed)	.371	.241	.241	.762	.497	.094	.343	.844	.654	.906	.749	.915	.722	.162	.230	.480
Exact Sig. [2*(1-tailed Sig.)]	.526(a)	.421(a)	.421(a)	.842(a)	.737(a)	.316(a)	.526(a)	.947(a)	.842(a)	.947(a)	.842(a)	.947(a)	.842(a)	.316(a)	.421(a)	.667(a)

	ITEM_17	ITEM_18	ITEM_19	ITEM_20	ITEM_21	ITEM_22	ITEM_23	ITEM_24	ITEM_25	ITEM_26	ITEM_27	ITEM_28	ITEM_29	ITEM_30	ITEM_31	ITEM_32
Mann-Whitney U	6.000	7.500	4.500	2.000	5.000	6.000	9.000	2.500	8.000	8.000	4.500	3.500	5.000	5.500	7.500	2.500
Wilcoxon W	7.000	8.500	5.500	3.000	176.000	7.000	10.000	173.500	9.000	9.000	175.500	174.500	6.000	6.500	8.500	3.500
Z	-.578	-.356	-.879	-1.495	-.771	-.569	.000	-1.400	-.206	-.223	-.949	-1.136	-.822	-.723	-.320	-1.222
Asymp. Sig. (2-tailed)	.563	.722	.379	.135	.441	.570	1.000	.161	.837	.824	.343	.256	.411	.470	.749	.222
Exact Sig. [2*(1-tailed Sig.)]	.737(a)	.842(a)	.526(a)	.316(a)	.632(a)	.737(a)	1.000(a)	.316(a)	.947(a)	.947(a)	.526(a)	.421(a)	.632(a)	.632(a)	.842(a)	.333(a)

	ITEM_33	ITEM_34	ITEM_35	ITEM_36	ITEM_37	ITEM_38	ITEM_39	ITEM_40	ITEM_41	ITEM_42	ITEM_43	ITEM_44
Mann-Whitney U	4.500	8.500	8.500	8.000	7.000	8.000	7.000	2.000	5.000	8.500	2.500	3.000
Wilcoxon W	5.500	179.500	179.500	179.000	178.000	9.000	178.000	173.000	176.000	179.500	173.500	174.000
Z	-.929	-.100	-.118	-.206	-.381	-.193	-.394	-1.569	-.824	-.097	-1.348	-1.194
Asymp. Sig. (2-tailed)	.353	.920	.906	.837	.703	.847	.694	.117	.410	.923	.178	.233
Exact Sig. [2*(1-tailed Sig.)]	.526(a)	.947(a)	.947(a)	.947(a)	.842(a)	.947(a)	.842(a)	.316(a)	.632(a)	.947(a)	.316(a)	.421(a)

a Not corrected for ties. b Grouping Variable: Student or teacher

Appendix Eleven: Class Teacher-Student Belief Comparisons (Mann Whitney-U tests): Class 5

	ITEM_1	ITEM_2	ITEM_3	ITEM_4	ITEM_5	ITEM_6	ITEM_7	ITEM_8	ITEM_9	ITEM_10	ITEM_11	ITEM_12	ITEM_13	ITEM_14	ITEM_15	ITEM_16
Mann-Whitney U	1.000	4.500	4.000	3.500	5.000	6.000	4.500	9.000	1.500	7.500	7.000	8.000	9.000	3.500	.500	6.500
Wilcoxon W	2.000	214.500	214.000	4.500	215.000	216.000	214.500	10.000	2.500	8.500	8.000	9.000	10.000	213.500	210.500	7.500
Z	-1.657	-1.049	-1.122	-1.140	-.953	-.775	-1.025	-.174	-1.458	-.468	-.540	-.352	-.208	-1.153	-1.714	-.707
Asymp. Sig. (2-tailed)	.098	.294	.262	.254	.340	.439	.306	.862	.145	.640	.589	.725	.835	.249	.086	.480
Exact Sig. [2*(1-tailed Sig.)]	.190(a)	.476(a)	.476(a)	.381(a)	.571(a)	.667(a)	.476(a)	.952(a)	.190(a)	.762(a)	.762(a)	.857(a)	.952(a)	.381(a)	.095(a)	.667(a)

	ITEM_17	ITEM_18	ITEM_19	ITEM_20	ITEM_21	ITEM_22	ITEM_23	ITEM_24	ITEM_25	ITEM_26	ITEM_27	ITEM_28	ITEM_29	ITEM_30	ITEM_31	ITEM_32
Mann-Whitney U	9.500	7.000	7.000	1.500	3.500	5.000	8.500	5.500	7.500	9.000	4.500	3.000	5.000	4.500	9.500	8.000
Wilcoxon W	10.500	8.000	217.000	2.500	4.500	215.000	9.500	215.500	8.500	10.000	214.500	213.000	215.000	214.500	219.500	218.000
Z	-.092	-.553	-.547	-1.578	-1.132	-.893	-.269	-.853	-.444	-.181	-1.007	-1.356	-.953	-1.025	-.099	-.360
Asymp. Sig. (2-tailed)	.927	.580	.584	.114	.258	.372	.788	.394	.657	.856	.314	.175	.340	.306	.921	.719
Exact Sig. [2*(1-tailed Sig.)]	.952(a)	.762(a)	.762(a)	.190(a)	.381(a)	.571(a)	.857(a)	.571(a)	.762(a)	.952(a)	.476(a)	.381(a)	.571(a)	.476(a)	.952(a)	.857(a)

	ITEM_33	ITEM_34	ITEM_35	ITEM_36	ITEM_37	ITEM_38	ITEM_39	ITEM_40	ITEM_41	ITEM_42	ITEM_43	ITEM_44
Mann-Whitney U	3.500	8.000	10.000	1.500	3.500	6.000	3.500	9.500	8.500	8.500	8.500	9.000
Wilcoxon W	213.500	218.000	11.000	2.500	213.500	216.000	4.500	10.500	218.500	218.500	9.500	219.000
Z	-1.232	-.365	.000	-1.543	-1.174	-.710	-1.177	-.099	-.269	-.269	-.298	-.177
Asymp. Sig. (2-tailed)	.218	.715	1.000	.123	.240	.478	.239	.921	.788	.788	.766	.860
Exact Sig. [2*(1-tailed Sig.)]	.381(a)	.857(a)	1.000(a)	.190(a)	.381(a)	.667(a)	.381(a)	.952(a)	.857(a)	.857(a)	.857(a)	.952(a)

a Not corrected for ties. b Grouping Variable: Student or teacher

Appendix Twelve: Educational Beliefs Held by Many, Some of Few of the Participants

Educational Beliefs Held by Many of the Participants

Content can be memorised.

Content taught is continually changing, extending and improving.

Effective teachers are organised and prepared.

Learning involves observing demonstrations of examples.

Learning is influenced by students' learning experiences which can be negative.

Students have beliefs.

Students learn best when they like and respect their teacher.

Teachers should be able to deal with various students' needs.

Teachers use teaching strategies which motivate them as teachers.

Teaching involves responding to students' questions.

Effective teachers' awareness of the learning environment enables them to determine the teachable moment.

Learning is influenced by students' emotions, feelings, likes and dislikes.

Learning is time-consuming

Students' beliefs change.

Teachers should be able to manage students' behaviour.

Teachers should be open-minded and intelligent.

Teachers should reflect on their own teaching.

Teachers' subject knowledge should be current.

Teaching involves enabling students to complete course requirements.

Teaching involves encouraging each student to develop their general learning and IT skills.

Teaching involves extending each student's knowledge.

Teaching involves providing feedback about assessment tasks.

Teaching involves providing students with choice, while facilitating knowledge construction.

Learning involves student-teacher interaction.

Learning is influenced by students' relationships with the teacher and other students.

Students gain subject knowledge from the course, teacher and other students.

Students should be creative, open-minded and have common sense.

Teachers continue to learn about their subject.

Teachers have beliefs and these are sometimes different from other teachers.

Teachers know that learning involves making mistakes and rectifying misunderstandings.

Educational Beliefs Held by Many of the Participants

Teaching involves encouraging each student to be aware of, monitor and reflect on their own learning.

Teaching involves providing students with employment-related, professional skills and abilities.

Teaching is challenging.

Educational Beliefs Held by Some of the Participants

Students should be confident.

Students' beliefs don't change.

Teachers should know themselves.

Teaching involves adhering to institutional rules and policies.

Teaching involves enabling each student to develop academically and to think critically.

Teaching involves the facilitation of interaction between students to encourage students to assist each other to learn.

Teaching is influenced by course design and organisation.

The purpose of learning is to continue learning.

Examinations are not a good measure of learning.

Learning involves each student developing professionally.

Learning involves students doing well academically at university.

Learning is challenging.

Learning is easy and simple, and requires a low level of effort.

Some students are born good learners.

Students should possess learning strategies.

Teachers know how to treat students holistically.

Teachers should be professional and qualified.

Teachers' beliefs change.

Teaching involves encouraging each student to be responsible for their own learning.

Being an effective teacher involves interacting with your colleagues.

Content taught should be complete and fully detailed.

Effective learners are organised.

Learning involves growth and change for each student.

Students should reflect on how they are taught.

Educational Beliefs Held by Few of the Participants

Content learnt is continually changing, extending and improving.

Disruptive, unmotivated students negatively influence the learning environment.

Learners assist and encourage each other to learn, especially by forming their own study groups.

Learning involves students assisting each other to learn.

Teachers should be confident.

Teachers should let their personality be evident in their teaching.

Teaching involves creating a positive learning environment.

Teaching involves creating positive relationships with students.

Content learnt should be complete and fully detailed.

Content taught is complex and authentic.

Effective teachers have appropriate technological skills.

Learning involves each student developing personal values and attitudes.

Learning is almost automatic and involves a low level of effort.

Some students have natural learning strategies.

Teachers should reflect on their own learning.

Teaching involves being aware of and structuring the physical learning environment.

Teaching involves managing students' behaviour.

Teaching involves providing students with an appropriate level of academic challenge and workload.

Effective teachers are born teachers.

Learning involves each student developing their intelligence.

Students' subject knowledge should be current.

Teachers' beliefs don't change.

Teaching involves encouraging each student to develop professionally.

Teaching involves implementing preventative management strategies.

Teaching involves modelling positive attitudes.

Content taught should be accurate.

Effective students communicate with other students.

Learning involves students answering questions.

Appendix Thirteen: Educational Beliefs with High or Medium Degrees of Teacher-Student Belief Similarity

Beliefs with High Degrees of Teacher-Student Belief Similarity

Content taught is made up of linked concepts.

Effective learners are responsible for their own learning.

Effective teachers are interested in students and treat them with respect.

Learning involves students actively completing tasks (including online, repetitive, and example-based activities).

Learning involves students in a complex process that involves a high level of effort.

Learning is difficult and challenging.

Teaching is challenging.

Learning involves interaction between students.

Students' subject knowledge should be current.

Teaching involves providing students with skills and abilities to use and apply in the community, society and everyday life.

Teaching involves responding to students' questions.

Content taught is complex and authentic.

Learning involves students asking questions.

Teachers continue to learn about their subject.

Teachers should be available to assist students.

Teaching involves implementing preventative management strategies.

Teaching involves modelling positive attitudes.

Effective learners are organised.

Students should be creative, open-minded and have common sense.

Effective teachers adapt their teaching strategies to suit different learners and learning situations.

Effective teachers' teaching strategies are clear and rational.

Learning involves observing demonstrations of examples.

Learning involves students assisting each other to learn.

Students have beliefs.

Teaching involves extending each student's level of understanding.

Effective teachers are born teachers.

Effective teachers are skilled, entertaining, timely and appropriate presenters.

Learning involves completing assessment tasks.

Learning involves creating knowledge.

Beliefs with High Degrees of Teacher-Student Belief Similarity

Learning involves each student developing their abilities to be aware of, monitor and reflect on their own learning.

Learning involves each student developing their intelligence.

Learning involves students completing course requirements and gaining qualifications.

Learning involves working with and selecting knowledge.

Students should be confident.

Students should enjoy, be motivated about, committed to and involved in learning.

Teachers know that all learners are different.

Teachers should be confident.

Teachers should reflect on their own teaching.

Teachers' beliefs don't change.

Teaching involves adhering to institutional rules and policies.

Teaching involves creating positive relationships with students.

Teaching involves encouraging each student to develop professionally.

Teaching involves the facilitation of interaction between students to encourage learning.

Disruptive, unmotivated students negatively influence the learning environment.

Teaching involves facilitating each student's development of personal values and attitudes.

Teaching involves the facilitation of interaction between students to encourage students to assist each other to learn.

Effective teachers are organised and prepared.

Teaching involves providing appropriate assessment tasks.

Content learnt is complex and authentic.

Content learnt is made up of linked concepts.

Learning involves completing activities that are specifically hands-on and practical activities.

Learning involves each student developing their abilities to become an independent learner.

Learning involves each student extending their knowledge.

Learning involves each student progressing at their own rate.

Learning involves receiving information and gaining knowledge.

Learning is influenced by students' emotions, feelings, likes and dislikes.

Students' beliefs change.

Teaching involves being aware of and structuring the physical learning environment.

Beliefs with High Degrees of Teacher-Student Belief Similarity

Teaching involves facilitating each student to develop or change their point of view.

Learning involves dealing with academic challenge and workload issues.

Learning involves each student developing personal values and attitudes.

Learning involves growth and change for each student.

Learning is almost automatic and involves a low level of effort.

Students create documents, notes, electronic files and resources in the learning process.

Students gain subject knowledge from the course, teacher and other students.

Teaching involves providing students with resources for learning (texts, other material, teacher as resource, computerised resources).

Beliefs with Medium Degrees of Teacher-Student Belief Similarity

Effective students are aware of their own qualities as a learner.

Students should be aware of themselves as learners.

Students should reflect on their own learning.

Students use various learning strategies.

Teachers should let their personality be evident in their teaching.

Teaching involves using communication and presentation resources for teaching.

Teachers have beliefs and these are sometimes different from other teachers.

Teaching involves encouraging each student to be responsible for their own learning.

Content learnt is continually changing, extending and improving.

Examinations are not a good measure of learning.

Learners assist and encourage each other to learn, especially by forming their own study groups.

Learning involves developing employment-related professional skills and abilities.

Learning involves each student developing their general learning and IT skills.

Learning is challenging.

Teaching involves using assessment to evaluate learning and to provide teaching direction.

The purpose of learning is to continue learning.

Effective teachers have appropriate technological skills.

Learning involves developing skills and abilities to use and apply in the community, society and everyday life.

Learning involves getting through course material within time limits.

Learning involves receiving feedback about assessment tasks.

Some students are born good learners.

Some students have natural learning strategies.

Students should possess learning strategies.

Teachers should be empathetic, personable, approachable, modest, patient and calm.

Teachers should reflect on their own learning.

Teaching involves asking and encouraging students to ask questions.

Teaching involves explaining information to students.

Teaching involves providing students with examples.

Content learnt should be complete and fully detailed.

Effective teachers use appropriate presentation resources.

Teachers should be able to manage students' behaviour.

Teachers should be the source of subject knowledge.

Teaching involves allowing each student to progress at their own rate.

Teaching involves balancing course requirements and workload within institutional time constraints.

Teaching involves managing students' behaviour.

Teaching involves the facilitation of student-teacher interaction.

Learning is easy and simple, and requires a low level of effort.

Teachers should be able to deal with various students' needs.

Content taught should be complete and fully detailed.

Effective teachers' awareness of the learning environment enables them to determine the teachable moment.

Learning involves students doing well academically at university.

Students already possess some subject knowledge.

Teachers know how to treat students holistically.

Teachers should know themselves.

Teaching involves extending each student's knowledge.

Teaching involves providing students with employment-related, professional skills and abilities.

Learning is influenced by students' relationships with the teacher and other students.

Students' beliefs don't change.

Teachers should be able to communicate with groups of students and individual students.

Beliefs with Medium Degrees of Teacher-Student Belief Similarity

Teachers should be professional and qualified.

Teachers' subject knowledge should be current.

Teaching involves encouraging and expecting students to do well.

Effective teachers reflect on and incorporate feedback from others in order to improve their teaching.

Teachers use teaching strategies which motivate them as teachers.

Teaching involves providing students with an appropriate level of academic challenge and workload.

Learning involves each student developing professionally.

Students should reflect on how they are taught.

Content taught is continually changing, extending and improving.

Learning involves building upon students' current knowledge.

Learning involves student-teacher interaction.

Learning is influenced by students' learning experiences which can be positive.

Teachers know that learning involves making mistakes and rectifying misunderstandings.

Teachers should be open-minded and intelligent.

Teachers should enjoy, be enthusiastic about and be committed to teaching.

Teaching involves enabling students to complete course requirements.

Teaching involves encouraging each student to be an independent learner who can make their own learning choices.

Teaching involves encouraging each student to be aware of, monitor and reflect on their own learning.

Students learn best when they like and respect their teacher.