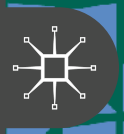

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Exploring University Teaching and Learning

Experience and Context

Keith Trigwell
Michael Prosser

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Exploring University Teaching and Learning

"Enhancing discipline-specific evidence-based development of the quality of teaching and learning in higher education has been my strategy during my whole career. Therefore and with great pleasure I read the book by Trigwell and Prosser which distills their teaching and learning research into a guide for those seeking to better understand their teaching environment. Building on their discovery of relations between the ways of teaching and the ways of learning, they expand on what is known about variation in teaching and how it links to course design, to research and to academic development. This book will be a valuable resource for many academics."

—Professor Sari Lindblom, *University of Helsinki, Finland*

Keith Trigwell • Michael Prosser

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Preface

In 1999 we had just finished writing a book that was published with the title *Understanding Learning and Teaching: The Experience in Higher Education*. As a summary of our research into university teaching and learning up to that year, the book contains an overview of students' experience of learning. It has a focus on how university teachers can use their awareness of the context of their students' learning to reflect on their teaching. It ended by revealing that in our empirical research we had found a relationship between the way university teachers teach, and how their students approached their learning. That relationship was important because without it, attempts to improve teaching would be for naught. That book is still in print, but of course it does not contain the story of what has happened in the 20 years since our report of the teaching-learning relationship.

Over the last 20 years we have continued to conduct research into university teaching and learning together and separately with other colleagues. That research has both replicated and extended the earlier research work. In doing so it has involved a shift in focus more towards university teachers' awareness of their own teaching context (which continues to include an awareness of their students' learning). While it has been published in many papers in a wide range of journals, we wanted to see it brought together to form the subject matter of a book. *Exploring University Teaching and Learning* is that book. It is essentially about the implications for teaching and learning in higher education of the variation in teachers' approaches to teaching.

The trigger for the writing of this sequel to *Understanding Learning and Teaching* was a request from Peter Kandlbinder, who asked us to summarise the last 20 years of our research in the form of a review paper for the on-line publication *HERDSA Review of Higher Education*. The format and content themes presented in this book were first written by us for that publication. Permission from the Higher Education Research and Development Society of Australasia Inc. to build on the summaries we crafted for that review is acknowledged.

As we approach the end of our careers, we have many more acknowledgements. In getting started on the 30-year teaching and learning research project featured in this book we received valuable guidance and support from Ingrid Moses and Mick Dunkin. We have benefitted massively from the generous mentoring we received from Ference Marton, Noel Entwistle and John Biggs who, in the 1970s, established the field that we later came to occupy. We have thrived in collaborative research contexts with many people, including Elaine Martin and Paul Ramsden (Paul died unexpectedly in 2017. He is remembered as a colleague, a leader and a friend.), Paul Ashwin, Rob Ellis, Elizabeth Hazel and Sari Lindblom-Ylänne. Our ideas were clarified and enhanced in conversations with referees and colleagues including Shirley Booth, John Bowden, Graham Gibbs, Peter Goodyear, David Kember, Herb Marsh, Erik Meyer, Paul Pintrich, Lennart Svensson, John Richardson and Torgny Roxå. As this book shows we have learnt much together with our PhD students – Gerlese Akerlind, Maliheh Babaee, Chris Cope, Jane Davey, Helen Forbes, Katherine Jukic, Lynne Leveson, Fangfang Li, Jo McKenzie, Anna Reid, Daniel Sze, Kate Thomson and Fiona Waterhouse. And we have been assisted over the years by a talented group of Research Assistants – Joan Benjamin, Harriet Dunbar-Goddet, Patsy Gallagher, Fei Fei Han, Andria Hanbury, Jason Kelleher, Gillian Lueckenhausen, Heather Middleton, Rosemary Miller, Anne Pitkelthy, Kitty te Reile and Phillip Taylor. We also wish to acknowledge all of our co-authors and many other colleagues throughout the world who have contributed to making our academic and social lives so enjoyable. We also thank Kaye Nolan and Laura Menschik who have shared our research/academic odyssey and still smile politely when conversations lurch towards variation theory or phenomenography.

Most of our research was funded by grants from the Australian Research Council, the Hong Kong University Research Grants Committee and the

United Kingdom Higher Education Academy, which we gratefully acknowledge. Finally, Palgrave Macmillan have given us the chance to produce this 'swansong' and for their professional support we are thankful.

Sydney, NSW, Australia
Melbourne, VIC, Australia
Hobart, TAS, Australia
2020

Keith Trigwell
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Contents

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Keith Trigwell is an Honorary Professor at The University of Sydney, Australia. His research interests include investigating qualitative differences in university teaching and students learning and the scholarship of teaching, including co-development of the Approaches to Teaching Inventory. He has been awarded life-time achievement awards by national and international organisations.

Abbreviations

3P	Presage Process Product
ATI	Approaches to Teaching Inventory
ATI-R	Approaches to Teaching Inventory Revised
CCSF	Conceptual change/student-focused (approach)
CDSF	Conceptual development/student-focused (approach)
EEI	Experience of Emotions Inventory
ETI	Emotions of Teaching Inventory
GPA	Grade Point Average
ITTF	Information transmission/teacher-focused (approach)
MEQ	Module Experience Questionnaire
OSI-R	Occupational Stress Inventory-Revised
PBL	Problem-based learning
PTEI	Perceptions of the Teaching Environment Inventory
SAL	Student Approach to Learning
SEM	Structural Equation Modelling
SOLO	Structure of the Observed Learning Outcome
SPQ	Study Process Questionnaire
SRL	Self-regulated learning
TOQ	Teaching Orientation Questionnaire

List of Figures

List of Tables

CHAPTER 1

Exploring Teaching and Learning in Higher Education

Abstract Do the different ways that teachers go about teaching have different outcomes for their students' learning? This is the question addressed in this book. It is introduced in this chapter through a model describing the relations between university teaching and student learning. Using a presage-process-product format, the model proposes (a) that students' experiences of their learning context are related to their learning outcomes through approaches to study and (b) that teachers' experiences of their academic context are related to their approaches to teaching and crucially, to the approach to learning adopted by their students. Empirical results focusing on relations between the *key* variations in teachers' and students' experiences that support the proposed model are the subject of this book.

Keywords Teaching-learning model • 3P model • Experience of teaching • Experience of learning • Key variation

A Scenario

Professor Randal Langridge had just received an award for outstanding teaching from his university. He was asked in an interview to talk about his teaching, and his response included the following:

K. Trigwell, M. Prosser, *Exploring University Teaching and Learning*, https://doi.org/10.1007/978-3-030-50830-2_1

> My role is to get the material over to students in manageable chunks that motivate the students, in a way that is understandable and at the same time making it interesting. I have it fixed what I want to cover in the lectures because I divide up the syllabus into a number of lectures and cover that over the semester. In each lecture I first go over what I have done in previous lectures, then introduce the theme of the current lecture, elaborate on that theme, move through material to be covered, then summarise the previous 50 minutes and finally invite questions. I know what notes I want students to get from the lecture, so I have handout notes prepared that contain gaps, and I expect students to fill those gaps during the lecture. This way they do not have to worry about when to take notes. My hope is that students get an understanding of descriptive material and its application as they need to know this in order to pass formal examinations.

In a similar science subject area, and in her teaching award interview, Professor Rita Spurling described her lectures and note-taking in a very different way.

> I start lectures by asking students what they think and take 5 or 6 responses. In the lecture I will walk around the theatre among the students as I point out information on the screen and it is my intention to keep them engaged with what I am saying rather than just slavishly writing down what I am saying. It is important that they take their own version of notes, not mine, if they are going to be conversant in the topic. This comes from my general philosophy of teaching that it is not about lectures being the presentation of a whole lot of information, or as something to be gotten through. The real value of lectures is not about information giving, but rather to provide a sense of intrigue. When you start to investigate something that is taken for granted, I think this challenge sparks inquiry. It is intriguing and leads to real understanding. Regurgitating provided information for assessment reasons is not what I call education.

While both teachers have received awards for their teaching, their approaches, in this small component of their teaching at least, are quite different.

A similar variation is also found in other disciplines. For example, in large class teaching in the social sciences, Teacher A says:

> … we do run classes with 200 to 300 students in them, so we're never going to get into full-on discussion situation. The best that we're going to do is to have five minute windows of chaos in the middle of the lecture where the students are working with a neighbour … I'm waking them up, so waking them up is the number one objective. Two, let them let off a bit of steam, so instead of having the constant low chatter running through the lecture, they're going to vocalise something. … no-one can concentrate for 20 minutes. Ask them to concentrate for 3 minutes of doing something else. (Prosser & Trigwell, 2014, p. 793)

Teacher B, on the other hand, describes social science lectures as follows:

> What I mean I guess is, some years for whatever reason, students grasp the basic concepts more readily, usually under conditions where the first two lectures, which are the most difficult conceptually, go well. … So, what I try to do is get people to think about an idea with some sort of catchiness, 'Oh I wonder why that happens?' They will actually then reconstitute into, and reinvigorate, the knowledge that they were getting, and discuss it. (Prosser & Trigwell, 2014, p. 793)

Here, again the distinction between the two approaches is clear. In the first quote, Teacher A is worried about concentration times and giving students a break so they can return to the lecture 'refreshed' and can retain the information or acquire the concepts. In the second quote, Teacher B focuses on students' conceptual understanding and changing or developing the way they think about something. Again, it is where the activity is directed that distinguishes the two approaches.

The question that interested us and has been the focus of the last thirty years of our research, is: 'Do the differences in these approaches evoke differing responses from students?'. As we will show in this book not only is **yes** the answer to this question, but that most of the students in the classes of Teacher B or Professor Spurling are more likely to be adopting higher quality learning approaches than the students taught by Professor Langridge or Teacher A.

In 1999 we first reported these relations between teaching and learning in the results of an empirical study (Trigwell, Prosser, & Waterhouse, 1999). Teachers in 48 different first year science classes were asked about

their approaches to teaching. The students in their classes (an average of 82 per class) were asked about their approaches to learning. When teachers reported use of a more transmission-based intention, their students were more likely to report adopting more superficial or reproducing learning methods. An intention in teaching to challenge students' conceptions was found to be positively associated with more meaningful study and negatively associated with superficial approaches.

In a second study (Prosser, Ramsden, Trigwell, & Martin, 2003), clusters of classes in 51 disciplinary varying first year courses were surveyed. The results from a total of 408 teachers and 8829 students confirmed the associations found in the first study. We will return to these studies in Chap. 3.

The way students perceive and understand their learning context and the way they approach their learning in relationship to these perceptions have been found to be major mediating factors between teachers' teaching and students' learning outcomes. Similarly, the way teachers perceive and understand their academic context is related to the way they approach their teaching. These studies also establish the presence of an important association between teaching and learning. Without an association between teaching and learning, efforts to change teaching approaches as a means to improve learning would be pointless. Because of it, attempts to better understand the teaching context and to constitute principles for teaching practice have continued. In this book we explore the research studies that have contributed to the empirical evidence that addresses the following question:

- Do university teachers experience aspects of the academic context (such as leadership, research, perceptions of workload and class size) in different ways and if so in what ways do those differences impact student learning?

We then show through a series of principles of practice in each chapter how this research might be applied to enhance the quality of teaching and students' learning.

A Model Linking Teaching and Learning

In approaching an answer to the question posed above, we use a model or heuristic device that links aspects of teaching and learning. The chosen model is based upon Dunkin and Biddle's (1974) and Biggs' (1979) 3P

(presage-process-product) models. Their models included only student learning in an academic context. The model we developed for this analysis is in two related parts: one focused on students and their learning and the other focused on teachers and their teaching.

The two parts of the model are related through the teachers' approaches to teaching and students' approaches to learning. The model is used as an organising device for the following chapters and to provide a coherent structure for the book as a whole. In each chapter the model acts as a visual map for the research conducted into the set of relations that constitute each part of the model. In doing so, it builds a coherent framework for the understanding of relations between teaching and learning in the context of academic environments, including curriculum design, research and leadership.

Research from the Student Approach to Learning (SAL) perspective has repeatedly revealed logical, systematic relations between four elements of the students' learning context: their conceptions and understanding, their perceptions of their learning context, their approaches to learning and the quality of their learning outcomes (see, for example, Hazel, Prosser, & Trigwell, 2002; Lizzio, Wilson, & Simons, 2002; Prosser & Trigwell, 1999; Richardson, 2006). These four elements constitute the student part at the top of the model and this research is presented in more detail in Chap. 2.

Our research has been driven by the teaching part of the model which features teachers' conceptions/understandings, their emotions and perceptions of the academic context and their approach to teaching. Relations between these three elements have also been reported (Prosser & Trigwell, 1997) confirmed in a follow-up study (Ramsden, Prosser, Trigwell, & Martin, 2007) and now also found in the e-Teaching environment (González, 2012). These three elements constitute the teacher part at the bottom of the model and this research is presented in more detail in Chaps. 3, 4, 5 and 6.

The relations between the seven teaching and learning elements and with the shared academic context are shown in the teaching-learning model in Fig. 1.1.

The components of the model, for analytical reasons, are presented as being separate and time-related (presage to product) entities. However, for both students and teachers, we see Fig. 1.1 as representing a dynamic set of inter-relations between aspects of the teaching-learning experience that can be seen as being 'simultaneously present in their awareness'

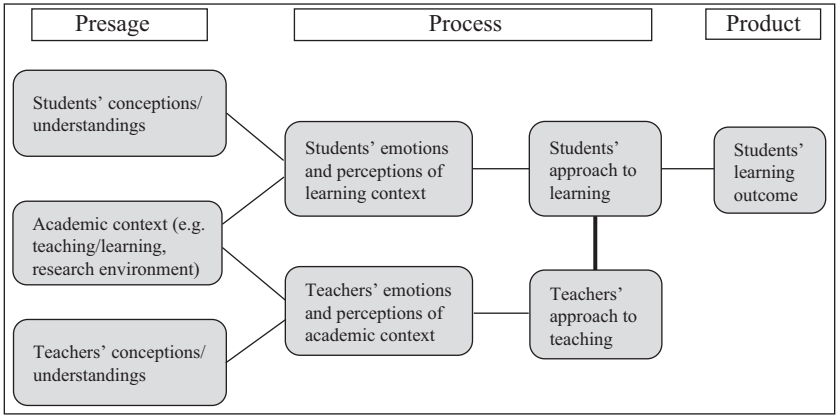

Fig. 1.1 Relational 3P (presage-process-product) teaching-learning model. (Source: Adapted from Trigwell et al., 1999, p. 60)

(Prosser & Trigwell, 1999, p. 17). This means that teachers and students will, at any time, be aware of a great many things, including the academic context, their current understandings, their approach to teaching/learning, and other things that may be less central to teaching/learning. For example, in reflecting on their learning outcomes, students will be aware of how this relates to what they already know, what they did to achieve this outcome, and what they might do should a similar situation arise in the future. In thinking about and preparing for their teaching, teachers will be aware of things such as the size of the class they are teaching, the demands on their time from research commitments, and what happened when they last taught the same topic.

As shown in the model, students and teachers share an *academic context*: that which constitutes the environment in which they teach and/or learn. It includes the physical buildings (laboratories, study centres and libraries); the learning environment (the assessment system and student learning support); the teaching infrastructure (teaching methods, course structure) and academic conditions such as research demands, leadership of teaching and the workloads of teachers and students. The importance of context is illustrated in the study by Lund and Staines (2015) who found that the departmental context (including policy areas such as promotion and tenure and characteristics of the learning environment) is

associated with the variation in how science teachers approach their teaching.

In the student part of the model, *conceptions/understanding* refer to what the students bring to each learning context and includes their evoked prior experience of learning and their understanding of the subject matter. The students' *emotions and perceptions of their learning context* are thought to be formed through the relationship between the academic context and their prior experience, and include perceptions of the workload required, the quality of the teaching and the assessment regime. Deep and surface approaches are the qualitatively different *approaches to learning* used in the model to explore relations with the quality of the *students' learning outcome*. A deep approach is one in which students have an intention to understand the material being studied, and in so doing attempt, for example, to relate the various parts of the material being studied to one another and to construct a whole, to relate that material to what they already know and to the real world. A surface approach is one in which the intention is to reproduce the material. Rote learning of parts of the material and memorising templates for the solution of problems are just two of the strategies used by students adopting this approach.

The teaching part of the model also features the *conceptions/understandings* of the teachers that include their prior teaching experience, how they see the structure of their subject matter and their conceptions of research. Perceptions of the teaching workload, the quality of teaching leadership, the class size and the departmental emphasis placed on student learning are some of the *perceptions of the academic context* experienced by teachers, and as with the student part of the model, two qualitatively different *approaches to teaching* are used: a conceptual change/student-focused approach (CCSF) and an information transmission/teacher-focused (ITTF) approach. When using a CCSF approach the teacher focuses more on what the student is doing and learning than on what they are doing or covering. The teacher provokes debate (and raises and addresses the taken-for-granted issues), uses a lot of time to question students' ideas, and develops a 'conversation' with students in teaching sessions, including lectures. An ITTF approach is one where the intention is transmission of facts and skills, through the use of well-planned teaching material as it is assumed that the students will learn from the received material and a good set of notes.

In each of the following chapters, this model is used to frame the research that shows how aspects of the teaching-learning environment may be linked to student learning outcomes.

Researching University Teaching

There are many ways to conduct research into university teaching, and many facets on which to focus. Our research project for the last 30 years has been focused on looking for relations between elements of the model in Fig. 1.1 rather than developing a detailed description of teaching. To achieve this goal, in the research described in this book we have adopted a relational research approach, which has two dimensions.

The first dimension is the consideration that experience is fundamentally related to the context being experienced. The same teacher may adopt different approaches in different contexts. For example, when teaching a large first-year class, a lecturer may spend more time presenting and less time finding out what the students know than she might do in a small group tutorial for a taught postgraduate course. We therefore emphasise an awareness of the academic/learning context, and perceptions of that context, in our investigations.

The second dimension is that we are less interested in the many ways that teaching can be conducted than the relations between the key components of that variation and the key variation in other aspects, such as learning or leadership. For this reason, our studies focus on just a part of the teaching 'picture' (usually the extremes of the variation) rather than a full rich description. (For a richer description from the SAL perspective you may wish to consult Entwistle's (2009) book on teaching.)

Our teaching-learning model is a relational model in both respects, in that it shows both the relations between the aspects of teaching and learning we seek to understand, and that it is relational in including the context.

While the relational research approach used to investigate university teaching and learning from the SAL perspective has been accepted in peer-reviewed publications for nearly 50 years, there are two aspects of the approach that are subject to continuing questioning. The first is that it is too simplistic to think of students and teachers approaches as dichotomies. For example, to describe learning in terms of deep or surface approaches (e.g. Haggis, 2009) or teaching in terms of intention to transmit information or to change students' conceptions. The second is that studies based on teachers' and students' self-reports may be telling only half the story

(Kane, Sandretto, & Heath, 2002) because self-reports of approaches may not be the same as the actual practice.

We opened this chapter with descriptions of two approaches to teaching, and in the text that followed we again describe only approaches involving an intention to transmit information or to change students' conceptions. And in describing students' approaches to learning in the model, we mention only deep and surface approaches. Our reasoning in adopting this format is that while we know that the position is more complex than involving two approaches to learning and to teaching, our focus is only on those approaches that are the key to the relations between the variations that we are seeking to explore.

As you will see in Chap. 3, our research into approaches to teaching has identified five qualitatively different approaches in some studies and six in others. They are organised into an inclusive hierarchy, meaning that some of the approaches (for example the transmission intention in the approach adopted by Professor Langridge) were seen to be less complete or less sophisticated than others (such as the approach adopted by Professor Spurling that included much more than transmission). When related to other variables, such as student learning, the bigger differences between the two approaches at the extremes of this range are likely to show more variation than those involving approaches in the middle of the range. In our research approach we are aiming to identify *key* or significant variations in experience (rather than *all* variations in experience) and as these are the approaches found at the extremes of the qualitatively different range of approaches, our research has a focus on just those two approaches. While we accept that most teaching approaches are currently mid-range rather than at the extremes, if an approach at one end of the range, such as the approach of Professor Spurling, is shown to have a stronger positive association with student learning, then a shift from mid-range towards that extreme may be advantageous for student learning.

With respect to the criticism that studies that are based on teachers' and students' self-reports may be telling only half the story, we have investigated the veracity of this claim in one of our earlier studies (Martin, Prosser, Trigwell, Ramsden, & Benjamin, 2000) and in terms of the research approach we use, found it not to be the case. Our research is conducted from a relational perspective, meaning that we consider that experience is a function of the context being experienced. When asking a teacher or student for a description of their approach, whether in interviews or questionnaires, we ensure that they are reminded to describe that

approach in a specific context, for example in a particular subject, or a specific teaching/learning activity, as illustrated in the opening paragraph on our quantitative instrument – the Approaches to Teaching Inventory (Appendix).

In a study of the different ways in which 26 university teachers intended to constitute a subject or topic for their students to study, we interviewed the teachers about their intentions in teaching a topic and then observed them teaching that topic. The teachers were asked how they intended to approach their teaching. Using this information, an hypothesis was formed as to how the classroom teaching would be conducted. Two major classes, usually lectures, were observed for each teacher. The observation was aimed at determining if the hypothesis formed after the interview held, or whether it was challenged by the observation. In all cases the observation did not disprove the hypothesis which was developed before the observation.

This result revealed that when the context of teaching and learning is tightly defined in interviews there is a close relationship between a teacher's self-reported intention in teaching and their observed practice (Martin et al., 2000, p. 409). Based on this result, and the tightly defined context of teaching and learning used in our research, we assert that self-reports provide an accurate and meaningful description of the phenomenon being researched. And we also accept that the assertion by Kane and colleagues may well be true in those cases where the articulated espoused theory and the observed theory in practice do not refer to the same context.

The Structure of the Book

In our earlier monograph (Prosser & Trigwell, 1999) our focus was on the variation in the students' experience of learning. Through a series of principles of practice for teaching and learning, we showed how teachers could become more aware of the student experience and use that information in their teaching. In this book we shift the focus onto the teachers' experience. The central theme is the different ways individual teachers experience teaching and how that relates to how their students learn. We argue that most of the differences are evoked by the academic context experienced by the teacher and in each of the chapters that follow, we again outline a set of principles of practice for teaching and learning that are drawn from the results of the research described in that chapter.

In Chap. 2 we focus on the student part of the model and review the work on the student experience of learning from the Student Approaches to Learning (SAL) perspective up until 1999, then present in more detail the work since then. In particular, we focus on the relationship between students' approaches to learning and their emotions relating to learning. We show how students adopting deeper approaches to learning have more positive emotional experiences of their studies, while those adopting more surface approaches show stronger negative emotions. We then focus on students' experiences in two widely used pedagogical approaches, namely learning online and in problem-based learning contexts. Finally, we move beyond the dichotomous definitions of students' approaches to learning and explore some of the complexities in SAL research that have emerged in recent years.

Chapter 3 focuses on the teaching part of the model. Since the initial publication of the Approaches to Teaching Inventory (Prosser & Trigwell, 1999, pp. 176–179), it has undergone a number of developments and refinements including translations into more than ten languages and application in many different contexts and cultures. The results from more recent studies on approaches to teaching are presented. The research confirming the relationship between teachers approaches to teaching and students approaches to learning in these various contexts is summarized and the emerging work on disciplinary variation in approaches and the part played by emotions in teachers' approach to teaching are addressed.

The relationship between teaching and research in higher education is a contentious issue. In Chap. 4 we review the empirical work relating teaching and research and argue for a deepening of how the relationship can be conceptualised based upon our model of teaching and learning. We discuss the relationship between the experience of teaching and research as being mediated by the experience of understanding the teaching subject matter. Indeed, we argue that there is a fundamental underlying structure in the way teaching and research are experienced. The implications of these relations for teaching are discussed.

Chapter 5 addresses issues of the leadership of teaching and how various forms of leadership are related to variation in the way teachers approach their teaching. Following a review of the research looking at the variation in the way university teachers experience leadership of teaching and how that relates to their experience of teaching, we then turn to how those experiences relate to student learning. We reveal a direct empirical link between teachers' experiences of leadership and the academic context,

their approaches to teaching and their students' experiences of teaching and learning, all in the context of the teaching-learning model outlined above.

The focus of Chap. 6 is research on how university teachers' approaches and experiences of teaching and learning change and develop over time. We examine the role formal university courses, seminars and workshops play in developing these approaches and changing these experiences. We argue that teachers with appropriate support can and do grow as university teachers in ways that are consistent with our teaching-learning model.

The final chapter is a summary of the view of university teaching and student learning presented in the book. We reiterate the underlying coherence in the way university teachers experience their teaching, their student learning, their research and perceptions of leadership and their ongoing growth and development. We describe the underlying rationale for the principles of practices identified in each chapter and present issues related to research methodology. We conclude with our own personal reflections on the 30-year research project that has used the model introduced above to inform the direction of the series of research studies that underpin this book.

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CHAPTER 2

Students' Experiences of Learning

Abstract This chapter contains a brief review, up to 1999, of the research on the student experience of learning from the student approach to learning perspective. The results and implications of more recent research on (a) the relationship between students' approaches to learning and their emotions relating to learning and (b) students' experience of learning online and in problem-based learning contexts are presented. These developments are related back to the model of teaching and learning underpinning the book and are used to frame a set of principles of teaching practice. Some of the complexity in students approaches to learning in terms of a more complex web of influences on learning are also discussed.

Keywords Approaches to learning • Emotions in learning • On-line learning • Problem-based learning

In the previous chapter we outlined our model which we have used to inform our research, scholarship and practice of teaching and learning. The part of the model that is the focus of this chapter is shaded in Fig. 2.1. The value of the model of teaching-learning experience lies in making more explicit the range of elements that make up the learning experience for students, and of the need for consideration of a full range of teaching/learning elements in designing new learning environments. Questions remain on whether the model applies to all students, studying all topics

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and all teaching techniques. In order to answer these questions, follow-up studies have looked at the impact of prior experience and understanding and learning emotions.

In our previous book (Prosser & Trigwell, 1999) we dealt, in detail, with the issue of students' prior experiences of teaching and learning and how that related to their perceptions of the teaching and learning environment, approaches to study and learning outcomes. Here we will briefly review that work and move on to other aspects of the students' learning experiences. We will address question such as:

- How do students' approaches to learning and perceptions of their learning context vary and relate to each other and their learning outcomes in higher education?
- What is the nature of the relationship between students' emotions and their approaches to learning and their learning outcomes?
- How do curriculum structures and teaching technologies affect ways in which students approach their learning and subsequently their learning outcomes?
- How can these key variations in students' experiences be used to further understand the complexity in those experiences?

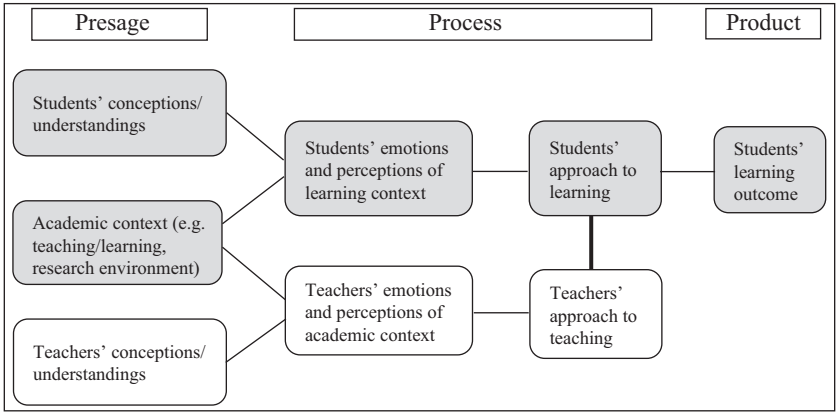

Fig. 2.1 The teaching-learning model showing the focus of this chapter (shaded areas). (Source: Adapted from Trigwell, Prosser, & Waterhouse, 1999, p. 60)

The role of emotions in learning, from the student learning perspective, is one that is under-researched. In addressing this issue, we will be arguing that students who adopt deeper approaches to study are more likely to have emotional experiences that are more positive and satisfying. This is in distinct contrast to the emotional experiences of those adopting more surface approaches. With the rapid development of more inquiry-focused and technology-enriched approaches to teaching and learning over the last 20 years, we will argue that the student learning perspective, and our model of teaching and learning, do provide a sound basis for scholarly reflections and curriculum development. Studies have been conducted into the influence of disciplines on teaching and learning. The research continues, with very few exceptions, to confirm that prior conceptions and understanding, perceptions of the learning context, and approaches to learning are directly and indirectly related to academic achievement. We will argue that the validity of the model has been tested in teaching and learning contexts such as these.

Prior Experiences, Perceptions, Approaches and Outcomes

The research reviewed in Chaps. 3, 4, 5 and 6 of our previous book summarised the outcomes of the research into students' experiences of learning up until 1999 (Prosser & Trigwell, 1999). That research showed that there was a fundamental key variation in the way students approached their learning. On the one hand there was an intention to reproduce in the short term – a surface approach. On the other hand, there was an intention to understand for the longer term – a deep approach. These two intentions and associated strategies represented a key variation in the way students approached their learning. As can be seen from our model, these approaches are seen to be evoked by students' prior experiences of teaching and learning and the specific teaching and learning context in which they are situated. The prior experiences are discussed in the 1999 book and include prior conceptual understanding of key concepts and ideas, variations in the prior understanding of the nature of the subject matter being studied and variation in prior conceptions of, and approaches to, learning.

These approaches were found to be systematically related to the ways in which students perceived the teaching and learning context. Different

students perceived the same context in different ways, related to their prior experiences. Our research showed that students, in the same context, who perceived that the teaching was of higher quality, who were clearer about the goals and objectives of the course they were in and who felt they had greater freedom in learning were more likely to adopt deeper approaches to study. On the other hand, students who perceived that the teaching was of lower quality, who were unclear about the goals and objectives, who felt that the workload was too high, who perceived that the assessment was testing reproduction and who felt they had no independence were more likely to be adopting more surface approaches (Prosser & Trigwell, 1999, p. 68). The fundamental issue to note is that these results are consistent within subjects as well as between.

But for us, it is how well all of this relates to the quality of student learning outcomes which justifies the research. Our research and that of others have consistently found relations between approaches to study and learning outcomes. Studies in various disciplines, in various teaching learning contexts have shown that there are systematic relationships between the quality of students' learning outcomes and their approaches to study. Surface approaches are consistently related to lower quality learning outcomes and deep approaches to higher quality learning outcomes. Here we list a selection of papers relating approaches to learning and learning outcomes from our own work (Crawford, Gordon, Nicholas, & Prosser, 1998; Ellis, Goodyear, O'Hara, & Prosser, 2007; Ellis, Goodyear, Prosser, & O'Hara, 2006; Hazel, Prosser, & Trigwell, 2002; Hegarty-Hazel & Prosser, 1991a, 1991b; Prosser, 1994; Prosser & Webb, 1994; Prosser, Trigwell, Hazel, & Waterhouse, 2000; Trigwell, Ashwin, & Millan, 2013; Trigwell, Ellis, & Han, 2012).

Again, we do not wish to argue that variation in approaches to study are the only determinants of students' learning outcomes – clearly there are many other factors. A recent systematic review and meta-analysis of psychological correlates of academic performance summarised the relationship between Grade Point Average (GPA) and a substantial number of these correlates (Richardson, Abraham, & Bond, 2012). Among them were students' approaches to study. The review found that deep approaches have a small positive association with GPA and surface approaches have a negative, somewhat larger, but still small association. It should be noted that the size of the approaches to study associations are similar to the majority of association and they are substantially larger than measures of social integration, academic integration and institutional integration. In

summary, we argue, with substantial supporting evidence, that students' approaches are a key variation in the quality of student learning outcomes.

Finally, in this section, it is the way students experience the teaching and learning context, as well as the context itself, which relates to their approaches to study and learning outcomes. All of these relations are represented in the top half of our learning and teaching model. In the next section we show how the Student Approaches to Learning (SAL) perspective relates to a number of key psychological correlates of good learning and show how such correlates can be interpreted from the SAL relational model.

Experiences of Learning and Student Emotions, Motivation and Self-Efficacy

While the focus of much of the research from a student learning perspective has been on the cognitive aspects of student learning – prior knowledge and understanding, perceptions of context, intentions, strategies and outcomes – more recently the role of students' emotions in learning situations, their motivation for learning and their self-efficacy has been an evolving and growing focus.

The role of emotions in university students' approach to learning emerged as an unexpected finding in a relational study of online learning (Ellis et al., 2006). We will return to this study in detail later, but here we wish to focus on the unexpected outcome. The study in question was one comparing student learning in online and face-to-face contexts. The study was conducted from a relational perspective, ensuring all data collection was situated within the learning context. Students were interviewed about their experiences of learning in the two contexts. The focus of the interviews was on their conceptions of, and approaches to, learning in the two contexts. On analysing the interviews, the analysts became aware of the variation in unanticipated responses from students focusing on affective aspects of their learning – their emotions in the online-learning context.

An example of a negative response was:

> I am one of those people who likes to not put my own ideas out there. I like to respond to others and until someone has put up something original and then I will agree or disagree with it or add to it. (Ellis et al., 2006, p. 250)

And a positive response was:

> I think that the on-line things are really good because some people might feel really shy in class or something and feel like they can't express themselves. Some people can express themselves better in writing than in talking. (Ellis et al., 2006, p. 251)

The authors state that these brief quotes open a new and important area of investigation from the students learning perspective.

Subsequently, Trigwell, Ellis, and Han (2012) did publish the results of such an investigation. The focus of this study was in the contextualised relation between students' emotions and their approaches to study. Do students who focus on meaning and understanding in their studies have more positive emotions towards their study, and do students who focus on short term reproduction have more negative emotions? The first task was to develop a Student Experience of Emotions Inventory (EEI). Drawing on the Academic Emotions Scale of Govaerts and Grégoire (2008) the authors developed the EEI. After systematic item and factor analyses of the inventory items, three scales were identified. The scales, each with one illustrative item, are shown below.

Positive Emotion Scale: Pride, Hope and Confidence (6 items)

I feel optimistic about my preparation for assessment in this course

Negative Emotion Scale: Frustration (anger and boredom) (5 items)

The learning activities of this course are not interesting

Negative Emotion Scale: Anxiety and Shame (7 items)

I am embarrassed when I cannot contribute to learning activities. (Trigwell et al., 2012, p. 815)

The Revised Study Process Questionnaire (Biggs, Kember, & Leung, 2001) was used to obtain indicators of students' deep and surface approaches to study. The results of the study are shown in Table 2.1.

Table 2.1 shows that a deep approach is positively associated with positive emotions of pride, hope and confidence and negatively associated with negative emotions of frustration, anger and boredom. On the other hand, a surface approach is associated with negative emotions of frustration, anger, boredom, anxiety and shame.

The results suggested that there was a relationship between the ways students emotionally experienced their biology course and the approach they took to the learning of that course. Students who experience stronger positive course-related emotions, such as hope and pride, are more likely to report adopting deeper approaches to their learning than those who

experience stronger negative emotions, such as anger, boredom, anxiety and shame. Students who describe more of the characteristics of surface approaches are more likely to report an experience of lower positive emotions and higher negative emotions (Trigwell et al., 2012). In a final conclusion, the authors stated that the main limitation was that the study was quantitative, and that a qualitative study may help to further unpack the relations between emotions and approaches.

In 2016, such a study from the situated student learning perspective was published (Postareff, Mattson, Lindblom-Ylänne, & Hailikari, 2017). These authors used interviews with 43 first year Finnish university students to investigate their emotions in their studies. They used the results of the qualitative analysis in a hierarchical cluster analysis to cluster groups of students with similar emotions and then quantitatively compared students' approaches to study in each cluster. The cluster analysis identified 3 clusters of students. The first cluster was substantially positive, with experiences of competence and enjoyment in learning. The second cluster was substantially negative with feelings of anxiety, confusion and frustration. The third cluster was again substantially negative with feelings of incompetence as well as confusion and anxiety.

Comparing the approaches to study with study progress and success for each of the clusters, the authors provided the following summaries:

Cluster 1 was labelled 'Quickly progressing successful students experiencing positive emotions': in particular, they described enjoying studying at the university. These students also described feelings of competence. The deep-approach score was rather high, and the surface-approach

Table 2.1 Principle components factor analysis of the students' emotions and students' approaches to learning variables

Variables	*Factors*	
	1	*2*
Positive emotion	.70	
Negative emotion 1	−.44	.56
Negative emotion 2		.83
Deep approach	.84	
Surface approach	−.47	.52

Source: Adapted from Trigwell et al., 2012, p. 819

score was the lowest of all the clusters. The score for organised studying was the highest of the three clusters, even though the differences were not statistically significant. Students in this profile succeeded well in their studies with a mean GPA of 3.7, with 5.0 being the maximum. They also progressed quickly in their studying, earning 58 credits during their first study year against the expected 50 credits.

Cluster 2 was named 'Quickly progressing successful students experiencing negative emotions'. These 14 students typically described frustration, confusion and anxiety, although feelings of incompetence were not typical of them. Their deep-approach scores were the highest, and their surface-approach scores were low. They succeeded as well as the students in cluster 1 and made the quickest progress, earning 60 credits during their first study year.

[Cluster 3] was labelled 'Slowly progressing students experiencing negative emotions'. The seven students in this cluster described being confused and anxious. They also experienced lots of feelings of incompetence, which was not characteristic of the students in the other clusters. They achieved the lowest scores on the deep-approach scale and the highest on the surface approach scale. Their study-success score was the lowest among the three clusters, the GPA being 3.1, and they progressed considerably more slowly than the students in the other clusters. They earned only 39 credits during their first study year and thus did not achieve the required 50 credits. (Postareff et al., 2017, p. 451)

Comparing the results of the two studies, the second study shows more complexity than the first. What is clear from both studies, however, is that feelings and emotions are strongly associated with approaches to study – focusing either on meaning and understanding or short-term reproduction. Common across both studies is that a surface approach is associated with feelings of incompetence and relatively poor performance. The relationship of approaches with feelings of anxiety and frustration are less clear.

Having looked at the issue of emotions in learning from a student learning perspective, we now turn to looking at the issues of motivation and self-efficacy (confidence to succeed).

More recently, student's motivation for success and self-efficacy have also been shown to be related to students' approaches to learning and their perceptions of the learning environment. For example, drawing upon work by Pintrich, Smith, Garcia, and McKeachie (1991), Ashwin and Trigwell:

> … reinterpreted ideas of motivation and self-efficacy from a relational perspective. From this perspective, it is possible that not all of a student's motivation and feelings of confidence will be evoked by a given situation. Rather, what aspects of their motivation and confidence are evoked will be related to their perception of the situation they are in. This means that, from this perspective, motivation is an integral part of a learner's awareness and an awareness that changes according to their relation to the situation, rather than a comparatively stable mental characteristic that is relatively separated from action. A similar argument is being used for self-efficacy and this is the reason for our drawing mainly on the work of Pintrich and colleagues. This research acknowledges a relational element in that motivation, task value, and self-efficacy are seen to change according to the context. For example, Pintrich and Zusho (2002) argue that motivational beliefs and self-regulatory activities are mediators between personal and contextual characteristics, on the one hand, and actual achievement or performance, on the other. (Ashwin & Trigwell, 2012, pp. 451–452)

In their study, Ashwin and Trigwell adapted the Task Value scale of Pintrich et al.'s (1991) Motivated Strategies for Learning Questionnaire to measure evoked motivation and their Self-Efficacy Inventory to measure evoked self-efficacy. These instruments, together with an approach to learning inventory (Richardson, 1990) and a perceptions of learning context inventory (Prosser & Trigwell, 1999) were completed by 831 first year students in a research-intensive teaching and learning environment. An item from each of the evoked motivation scale and evoked self-efficacy scale are shown below.

Evoked motivation scale

I am very interested in the content (subject matter) of my degree

Evoked self-efficacy scale

I'm certain I can master the skills being taught in my degree course

Table 2.2 shows the result of a correlational analysis of the relationship between the evoked motivation and self-efficacy scales and the perceptions and learning approaches scales.

Table 2.2 shows substantial correlations between the evoked motivation and evoked self-efficacy scales with perceptions of learning environment and approaches to study. All the correlations are in the direction expected. That is, for example, perceptions of good teaching are positively associated with evoked motivation and self-efficacy. Perceiving that the

teaching is good is related to higher levels of motivation and higher levels of confidence in being able to achieve the learning outcomes.

Of interest are the associations between approaches and evoked experiences. We know from our model that approaches are directly related to quality of learning outcomes. We see that a deep approach to study is positively associated with higher motivation to succeed and higher levels of confidence in being able to succeed. While a surface approach is associated with lower levels of motivation and lower levels of confidence in being able to succeed.

So, in this section we have shown how a number of psychological correlates of good learning can be interpreted from a student learning relations perspective – relating each item clearly to a particular learning context – and how they in turn relate to the key variables in our learning and teaching model. We have also been able to show how student approaches to learning are systematically related to their emotions, motivation and confidence and how perceptions of high-quality student learning environments are related to their motivations to study.

In the next section we focus on student experiences of learning in two of the more contemporary teaching and learning contexts – namely online and problem based.

Table 2.2 Correlations coefficients (r) between the two evoked experience scales and the four perceptions of learning environment scales and the two approach to learning scales (n = 831)

Perceptions and approaches	*Evoked experience scales*	
	Evoked motivation	*Evoked self-efficacy*
Good teaching	.38	.27
Clear goals and standards	.22	.31
Appropriate workload	.26	.45
Appropriate assessment	.26	.10
Deep approach	.49	.41
Surface approach	−.48	−.54

Source: Adapted from Ashwin & Trigwell, 2012, p. 458

Student Approaches to Learning Online and in Problem-Based Learning

In this section we wish to show how our model of teaching and learning can help to better understand students' learning experiences in teaching and learning contexts. With the need to enhance flexibility for students in their studies, and to better develop more inquiry-oriented learning skills, the use of both online and problem-based approaches has been rapidly developing.

Learning Online

In a series of studies in several disciplines, Ellis and colleagues have gathered evidence on students' experience of learning through on-line discussion and in face-to-face contexts (Ellis et al., 2006, 2007; Ellis, Goodyear, Calvo, & Prosser, 2008b). In social work, psychology, pharmacy and engineering, similar patterns of relations between the 3P model student variables were found. Using questionnaires, the studies investigated what students thought they were learning through discussions (their conceptions), and how they engaged in those face-to-face and online discussions (their approaches). In all cases, associations as expected from the 3P model were found among students' concepts of discussions, approaches and levels of achievement.

Here we will refer to the most highly cited of these papers, namely the 2006 paper. This was the foundation paper for the work reported in the subsequent papers. The paper focused on a comparison of student learning experiences in online and face-to-face discussions. The study was conducted in a second-year psychology subject in which students were engaged in both online and face-to-face discussions. It involved 51 students completing a questionnaire and 19 in-depth interviews. In the open-ended questionnaires and the interviews students were asked to respond to the following questions:

(a) What did you learn through discussions in your course? This includes all of the discussions that you were involved in in the course (that is, any discussions held in lectures, tutorials, workshops, online, etc.)
(b) How did you approach engaging in face-to-face discussions in your course? What sorts of things did you do to engage (or not) in the

discussions? Why did you use those strategies to engage (or not) in the discussions?

(c) How did you approach engaging in the online discussions in your course? What sorts of things did you do to engage (or not) in the discussions? Why did you use those strategies to engage (or not) in the discussions? (Ellis et al., 2006, p. 247)

In the first stage of the analysis, the 19 interviews were analysed to identify student conceptions of learning through discussion and their approaches to learning through discussion. In the second stage the categories were used to analyse the three open-ended written questions. The first stage was used to identify conceptions and approaches, the second stage to analyse distributions and associations. The first stage will answer the question 'Do students approach their learning through discussion in structurally similar or dissimilar ways to face-to-face or online?'. The second stage will answer the question 'Does the context of discussion – face-to-face or online – affect the depth at which students engage in discussion?'

Table 2.3 shows face-to-face and online categories of description of conceptions and Table 2.4 shows categories of approaches.

The conceptions of learning through discussion in Table 2.3 range from discussions as a way of acquiring and checking ideas to a way of challenging and developing ideas. The first two we described as fragmented and the second two as cohesive.

Categories A and B of approaches to learning through discussion in Table 2.4 had an intention to listen to the ideas of others, and to complete task requirements while Categories C and D showed an intention to use discussion to change and develop your ideas. Approaches A and B we described as surface approaches and C and D as deep approaches. Again, these categories are hierarchically inclusive. But the most important outcome of this analysis is that there is a similar structural relationship between approaches to learning face-to-face and online. Students approach their learning through discussion in structurally similar ways for both face-to-face and online learning contexts.

Table 2.5 shows substantial relationships between conception and approach for both the face-to-face and online contexts. It shows that all students with a fragmented conception of learning adopted surface approaches in both contexts. This is consistent with previous research. But it also shows that amongst the students with a cohesive conception, the

Table 2.3 Categories of conceptions of learning through discussion

Category	*Description*	*Representative quotation*
A	Checking ideas	Getting the teacher's point of view … it's good being able to talk and make sure you are really learning what you are supposed to be learning. It is just sort of reassuring
B	Acquiring ideas	It elaborates the readings even more like it sort of expands the readings out a bit … when you go to the tutorials and you express your ideas, it sort of makes them valid to yourself. Like you sort of remember it a bit more by the end of the tutorial … you just get to learn a bit more about the other people's ideas
C	Developing ideas	It sort of gives you different views of what people are getting out of the readings and stuff … it helps me, I guess, just because I am not getting stuck in just this one mindset, it sort of makes me for a topic to go deeper, and just get other perspectives … I guess it gives me an appreciation that people do see it differently, that it's not clear cut. It's one thing having my opinion, and it will mean different things to different people
D	Challenging ideas	It [discussing] challenges my beliefs, which is always good … because a belief is something that is based on knowledge and experience and your understanding of the world, and if it is being challenged you are testing it. … If my beliefs are challenged, I believe that my understanding of concepts is more complete

Source: Adapted from Ellis et al., 2006, p. 249

online context seems to evoke a higher proportion of students adopting a deep approach. Overall, the results suggest that students with fragmented conceptions of learning are very unlikely to be adopting a deep approach to their studies. This is consistent with our model of learning and teaching (Fig. 2.1).

The researchers concluded that students who do not understand how discussions can help them to interrogate, reflect on and revise their ideas, tend not to approach either face-to-face or online discussions in ways likely to improve their understanding or their levels of achievement.

Problem-Based Learning

The importance of underlying learning conceptions was also revealed in several relational studies of problem-based learning (PBL). The idea of using problems as the curriculum content focus, and small group teaching

Table 2.4 Categories of approaches to learning through discussion

Category	*Description*	*Representative quotation*
A	Engaging in face-to-face discussions to fulfil task requirements	I am one of those people who likes to not put my own ideas out there. I like to respond to others and until someone has put up something original and then I will agree or disagree with it or add to it …. I guess I find it easier …
	Engaging in online discussions to read postings to avoid repetition	I tend to read all of them first. Because I tend to want to write something a bit different to all of them and sort of stand out a little bit because I thought I would get good marks for that, but that's not the point. …
B	Engaging in face-to-face discussions to hear other experiences and ideas	Usually, like because we go around and usually by the last people your ideas and everything has been said you end up coming to basically the same sort of answer, …
	Engaging in online discussions to use postings to add to ideas	I don't think there is that much learning the most amount of learning would happen in lectures … I don't think there is that much learning, … I don't think you are actually learning something, …
C	Engaging in face-to-face discussions to analyse experiences and opinions	I do enjoy being there and having that instantaneous kind of being able to converse and everything, … I mean it gives you a chance to kind of reflect on what you think and everything, like your own thoughts
	Engaging in online discussions to evaluate postings to challenge ideas	… it (on-line discussion) is about what these readings are saying and really reflecting on them seriously because I guess the tutorial you can quite easily get away without doing the reading, without thinking about them that much, …
D	Engaging in face-to-face discussions to analyse experiences and opinions through feedback	As far as learning, I like other people's ideas. I am never presumptuous enough to think that anything I say is the absolute truth … I like to see how other people absorb my information. It is important to me that I have explained it well enough so other people can learn off it
	Engaging in online discussions to evaluate postings to reflect on key ideas	It just makes me think, like the ideas, like someone today when a post I made this morning and one two days ago…It wasn't really that original, but it was something which I hadn't thought of before

Source: Adapted from Ellis et al., 2006, p. 251

Table 2.5 Relationships between learning conceptions and approaches

Conception of learning through discussion		*Approaches to learning through discussion*		*Totals*
		Surface (A&B)	*Deep (C&D)*	
Cohesive	Face-to-face	16	9	25
	Online	9	16	25
Fragmented	Face-to-face	26	0	26
	Online	26	0	26

Source: Adapted from Ellis et al., 2006

to facilitate learning of the issues raised by the problem, has been widely adopted (Savin-Baden, 2000). This approach has also received a lot of research attention as a teaching-learning method that encourages deep or meaningful learning. The focus of several recent studies has been on what lies behind the adoption by students of meaningful learning approaches. Consistent with the outcomes described in the previous section, the results show that the majority of students who held relatively unsophisticated conceptions of problem-based learning adopted relatively unsophisticated approaches to learning (Duke, Forbes, Hunter, & Prosser, 1998; Forbes, Duke, & Prosser, 2001; Hendry, Lyon, Prosser, & Sze, 2006). As well, learning conceptions and approaches that emphasise learning for understanding correlate positively with attaining higher course marks (Ellis, Goodyear, Brillant, & Prosser, 2008a).

What is found consistently in these studies is that the variation in students' perceptions and understanding of what PBL is about is fundamental to the way they approach their studies and to the outcomes of their learning. Such knowledge is crucial to any theoretical model of PBL and has direct practical implications for the design of learning tasks and the induction of students into a PBL environment (Prosser, 2004; Prosser & Sze, 2014).

Complexity in Student Experiences of Studying

The studies described above consistently show expected relations between students' presage, process and product variables in a variety of disciplines and contexts, and similar relations are also found in different cultural contexts (Webster, Chan, Prosser, & Watkins, 2009). However, some studies also reveal some differences. We describe these differences in terms of Meyer and colleagues' concepts of orchestration and disintegration (Entwistle, Meyer, & Tait, 1991; Meyer, Parsons, & Dunne, 1990). Using the concept of a student learning orchestration or 'the manner in which students manage their learning activities in response to perceived task or course demands' Hazel et al. (2002) reported three different forms of learning orchestration – understanding (perceptions supporting, and the adoption of, a deep approach), reproducing (perceptions supporting, and the adoption of, a surface approach) and most importantly disintegrated (perceptions supporting, and the adoption of, both deep and surface approaches). The significant outcomes in this biology study (with similar outcomes in physics found by Prosser, Trigwell, Hazel, & Waterhouse, 2000) were that the students with the best outcomes were in the understanding cluster, while those with the worst outcomes were in the disintegrated cluster.

In biochemistry (Minasian-Batmanian, Lingard, & Prosser, 2005, 2006) students with more complex and coherent conceptions of the topic report that they were more likely to adopt deeper approaches to study than those with more fragmented conceptions. However, compared to previous studies, a surprisingly high proportion of students with more cohesive conceptions still intended to adopt more surface approaches. This orchestration may reflect the particular context of their learning, which involved a compulsory subject containing material about which most students have minimal background understanding and have difficulty seeing its relevance.

In a large-scale study employing correlation and multi-variate analyses, Trigwell et al. (2013) report that the results from the correlation analysis of the 3P model student variables confirmed those found in the numerous earlier studies described above. The multi-variate analyses also indicated that a surface approach to learning was the strongest, if negative, predictor of academic achievement, with self-efficacy and motivation found to be positively and directly related. In contrast to the correlation results, perceived teaching quality and conceptions of learning were only indirectly

related to academic achievement and deep approach to learning was not related at all. The authors conclude that:

> … there are five outcomes of this study: First, the strongest predictor of academic achievement is a surface approach to learning; second, self-efficacy and motivation (perceived value of tasks and intellectual stimulation) are also directly related to academic achievement; third, quality of teaching, deep approach, and conception of learning do not contribute directly to variation in academic achievement; fourth, perceptions that the workload is too heavy evokes more of a surface approach, but workload is also directly related to learning outcome, and may affect outcomes without changing approaches to learning; and finally, perception of teaching quality had only an indirect effect on academic achievement, which was mediated by surface approach to learning. In other words, students who perceive the teaching practices as effective are less likely to adopt surface approaches to learning, which in turn affects their learning outcome. (Trigwell et al., 2013, p. 376)

In summary, some 40 years after the 3P model was proposed as a way of better understanding student learning, these results reinforce arguments that more needs to be known about how students interpret the requirements of their study if the complex web of influences upon study activities, academic achievement and longer-term professional competence is to be unravelled. Varying student awareness of any of these entities is likely to result in a change in awareness of other entities. Information of this sort can be, and has been, used to design teaching and context interventions to improve student learning.

Principles of Practice for Teaching and Learning

In this chapter we have focused on students' experiences of learning and its relationship to the quality of learning outcomes. We have argued that it is students' perceptions of their teaching and learning environment and their approaches to study, situated in relation to those perceptions, which are central to the achievement of their learning outcomes. Students enter their course with a substantial variation in prior experiences. As a result, they experience that same course in different ways. Their perceptions of the same course vary. But they approach their studies in that same course in relation to their perceptions. Their approaches vary. We have argued that there is a fundamental underlying variation in these approaches. That

variation we have discussed in terms of surface and deep approaches. We do not argue that this variation describes their approaches – that would require a richer description. But we do argue that it is a fundamental variation in terms of their achievement of their learning outcomes.

While much of this is consistent with the arguments outlined in our 1999 monograph (Prosser & Trigwell, 1999), we have broadened and deepened that research. We have placed the outcomes of our research in the broader psychological literature and provided an interpretation of that literature in terms of a more relational perspective. We have shown how these approaches to learning relate to students' emotions in learning, and how they may be affected by their motivations for learning and by their confidence in their ability to learn. We have shown how the 3P model can help understand students' experiences within particular teaching and learning contexts of online and problem-based, and we have opened up some of the complexity in students' experiences.

While we do not argue that our approach to researching teaching and learning results in ways of telling teachers how they can improve their students' learning – identifying better strategies for teaching for higher quality students learning – we do argue that it can identify principles of practice for better student learning.

Consequently, we argue that the principles of practice which emerge from this review of students' experiences of teaching and learning are:

- Principle 1. Students enter our learning and teaching contexts with substantial variation in their prior experiences of learning and teaching, perceive the context and approach their studies in relation to those prior experiences and the context, with learning outcomes coherently related to those perceptions and approaches.
- Principle 2. Students' emotions in their study are formed in relation to their prior attitudes and perceptions of the present teaching and learning context, and they are related to learning approaches and outcomes.
- Principle 3. Student experience of different curriculum structures and learning technologies can be interpreted and understood in terms of our model of students' learning, suggesting a coherent underlying structure to student experiences and outcomes.
- Principle 4. These key variations are essential to the understanding of the complexity in students' experiences of learning.

Having reviewed our research on students' experiences of learning, we ask the question 'How do university teachers experience their teaching in ways which may enhance students learning?'. This is the question which is the focus of the next chapter.

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CHAPTER 3

Teachers' Experiences of Teaching

Abstract This chapter begins with a summary of the qualitative studies examining teachers' approaches to teaching, leading to an analysis of the refinements of the Approaches to Teaching Inventory (ATI) and a summary of the qualitative studies behind the inventory. The ATI has been used to identify and confirm the empirical relationship between teachers approaches to teaching and their students' approaches to learning in various contexts. These studies and their implication for teachers are discussed. Variation found in approaches to teaching through the emerging work on disciplinary differences forms the core of the chapter. It concludes by showing how emotions in teachers are related to teachers' approaches to teaching.

Keywords Approaches to teaching • Teaching and student learning • Emotions in teaching • Approaches to Teaching Inventory

Having reviewed the developments in students' experiences of teaching and learning since our earlier book, we now turn to the more recent research on teachers' experiences of teaching and focus on the shaded areas of the model in Fig. 3.1. What do we know about teaching which facilitates students' deeper engagement with their studies? What characterizes teaching that facilitates such engagement? Again, in the first part of the chapter we briefly review our research until 1999. In that work we

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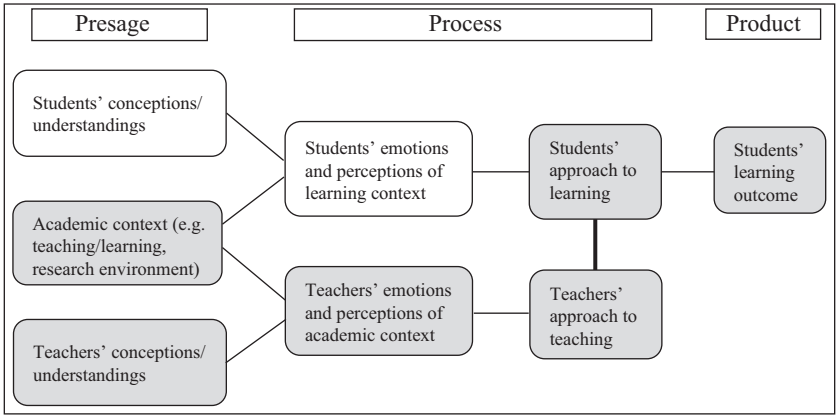

Fig. 3.1 The teaching-learning model showing the focus of this chapter (shaded areas). (Source: Adapted from Trigwell, Prosser, & Waterhouse, 1999, p. 60)

mapped out our first descriptions of the variation in teaching of university teachers. We developed a first draft of an approaches to teaching inventory and provided the first evidence of how university teachers' approaches to teaching in large classes relates to their students' approaches to learning.

Since the original version of the Approaches to Teaching Inventory, there have been a number of further developments and refinements. It has been translated into many languages and applied in various contexts and cultures. The research confirming the relationship between teachers approaches to teaching and students approaches to learning in various contexts since our original publication is reviewed below. The emerging work on disciplinary variation in approaches and the emotional aspect of how teachers approach their teaching will be addressed. We will address questions such as:

- What is the nature of the variation in teachers' approaches to teaching in higher education, and how does that link to students' approaches to learning?
- How do teachers' perceptions of the teaching and learning environment and their emotions relate to how they approach their teaching?

- How is the variation in approaches to teaching manifested within and between disciplines and in different teaching and learning situations?
- What principles of practice emerge from an exploration of teachers experiences of teaching?

This chapter addresses the fundamental issue of how teaching in higher education relates to learning in higher education. As can be seen from the model, we propose that that link is between the way teachers approach their teaching and the way their students approach their learning. Having established in the previous chapter the way students' approaches to learning relate to their learning outcomes, the link established in this chapter will result in an indirect link between teachers approaches to teaching and students learning outcomes mediated by students approaches to learning. Following the establishment of that link we will examine how teachers' emotions relate to their approaches and how the approaches are manifested in different disciplines and teaching and learning situations.

Teachers' Approaches to Teaching

If, as we have shown in the previous chapter, the variation in student learning approaches is systematically related to the variation in the quality of their learning outcomes, the next questions for us was 'Does the variation in the way teachers approach their teaching in higher education have any relationship to how their students approach their learning?'. In order to address this question, we needed to first answer the question 'How do university teachers approach their teaching?'. In addressing this question, we drew upon ours' and others' work in researching students' approaches to learning. That is, we asked ourselves 'What is the fundamental variation in the way university teachers approach their teaching?'

In the 1990s, we conducted interviews with teachers of large first year science classes to explore approaches to university teaching. Using analytical methods derived from phenomenography (Marton & Booth, 1997) we described five qualitatively different approaches to teaching (Prosser & Trigwell, 1999; Trigwell, Prosser, & Taylor, 1994).

The descriptions of approaches, including a quote for the extremes of the approaches, were:

Approach A: A teacher-focused strategy with the intention of transmitting information to students

This approach is one in which the teacher adopts a strategy which is teaching rather than learning focused, with the intention of transmitting to the students, information about the discipline. The focus is on transmitting facts and transmitting demonstrated skills, but not on the relationships between the facts or the skills. The prior knowledge of students is not considered to be important and it is assumed that students can learn without being active in the teaching-learning process.

My approach is based on the assumption that students have no previous experience of this material, but that they are reasonably bright so they can absorb a certain amount. All I am doing is giving them a series of opportunities to come to understand more, so we go through the same information in different ways. If they didn't absorb it the first time, there is the opportunity to absorb a bit more the next time … I'll write my notes in such a way so that the students don't have to decide when to take notes. I tell them to. I'll dictate to them. I have handouts prepared. I have gaps in them that they fill in and I take that decision away from the students about when and how to take notes …

Approach B: A teacher-focused strategy with the intention that students acquire the concepts of the discipline

This approach is one in which the teacher adopts a teacher-focused strategy, with the intention of helping his or her students acquire the concepts of the discipline and the relationships between them. They assume that their students can gain these concepts by being told or shown the concepts and their relationships. As in Approach A, teachers do not assume that their students need to be active for the teaching-learning process to be successful. The approach differs from Approach A in that students are not only expected to be able to recall facts and solve problems but are also expected to be able to relate concepts and solve transfer problems.

Approach C: A teacher/student interaction strategy with the intention that students acquire the concepts of the discipline

This approach is one in which the teachers adopt a strategy involving an interaction between the student and the teacher aimed at helping students acquire the discipline-based concepts and the relationships between them, as in Approach B. It differs from Approaches A and B because students are seen to gain this disciplinary knowledge through active engagement in the teaching-learning process.

Approach D: A student-focused strategy aimed at students developing their conception

This approach is one in which the teachers adopt a strategy which is focused on the students and their learning to help students further develop the world view or conception they already hold. A student-focused strategy is assumed to be necessary because it is the students who have to construct their knowledge in order to develop their conceptions.

Approach E: A student-focused strategy aimed at students changing their conceptions

This approach is one in which teachers adopt a student-focused strategy to help their students change their world views or conceptions of the phenomena they are studying. Like Approach D, students are seen to have to construct their own knowledge, and so the teacher has to focus on what the students are doing in the teaching-learning situation. This approach differs from Approach D in that the intention is that the students have to re-construct their knowledge to produce a new world view or conception. The teacher understands that he/she cannot transmit a new world view or conception to the students.

What I want to achieve with [these techniques] is confronting students with their preconceived ideas about the subject, which quite often conflict with what we are talking about – the official dogma as it were. So you've got to bring out that conflict and make the people aware that what they already know may not be what is the official line … I would do a demonstration and say, Look I'm going to do this. What's going to happen? And then do it. And what happens is different to what most people are going to guess. So, you get them thinking about that and quite often they would answer the question wrong. I then say, hey, that's homework – go and think about that for next time. (Trigwell et al., 1994, pp. 79–82)

These categories form a hierarchically inclusive structure, such that category B incorporates and expands on Category A and each subsequent

category incorporates and transforms the previous category. This structural relationship is shown in Table 3.1.

From Table 3.1 it is clear that there is a structural divide between A, B and C on the one hand and D and E on the other in terms of the former being teacher-focused and the latter being student-focused. They range from an information transmission/teacher-focused approach (ITTF), to a conceptual change/student-focused approach (CCSF). It should again be stated that these represent key aspects only of a variation in approach to teaching.

In a more recent study of the relationship between teaching and research (to be returned to in detail in Chap. 4) we repeated the investigation of teachers' experience of teaching (Prosser, Martin, Trigwell, Ramsden, & Middleton, 2008). In this study we defined the broader experience of teaching in terms of the approach to teaching and the structure of the subject matter being taught and constituted six categories of description:

Category A: In this category the act of teaching is teacher-focused with the intention of transferring information to the students. Subject matter is concrete and taken for granted and seen as independent parts or topics.

Category B: In this category the act is teacher-focused, student activity with the intention of transferring information to students. Subject matter is concrete and taken for granted and seen as a series of related topics or as parts being related to other parts.

Category C: In this category the act is teacher-focused, student activity with the intention of students acquiring the concepts of the discipline. Subject matter is a concrete and connected structure of topics with parts being related to other parts.

Table 3.1 Strategy and intention dimensions of approaches to teaching

Strategy	*Intention*			
	Information transmission	*Concept acquisition*	*Conceptual development*	*Conceptual change*
Teacher-focused	A	B		
Student/teacher interaction		C		
Student-focused			D	E

Source: Adapted from Trigwell et al., 1994, p. 78

Category D: In this category the act is teacher-focused, student activity with the intention of students acquiring the concepts of the discipline. Subject matter is a concrete and connected structure within a discipline or field, with parts being related to a whole (field).

Category E: In this category the act is student-focused, student activity with the intention of students developing their conceptions. Subject matter is relational as in the relationship between teachers understanding and students experience, it is seen in terms of a whole made up of constituent parts.

Category F: In this category the act is student-focused, student activity with the intention of students changing their conceptions. Subject matter is relational as in the relation between teachers' world views and student world views which are open to change, it is seen in terms of wholes related to other wholes. (Prosser et al., 2008, pp. 6–7)

Structurally, the key difference between these experiences of teaching is that the subject matter in Categories A–D either focuses on parts relating to other parts or parts relating to wholes. Only in Categories E and F is the focus of the subject matter on wholes (either constituted in terms of parts or relating to greater or other wholes). The interesting development in these categories was that we found that there was an intrinsic relationship between the way the teachers approached their teaching and the subject matter they taught. Another was the separation of the teacher activity and the student activity within a teacher-focused strategy. The important distinction is that student activity can be directed at concept acquisition or conceptual change and development – a fundamental variation in approach to teaching.

Approaches to Teaching Inventory

The qualitative differences in approaches to teaching found in the original interviews were used by Prosser and Trigwell to develop the original 16-item Approach to Teaching Inventory (ATI) (Prosser & Trigwell, 1999, 2006; Trigwell & Prosser, 2004). That inventory was used in the seminal study of the relationship between approaches to teaching and approaches to learning to be described in the next section. It was subsequently revised, with some changes in wording and addition of 6 items (ATI-R) (Trigwell, Prosser, & Ginns, 2005).

The ATI and the ATI-R contain two scales distinguished mainly by the differences in teachers' intentions found in the qualitative studies.

Approaches having a teacher-focused strategy are seen as being qualitatively different to the student-focused strategy adopted in the more complete approaches (E and F). One scale (Conceptual change/student-focused (CCSF)) captures the teachers' intention to develop and change conceptions (Approaches E/F) and the other (Information transmission/teacher-focused (ITTF)) captures the extent to which the teacher focuses on what they present and how they present it (Approaches A-C). The ATI-R is attached as an Appendix.

Two items from each of the two ATI-R scales are shown below:

Information Transmission / Teacher-focused (ITTF)

12. In this subject, I provide the student with the information they will need to pass the formal assessments
17. In this subject my teaching focuses on the good presentation of information to students

Conceptual Change / Student-focused (CCSF)

9. In teaching sessions in this subject, I deliberately provoke debate and discussion
14. I make available opportunities for students in this subject to discuss their changing understanding of the subject. (Trigwell et al., 2005, p. 356)

It is important to note that we conceive and interpret the results of the administration of this instrument in relational terms. We emphasise the use of 'in this subject' in the items. Without this emphasis, the results could be interpreted as an orientation to teaching – a relatively stable construct. We interpret the results as an approach – allowing for individual variation between teaching and learning contexts.

The ATI-R has been translated into a number of languages (e.g. Spanish, Turkish, Dutch, Chinese, Finnish, Arabic, Swedish, Portuguese) and has been used on several continents to study teachers' approaches to teaching in higher education.

In order to capture learning intentions and approaches, almost all the studies described in this review used semi-structured interviews and/or self-report inventories such as the ATI or Study Process Questionnaire (SPQ) (Biggs, 1987) to study the experiences of teachers and learners.

Studies confirming how these experiences relate to practices have also been reported. For example, observation of teachers' practice has revealed that when the context of teaching and learning is tightly defined there is a clear relationship between a teacher's self-reported intention in teaching and their observed practice (Martin, Prosser, Trigwell, Ramsden, & Benjamin, 2000, p. 409).

While we have focused somewhat on the development of the ATI-R, in terms of the focus of this book we return to the key issue of the relationship between approaches to teaching and approaches to learning – the essential link between the students' experience of learning and the teachers' experience of teaching in our model.

Linking Teaching and Learning

Everything in this chapter so far would be for nought if there is no link between teaching and learning. We have explored that link in two separate studies using our ATI as an indicator of teachers' approaches to teaching and a version of Biggs' SPQ as an indicator of students approaches to learning (Biggs, 1987). Consistent with our relational perspective, we amended the SPQ to try to ensure students were aware they were completing it in relation to a particular course. The teachers were asked to complete the ATI for the same course, so both surveys were situated in the same subject or course.

The associations between teachers' approaches to teaching and their students' approaches to learning were explored in two separate studies in large first year courses (Prosser & Trigwell, 1999; Trigwell, Prosser, Ramsden, & Martin, 1998). In the first study, teachers in 48 different first year science classes were asked about their approaches to teaching. The students in their classes (an average of 82 per class) were asked about their approaches to learning using the SPQ. In the second (replication) study, structurally similar results were found. While the first study focused on individual teachers and their students in individual lecture programs in first year sciences, the second study focused on teaching teams across a whole subject in a range of first year disciplines. Teaching staff and students in 51 different first year courses were surveyed. A total of 408 teachers and 8829 students were involved. Factor analyses of both sets of results are shown side-by-side in Table 3.2.

The first study shows that an information transmission/teacher-focused approach to teaching is associated with surface and non-deep approaches

Table 3.2 Factor analysis results for students' approaches to learning and teachers' approaches to teaching variables

Approach variables	*First study factors*		*Second study factors*	
	1	*2*	*1*	*2*
Student approaches				
Surface approach	.69	−.38	−.35	.73
Deep approach	−.76		.87	
Teacher approaches				
ITTF	.66			.85
CCSF		.97	.73	−.39

Source: Adapted from Trigwell et al., 1999, p. 64 (first study) and Prosser & Trigwell, 1999, p. 158 (second study)

to study and a conceptual change/student-focused approach to teaching is associated with a non-surface approach to study. The second study shows that a conceptual change/student-focused approach to teaching is associated with a non-surface and a deep approach to learning. An information transmission/teacher-focused, and non-conceptual change/student-focused approach to teaching is associated with a surface approach to learning.

Similar results were found in both studies. When teachers reported use of an information transmission/teacher-focused approach, their students were more likely to report using more of a surface approach to study and less of a deep approach. A conceptual change/student-focused approach in teaching was found to be positively associated with students' deeper approaches and negatively associated with surface approaches to study.

Using the SPQ and a general orientation to teaching questionnaire (TOQ) at the department level, Kember and Gow (1994) in Hong Kong had found a similar result. The TOQ was developed from interviews with teachers about their approach to teaching in the study. The TOQ consists of two scales, Learning Facilitation and Knowledge Transmission, with several subscales in each scale. The questionnaires were administered in 15 departments across two institutions in Hong Kong. A cohort of students in each department completed the SPQ shortly before taking their final examination. Mean scores by department for the SPQ and TOQ were calculated and correlated. All correlations were in the direction expected, although with a sample size of 15 a number of substantial correlations did not meet statistical significance.

In commenting on the findings, the authors state that:

> in departments where the predominant orientation is toward knowledge transmission, the students' use of deep approach is likely to decline through the period of the course of study. On the other hand, departments with a propensity toward learning facilitation tend to discourage the use of surface approaches. The effect of an orientation toward learning facilitation is perhaps more likely to manifest itself in this way rather than as a positive advance in the use of a deep approach because of the difficulty of inducing students with a propensity toward a surface approach to consistently adopt a deep approach. (Kember & Gow, 1994, p. 67)

At the class level, Gibbs and Coffey (2004) in the United Kingdom conducted a complex study involving 104 trainee university teachers across 20 universities. The trainee teachers completed the ATI prior to and after their training, and their students completed the Module Experience Questionnaire (MEQ). The MEQ included scales measuring surface and deep approaches to study. The results showed a small and non-statistically significant decrease in ITTF scores and a larger and statistically significant increase in CCSF scores. In terms of the students approaches to study, it was found that there was a small, but statistically significant decrease in the surface approach scores and a small non-statistically significant increase in deep approach scores.

Finally, it may be interesting to note that these associations have been confirmed at the secondary school level. Rosário, Núñez, Ferrando, Paiva, Lourenco, Cerezo, and Valle (2013) have replicated these associations in secondary school biology classes and have concluded that:

> Overall, the present two-level SEM study supports the prediction that the teacher's reported approach to teaching is related to his or her students' reported approaches to studying. Similarly, the teacher's reported approach to teaching is indirectly related to the students' academic achievement. (Rosário et al., 2013, p. 73)

While there may not be a direct connection between the way teachers design and teach their courses and the quality of their students' learning outcomes, the research described in this section has shown that there is at least a replicable, substantial, indirect relationship. The way students perceive and understand their learning context and the way they approach their learning in relationship to these perceptions have been found to be

major mediating factors between teachers' teaching and students' learning outcomes. These studies establish the presence of an important association between teaching and learning. Without it, efforts to change teaching approaches as a means to improve learning would be for naught. Because of it, attempts to better understand the broader teaching context have continued, as described in the remainder of this chapter.

Perceptions of Teaching and Learning Context and Relation to Approaches to Teaching and Student Learning

Having established that there is a substantial variation in the way university teachers approach their teaching, and how that relates systematically to the way their students approach their learning, we turn now to the perceived influences on university teachers' approaches to teaching.

We have previously described the results of our investigations into the relations between perceptions and approaches (Prosser & Trigwell, 1997, 1999). In our original study, we interviewed 13 physical science teachers, asking them what sorts of things influenced how they approached their teaching. Based upon those interviews, we developed a Perceptions of the Teaching Environment Inventory (PTEI). We then surveyed a sample of 46 teaching staff with our ATI and our PTEI. The subscales of the PTEI are:

> Control of teaching: control of how much and what is taught
> Appropriate class size: class size influence on interaction between teacher and students
> Enabling student characteristics: increasing variation in student characteristics
> Departmental support for teaching: lack of balance in valuing teaching and research
> Appropriate academic workload: balance of time for teaching and research. (Prosser & Trigwell, 1997, p. 39)

That inventory was subsequently administered in a separate study to over 400 university teachers from 55 classes and 11 universities across four fields of study, and broadly replicated the results of the first study. A factor analysis of the results of the second study are shown in Table 3.3.

Table 3.3 Factor analyses of teachers' approaches to teaching and their perceptions of the teaching environment variables

Scale	*Factors*	
	1	*2*
Perceptions of teaching environment		
Appropriate academic workload	.70	
Appropriate class size	.83	
Control of teaching	.46	−.66
Enabling student characteristics	.80	
Departmental support for teaching		−.72
Approaches to teaching		
Information transmission/ teacher-focused		.80
Conceptual change/student-focused	.43	−.37

Source: Adapted from Prosser & Trigwell, 1999, p. 157

Table 3.3 shows that a conceptual change/student-focused approach was associated with perceptions that the teacher had control over what was taught, and how, and that the class size and workload were manageable. An information transmission/teacher-focused approach was associated with a perception of a lack of control over what was taught and how, and a departmental lack of commitment to student learning. It should be emphasised that these were perceptions. That is, for example, it is not the sizes of the class which is important, but the teachers' perceptions of how manageable those class sizes are.

The results suggest that, in general, teachers who adopt more conceptual change/student-focused approaches are more likely to perceive their teaching environment more positively, while those adopting a more information transmission/teacher-focused approach perceive their teaching environment more negatively.

Do we have any direct evidence of how these teacher perceptions and approaches relate to students' learning experiences? In a rather complex design, Prosser, Ramsden, Trigwell, and Martin (2003) report the outcomes of such a study. In the study involving large first-year classes in 51 subjects, over 8000 students were surveyed using Biggs' Study Process Questionnaire (Biggs, 1987) and Ramsden's Course Experience Questionnaire (Ramsden, 1991). A cluster analysis of the student data was used to identify two sets of subjects – 34 in a Lower Quality learning experience cluster and 17 in a Higher Quality learning experience cluster.

In those 51 subjects 408 teachers completed the Approaches to Teaching Inventory (and the Perceptions of the Teaching Environment Inventory). The teacher data were then analysed separately for each of the Lower Quality and Higher Quality learning experience clusters. From each of these clusters the teacher data were factor analysed after being broken down by teacher experience (Tutors and Demonstrators on one hand and Senior Tutors and above (Lecturers and Professors) on the other). The results are shown in Table 3.4.

Drawing on the work of Meyer and colleagues (Entwistle, Meyer, & Tait, 1991; Meyer, Parsons, & Dunne, 1990) we are using the concepts of dissonance and consonance to interpret these data. In their work they found patters of relationship between student perceptions and approaches for students with very poor learning outcomes which they described as dissonant. They were not coherent in terms of the underlying theory. Using these concepts, we summarised the results of that analysis as follows:

> In summary, the analysis of the Tutors and Demonstrators in the Lower Quality learning experience subjects was highly dissonant in terms of approaches to teaching, with little or no [coherent] relationship between approaches and perceptions. On the other hand, the analysis for the more senior teachers in the Higher Quality learning environment subjects was clearly consonant in terms of approaches to teaching, with coherent relations with perceptions of the teaching context. The other two analyses

Table 3.4 Factor analyses of teachers' approaches and perceptions in high- and low-quality learning experience subjects

	Lower quality learning experience				*Higher quality learning experience*			
	Tutors and demonstrators		*Senior Tutors and above*		*Tutors and demonstrators*		*Senior Tutors and above*	
	Factor 1	*Factor 2*	*Factor 1*	*Factor 2*	*Factor 1*	*Factor 2*	*Factor 1*	*Factor 2*
CCSF		.79	.64			.63		.77
ITTF		.81		.71		.80	−.82	
TP1	.84		.35	.74	.85			.84
TP2	.82		.78		.84		.79	

TP1: Perceptions of appropriate workload, appropriate class size, enabling student characteristics

TP2: Perception of teacher control of curriculum and teaching, departmental commitment to student learning

Source: Adapted from Prosser et al., 2003, pp. 44–45

> showed elements of dissonance in approaches to teaching and elements of incoherent relations between approaches and perceptions. (Prosser et al., 2003, p. 45)

We concluded that 'there is a variation in the structural relationship between university teachers' approaches to teaching and perceptions of the teaching context in situations in which students report higher and lower quality learning experiences' (Prosser et al., 2003, p. 46). In both sets of subjects, the less experienced and more junior staff seem to believe that they can change and develop their students' conceptual understanding by providing them with appropriate information. It also suggests that it is vitally important that the senior staff have a coherent understanding of the difference between conceptual change and information transmission approaches to teaching, supported by positive perceptions of the teaching environment.

Variations Between and Within Disciplines and Fields of Study

Anecdotal evidence suggests that there are substantial variations between disciplines and fields of study in the ways university teachers experience their teaching. Our research and that of our colleagues suggest that the broad range of approaches described in the previous sections apply across broad fields of study but may appear differently in practice.

We and our colleagues (Martin et al., 2000) replicated our earlier qualitative science-based study (Trigwell et al., 1994) with a sample of 26 teachers distributed across four broad fields of study: Social Sciences & Humanities; Business & Law; Science & Technology; and Health Sciences. We found that the underlying intentions of information transmission on the one hand and conceptual change on the other were constituted across the fields. However, there is evidence that there is a variation in the distribution between fields. For example, while the samples were not randomly selected and the sample sizes were relatively small, six of the seven humanities and social science academics had adopted more of a conceptual change/student-focused approach to teaching while only one of the seven science and technology teachers had adopted this approach.

In a much larger quantitative study of 340 university teachers from across Finland and the United Kingdom, this variation between disciplines

was confirmed. Table 3.5 shows the means of the ATI approaches to teaching scales broken down by discipline groups (after Biglan, 1973).

In summarising these differences, the authors stated that

> responses from the 'pure hard' disciplinary group scored significantly lower on the CCSF scale than the responses from 'pure soft' and 'applied soft' groups. Moreover, responses from the 'applied hard' group scored significantly lower on the CCSF scale than the responses from the 'pure soft' group. The comparisons further showed that the responses from the 'applied hard' group scored significantly higher on the ITTF scale than those from the 'pure soft' and 'applied soft' groups. (Lindblom-Ylänne et al., 2006, p. 292)

So, the empirical evidence in both the small-scale interview study and the large-scale quantitative study is consistent with the anecdotal evidence. The 'hard' disciplines are associated with more information transmission/teacher-focused approaches and the 'soft' disciplines with the conceptual change/student-focused approaches. It should be noted, however, that we found CCSF approaches in 'hard' disciplines and 'soft' disciplines with ITTF approaches.

Turning now to more detailed studies within specific disciplines. Leveson (2004) conducted a qualitative study of the teaching experience of 24 accounting teachers in seven Australian universities. She identified five categories of description of teaching approaches ranging from an 'educator-centred strategy with the intention of transmitting information to develop competence in basic accounting procedures' to 'a student-initiated, student-centred strategy with the intention of encouraging

Table 3.5 Means of approaches to teaching by discipline groups (on 5-point ATI scales)

Scale	*Discipline groups*			
	Pure hard (e.g. chemistry)	*Pure soft (e.g. history)*	*Applied hard (e.g. medicine)*	*Applied soft (e.g. education)*
ITTF	3.04	2.81	3.26	2.97
CCSF	3.41	4.01	3.62	3.86

Note: Independent sample t-test shows statistically significant differences between means

Source: Adapted from: Lindblom-Ylänne, Trigwell, Nevgi, & Ashwin, 2006, p. 291

growth and change' (Leveson, 2004, p. 539). Similarly, Leveson identified five categories of description of accounting teachers' conceptions of learning accounting. They ranged from 'learning in accounting as accumulating accounting facts from sources external to the student' to 'learning in accounting as personal change and development through student-directed engagement with course material and requirements' (Leveson, 2004, p. 536). She found that the 19 (of 24) teachers reporting a more Information Transmission approach to teaching also saw learning accounting as accumulating facts.

Leveson (2006) also looked at the accounting teachers' conceptions of accounting. They ranged from 'accounting as a technical process whose purpose is to capture and present aspects of an objective, observable economic reality and to express these in number form' (Leveson, 2006, p. 133) to 'accounting as a system of rules and procedures that reflect cultural values pertaining to the rights and obligations that exist within a society' (Leveson, 2006, p. 150). Again, a logical and empirical close association between approaches to teaching accounting and conceptions of accounting were identified. This study suggests an underlying structure in the way teachers experienced the teaching of accounting, their students learning of accounting, and importantly, their conceptions of accounting itself.

A similar set of results was found in a qualitative study of nursing by Forbes (2006, 2010). She looked at 20 clinical nurse teachers' approaches to clinical teaching as well as their approaches and conceptions of nursing itself. Approaches to clinical teaching ranged from clinical teaching experienced as 'using teacher-focused strategies, with little interaction between teacher and students, aimed at reproduction of routine tasks' to 'using student-focused strategies, with interaction between teacher and student, aimed at helping to develop and change their conceptions of nursing' (Forbes, 2006, p. 153). Conceptions of nursing ranged from 'nursing is performing of tasks' to 'nursing is collaborating to provide appropriate patient care aimed at achieving individual patient outcomes' (Forbes, 2006, p. 118). Again, a close logical and empirical association was found between the approach to clinical teaching and conceptions of nursing. An underlying experience structure was again observed.

In a study of the teaching of music, Reid (1999) found experiences similar to those described above. Her categories ranged from teaching as dissemination, where the student learns from being exposed to the teacher (level 1), to exchange, in which the shared experiences of music lead to

change in both teacher and student (level 4). Again, an underlying structure was evident as these experiences were found to relate to ways of understanding music, or what Reid describes as the 'Music Entity' (Reid, 1999, pp. 69, 198).

In summary, these studies suggest that there is substantial variation within and between disciplines. The within discipline variation is particularly interesting in that that variation seems to be related to how the teacher understands the focus of the discipline. Disciplines do not seem to be understood in the same way by adherents to that discipline. That is, there is a variation in the way disciplines are understood that relates systematically to the variation in the approach to teaching in that discipline.

Variation in Experiences Within Teaching and Learning Strategies

Over recent years there has been a substantial amount of discussion of teacher- and student-centred approaches to teaching and learning, focusing on student behavioural activity. In contrast, the focus of the work reported here, drawing on our model of teaching and learning, is more on the underlying intentions of teachers and students rather than their behavioural activity.

In large class teaching, two physical science teachers have described their approaches as follows:

> Teacher 1: My approach is based on the assumption that students have no previous experience of this material, but they are reasonably bright, so they can absorb a reasonable amount. All I am doing is giving them a series of opportunities to come to understand more, so we go through the same information in different ways. If they didn't absorb it the first time, there is an opportunity to absorb it a bit more the second time …
>
> Teacher 2: What I want to achieve with these techniques is to confront students with their preconceived ideas about the subject, which quite often conflict with what we are talking about—the official dogma as it were. So, you've got to bring out that conflict and make the people aware what they already know may not be the official line. (Prosser & Trigwell, 2014, p. 792)

The first teacher is using a sophisticated form of an ITTF approach to teaching, attempting to transfer information to students, while the second

much more a CCSF approach, attempting to challenge students and change their understanding. As noted above, the variation in approaches to teaching in large first year classes is systematically related to students' approaches to learning.

From interviews and observations on *lecturing*, Martin, Prosser, Trigwell, Ramsden, and Benjamin (2000) concluded that teachers who were adopting more CCSF approaches to teaching, constituted knowledge in the lecture (the object of study for students) that was more relationally structured and more focused on students' understanding. Those who were adopting more ITTF approaches constituted knowledge that was more multi-structural and less focused on student understanding. This study will be returned to in more depth in Chap. 4.

In a series of articles, Ellis and colleagues studied teachers' and students' conceptions, approaches and learning outcomes of teaching and learning with strategies associated with *learning technologies*. In one such qualitative study, Ellis, Hughes, Weyers, and Riding (2009) investigated the experiences of 19 university teachers teaching face-to-face and on-line. They identified key differences in the ways in which teachers conceive of learning technologies, in the ways in which they approach designing for blended learning, and in the way they approached their teaching in blended learning contexts. The conceptions of learning technologies ranged from one in which the technology was seen as a tool to enhance student access, to one in which the technology supports student active learning and the construction of their knowledge. The approaches to designing ranged from one in which the design was aimed at achieving pragmatic ends – 'sheer convenience' – to one in which the design was aimed at facilitating active learning, and finally to one helping students develop their understanding through intentionally engaged active learning. As in previous examples, there were close conceptual and empirical relationships between the sets of categories, with the authors concluding that the results:

> suggest that concepts of learning technologies that are orientated towards access and information delivery tend to be associated with approaches to design that do not display an awareness of how to integrate them to support student learning and are more about efficiency. Conversely, the concepts of learning technologies that are orientated towards active learning and building knowledge tend to be related to approaches to design that aim to

> encourage student learning that can lead to applied understanding. (Ellis et al., 2009, p. 117)

In conclusion, these examples of strategies from lecturing and on-line learning show that there is variation in prior conceptions and adopted approaches within different teaching and learning strategies. It is not the strategy that is the determinant of how students approach their learning, but the teacher's intention in using the strategy. This is not to say that some strategies may or may not be better than others in supporting the deep engagement by students with the subject matter, but that within each strategy it is possible to adopt more CCSF approaches in ways to actively engage students. As described previously, these examples also show the underlying coherence in the way teachers experience their teaching when focused on a particular teaching and learning context.

Teachers' Emotions and Approaches to Teaching

With increasing teaching workloads and increasing pressure on academics to produce research outcomes, anecdotal evidence suggests that academics are experiencing a greater range of emotional reactions to their teaching. But in terms of the model of teaching, how does increasing emotional response relate to the way academics approach their teaching?

Zhang (2004) investigated relations between stress and teaching approaches using the ATI and an Occupational Stress Inventory (OSI). Zhang used both zero order correlational analysis to study relations between the ATI and OSI-R subscales and hierarchical multiple regression analyses to study the prediction of approaches to teaching from the occupational stress scales. While the outcomes of the research are quite complex, Zhang stated in her discussion that 'fundamentally significant relationships exist between teaching approach construct and occupational stress construct.' (Zhang, 2004, p. 212).

Rather than focusing on teacher stress and approaches to teaching, Trigwell (2012) focused more directly on their emotions and their approach to teaching. Using the ATI and a wider range of emotions in a newly developed Emotions of Teaching Inventory (ETI), Trigwell looked at the relationship between approaches to teaching and emotions of 175 university teachers. In the first part of the analysis he examined the construct validity and reliability of the newly developed ETI and identified five emotions variables related to teaching: Pride, Motivation, Anxiety,

Embarrassment and Frustration. An example of an item from each of the subscales is shown in Table 3.6.

Table 3.7 shows the results of a factor analysis of the ATI and the ETI scales. The table shows that a CCSF approach is associated with more pride in, and motivation for their teaching and less frustration with it. An ITTF approach is associate with a greater anxiety and embarrassment with their teaching. The results suggest that there are significant relations between CCSF approaches to teaching and positive emotions towards teaching, and between ITTF approaches and negative emotions.

While the results are as may be expected – that focusing on students and their learning is emotionally more positive than focusing mainly on presentation and information transfer – emotions including stress and 'burnout' are issues that remain under-researched and warrant much greater attention.

Principles of Practice for Teaching and Learning

This chapter began with a fairly clear and uncomplex analysis of key variations in approaches to teaching. We showed how that variation relates directly to how students approach their learning and indirectly to learning outcomes. The studies showing this relationship were conducted in large first year classes – making the results quite robust. As the chapter progressed the picture became less clear. We found that teachers' perceptions – not necessarily the reality – of their teaching context help understand their approaches. We saw that there was, as expected, variation between disciplines in the frequencies of adopting different approaches. But surprisingly we found substantial variations within disciplines, and that those variations related to how the discipline was understood by the teacher. We

Table 3.6 Subscales and items from the Emotions of Teaching Inventory

Subscale	*Item*
Pride	13. I get a feeling of pride as a result of my work on this course
Motivation	6. I look forward to doing the work I do on this course
Anxiety	10. I feel nervous when I ask students to do the learning activities in this course
Embarrassment	9. I am embarrassed when my planned learning activities appear to fail
Frustration	5. Getting students to engage in the learning activities in this course is a frustrating experience

Table 3.7 Factor analysis of approaches to teaching and emotions in teaching variables

Scales	*Factors*	
	Factor 1	*Factor 2*
Approaches to teaching		
Conceptual change/student-focused	.50	
Information transmission/teacher-focused		.73
Emotions in teaching		
Pride	.78	
Motivation	.85	
Anxiety		.63
Embarrassment		.74
Frustration	−.74	

Source: Adapted from Trigwell, 2012, p. 615

also found variations within strategies such as large group teaching and online approaches, suggesting it is not the strategy that is the determinant of approach. Some teachers adopt more of a CCSF approach in large groups lectures while others adopt more ITTF approaches. Finally, we found that there are emotional correlates of these different approaches, with teachers adopting more CCSF approaches finding teaching more emotionally satisfying compared with those adopting more ITTF approaches.

All of this makes identifying a set of teaching principles and practices quite difficult. Nevertheless, we suggest the following:

- Principle 1. Teachers approach their teaching in fundamentally different ways, and the variation in approaches relate systematically to how their students approach their learning.
- Principle 2. There is a relationship between the ways in which teachers perceive their teaching and learning environment and the way they approach their teaching.
- Principle 3. Teacher emotions in teaching a subject are systematically and coherently related to how they approach their teaching in that subjects.
- Principle 4. These key variations in teachers' experiences of teaching are manifested in a range of different disciplines and teaching and learning situations.

In this chapter research on teaching associated with, and informed by, the 3P model of teaching and learning has been reviewed. It has shown how the ways of thinking about and conceptualising teaching and learning outlined in the model is robust and can assist in the understanding of a broad range of contemporary teaching and learning issues in ways to enhance the quality of student learning. The point of departure for all of this research has been a focus on quality student learning and how that can be enhanced and achieved through a focus on the experiences of teaching and learning by individual teachers and students.

In the next chapter, we turn to a more detailed study of how teachers describe their understanding of their subject matter and of their research, and how the variations in these understandings relate to variations in approaches to teaching. We argue that there is a fundamental underlying coherence in how teachers experience their subject matter, their research and their approaches to teaching.

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CHAPTER 4

Teachers' Experiences of their Subject Matter and of Research

Abstract This chapter reviews the empirical studies relating teaching and research (e.g. student evaluations of teaching related to research citations and publications) and argues for a deepening of how the relationship can be conceptualized. The way the structure of the subject matter of teaching and research is conceptualized is considered to be fundamental to the relationship. How the relationship between the experiences of teaching and research is mediated by the experience of understanding the subject matter is revealed: a fundamental underlying structure in the way teaching and research are experienced is proposed. Finally, the implications/issues for practice of the relationship which has emerged from the research is discussed in terms of the model of teaching and learning used in the book.

Keywords Teaching-research nexus • Subject matter of teaching • Underlying structure of experience • Relations between teaching, research and subject matter

As shown in the shaded areas of the teaching-learning model (Fig. 4.1) the focus of this chapter in on the relations between the teachers' research (the academic context) their understanding of the subject matter they are teaching, their perceptions of those presage elements and their approaches to teaching.

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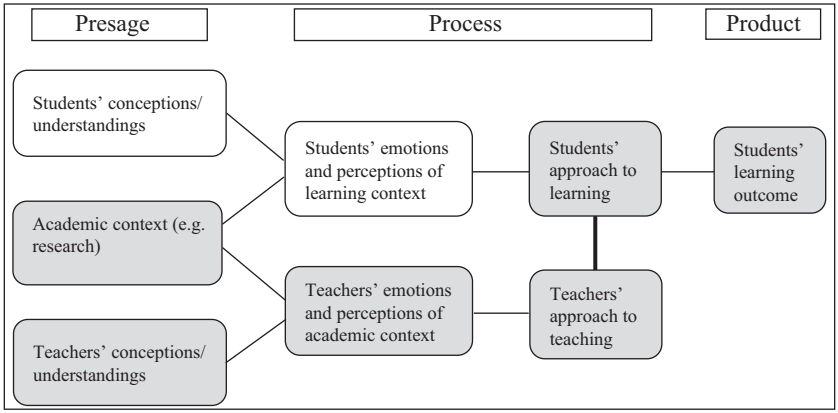

Fig. 4.1 The teaching-learning model showing the focus of this chapter (shaded areas). (Source: Adapted from Trigwell, Prosser, & Waterhouse, 1999, p. 60)

The key questions we address are:

- What is the nature of the relationship between university teaching and research?
- How does the way university teachers see the structure of their research field relate to what and how they teach?
- What ways of thinking and practicing in teaching emerge from an examination of the relations between teachers' experience of teaching and their experience of the structures of their taught subject matter and research fields?

To illustrate the importance of these sort of questions to university teaching, we begin the chapter by focusing on a related question about the subject matter of teaching. Many university teachers are now familiar with the idea of constructive alignment (Biggs, 1996) which is achieved when curriculum design and teaching leads students to perceive that what is being assessed is in alignment with both the intended learning outcomes and the teaching/learning activities designed to achieve those outcomes. Biggs (1999) notes that when the three components are aligned, 'The students are "entrapped" in this web of consistency, optimizing the likelihood that they will engage in appropriate learning activities, …' (p. 26). The question is: How might differences in the ways teachers understand

the structure of their subject matter be related to the effectiveness of the use of the idea of constructive alignment in the curriculum design element of teaching?

In the hypothetical cases below, we present two approaches to constructive alignment. Both approaches are likely to achieve constructive alignment, but they could also result in very different outcomes in terms of student learning.

> Case 1: The intended learning outcomes are described in terms of understanding concepts and definitions, and the relations between them. The teaching approach is based on lectures and tutorials in which definitions are given, concepts explained, and numerous examples of relations between concepts are provided, along with set problems for students to practice dealing with the relations. Assessment involves testing students' understanding of definitions and their ability to solve problems involving relations between concepts, as practiced on the set problems and discussed in the tutorials.
>
> Case 2: The object of study is focused on the subject matter as a whole, which is seen as being constituted from concepts and relations between them. Teaching is organised around the idea of self-directed learning through group work based on a real-world holistic problem project in the field of study that exemplifies relations between concepts. Assessment requires students to present an analysis of the project process and outcomes and how they might be related to other similar real-world problems. (Trigwell & Prosser, 2014, p. 143)

In both cases, constructive alignment is described but because the object of study is seen as holistic in case 2, and focused more on the parts (concepts, definitions and examples) that make up the subject matter in Case 1, the differences in the quality of the learning outcomes in the two cases is likely to reflect these differences in the quality of the intended learning outcomes. To achieve the best outcomes in adopting a constructive alignment approach, teachers need to be aware of how they experience the subject matter of teaching.

For teaching, this argument is similar to that pertaining to the improvement of student learning through the application of better student study techniques. The value of programs to improve student learning may be undermined if an awareness of the qualitative variation in approaches to learning is not included. Improving study techniques that inadvertently maximize the effectiveness of surface approaches to learning is unlikely to be a way of improving student learning. Similarly, the encouragement of

the use of constructive alignment in a subject experienced in a holistic way, may be more effective in improving student learning than alignment encouraged in a subject experienced more in terms of parts.

In this chapter we use the idea of parts and wholes to look at how teachers experience their subject matter and their research field and how teaching and research are related. We then explore the implications for teaching of the research focused on the qualitative variation in teachers' experiences that lies behind the two cases described above.

Teachers' Experience of the Structure of Their Research Field

Is there qualitative variation in how university teachers understand the structures of their research field, and if so, how is it related to what and how they teach?

To explore these questions, we interviewed 37 university teachers who had strong publication and grant success records and who were teaching topics similar to their research areas. They represent a range of disciplines and universities from both the United Kingdom and Australia (Prosser, Martin, Trigwell, Ramsden, & Middleton, 2008). We asked the teachers to talk about the structure of their research field and, as with our studies of teaching outlined in the previous chapter, a phenomenographic research approach (Marton & Booth, 1997; Prosser & Trigwell, 1999, p. 57; Trigwell, Prosser, & Taylor, 1994) was adopted. What was different in this case was that in the analysis of the interview data, we made use of a new structural element based on distinctions between parts and wholes.

For the study described in this section, qualitative variation was constituted as a range in terms of whether the description of the structure of the research field was mainly referring to parts of the field, to parts related to other parts, to parts related to wholes, to wholes related to parts, or to wholes related to other wholes. Descriptions focused on parts were considered to be more atomistic or fragmented, and those focused on wholes considered to be more holistic or more cohesive or inclusive as described in Chap. 2. Four qualitatively different categories of description (A-D) were constituted from the interview data. They are described below with illustrative quotes from the interviews included for the two extremes of the range (A and D).

Research is experienced as:

Category A: a series of projects that do not in themselves extend disciplinary knowledge but are self-contained. They may draw on disciplinary based knowledge and procedures in order to solve a problem. The object of study is constituted in terms of atomistic or independent parts. In this category the act is to address problems drawing on the field with the intention of benefiting the profession or society, as illustrated below. [focus on parts]

> I got a scholarship from the architects this year, and I investigated a group called Crash in London and while I was there, I participated in Architecture Week, which is a big deal in London where a lot of architects donated their services to help Shelter. …When I came back I was able to convince them that in Architecture Week in Australia we could do what the Brits were doing and they said, "Oh, well we can support what you're doing, if you set up a little charitable organization". So … the Institute of Architects launched, the President did …this Crash Sydney similar to the UK one, and then two days later the architects, about 50 of them, gave up about half a day's work to raise funds for Crash. Now why I think that's important is [they are] helping to project other than the elite image that they have. … I've just written another paper for a homelessness magazine called 'the Underbelly of the Architect rises to the occasion' … they don't all like working for the big end of town because some of the real challenges are at the other end. But because no one ever pays them it's very difficult for the profession to do what I do.

Category B: The further development of a series of field-of-study-based concepts, issues or procedures that are linked and integrated coherently. The focus is/maybe on developing a technical mechanism or tool for analysis which already exists or whose parameters are set by others. The object of study is constituted in terms of independent parts that are related to the whole field. The act is to identify problems from the field with the intention to add to or expand the field. [focus on parts to wholes].

Category C: The application or development of theory within the boundaries of the field of study. It involves the use of existing technical mechanisms or analytical tools, but theory development using established theoretical constructs is its focus. The object of study is seen as a whole (field) that is composed of its constituent parts. The act is to iterate between the problem and the field with the intention to further develop the field. [focus on wholes to parts].

Category D: The development and change of understanding about a field; is open-ended and inquiry-focused. Research creates more questions that have to be answered. It is about developing ideas broader than those contained within the field of study by bringing together ideas external to the field of study. The object of study is the whole (field) and how it is related to other wholes (fields). The act is to constitute the problem from the field with the intention to change the field. The following quote illustrates this experience:

> So, how does that particular piece of research relate to the broader field of study? Well, I suppose it's a contribution to medieval literature in general, in that I am looking at particular medieval texts. Well, obvious things like Chaucer, Piers Plowman, the Middle English romances. I suppose it's canonical texts really; texts that are often written about by medievalists, often studied, often anthologised, but also looking at less well known texts as well. So I'm trying to broaden the canon of medieval literature by adding in some less well known texts. And I am also talking about the urban economy in ways that haven't really been talked about before by, … certainly by medieval literary critics, obviously more so by medieval economic historians, although the historical perspective is often very different from the literary textual perspective. So I'm trying to combine that kind of historical economic understanding with the kind of textual analysis that's more common in medieval literature generally. So, I suppose that's where it's innovative. (Adapted from Prosser et al., 2008, pp. 8–10)

There is a clear structural qualitative difference between these categories, with Categories A and B involving more fragmentation with a focus on parts, and C and D more complete or cohesive with a focus on wholes.

Once we completed the description of the four categories from the pooled transcripts, each of the 37 transcripts was, according to its contained utterances, allocated to the category of description nearest to the more complete or coherent end of the range. Five transcripts were considered to have a focus mainly on parts (Category A), 18 on relating parts to wholes (B), and 14 with a focus on wholes (wholes to parts or wholes to wholes) (C and D).

Having identified a range of ways that research active staff experience the structure of their research fields, we were in a position to see if there were any relations between this range and how the same academic staff experienced their subject matter and their teaching. We were interested in

knowing whether teachers who saw the structure of their research field as being focused on parts, also saw their curriculum as being about parts rather than the 'bigger picture' of the disciplinary subject matter, and if so, how that was related to their approach to teaching.

Teachers' Experience of the Structure of the Subject Matter of Teaching

In an earlier study (Prosser, Martin, Trigwell, Ramsden, & Lueckenhausen 2005) we explored the variation in teachers' experience of the object of study – what it was that they constituted for their students to learn. We conducted that study with 31 members of the teaching staff in four different disciplines and found five qualitatively different ways that teachers experience their subject matter. What we did not do in that study was ask those teachers about their experience of research. Nor did we conduct the phenomenographic analysis of the transcripts in terms of parts and wholes. In the research study described above (Prosser et al., 2008) we replicated the study of the experience of the structure of the subject matter with the same group of 37 academic staff and with the parts-wholes ideas in mind.

In the 2008 replication study, as in the first study, five qualitatively different ways that teachers experience their subject matter were found. These are described below as Categories A-E. An interview quote from each of the extremes (A and E) is included from the 2005 study.

The understanding of structure of the subject matter is experienced as:

Category A: A series of facts and/or techniques, with an awareness that the subject matter sits within one or more fields of study, but the focus is on the individual internal facts and processes pertaining to the subject matter.

> It would be technical information, technical information relating to the design of plastic components. There's information on the ranges of plastic materials that might be available but then there are specific design requirements for those materials, basic things the designer must understand about drafting: how to actually get the plastic part out of a metal tool and how therefore, to design adequately to get that part out of a tool; and what does a split line look for in a complex part. And those type of things that are applicable to a professional designer.

Category B: A series of individual concepts or topics; with an awareness that the subject matter sits within one or more fields of study, but the focus is on the individual internal concepts and issues pertaining to the subject matter.

Category C: A series of concepts, issues or procedures, which are linked and integrated to form a whole with a coherent structure and meaning; with an awareness that the subject matter sit within one or more fields of study, but the focus is on the internal structure of the subject matter.

Category D: A series of concepts, issues or procedures, which are integral to the formation of a whole with a coherent structure and meaning, with an awareness that the subject matter is structured according to one or more organising principles within a field (or fields) of study, but the focus is on the internal structure of the subject matter and the way the concepts or procedures are related.

Category E: A coherent whole, which is supported by organising theories within one or more broader fields of study; with an awareness the subject matter comprises themes or issues which are problematic, such as a series of debates, but the focus is on the ways in which the whole is generalised to a high level of abstraction.

> How do you see within this subject its parts being connected?
>
> I don't usually think of it as parts. I usually think of it as examples. So I see that what we're grappling with all the time are very complex questions about human behaviour, human interactions, social change. And then in all of the bits that I like to study, because they interest me most, I just see those as illustrations of maybe that bigger theme reflected in different ways, competing pressures. So if you took, for example, the example of euthanasia, in many ways the issues that I would be interested in are the same issues, whether it was abortion or euthanasia, or indeed some kind of regulation of corporate crime. So it's the examples that change, but fundamentally you're looking at it as a social document.

In Category A the focus is on facts and techniques and in Category B on concepts, issues and procedures but they are both atomistic and focus on the subject matter itself. Using the language of the SOLO taxonomy (Structure of the Observed Learning Outcome, Biggs & Collis, 1982) this focus on lists or parts can be described as multi-structural. Category C includes a focus on concepts, issues and procedures, but they are seen to be linked or related to form a coherent whole rather than being seen as

atomistic. In (adapted) SOLO Taxonomy terms this can be described as linked relational. In Category D the concepts issues and procedures are seen to be aspects of an integral whole rather than linked together to form a whole (integral relational). Category E differs in having a focus on the underlying or underpinning theories within which the concepts, issues and procedures are constituted rather than just on the concepts, issues and procedures themselves. With the focus on underpinning theories, the experience shifts in focus away from the subject matter itself to how that subject matter fits into the broader field of study. Category E is extended abstract in SOLO Taxonomy terms.

When each of the transcripts was allocated to the most holistic category, eight transcripts were considered to be multi-structural and focused on parts (A and B), 14 on relating parts to wholes – linked relational (C), and 15 integral relational and extended abstract, with a focus on wholes (wholes to parts or wholes to wholes) (D and E).

Relations Between Experiences of Teaching, Research and Structure of Subject Matter

The relationship between teaching and research is a highly contested issue, and links between the two are considered to be problematic (Locke, 2005). A substantial body of empirical evidence suggests that there is little or no relation between teaching and research when, for example, teaching is measured by student evaluation of teaching and research performance is based on citations and publications (Hattie & Marsh, 1996; Marsh & Hattie, 2002; Ramsden & Moses, 1992). This near zero correlation means that the successful researchers are not necessarily seen by students as good teachers. However, this result does not support the argument for teaching in a non-research environment, because a separation would mean losing either half the good teachers and/or half the good researchers. The near zero correlation is also counter-intuitive and at odds with how many academic staff involved in teaching and research describe the influence on teaching of problem solving in research the discussions with students that can lead to research ideas (Brew & Boud, 1995; Jenkins, Blackman, Lindsay, & Paton-Saltzberg, 1998; Rowland, 1996).

The contrast between the academic' intuitive beliefs and the empirical research results has stimulated a search for explanations that involve looking at the relations between teaching and research in other ways than the

use of quantitative indicators (publications and evaluations of teaching). For example, Elton (2000) proposed that a positive nexus between teaching and research might be achieved through focusing on student learning as a process, since 'student-centred teaching and learning processes are intrinsically favourable towards a positive nexus, while more traditional teaching methods may at best lead to a positive nexus for the most able students'. Different ways of teaching are considered by Martin and Ramsden (2000) to be associated with differences in the nexus between teaching and research. For example, teaching focused on the delivery of information is less likely to invoke research-teaching relations than teaching experienced as 'making student learning possible'. And drawing on Boyer's (1990) attempt to integrate different aspects of academic work through the concept of scholarship, Glassick, Huber, and Maeroff (1997) proposed that academics practicing the 'scholarship of teaching' experience a symmetry between teaching and research through the common scholarship elements of clear goals, adequate preparation, appropriate methods, significant results, effective publication, and reflective critique. While offering possible explanations for teaching-research relations, there is, as yet, no empirical evidence to support any of these ideas.

The results from the analyses described in the two sections above, if used together with descriptions of the variation in teaching approach, as discussed in Chap. 3, do provide an empirical and alternative approach to explore relations between teaching and research. In the interviews with the 37 research-active teachers who were asked about their experience of the structure of their subject matter, and their experience of the structure of their research field, we also asked them about their experience of teaching a topic related to their research (Prosser et al., 2008).

In Chap. 3 we noted how the variation in approaches to teaching could also be described in terms of parts and wholes. An information transmission/teacher-focused approach included a focus on the parts of the subject matter and a conceptual development/change/student-focused approach included a more holistic conception of subject matter. When each of the 37 transcripts about teaching in the research-teaching study were allocated to the more complete approach to teaching category, eight transcripts were considered to be describing transmission-intended teaching that included a focus on parts of the subject, 14 were focused on relating parts to wholes, and 15 described a student-focused approach in which the subject matter was seen as a whole related to its parts, or a whole related to other wholes.

Using both the teaching intentions and the part-whole distinctions, Table 4.1 shows how, for these 37 teachers, their approach to teaching is related to how they experience the structure of their research field.

Table 4.1 shows that of the 14 teachers who describe their research field in terms of a focus on wholes (wholes-to-parts, wholes and wholes-to-wholes) 10 of them talked of adopting a wholes-based, student-focused teaching approach with a conceptual change or development intention. None of them described their teaching approach in terms of the transfer of subject matter constituted mainly as parts, or with a teacher-focus. On the other hand, all five teachers who saw the structure of their research field in terms of parts, did describe their teaching approach in terms of the transfer of subject matter constituted mainly as parts or as parts-to-wholes.

An illustration of how two teachers experience the relations between teaching and research is provided in Cases 3 and 4 (Trigwell & Prosser, 2009). The first case represents experiences of research and teaching which are more about focusing on parts and how parts relate to each other, rather than on wholes or the larger themes and ideas. Research is seen as a series of projects and teaching is about giving or presenting students with bits of knowledge and skills. The second case represents experiences of research and teaching taking their point of departure from broader theoretical and conceptual themes. Research is aimed at developing broader understandings, and what is focused on in research is meant to help develop the broader understanding. Similarly, in teaching the focus is on what the students will learn and how they will change their overall understanding of the broad topic or field, not just develop knowledge through a collection of parts.

Table 4.1 Relations between teachers' approaches to teaching and their experience of the structure of their research field in terms of parts and wholes for 37 research-active teachers

Teaching approach	*Experience of structure of research field*		
	Parts	*Parts-to-wholes*	*Wholes*
ITTF (Parts)	3	5	0
Mid-range (Parts-to-wholes)	2	8	4
CDSF/CCSF (Wholes)	0	5	10

Source: Adapted from Prosser et al., 2008, p. 12

Case 3: Social work – Female

Research:

Basically I … the sort of research that I've done has had two foci. One of them is that I've been watching what's happened to community development over the period of economic rationalism and then how it's been reclaimed and that's part of what I've just been talking about. I suppose the second part has been around responding to community issues and concern and using research as a tool for creating change. So the two areas have been: one was where the women's organisations in the Western suburbs of Melbourne were impacted on by the contracting and managerialist agendas of the Kennett government, so that the competition (and they basically started to fight against each other or compete against each other, like every other human service organisation in order to win tenders …) unraveled the relationships they had between them. And so I did a lot of work with them and did a lot of work with the agencies, trying to rebuild some of those relationships through using research. And the second things was that in my own community in Kensington, which is an inner city suburb, it has been chosen as the pilot for redeveloping public housing in the state, the first of thirteen projects. And they've pulled down what we call walk-up flats and the people in my community came to me and said that they thought we were going to lose the children in our community; that the schools and childcare centres would have to close because of this, and they asked me to try and work out what that meant and what they could do about it. So that was the second bit of research.

Teaching:

'And is that mainly in the lectures or in the tutorials that you do those sorts of things?'

They sort of merge into each other, to some extent. We also critique what issues of the day and pull apart what's happening in terms of agendas and underlying values and stuff. So I might start the lecture by looking at … last week I started the lecture by looking at Pauline Hanson, what had happened that week and why. It was in a [inaudible few words] and pulled that apart, and then we moved on to look at some of the lecture material and then we ended up with a presentation by students in the tutorial. So it varies from week to week, depending on what seems to work. I want them to start thinking. I want them to have a knowledge about the world that they can then use for themselves on an ongoing basis. I want them to be able to intervene in policy issues in their practice when they're practitioners. I don't imagine what I teach will be sufficient to get very far in that, and they get another subject in social policy in the final year, so this is just one of the building blocks. It is a building block towards building their knowledge

about how policy is made. I'm wanting them to possibly write policy themselves in the future, and to certainly critique it and be able to react to it, so it is very much linked to a practice base.

Case 4: History – Male

Research:

The key aspects are: one, we have stereotypes of public knowledge about places that have been shaped by the notion of 'slum', so that relates to a much bigger theme of 'let's study the genre of slum representation through history' … how it emerged, which takes you immediately beyond Melbourne, a colonial city, to other colonial cities, and to the parent country, the parent culture, and what originated in London in the early nineteenth century. So, tracing that through product of sort of language, of reformism, of theatricality, performance; tracing it through the music hall, and literary representation and so-on, and seeing how that impacts, how it shapes public knowledge in a global network … And that forces one to look beyond traditional historical documents to a range of other sources, in order to build up a more credible picture of this place. And again, that relates to much bigger themes that take one immediately beyond [city], to what I'd like to think as sort of cutting-edge areas in terms of scholarship, which cross boundaries and which attracts interest around the world.

'OK, and can you tell me a little bit more about that broader field that you're talking about?'

Yep. I suppose they're … one aspect would be history and representation. Pretty much any discipline over the last ten years has become interested in representation and cultural studies in one way or another. Here's a case in which history is engaging with … historians are engaging with broader dialogue about that, about representation, about tropes and metaphors and blah blah, which can be done well and which can be done in a rather half-baked way as well, so that's … pushing the boundaries. … How far can historians use imagination to explore the past? … and I suppose the third one is history and archaeology, history and material culture, and the sort of integration, and the sort of synergies that might emerge out of that.

Teaching:

I suppose, ultimately, the key aspect was one, disorienting them a bit in terms of pre-conceptions, but nonetheless, having them come out of the course with a … with a … some sort of organic sense of urban history, or possibilities of studying the past, with an urban focus; so putting the pieces together, and then putting them back into patterns that are, hopefully, slightly different from the pre-conceptions they went in with, to start off with. And in doing that, coming out with a detailed knowledge of a particular place, a

> particular city, but nonetheless, now having a sense of how that fits into broader things, broader historical developments.
>
> 'How does the area relate to the wider field?'
>
> … The other one, perhaps more importantly, is that it's easy for a national history to become too inward-looking and insular and self-indulgent, and it's very important to fit Australian history into broader contexts and also into broader strands of historical debate and discourse, otherwise it could become pedestrian, as well as being insular. And there's the much broader field of urban history, and I mean, I'm on boards of things, and urban history comes out of Cambridge, comes out of the States, and it's important to fit what we're doing into those broader … I mean, be part of that broader debate … so that's another aspect, I suppose, and I suppose, the third one too, is on a more conceptual level, methodological … is connecting with those … that premise, from the small to the general, which is … ties in with multi, cross-disciplinary debate, sort-of anthropology, historical geography, ethnography, basically. Yeah, all of those things. (Trigwell & Prosser, 2009, pp. 331–335)

In Case 3, the social work academic describes her research more as a series of projects. She talks about two projects, seemingly not well related. The focus seems to be more on the social issues of concern rather than on developing theory and understanding of the broader context but addressing a particular social issue. In teaching, she lists a number of things she does, and talks about things she wants, not what the students will do or more importantly what the students will learn. She talks about teaching as a series of activities and about building blocks of knowledge. The descriptions about research seem to fit the parts-to-parts categories, while the descriptions of teaching parts-to-parts or parts-to-wholes. In neither research nor teaching is there a focus on the whole, on how that is being developed in research and how students are developing a more holistic understudying in teaching.

On the other hand, in Case 4, the historian talks about research much more conceptually. The things he focuses on are aimed at addressing bigger themes and ideas – they are examples of larger wholes. He talks about what history as a whole is interested in, and how his work addresses those broader themes. In teaching he firmly focuses on students developing conceptualisations, how they need to change their pre-conceptions and how what he is teaching students fits into a broader whole of understanding. In both research and teaching, he seems to focus on the whole, how it differentiates into parts and how to continue to build a whole.

Relations Between Teaching and Subject Matter and Between Research and Subject Matter

Tables 4.2 and 4.3 show relations between experiences of the structures of research field and subject matter, and of teaching and the structure of subject matter in terms of parts and wholes for the same 37 teachers. What is apparent from the distribution of teachers in both tables is that with one exception, the majority of teachers who experience their subject matter in terms of wholes (extended abstract), or as parts to wholes (relational), or as parts (multi-structural), also see research (Table 4.2) and teaching (Table 4.3) in structurally similar ways.

In statistical terms the direction and strength of relations found between the experience of subject matter and research (Table 4.2) and between teaching and the strucssstture of the subject matter (Table 4.3) are positive and strong (Prosser et al., 2008). The relations between teaching and research are positive and less strong, as illustrated diagrammatically by the extent of overlap of the three variables in Fig. 4.2. This suggests that while there is a moderate direct empirical relationship between teaching and research, how the subject matter is experienced may be a mediating factor in teaching-research relations.

These research developments suggest that academics' experiences may form the basis for an explanation of the existence or absence of a link between the search for new knowledge and the sharing of existing knowledge. In contrast to the zero correlations found between research and teaching when quantitative indicators (such as research publications and evaluations of teaching) underlying structural relations in teachers'

Table 4.2 Relations between experiences of structure of research field and structure of subject matter in terms of parts and wholes for 37 research-active teachers

Structure of research field	*Experience of structure of subject matter*		
	Multi-structural	*Linked Relational*	*Integral Relational and Extended abstract*
Parts	4	1	0
Parts-to-wholes	4	11	3
Wholes	0	2	12

Source: Adapted Prosser, Martin, Trigwell, Ramsden, and Middleton (2008) p. 11

Table 4.3 Relations between teaching approach and experience of the structure of subject matter in terms of parts and wholes for 37 research-active teachers

Teaching approach	*Experience of structure of subject matter*		
	Multi-structural	*Linked Relational*	*Integral relational and Extended abstract*
ITTF (Parts)	6	2	0
Mid-range (Parts-to-wholes)	2	10	2
CDSF/CCSF (Wholes)	0	2	13

Source: Adapted from Prosser, Martin, Trigwell, Ramsden, and Middleton (2008) p. 11

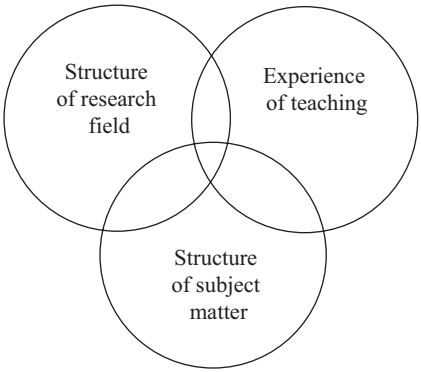

Fig. 4.2 Observed relations between experiences of structure of research field, teaching, and structure of subject matter shown diagrammatically as the degree of overlapping variables. (Source: Adapted from Prosser et al., 2008)

experience of research, teaching, and how they understand their subject matter may explain some of the synergies in teaching-research relations described by academics. These relations may also have implications for the quality of teaching and learning as discussed in the next section.

Principles of Practice for Teaching and Learning

Three principles of practice emerge from the model we are using to understand variation in approaches to teaching and the research presented in this chapter. They concern (a) relations between subject matter and approach to teaching, (b) course design and (c) research-teaching-subject matter links.

With respect to the first principle, teachers who see subject matter as focused on parts and approach their teaching with an information transmission and teacher-focused approach are likely to be the teachers of students who have more surface-oriented approaches to learning, with lower quality learning outcomes. And teachers who see the subject matter in holistic ways and approach their teaching with conceptual change and student-focused approaches are more likely to be teaching students who adopt deeper approaches to learning and have higher quality learning outcomes.

We described in Chap. 3 how variation in teachers' approaches to teaching is related to variation in students' approaches to learning. We have now shown that variation in understanding the structure of the taught subject matter is related to variation in approaches to teaching, so there may be implications for student learning in the ways teachers experience their subject matter.

These relations lead to the conclusion that university teachers need to reflect upon their own ways of understanding subject matter and consider the implications of this for the ways in which they teach and bring their students into a relationship with that subject matter. The extent to which teachers conceive of their subject matter in terms of wholes or parts and the relationship of parts to wholes may have consequences for the ways in which they teach and the way students develop their own sense of understanding of the subject.

- Principle 1. In the same teaching disciplines there is qualitative variation in the ways the structure of that disciplinary subject matter is experienced and this variation is related to variation in approaches to the teaching of that subject matter.

The second principle is derived from interview studies we have conducted with academic staff that have revealed a range, in the same disciplines, in how the structure of the object of study is understood. That there is such variation in the ways the subject matter is experienced *within* disciplines may come as a surprise to most course designers, as some uniformity of subject matter understanding is usually taken for granted.

At one end of the range, academic course designers describe working with a limiting or qualitatively less cohesive object of study experience. They see the object of study (the subject matter of the topic) as it is represented in the external world, or in other words, knowledge which is given

and/or taken for granted and unproblematic, with the focus being on that part of the curriculum assigned to that teacher, and not necessarily as part of bigger whole. Their intention is to organise and present the content as coherent parcels of knowledge, sometimes related to other parcels, but rarely to broader fields or themes or other disciplines.

At the other end of the range, teachers in the same discipline are seeing the same content in qualitatively different ways. For example, they describe it as a coherent whole rather than as parts, treat it as questionable or problematic knowledge, and look to relate the content to the bigger picture, both within the discipline and beyond (this is equivalent to the relational label in SOLO Taxonomy terms). In the sense that knowledge is not stable, and that it changes with teaching, this experience can be described as dynamic, and as involving the teacher, the teaching and the students.

The effects on student learning of the use of these qualitatively different teaching approaches is, according to our teaching-learning model and the research presented in Chap. 3, likely to be significant.

- Principle 2. Approachess to course and curriculum design may be enhanced through an awareness of the variation in ways of understanding the structure of the taught subject matter.

The third principle emerged from underlying structures found in the experiences of research-teaching staff. Phenomenographic studies have revealed that there can be a wide range of qualitatively different ways of experiencing aspects of the world (for example, chemistry (Lybeck, Marton, Strömdahl, & Tullberg, 1988) physics (Prosser, 1994) and knowledge (Säljö, 1997) and that there are relations between differing experiences. For example, there is an underlying structural relationship between the ways students experience or conceive of learning and how they approach their learning (Crawford, Gordon, Nicholas, & Prosser, 1994). When learning is seen as memorizing or a quantitative increase in knowledge, students are more likely to adopt a congruent surface approach, and when learning is seen as the abstraction of meaning or an interpretive process aimed at understanding reality, a congruent deep approach is more likely. Addressing students' experience of learning is a way of addressing the quality of their learning approaches.

In the studies described in this chapter, we have shown that for research active university teachers there is an underlying parts-wholes structure

relating teaching, research and subject matter understanding. The strength of the relations between the experience of research and experience of teaching is moderate in statistical terms but the relationship is never-theless there. A stronger relationship exists between teaching and understanding subject matter on the one hand, and research and understanding subject matter on the other, suggesting that how subject matter is experienced may be a mediating factor in teaching research relations.

Teachers describe research and subject matter experiences in which we detect an underlying focus on parts, on parts to wholes or on wholes, with a focus on wholes being related to more student-focused/conceptual change and development approaches to teaching, rather than more information transmission and teacher-focused approaches. Student-focused/conceptual change approaches are associated with higher quality outcomes of learning than information transmission and teacher-focused approaches (Chap. 3). Therefore the issue for us is not that academic staff are active or not active researchers, but whether the teachers that are active researchers are focused more on overall conceptual understanding and development rather than just on individual isolated problems, and for all teachers, their subject matter is seen more in terms of wholes than parts.

There is a congruence between the ways research and subject matter are understood and the quality of teaching. It is not the quantity of research that is associated with quality of teaching, but how scholarship in and of the discipline or profession is maintained and developed that is important.

- Principle 3. In the same teaching context there is qualitative variation in the ways the structure of the research field is experienced and there are underlying structural relations, mediated by the experience of the structure of the taught subject matter, between the ways teachers' experience teaching, and their experience of the structures of their research field.

Any or all of these principles may raise issues for teachers' approaches to teaching and, as shown in the teaching-learning model, for student learning.

In the next chapter we look at how leadership of teaching is related to the teaching approaches adopted by teachers in the context of that leadership. From a large-scale quantitative study we describe results that show that there are empirical links between teachers' perceptions of leadership and students' learning.

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CHAPTER 5

Leadership of Teaching and Learning

Abstract This chapter introduces the research investigating how forms of teaching leadership are related to variation in the way teachers approach their teaching. The results show that there are direct empirical links between teachers' experiences of leadership and the academic context, their approaches to teaching and their students' experiences of teaching and learning, all in the context of the teaching-learning model described in the first chapter. The nature of leadership of teaching and learning that is aimed at supporting higher quality teaching and students' engagement with their subject matter in a deeper way is discussed. The chapter concludes with an articulation of principles of practice for both teachers and formal leaders of teaching.

Keywords Teaching leadership • Subject coordinators • Experience of leadership • Leadership and student learning

As shown in the shaded areas of the teaching-learning model (Fig. 5.1) the focus of this chapter is on the relations between teaching leadership (in the academic context) the teachers' understanding of leadership, their perceptions of those presage elements, their approaches to teaching and associations with student learning.

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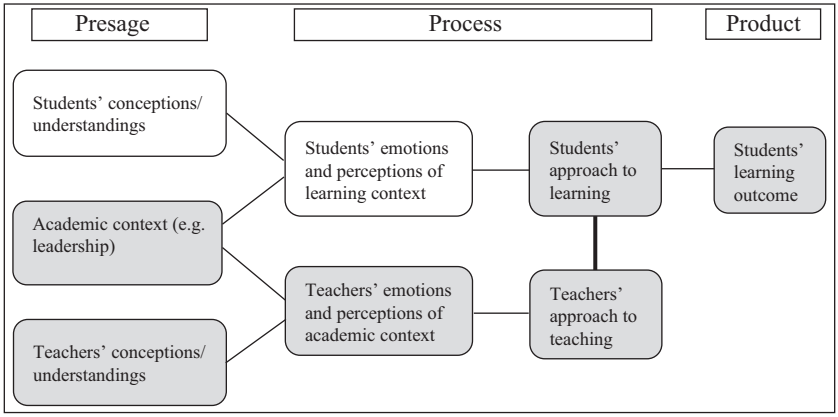

Fig. 5.1 The teaching-learning model showing the focus of this chapter (shaded areas). (Source: Adapted from Trigwell, Prosser, & Waterhouse, 1999, p. 60)

The key questions we address are:

- What is the variation in the experience of the leadership of teaching and learning?
- What is the nature of the relationship between the experience of university teaching, the leadership of teaching and student learning?
- What issues for teachers and the leaders of teaching emerge from an examination of the relations between the experience of teaching and the experience of leadership?

Leadership of Teaching

The success of any organization, including an academic institution, to a large extent rests on effective leadership (Meek, Goedegebuure, Santiago, & Carvalho, 2010). While most research into leadership in universities has focused on departmental heads and senior managers, there is a growing body of research into mid-level leadership and how it is perceived (Holt, Cohen, Campbell-Evans, Chang, Macdonald, & McDonald, 2013; Mårtensson & Roxå, 2016; Milburn, 2010; Öqvist & Malmström, 2018; Roberts, Butcher, & Brooker, 2010; Vilkinas & Ladyshewsky, 2012; Vuori, 2011). It is the mid-level leadership of teaching by Subject

Coordinators (also known as Program Leaders, Course Leaders, Program Coordinators, Unit Coordinators or Program Directors) that is the main focus of this chapter.

Roberts, Butcher, and Brooker (2010) note that a Subject Coordinator 'is responsible for managing and coordinating a unit of study, the students who enrol in the unit and, depending on the size and nature of the unit, guest and sessional staff. As the person in charge of a unit, the … Coordinator is also responsible for collaboratively building networks with key stakeholders, setting the example in disciplinary practice, adopting scholarly teaching practices, developing and continually refining units, maintaining unit quality and disciplinary integrity, and looking after the interests of their students.' (Roberts et al., 2010, p. 5)

Programs are being suggested (Marshall, Orrell, Cameron, Bosanquet, & Thomas, 2011) or provided to support the development of teaching leaders (Ladyshewsky & Flavell, 2011; Scott, Coates, & Anderson, 2008; Wang, 2007) and through that engagement an increase in the potential for development of teaching and learning (Mårtensson & Roxå, 2016). Subject Coordinators who are seen as leaders also 'proactively and professionally deliver and model scholarly teaching approaches to students and staff that reflect contemporary disciplinary content and practice. They are also successful in inspiring and motivating students, and providing them with an excellent learning experience.' (Roberts et al., 2010, p. 5)

These descriptions suggest that there are relations between teaching leadership and student learning. Milburn (2010) also argues for such relations, noting that Program Directors provide a unique and influential academic leadership role that has a significant impact on both the quality of student learning and program innovation. In his interview study he found that Program Directors chose to define their role in terms of the significant potential for influencing student learning rather than in terms of leadership styles or traits. However, in none of these studies has an empirical link between teaching leadership and student learning been established. This position is in contrast to the many studies conducted in the primary/secondary school systems (see for example, Robinson, Lloyd, & Rowe, 2008).

In this chapter we describe the research involving the shaded areas of the teaching-learning model (Fig. 5.1) that links the university teachers' experience of leadership with student learning, but first we look at variation in how teachers and leaders experience leadership.

Variation in Teaching Leaders' Experience of Leadership of Teaching and Learning

In their study of the role of Subject Coordinators, Roberts and colleagues found that the Coordinators were not all considered or considered themselves, to be learning leaders (Roberts et al., 2010, p. 5). We have also found considerable variation in teaching leaders' experience of their own leadership through interviews with 24 Heads of Department, and 26 Subject Coordinators of large first-year subjects (Martin, Trigwell, Prosser, & Ramsden, 2003). The Heads were interviewed about their leadership of their departments, and the Subject Coordinators were interviewed about their leadership of the first-year subjects they were coordinating. The sample was selected from across four fields of study – Arts and Social Sciences, Science and Engineering, Commerce and Law, and Health Sciences – with approximately equal weighting from each field. The interviewer asked them to focus on one of the teaching leadership challenges they had successfully faced in recent times, describe the background of the issue, how they dealt with it, why they dealt with it in that way, what they were trying to achieve, and what the outcome was.

The aim of this study was to identify the qualitative variation in conceptions of leadership of teaching held by Heads and Subject Coordinators from the perspective of the Heads/Subject Coordinators themselves, and to describe this variation in terms of categories of description. Six categories (A-F) of the experience of leadership were identified. They ranged from one in which the focus was on the bureaucratic structure of the organisation of the department (A) to a focus on teaching and emphasising the students' experience of studying a changing and developing curriculum (F) as shown below:

Category A: a focus on the bureaucratic structure and organisation of the department; this structure and organisation is imposed on the department by the Head;

Category B: a focus on the role, responsibility and practices of the Head: he/she imposes his/her perceptions of good practice in teaching upon the teachers in the department;

Category C: a focus on the nature and content of subjects or disciplines; the nature or content is discussed and/or negotiated between the Head/Coordinator and the teachers in the department;

> Category D: a focus on the roles, responsibilities and practices of the teachers in the department; these roles, responsibilities and practices are discussed and/or negotiated between the Head/Coordinator and the teachers;
> Category E: a focus on teaching emphasising the students' experience of studying in the department or course; the students' experiences form the basis of discussion and/or negotiation between the Head/Coordinator and the teachers in the department;
> Category F: a focus on teaching emphasising the students' experience of studying in a continually changing and developing curriculum; how to change and improve these experiences is the basis of systematic discussion and consultation between the Head/Coordinator and teachers, with the Head/Coordinator systematically establishing the means to enable teachers to develop. (Martin et al., 2003, pp. 250, 251)

Categories A and B were found only in interviews with Heads of Departments and involve the imposing of perceptions of good teaching onto the teachers. Both Heads and Subject Coordinators also described their leadership as involving discussion and/or negotiation (Categories C-F), with Category F alone also including enabling or transformational leadership features. Categories C-F form an inclusive hierarchy, with Category F being the most inclusive.

Teachers' Experiences of the Leadership of Their Teaching

Given the range in the ways a group of teaching leaders experienced their own leadership, it should come as no surprise to find that there is considerable variation in how the followers (in this case the teachers) experience that leadership.

To capture the teachers' experience of their leadership environment we interviewed 28 teachers from a range of departments about their perceptions of leadership in a large first-year subject of which they were one of many teachers. The subject was the same as the one on which the Subject Coordinators were asked to focus, as described above. The interviewer asked the teachers to talk about how the group worked together, who decides what is taught and how it is taught, what they wanted students to learn, what is the responsibility of the Subject Coordinator, and to whom

do they look to champion a new idea. The aim was to identify categories of description of how the teachers' experienced the leadership of their Subject Coordinators.

The seven categories of teachers' experiences of leadership of teaching were found:

> Category A: there is little experience of leadership and management by teachers as there is seen to be little need for change or development in the subject.
> In the remaining categories, leadership and management are experienced by teachers in terms of decisions for change and development to the subject.
> Category B: change and development being imposed upon the teaching team by bodies or individuals external to the team, but internal to the department (for example, the Head of Department);
> Category C: change and development being imposed by one of the members of the team (usually the team leader or Subject Coordinator) on the other members of the team;
> Category D: change and development being negotiated between the team and bodies or individuals external to the team, but internal to the department;
> Category E: change and development being negotiated between members of the teaching team and the team leader;
> Category F: change and development being arrived at collaboratively by the teaching team acting as a peer group;
> Category G: change and development initiative taken by individual members of the teaching team without discussion with other members of the team, but within a previously collaboratively agreed framework. (Adapted from Martin et al., 2003, p. 253)

This variation in the teachers' perceptions of the leadership of their Subject Coordinators ranged from little or no leadership, to leadership involving collaboration between members of the teaching team. In terms of how the teachers saw these approaches to leadership, Categories A-C describe a non-collaborative approach, Categories D and E involve negotiation and are transactional, and Categories F and G involve collaboration and are labelled transformational. When the transcripts were allocated to the highest (most inclusive) category well-represented in the transcript, ten were assessed to be non-collaborative, 13 were transactional and five were assessed to be transformational.

As a teacher from each of the 28 subjects was paired with a Subject Coordinator from the same subject, it was possible, by comparing transcripts, to assess the extent to which the teachers' and leaders' experiences were matched. The analysis of results showed a medium sized positive relationship between the Subject Coordinators' conceptions of leadership and the teachers' perceptions of that leadership (Martin et al., 2003, p. 255). There were no cases in which the Subject Coordinator's conceptions were transformational and the teacher's experience was of non-collaboration.

Billot, West, Khong, Skorobohacz, Roxå, Murray, and Gayle (2013) have described the teachers' experience of their leadership as being increasingly vital to improving the student learning experience. In a qualitative study, 38 narratives describing the experience of being a follower and interacting with a formal leader were collected from university teachers in seven institutions worldwide. They describe the results as affirming the premise that, just as teachers are defined by their students' learning, leaders are defined by their followers' engagement. The moderate relations we have found between leader and follower also suggest that in terms of improving teaching and learning, the leaders need to be aware of their own conceptions of leadership. However, as neither of the two results presented here describe the nature of the relationship between leadership and how teachers go about their teaching, we address this in the next section.

Relating the Experience of Leadership to the Experience of Teaching

The point of departure in this way of studying leadership is that, according to the teaching-learning model, it is the way in which leadership is experienced, rather than the objective reality of the leadership or the leaders' experience that is related to approach to teaching. In this section we describe two of our studies in which the teachers' experience of leadership is found to be related to the way they approach their teaching.

In the first study of leadership-teaching relations, the 28 teachers who were interviewed about their perceptions of the leadership of their Subject Coordinators (as described above) were also asked about how they approached their teaching in the subject (Martin et al., 2003). The transcripts of each of the 28 teachers was allocated to either an information

transmission/teacher-focused (ITTF) or conceptual change/development/student-focused (CDSF/CCSF) approach according to the greater extent to which that approach was represented in the transcript. The transcripts of the same teachers had already been allocated to one of the seven categories of experience of leadership, with ten being assessed to experience non-collaborative leadership, 13 as transactional and five as transformational.

The relationships between the way teachers experienced leadership and their approaches to teaching is shown in Table 5.1. Statistically it reveals a large positive relationship between the teachers' perceptions of leadership and teaching. There are no teachers who perceive the Coordinators' leadership as transformational and who also adopt an ITTF approach. Those teachers who are more likely to adopt CDSF/CCSF approaches to teaching perceive their leadership to be transactional or transformational with more of a focus on students and their learning, and on working collaboratively with teachers to identify the need for change and development within the subject. Those teachers more likely to be adopting more ITTF approaches were likely to perceive leadership to be lacking or imposed with little or no collaboration or involving transactional negotiations.

In the second study of leadership-teaching relations, structural equation modelling was used in a large complex quantitative study of 439 university teachers, to study the causal relationship between teachers' perceptions of leadership, their perceptions of their teaching and learning context and their approaches to teaching (Ramsden, Prosser, Trigwell, & Martin, 2007). The structural model was composed of nine variables – experiences of leadership for teaching and the extent of collaborative management (leadership, collaborative management), the commitment teaching colleagues had to student learning (student commitment),

Table 5.1 Relations between teachers experience of leadership and their approach to teaching (n = 28)

Teaching approach	*Experience of leadership*		
	Non-collaborative	*Transactional*	*Transformational*
ITTF	8	8	0
CDSF/CCSF	2	5	5

Source: Adapted from Martin et al., 2003, p. 256

perceptions of the teaching context (class size, teacher control, student characteristics, overall context) and approaches to teaching (ITTF, CCSF).

Correlations between the nine variables are shown in Table 5.2. The statistically significant correlations suggest relations between leadership/collaborative management and perceptions of the teaching context, and between approaches to teaching and perceptions of the teaching context, but there is no significant direct relationship between leadership/collaborative management and approach to teaching.

The path analysis indicated a more nuanced set of relations. The final structural model provided evidence that positive perceptions of leadership for teaching and collaborative management of teaching are associated with perceptions that student learning is valued and that the teaching context supports high quality teaching. This in turn was associated with CCSF approaches with teaching being focused on students and their understanding rather than on the teacher and the transmission of information to students (Ramsden et al., 2007).

We argue that this path from experiences of teaching leadership to approaches to teaching (by way of perceptions of teaching context) affording either a student-focused or a teacher-focused approach is causal. The reasons for this interpretation are that it is consistent with the results of both formal and informal studies of the relations between leadership and

Table 5.2 Pearson correlation coefficients for nine leadership and teaching variables

	Collab. manage	*Commitment*	*Class size*	*Student character.*	*Teacher control*	*Context*	*CCSF*	*ITTF*
Leadership	.67*	.49*	.13	.07	.19*	.18*	.13	−.04
Collab. management		.51*	.11	.03	.36*	.23*	.05	−.13
Commitment to students			.36*	.18*	.35*	.30*	.20*	−.22*
Class size				.36*	.20*	.74*	.10	−.11
Student characteristics					.22*	.74*	.18*	−.14
Teacher control						.66*	.15	−.22*
Context							.20*	−.22*
CCSF								−.10

N = 439; *p < 0.001

Source: Adapted from Ramsden et al., 2007, p. 145

employer attitudes and behaviours in educational and non-educational organisations (Billot et al., 2013; Donaldson, 1991; Kotter, 1990; Milburn, 2010; Ramsden, 1998; Ramsden, Martin, & Bowden, 1989) and that it is consistent with the causal directions found in the interview evidence from the qualitative study described above.

In Chap. 3 we described several studies in which variation in teachers' approaches to teaching were found to be related to variation in the quality of student learning. These studies, together with the results described above, provide evidence of empirical links between teachers' experiences of leadership and teaching context, their approaches to teaching and to their students' experiences of teaching and learning as shown in Fig. 5.1.

Viewing teaching leadership from the student perspective provides additional insight into how teaching leadership might be considered. According to Richards (2012) students are aware of the influence of leadership. In a questionnaire study she found that students believe that seeing their teacher as a leader has a positive impact on their learning. Students described the leaders of their learning as passionate, organized, knowledgeable and accessible and that self-organization skills and the interpersonal skill of empathizing were the most important leadership capabilities.

Our own studies suggest that the courses in which students report higher quality learning approaches and learning contexts are likely to be the ones in which their teachers report more CCSF rather than ITTF approaches to teaching, more collaborative management and transformational leadership, stronger departmental commitment to student learning and a more positive context for teaching. CCSF approaches involve a focus on what the student is experiencing, collaborative management means these teachers are a part of the decision making, and transformational leadership supports the establishment of a positive context for teaching.

Principles of Practice for Leadership, Teaching and Learning

From the model we are using to explain individual approaches to teaching and learning and research on the variation in experience of leadership described in this chapter, three principles emerge for leadership, teaching and learning.

- Principle 1. In the same leadership context, there is qualitative variation in the ways teaching leaders experience leadership.

Conceptions of leadership of teaching among mid-level leaders ranged from one in which the focus was on the bureaucratic structure of the organisation of the department to supporting teaching with a student focus and an emphasis on the students' experience of studying a changing and developing curriculum. While a departmental context and Head of Department will influence leadership approaches (Milburn, 2010), a leaders' awareness of their own leadership conceptions will also be a key factor in influencing approaches to leadership.

- Principle 2. The variation in the ways teaching leaders experience leadership is related to variation in the ways their teacher/followers experience that leadership.

The studies reported in this chapter reveal a moderate positive relationship between teaching leaders experience of leadership and how their teacher/followers experience that leadership. Of the departments where 18 of the 28 Subject Coordinators described their leadership conceptions as transformational or transactional, in only one did the teacher not experience the leadership as involving negotiation or collaboration. While Billot et al. (2013) conclude from their research that academic leaders must attend to the characteristics and needs of their followers, these relations suggest that academic leaders must also attend to their own conceptions of leading.

- Principle 3. The variation in how teachers experience the leadership of Subject Coordinators is related to variation in their approaches to teaching which in turn is related to variation in students' approaches to learning.

It is this principle that illustrates the significance of the previous two principles. In finding a direct empirical link between teachers' experiences of leadership and teaching context, their approaches to teaching and to their students' experiences of teaching and learning, the importance of the Subject Coordinators role in teaching and in student learning is clarified. Subject Coordinators need to be aware of how their leadership is perceived and what effects that perception might have on teaching and learning.

Teachers' experience of how they are led can be a barrier or an enabler in their attempts to adopt an approach to teaching that is supportive of high-quality student learning. Hockings (2005) has described a case in which leadership, institutional policies and practices were perceived to create rather than remove barriers to effective academic work. In the study described in this chapter, the teachers who perceived leadership to be lacking or imposed with little or no collaboration or negotiation were found to be more likely to adopt teacher-focused and information transfer teaching approaches. Awareness of barriers inhibiting good teaching or enablers supporting good teaching is a part of departmental context that is supportive of student learning.

In this and the preceding chapters, we have presented research that has identified the relations we have found between student learning and a range of facets of the teaching environment. In the next chapter we use that information and new research to look at how university teachers develop and grow as facilitators of student learning.

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CHAPTER 6

Changing and Developing Teachers' Approaches to Teaching

Abstract The focus of this chapter is research on how university teachers' approaches to and experiences of teaching and learning change and develop over time. It addresses the role formal university courses, seminars and workshops play in developing these approaches and changing these experiences. It concludes that teachers with appropriate support can and do grow as university teachers in ways that are consistent with the teaching-learning model underpinning the book and provides principles of practice to support and enable that growth.

Keywords Growth as a teacher • Changing approaches to teaching • Teaching development courses

In this Chapter we focus on the shaded areas of Fig. 6.1 and turn to research on how university teachers' approaches and experiences of teaching and learning change and develop over time. Having shown in previous chapters that, consistent with our model of teaching and learning, university teachers who adopt more CCSF approaches to their teaching have students who adopt deeper approaches to their studies and indirectly achieve higher quality learning outcomes, the issue is:

- What evidence is there that teachers can change and develop more CCSF approaches over time, and how can they be supported in that achievement?

K. Trigwell, M. Prosser, *Exploring University Teaching and Learning*, https://doi.org/10.1007/978-3-030-50830-2_6

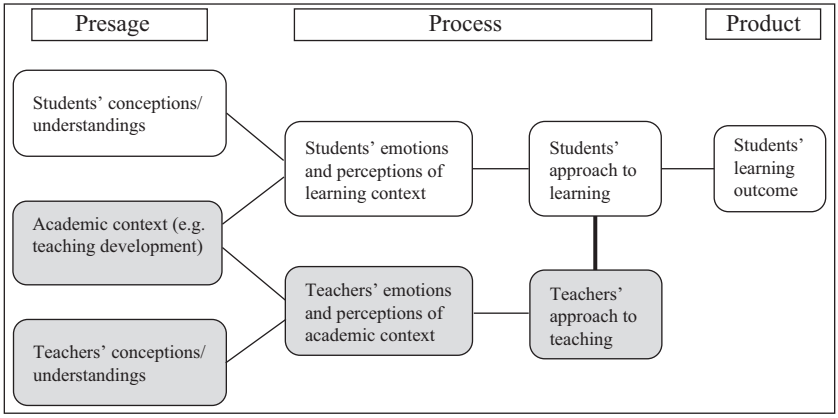

Fig. 6.1 The teaching-learning model showing the focus of this chapter (shaded areas). (Source: Adapted from Trigwell, Prosser, & Waterhouse, 1999, p. 60)

To address this issue, we examine the role that formal courses, seminars and workshops play in developing these approaches and changing these experiences. In the chapter we argue that teachers with appropriate support can and do grow as university teachers consistent with the model. We conclude by outlining some principles of practice aimed at developing and enhancing teachers' experiences of teaching and learning which are consistent with the research project used as the focus of the book.

The key questions for this chapter are:

- Do, and if so how do, teachers change and develop their approach to teaching and experience of the academic teaching and learning context?
- What role do formal courses, seminars and workshops play in supporting teachers to develop their approaches to teaching?
- What principles of practice could teachers adopt who wish to change and develop their teaching and their students learning consistent with the principles of practice for teaching outlined in this book?

We will show that university teachers, with appropriate support, do change and develop their approach to teaching over time. With support, they can and do move away from a focus on a basic information transfer but may not develop beyond clarifying and explaining the materials in the discipline or profession. Intentions to develop and change students' conceptual understanding – teaching approaches related to deeper approaches to learning – is not part of an approach achieved by many teachers.

Developing Approaches to Teaching

We begin our exploration of the central questions for this chapter by examining some of the research describing how teachers do change their approaches and experiences over time.

Åkerlind, in her qualitative study of 28 university teachers, investigated how those teachers grew and developed as university teachers (Åkerlind, 2003). In the interviews, the teachers were asked about their understanding of teaching (their conceptions and approaches), what growth and development meant to them and examples of how they went about growing and developing as teachers.

Her analysis showed that there were three fundamentally different ways in which teachers experienced growth the development as university teachers. They were increases in:

A: the teacher's comfort with teaching, in terms of feeling more confident as a teacher or teaching becoming less effortful;
B: the teacher's knowledge and skills, in terms of expanding content knowledge and teaching materials, and/or an expanding repertoire of teaching strategies;
C: learning outcomes for students, in terms of improving students' learning and development. (Åkerlind, 2003, p. 380)

In her discussion of these three sets of experiences, Åkerlind argued that the first had a focus on developing the ease of teaching and developing confidence as a teacher. The second focused on the development of teachers' knowledge and skills. Finally, only in the third was there a focus on students' learning and development. In her analysis, Åkerlind further argued that these three experiences represented a dimension of variation ranging from teacher-focused to student-focused.

In summary, she concluded that:

> those teachers who were primarily focused in their teaching on imparting information to students were at the same time focused in their teacher development on increasing personal comfort and confidence in their teaching and their teaching abilities. (Åkerlind, 2003, p. 386)

That is, the experience of both teaching and teacher development was teacher-focused. In contrast, she notes that:

> teachers who were focused in their teaching on encouraging students to think critically and become independent learners were simultaneously focused in their teacher development on increasing their teaching knowledge and skills to more effectively enhance students' learning … Here we see a student-focused understanding of teaching combined with a student-focused and teacher-focused understanding of teacher development. (Åkerlind, 2003, pp. 386–387)

While Åkerlind's study was reflective in that teachers were asked to reflect on their experience of growth and development in a single interview, McKenzie's (2003) study was longitudinal. She, however, reaches similar conclusions. She interviewed 22 teachers in a longitudinal study on three occasions. Rather than asking participants to reflect on their experiences of teaching and change in a single interview, she focused on how they were experiencing teaching at each interview and mapped their change over the three interviews.

McKenzie identified 5 distinct ways in which change in teaching was experienced. They were:

A: Change in teaching as changing the content which is taught
  A1 changing the selection of content included or excluded
  A2 changing the way the content is organised for teaching
B: Change in teaching as changing teaching strategies
C: Change in teaching as relating teaching more effectively to learning
D: Change in teaching as experiencing the meaning of teaching differently.
  (McKenzie, 2003, p. 187)

The first two, A1 and A2, were described as teaching focused – focusing on the teacher selecting and organising content. Experience B was also

described as teaching focused with a shift to focusing on the devolvement of teaching strategies. Experience C was described as being student learning focused, with a focus on relating teaching to learning. The teacher's focus is shifting away from a focus on teaching to learning in relation to teaching. Finally, Experience D shows a further shift that is student focused, but with a focus on the teacher developing an understanding of students and their learning.

In her conclusions, she states that, on the one hand:

> teachers who focus only on changing their content or strategies with teacher-focused intentions do not … focus on critical aspects of student-focused ways of experiencing teaching. Their ways of experiencing teaching remain teacher-focused. (McKenzie, 2003, p. 274)

On the other hand:

> teachers who experience change in teaching as becoming more student-focused … are focused on understanding teaching and learning. (McKenzie, 2003, p. 274)

Thus, the teachers who change to a more student-focused approach to teaching go beyond concerns about content and strategies to focusing on their students and their students' understanding.

We wish to again emphasise that the categories in these two studies describe key variations in the way teachers experience growth and development. As with student approaches to study and teachers approaches to teaching, these phenomenographic studies do not, and are not meant to, describe rich descriptions of teachers' growth and development.

Our interpretation of the outcomes of these two substantial studies by two experienced academic developers is that teachers do change and develop as university teachers. Though from our perspective, some changes are somewhat limited. It seems that most teachers are likely to start out quite teacher-focused. Their issue is to build their confidence in both the understanding of the subject matter and the development of teaching strategies. There is little focus on the student and their learning. Over time, as confidence grows, there can be a change of focus to better understand teaching and learning. Finally, the teacher may shift focus from the teacher to the students and their learning.

This shift is not inevitable. Many teachers maintain being good teachers by being teacher-focused. These teachers can engage in interactions with their students and may encourage student activity. But the focus is on the teacher, not on what the students have learnt or how they learn. This is the key distinction between what we may term student-centred (encouraging active engagement by students) and student-focused (focused on what and how they learn). That is a change away from active engagement aimed at a sophisticated form of transmission to student-focused aimed at changing and developing student understanding.

Academic Development Programs and Approaches to Teaching

Having shown that teachers can and do grow and develop their teaching in ways consistent with our model of teaching and learning, the next issue is, how can we better facilitate growth and development consistent with the model. For many years now, universities in several countries have been developing certified programs in teaching and learning in higher education. The aims of these certificates have been broadly consistent with our model. The issue here is:

- What is the evidence that participation in these programs results in growth and development consistent with the model?

To address this question, we turn now to studies using the ATI to map changes in approaches to teaching. In the first, Gibbs and Coffey (2004) used the ATI to investigate changes in approaches to teaching in two, non-randomly selected, groups of new teachers. One group was undergoing a systematic training program in university teaching and the other received no training. In their study, they were able to show that there was a statistically significant increase in CCSF scores of the training group, and a non-statistically significant decline in the ITTF scores. In contrast for the non-training group there were non-statistically significant declines in the CCSF scores and an increase in the ITTF scores.

In the same study, the students of the training group were surveyed pre- and post with an approach to study questionnaire. The results showed that there was a non-statistically significant increase in deep approach scores and a statistically significant decrease in surface approach scores.

Gibbs and Coffey (2004) concluded that training can increase the extent to which teachers adopt more CCSF approaches and can change teachers in ways that can improve student learning. While there were substantial sampling problems in this study, it is the first to show evidence of the effect of teacher training in changing and developing university teachers in ways to improve their students learning.

In a large, more complex quantitative and qualitative study of the effect of pedagogical training on teaching in higher education, Postareff, Lindblom-Ylänne, and Nevgi (2007) highlighted some complexity in the outcomes. Their study included over 200 teachers with varying lengths of experience in university teaching (ranging from less than two years to more than 13 years) and varying lengths of pedagogical training (ranging from no pedagogical training to one full year of training). All participants completed the ATI and 23 were interviewed.

In their discussion of the results, the authors stated:

> Analyses of the effect of the length of pedagogical training on teaching approaches showed that the training enhances a shift from the ITTF approach, to the CCSF approach, but also that this is a slow process. Teachers who had just begun their studies in pedagogical courses scored even lower on the CCSF approach scale than teachers who did not have any pedagogical training. Only after a year-long process of pedagogical training, teachers reported to be more student-centred than those who did not have training at all. In addition, only teachers who had pedagogical training for at least one year (30 ECTS or more), scored lower on the ITTF approach scale than the other groups who had less training or no training at all. (Postareff et al., 2007, p. 568)

This very important result, that short programs in pedagogical training can have negative effects on teachers' development, will be returned to later in this Chapter in an account of a major systematic review of such programs by Prebble, Hargraves, Leach, Naidoo, Suddaby, and Zepke (2004). Suffice it to say, that it seems that in the early stages of such programs after only a short course, teachers experience some disequilibrium in the approaches to teaching, which can only be resolved by a more systematic longer program. Such a result should be expected if the change involves a substantial conceptual shift, as is the case.

While the Gibbs and Coffey paper was similar to the McKenzie study in that they both included longitudinal studies, the following two papers, by

Hanbury, Prosser, and Rickinson (2008) and Ginns, Kitay, and Prosser (2008) are similar to the Åkerlind and Postareff, Lindblom-Ylänne and Nevgi papers in that they both ask respondents to reflect back on their experience over time.

Hanbury, Prosser, and Rickinson (2008) surveyed 388 academics across 32 UK higher education institutions who had completed a year-long UK-accredited teaching development program. One aspect of the study included asking respondents to complete the ATI twice, once reflecting on how they would have responded at the start of the program, and again on their response at the end of the program. Another aspect of the study was focus group discussions with 28 program participants about their experiences of studying in the programs.

The analysis of results showed large and statistically significant increases in CCSF scores and a smaller and statistically significant decrease in the ITTF scores. That is, the participants experienced a substantial move towards more conceptual change/student-focused approaches and a less substantial move away from an information transmission/teacher-focused approach on participating in the course.

Interestingly, the focus group discussion reinforced the previous conclusion about the length of time needed to bring about these changes. In summary, one participant stated that:

> I was not engaged while doing the course, not until writing up and reflecting on the experience. You want to be doing other things, a three-hour wedge of time on the programme each week was really difficult to manage. But the benefits come later and are on-going; the value of the supportive environment is huge. (Hanbury et al., 2008, p. 475)

A similar conclusion was reached by Knight (2006). In a study of perceptions of graduate certificates across the UK, Knight noted that the respondents reported a shift from teacher-focused to student-focused approach to teaching. But he also noted that past participants rated the programs higher than recent participants, suggesting a delayed appreciation of the impact.

In an interview study of 14 graduates of a one-year graduate certificate, Ginns, Kitay, and Prosser (2008) came to a similar conclusion: 'The results … suggest a shift in self-reported experiences of teaching from less to more complex experiences'. The authors had previously defined less to more in terms of our approaches to teaching. Indeed, this is illustrated in

comments from participants discussing their teaching prior to completing the graduate certificate, and then some time after completing the program. First, before completion:

> I felt teaching was just trying to come to the classroom and then get the students to accept what the teacher's going to teach.
>
> I tried to make my lectures very clear and structured and lead the students on a journey.

Then two comments from participants some time after completing the certificate:

> I suppose it comes back to students who are actively involved in their own learning … So, if you allow them to conceptualise things rather than just being told that's the way it is, they can relate to it better.
>
> … we realised that what was important here was not actually delivering a lot of detailed content, it was getting across a way of thinking and helping students change their naïve concepts … into more highly developed concepts. So really, I was trying the change students' concepts and approaches to problems in [my field of Study]. (Ginns et al., 2008, p. 179)

Finally, as a way of summing up, Prebble, Hargraves, Leach, Naidoo, Suddaby, and Zepke (2004) asked an interesting question: 'What is the impact of academic development programmes on student learning outcomes?'. They conducted a systematic analysis of the literature, examining over 150 studies and reducing them to 33 primary sources for analysis. Early in the project they realised that there were few if any publications directly relating academic development to learning outcomes. They acknowledge that the relationship is complex and contingent. In the event they adopted a two-step process, examining the literature for two independent propositions:

Proposition 1: Good teaching has a positive effect on student learning outcomes.
Proposition 2: Through a variety of academic development interventions, teachers can be assisted to improve the quality of their teaching. (Prebble et al., 2004, pp. 12, 13)

Having reviewed the literature relating to Proposition 1, including much of the literature referred to in Chap. 2 and our model for student

learning, they concluded that research from this student approach to learning perspective does show that more conceptual change/student-focused approaches to teaching lead to higher quality student learning outcomes.

In response to Proposition 2, they examined the evidence for short training courses; in situ training; consulting, peer assessment and mentoring; student assessment of teaching; and intensive staff development. In comparing the outcomes of each of these forms of staff training they state:

> Teachers' conceptions about the nature of teaching and learning are the most important influences on how they teach. Intensive and comprehensive staff development programmes can be effective in transforming teachers' beliefs about teaching and learning and their teaching practice. (Prebble et al., 2004, p. 91)

The conclusions from these studies are consistent with the messages in this book about the relationship of teaching to learning and how to support the development of good teaching for students' learning.

Principles of Practice for Developing Teaching and Learning

In this chapter we have shown how university teachers change and develop their teaching in ways consistent with our model. Over time and with support, teachers do move away from just presenting their subject matter to their students, and towards helping their students become more active learners and finally focusing on how they would like the students to change and develop their understanding and the range of activities which will support those changes. We have noted, however, that many teachers do not complete this journey. Some remain committed to approaches aimed at transmission only, many introduce activities to engage students actively, and some make the conceptual shift to focusing on how and what they want their students to learn and how they can help them learn it.

We have also seen how teachers can be helped along this journey through academic development activities. But those activities need to be sustained over at least a year and have a focus on conceptions or beliefs. Short workshops and seminars may help in awareness raising but often leave teachers confused and unsure. What we have been talking about is a conceptual change in ways of conceiving of and approaching teaching and

student learning. All the literature on conceptual change shows that it is a difficult and confronting process. It is not achieved quickly and easily. The move from transmission to student activity is relatively easy, but the move away from what is to be presented or transmitted through an activity to how we want our students to change and develop and therefore what sorts of student-focused activities are needed is a difficult move.

This brings us to the principles of practice which emerge from this review.

- Principle 1. Teachers need to be aware that their ideas about, and approaches to, teaching should and do change and develop over their career.
- Principle 2. Teachers need to be supported to periodically critically reflect on their ideas about teaching and how they should approach it.
- Principle 3. Teachers need to be aware that, while short workshops and seminars are appropriate for raising awareness about issues in teaching, it usually takes a longer-term engagement to change and develop ideas about teaching.
- Principle 4. Academic developers and others responsible for supporting teachers to become better teachers need to enable teachers to critically reflect on how they approach their teaching and recognise that short workshops and seminars are unlikely to achieve this purpose.
- Principle 5. Institutions need to be aware that the development of good teaching involves the development of ideas about teaching as well as developing skills in teaching.

In the final chapter we summarise our views of teaching and learning that have emerged from the 30 years of research described in this book and in our earlier text *Understanding Learning and Teaching: The Experience in Higher Education*. We provide a rationale for the principles of practice in each of Chaps. 2, 3, 4, 5 and this chapter and describe nine implications for good classroom learning and teaching that have emerged from this research.

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CHAPTER 7

Summary and Conclusions

Abstract This chapter contains a summary of the view of university teaching and student learning presented in the book. The underlying coherence in the way university teachers experience their teaching, their student learning, their research and perceptions of leadership and their ongoing growth and development are reiterated. A description of the underlying rationale for the principles of practice identified in each chapter is presented, along with issues related to research methodology. The conclusion contains personal reflections on the 30-year research project that has used the model introduced in Chap. 1 to inform the direction of the series of research studies that underpin this book.

Keywords Principles of practice • Research methodology • Personal reflection

Summary of Our View of Teaching and Learning

In the opening Chapter of this book we asked the question: 'Do the different ways that teachers go about their teaching have different outcomes for their students' learning?'. We introduced our Presage-Process-Product model as a way of structuring our understanding of the answer to this question. In the process we raised a number of issues relating to teaching that may place our answer into a broader academic context.

K. Trigwell, M. Prosser, *Exploring University Teaching and Learning*, https://doi.org/10.1007/978-3-030-50830-2_7

In Chap. 2 we showed how the quality of students' learning outcomes was related to how they approach their studies, which in turn are a function of the way students experience their teaching and learning context. Their perceptions of the context are conditioned by their previous experiences of teaching and learning and the design of that context. We argued that while all students in the same class experienced the same context, they experience that context in different ways which in turn relate to how they approach their learning. We showed that students who focused on meaning and understanding in their studies – a deep approach – have more positive emotional experiences of teaching and learning, and those focusing on short term reproduction – surface approach – have more negative emotional experiences. We provided evidence that these principles underly quality learning in a variety of teaching and learning contexts, notably online and problem based.

In Chap. 3 we reviewed our and our colleagues' research on teachers' experiences of teaching. We showed that there is a wide qualitative variation in the way university teachers approach their teaching. At one extreme are approaches aimed at transferring information to student and at the other, teachers working towards developing and changing students' fundamental understandings of key concepts, ideas and practices. These approaches were shown to relate to the way their students approach their learning, with an information transfer focus related to surface approaches, and conceptual change and development approaches to deep approaches to learning. We then showed how these approaches were manifested in a range of disciplines and finally how teachers' emotions towards teaching was related to their approach. Teachers adopting more information transfer approaches showed more negative emotions and those adopting more conceptual change approaches showed more positive emotions towards teaching.

In Chap. 4 we turned to how these approaches to teaching related to the way the teachers experienced the structure of the subject matter they were teaching and the structure of their research field. In that Chapter we identified what we consider to be a fundamental underlying coherence in the way teachers experience their teaching, the subject matter they are teaching and their research. Those teaching by adopting more information transmission approaches to teaching describe their subject matter more in terms of facts, techniques, individual concepts and topics, with little or no focus on the overall coherent structure of the subject matter. While those with an approach to teaching focused more on conceptual

understanding and change describe a more coherent overarching structure to their subject matter and how the various aspects of the subject matter came together to form a coherent whole. In a similar way we found that teachers who described their research in terms of a series of projects with little focus on extending disciplinary boundaries and understanding tended to adopt more of an information transmission approach, while those who described their research in terms of furthering the development of their field as a whole and how their part related to and furthered that development were adopting more conceptual development and change approaches to teaching.

The results of these studies led us to speculate that there may be an underlying coherence in the way teachers experience their teaching, subject matter and research, and that this would help explain the difficulties many teachers have in changing and further developing their teaching in ways described in this book and in terms of the model of teaching and learning explored. This suggests that teachers who understand their discipline and research more in terms of individual parts are unlikely to adopt more conceptual development and change approaches to teaching. But consistent with earlier chapters, teachers who focus more on the field as a whole and their part in that field may or may not adopt more conceptual development and change approaches, depending on their perceptions of the teaching and learning context. This would suggest that teachers with an orientation to information transmission approaches are very unlikely to adopt more conceptual development and change approaches, while those with an orientation to the conceptual change and development approach may or may not adopt such an approach depending on their perceptions of the teaching and learning context. Of course, as noted, this is somewhat speculative, but it does suggest that changing teaching in these ways does require a substantial conceptual change in ways of thinking about and conceiving of their discipline – consistent with Noel Entwistle and colleagues' ideas of ways of thinking and practicing (Entwistle, 2009; McCune & Hounsell, 2005).

The effect of perceptions of context referred to in different parts of this book are reinforced by the effects of teachers' perceptions of leadership described in Chap. 5. In this Chapter we identified a causal path between experiences of teaching, perceptions of teaching and learning context and approaches to teaching. In departments in which teachers perceive a more transformational approach to leadership, they are more likely to perceive a

positive context for teaching and learning and adopt a more CCSF approaches to teaching.

Finally, in Chap. 6 we looked at research into changing and developing as university teachers. We saw that teachers do change and develop their teaching consistent with the ideas developed in this book. Teachers do develop from initially having an orientation to an ITTF approach and do develop an orientation to a CCSF approach. Not all teachers develop, but many do. We saw no evidence of regression the other way. No teachers who had an orientation to a CCSF approach regressed to an ITTF Approach. But more importantly, we found that the development of a CCSF orientation to teaching takes time, with an extended focus on teaching and learning. Short workshops may help develop a particular strategy, but whether that strategy is adopted in ways consistent with a CCSF orientation depends on a conceptual shift away from ITTF to CCSF. But such a shift requires an 'intensive and comprehensive' staff development program, with a clear focus on changing and developing teachers' conceptions of teaching and learning.

This work, as summarised, has led us to believe our model of teaching and learning is comprehensive, robust and evidence based. In order to improve the quality of student learning we need to work towards changing and developing teachers approaches to teaching. This requires a concerted effort by institutions to support teachers in these changes.

Rationale for Principles of Practice

At the end of each Chapter we outlined a set of principles of practice to emerge from the analysis of research in the Chapter. We described such principles of practice in our 1999 book as follows:

> These principles have been identified from the research reviewed in each of these Chapters. They provide a concise summary of the ideas presented in each Chapter and a basis for practical development of learning and teaching contexts. They are also a set of principles against which existing practice can be examined and point to issues which need careful consideration in the development of new practices. They are not meant to be guidelines for, or provide templates or recipes for, good practice, but to highlight those aspects which teachers need to maintain in the foreground of their awareness when designing or redesigning learning and teaching contexts in higher education. (Prosser & Trigwell, 1999, p. 166)

In that 1999 book, we drew the following implications for good classroom learning and teaching from the principles of practice discussed in that book. They were that good teaching involves an awareness of:

- Students learning situations
- The contextual dependency of learning and teaching
- Students perceptions of teaching technologies used in teaching
- Students diversity (including cultural diversity) in classrooms
- Continuing efforts to evaluate our teaching for improved learning.

Based upon the principles of practice discussed in Chaps. 2, 3, 4, 5 and 6 of this book, we wish to add the following; that good teaching also involves an awareness of:

- The role of teacher and student emotions in teaching and learning
- An underlying structural relationship between approaches to teaching, structural understanding of subject matter being taught, and research being enacted
- The impact of leadership on how and what is taught in the classroom
- Continuing to engage in evidence-based reflection on the practice of teaching as it engages student learning.

This list of nine specific issues in many ways represents a distillation of our views on what is required for high quality teaching and learning.

Some Reflections on Research Methodology

For those interested in engaging in continued classroom-based research based upon the model of teaching and learning espoused in this book, in this section we wish to outline some of the principles underlying our research. We do not argue that this should be the only way or even the best way of conducting classroom-based research, but it represents our way, and in the process may help to deepen an understanding of the research outlined so far.

The focus of our research has been on the development of a model of the experience of teaching and learning in higher education. The model is heuristic in the sense that it helps us structure our research. Our research has also focused on self-reported descriptions of experience rather than on observed behaviour. We did report one study in which we formed

observational hypotheses of what we would observe in a classroom based upon pre-interviews with the participants. In the pre-interviews we asked participants to focus on what they planned to do in their lecture and what was the underlying intention. As we reported (Martin, Prosser, Trigwell, Ramsden, & Benjamin, 2000) our hypotheses were confirmed. The key element in all our work has been to ask participants to focus on a particular context, and seek associations and correlations based upon descriptions and variables within the context. In terms of the thoughts of Argyris and Schön (1974) our focus has been on 'theories-in-use' not 'espoused theories'.

In terms of analytical methods, we have used qualitative phenomenographic analyses to analyse qualitative data and multivariate quantitative analyses (exploratory and confirmatory factor analyses, structural equation modelling (SEM) and cluster analyses) to analyse quantitative data. The phenomenographic analyses have tried to describe key aspects of the variation within the qualitative data in terms of categories of description and then to classify the data in relation to those categories (see Marton, 1986). The quantitative analyses have focused on exploring associations between key variables, not hypothesis testing.

Given our phenomenographic perspective, we have not sought to develop causal models (even though we have at times used SEM), but rather relational, context dependent models of experience. A key aspect of much of our work has been to seek replication in subsequent studies for all our findings. Replication not in the sense of replicating exact results but replication in the sense of reproducible structures in our data.

Finally, we have been interested in the applicability of our results to support university teachers to improve the quality of their students learning. For, as Paul Pintrich has noted in his comparisons of his self-regulated learning (SRL) perspective with our SAL models:

> Moving beyond this philosophical difference, SRL and SAL models may be incommensurable in terms of the choice of grain size. SAL models tend to emphasize a more global and holistic approach to describing student motivation and learning that highlights general student approaches to learning. This has the advantage of being relatively simple and easy to understand, especially for faculty who are not researchers on college student motivation and learning.
>
> This is particularly helpful in faculty development efforts to improve college and university teaching. The general distinction between surface- and

> deep-processing approaches to learning resonates with faculty and can help them understand student motivation and learning in a way that they can readily use and apply in their own classroom. It provides a common language and framework that researchers, faculty development experts, and faculty can use to improve college and university teaching. In this way, it is much more applicable to educational improvement and development efforts. (Biggs, 2001)

> In contrast, SRL models may provide a larger number of constructs at a smaller grainsize that describe student motivation and cognition in all its complexity. However, these models are often quite cumbersome and too difficult to use in faculty development efforts. The terminology is foreign and often too complex for faculty who lack prior knowledge in education or psychology. In this sense, the choice of grain-size may be a function of the goals of the researchers in terms of their interest in faculty development and the improvement of university teaching and learning in comparison to those interested in more basic research on college student motivation and learning. (Pintrich, 2004, p. 403)

Personal Reflection and Conclusion

We began this book by describing four teachers' – two from the sciences and two from the social sciences – approaches to teaching. The first in each pair focused on teaching for reproduction and the second on meaning and understanding. We believe that through the research described in this book we have shown that the former approaches to teaching are generally less satisfying to teachers and to students and in most cases lead to lower quality learning outcomes than the latter approaches.

We believe strongly that focusing on meaning and understanding is at the heart of good and satisfying teaching and student learning. We also understand that for less experienced teachers the process of being comfortable in large classes (which are the only classes we have nowadays) takes time and courage. We remember when we were initially confronted with 'presenting' large lectures in the sciences in our early days of teaching the feeling you have in your tummy. Over time and through our ongoing research we came to understand that 'engaging' students with key ideas related to their experiences of living in the world and monitoring their response was the key to good teaching.

It was the same for our academic development work. Both of our initial approaches were to try to present to teaching staff elements of good

teaching. Over time we found that this was not very engaging or productive. We learnt that we needed to draw upon and relate to their experiences of teaching and learning. Over a number of years, we think, we have become better able to support teachers by helping them reflect on their experiences in relation to the ideas and approaches generated by our research.

We hope that we have been able to engage our readers with some of our ideas and encourage them to try new approaches to teaching and their own research into their students' learning.

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Appendix: Approaches to Teaching Inventory-Revised (ATI-R)

This inventory is designed to explore a dimension of the way that academics go about teaching in a specific context or subject or course. This may mean that your responses to these items in one context may be different to the responses you might make on your teaching in other contexts or subjects. For this reason, we ask you to write here the subject/course of your response:

For each item please circle one of the numbers (1–5). The numbers stand for the following responses:

1. this item was **only rarely or never** true for me in this subject.
2. this item was **sometimes** true for me in this subject.
3. this item was true for me **about half the time** in this subject.
4. this item was **frequently** true for me in this subject.
5. this item was **almost always or always** true for me in this subject.

Please answer each item. Do not spend a long time on each: your first reaction is probably the best one.

	Only rarely				*Almost always*
1. In this subject, students should focus their study on what I provide them.	1	2	3	4	5
2. It is important that this subject should be completely described in terms of specific objectives that relate to formal assessment items.	1	2	3	4	5
3. In my interactions with students in this subject I try to develop a conversation with them about the topics we are studying.	1	2	3	4	5

(*continued*)

K. Trigwell, M. Prosser, *Exploring University Teaching and Learning*, https://doi.org/10.1007/978-3-030-50830-2

(continued)

	Only rarely				*Almost always*
4. It is important to present a lot of facts to students so that they know what they have to learn for this subject.	1	2	3	4	5
5. I set aside some teaching time so that the students can discuss, among themselves, key concepts and ideas in this subject.	1	2	3	4	5
6. In this subject I concentrate on covering the information that might be available from key texts and readings.	1	2	3	4	5
7. I encourage students to restructure their existing knowledge in terms of the new way of thinking about the subject that they will develop.	1	2	3	4	5
8. In teaching sessions for this subject, I deliberately provoke debate and discussion.	1	2	3	4	5
9. I structure my teaching in this subject to help students to pass the formal assessment items.	1	2	3	4	5
10. I think an important reason for running teaching sessions in this subject is to give students a good set of notes.	1	2	3	4	5
11. In this subject, I provide the students with the information they will need to pass the formal assessments.	1	2	3	4	5
12. I should know the answers to any questions that students may put to me during this subject.	1	2	3	4	5
13. I make available opportunities for students in this subject to discuss their changing understanding of the subject.	1	2	3	4	5
14. It is better for students in this subject to generate their own notes rather than copy mine.	1	2	3	4	5
15. A lot of teaching time in this subject should be used to question students' ideas.	1	2	3	4	5
16. In this subject my teaching focuses on the good presentation of information to students.	1	2	3	4	5
17. I see teaching as helping students develop new ways of thinking in this subject.	1	2	3	4	5
18. In teaching this subject it is important for me to monitor students' changed understanding of the subject matter.	1	2	3	4	5
19. My teaching in this subject focuses on delivering what I know to the students.	1	2	3	4	5
20. Teaching in this subject should help students question their own understanding of the subject matter.	1	2	3	4	5
21. Teaching in this subject should include helping students find their own learning resources.	1	2	3	4	5
22. I present material to enable students to build up an information base in this subject.	1	2	3	4	5

Prosser & Trigwell, 2005 Thank you

Approaches to Teaching Inventory-R Notes

This 22-item version of the ATI was expanded to include new items to accommodate more flexible learning environments than those from which the ATI was developed. The original version is available in Prosser and Trigwell (1999) and the most recent 16-item version is available from Trigwell and Prosser (2004).

The Approaches to Teaching Inventory-Revised (ATI-R) has two scales:

Information transfer/Teacher-focused scale (ITTF)
Conceptual Change/Student-focused scale (CCSF)

ITTF Items 1, 2, 4, 6, 9, 10, 11, 12, 16, 19, 22
CCSF items 3, 5, 7, 8, 13, 14, 15, 17, 18, 20, 21

Scoring is based on the mean numeric response (1–5) for each item in the scale.

We have not published norms, nor will we, as we have gone to some lengths in writing on the research behind this inventory, that responses to it are relational and are specific to the context in which they are collected. Teachers who adopt one approach in one context may not adopt the same one in a different context. Our main use of the inventory has been as a source of data for analysis of associations within a specific context. For example, the associations between approach to teaching and perceptions of leadership in departments, or relations between approach to teaching and student approaches to learning.

Permission is given for free use of the ATI-R.

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Index

K. Trigwell, M. Prosser, *Exploring University Teaching and Learning*, https://doi.org/10.1007/978-3-030-50830-2