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Student learning and the experience of teaching

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The intentions that university teachers describe in their approach to teaching have been found to vary between teachers and to vary for the same teacher in different contexts. In addition, this variation is related to variation in the learning quality of the students of those teachers. Quantitative empirical studies reveal that when teachers' intentions are focused on developing/changing students' conceptions (rather than on the instruction or the content) their students are more likely to report adopting more meaningful learning approaches. These results provide a "scientific grounding" for discussions on effective university teaching and learning, and on interventions aimed at achieving higher quality student learning. Research over the past 40 years leading to the identification of these teaching-learning relations, and more recent studies of the experience of university teaching and learning, are reviewed in this paper. It concludes with a comment on some of the patterns to emerge from the overview and ways in which this research could be extended.

Keywords: *approaches to learning; approaches to teaching; relational studies of student experience.*

1. Introduction

One of the enduring questions asked by university teachers is, how does their teaching influence student learning? (Kandlbinder, 2012). There have been many learning theories and models that have attempted to answer this question. One answer is from quantitative empirical studies that reveal that when teachers' intentions are focused on changing students' conceptions (rather than on the presentation of content) their students are more likely to report adopting deeper approaches to learning. The study of university

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teaching has been given more of a scientific grounding as a result of research showing relations between teachers' approaches to teaching and their students' approaches to learning.

This work has evolved out of separate relational studies of students' experiences of learning and teachers' experience of teaching. The research consistently shows that teachers' and students' adoption of relatively unsophisticated conceptions (of teaching/learning) is related to relatively unsophisticated approaches to teaching/learning, and in turn those approaches are related to poorer outcomes. As such, relational studies of student experiences of learning provide knowledge that is crucial to any theoretical understanding of teaching and learning and has direct practical implications for the design of learning tasks, ways of teaching and the induction of students into a university environment.

This review begins by describing a model of the teaching-learning experience that defines the association between teaching and learning approaches. In section 3 a brief overview of the extensive history of the Student Approaches to Learning (SAL) research and how studies of university teaching were developed from the same perspective. In section 4 a summary is provided of studies that have investigated how the teaching experience of teachers and the learning experience of their students are related. Section 5 focuses on research into factors in the teaching domain such as teaching strategies and leadership in teaching, and in section 6 the focus shifts to related research on teaching that contributes to understanding academic development practice.

2. A model of the teaching-learning experience

Research from the SAL perspective has repeatedly revealed logical, systematic relations between students' learning 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). These four variables characterise the student side of a model of the teaching-learning experience adaptated from the 3P (presage, process, product) model of Biggs (1979) and Dunkin and Biddle (1974). The teaching side of the model features teachers' conceptions/ understandings, their perceptions of the teaching context and their approach to teaching.

The components of the model are shown in Figure 1 which, for analytical reasons, are described as being separate and time-related entities. However, for both students and teachers, Figure 1 represents aspects of the teaching-

learning experience that can be seen as being "simultaneously present in their awareness" (Prosser & Trigwell, 1999, p. 17). This means that teachers and students will, at any time, be aware of a great many things, including the teaching/learning 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.

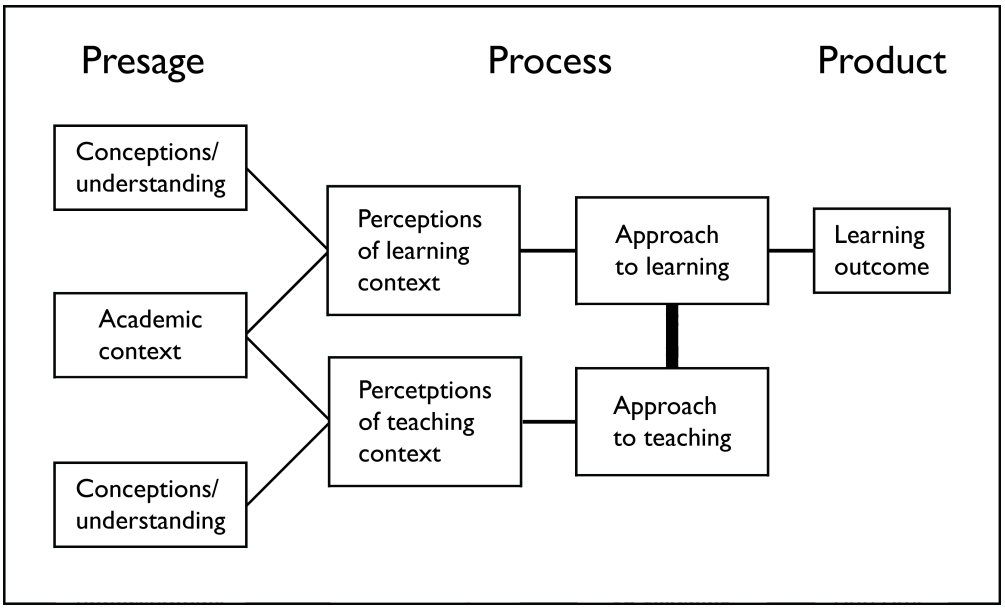

Figure 1. 3P model of teaching-learning experience

The research on learning context, conception, perception and approach variables identified as being consistent with the 3P model has been extended significantly in the last 20 years. In a series of related research studies, Prosser and Trigwell explored the relations between the teacher variables shown in the bottom half of the model and the students experience variables shown in the top half. They also found—and later confirmed—a relationship between teaching and learning in which students who reported more meaningful approaches to learning were found to be in the classes of teachers whose intentions were focused on developing/changing students' conceptions rather than on their own delivery or the content (Prosser, Ramsden, Trigwell & Martin, 2003; Trigwell, Prosser & Waterhouse, 1999). The association between the ways teachers think and act in their teaching,

and the ways their students approach their learning provide an evidence-based platform for discussions on the ways university teaching might be enhanced and on the nature of interventions aimed at achieving higher quality student learning.

3. Student experiences of learning

The value of the 3P 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 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.

The validity of the model has been tested in different teaching contexts, like online and problem-based learning. Studies have also 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. Some examples of these confirmatory studies are described below.

Prior learning experience

The conceptions that students bring to the learning situation was shown in the early studies on student learning to be directly related to the students' approaches to learning. Two additional aspects of students' prior experiences of learning—their motivation and self-efficacy—have also been shown to be related to students' approaches to learning and their perceptions of the learning environment (Ashwin & Trigwell, 2012). In revealing such relations, the results show that all three prior learning experiences are distinct and measurable and can be used to better understand the ways in which students experience learning in higher education.

Emotions in learning

The role of emotions in university students' approach to learning emerged as an unexpected finding in a relational study of online learning (Ellis, Goodyear, Prosser, & O'Hara, 2006). The results suggested that there was a

relationship between the ways students emotionally experienced their biology course, the approach they took to the learning of that course and their academic achievement in 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, Ellis, & Han, 2012).

Student 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; Ellis, Goodyear, O'Hara, & Prosser, 2007; Ellis, Goodyear, Calvo, & Prosser, 2008). In social work, psychology, pharmacy and engineering, similar patterns of relations between the 3P model student variables were found. Using closed-ended 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. 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.

For teachers or course designers wishing to create university experiences in which discussion is used to promote learning, this type of insight is critical. Interestingly, few differences were observed between online and face-to-face contexts, with students' conceptions and approaches found to explain more variation in learning achievement than the online or face-to-face teaching contexts.

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 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. The results show that the majority of students held relatively unsophisticated conceptions of problem-based learning that were related to relatively unsophisticated approaches to learning (Duke, Forbes, Hunter, & Prosser, 1998; Forbes, Duke, & Prosser, 2001; Hendry, Lyon, Prosser, & Sze, 2006) and learning conceptions and approaches that emphasise learning for understanding correlate positively with attaining higher course marks (Ellis, Goodyear, Brillant, & Prosser, 2008).

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).

Variant learning experience study results

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. 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 and colleagues (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 and colleagues (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 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.

In summary, some 40 years after the 3P model was proposed as a way of better understanding student learning, the 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.

4. Teaching-learning relations

In order to investigate the relations between teaching and learning on a large scale, ways to efficiently assess the differences in teaching approaches were needed. In the 1990s, interviews with teachers of first year science were used by Prosser and Trigwell to explore approaches to university teaching. Using analytical methods derived from phenomenography (Marton & Booth, 1997) they described five qualitatively different approaches to teaching (Prosser & Trigwell 1999; Trigwell, Prosser, & Taylor, 1994).

Approach A

A Teacher-focused strategy adopted with the intention of transmitting information to students, in which students' activity is not an essential element. The focus of teacher activity is on presenting/ demonstrating discipline-based facts and skills.

Approach B

A teacher-focused strategy used with the intention that students acquire the concepts of the discipline, in which student activity in the teaching/learning process is needed. The focus of activity remains on the teacher disseminating discipline-based information with an understanding that different dissemination strategies will assist students to understand the material.

Approach C

A teacher-focused, student activity strategy adopted with the intention that students acquire the concepts of the discipline. Here the focus of activity is on building students' understanding of the subject matter through working within predetermined teacher and/or content framework structures and introducing student activity around these desired structures.

Approach D

A student-focused strategy aimed at students developing their conceptions, in which the focus of the teacher's attention is on the students as well as on the teacher, and focus of student activity is on elaborating and extending their understanding of the subject matter by employing discipline frameworks of concepts in tasks in which the framework is seen as a resource.

Approach E

A student-focused strategy aimed at students changing their conceptions. Here the focus of student activity is on students' restructuring their current world view by interacting with subject material in a way that challenges their currently held conceptions, so that they restructure and change these conceptions.

The qualitative differences in approaches to teaching found in interviews were used by Prosser and Trigwell to develop an Approach to Teaching Inventory (Prosser & Trigwell 1999, 2006; Trigwell & Prosser 2004; Trigwell Prosser, & Ginns, 2005). The Approach to Teaching Inventory (ATI) contains two scales distinguished mainly by the differences in teachers' intentions found in the qualitative studies. In having a teacher-focused intention, approaches A-C are seen as being qualitatively different to the student-focused intention adopted in Approaches D and E. One scale (conceptual change/student-focused (CCSF)) captures the teachers' intention to develop and change conceptions (Approaches D and E) 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).

In order to capture learning intentions and approaches, almost all the studies described in this review used 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 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).

Associations between teachers' approaches to teaching and students' approaches to learning

Using the ATI the associations between teachers' approaches to teaching in large first-year classes and their students' approaches to learning were explored in two separate studies (Trigwell, et al., 1998, 1999). 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 study, clusters of classes in 51 different first year courses were surveyed. A total of 408 teachers and 8829 students were involved. Similar results were found in each study. When teachers reported use of an information transmission intention, their students were more likely to report using more of a surface approach to study. A conceptual change intention 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 inventory at the department level, Kember and Gow (1994) found a similar result. In departments where teachers described more of a learning facilitation than knowledge transmission orientation, the students studying in those departments reported using more of a deep learning approach. At the class level, Gibbs and Coffey (2004) also found that when teachers in a training group developed more student-focused teaching approaches, their students adopted less of a surface approach to learning.

While there may 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 an 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 teaching context have continued, as described in section 5.

5. Furthering/Broadening/Deepening understanding of teaching

After the initial phase of research during which Prosser and Trigwell (1999) mapped out the theoretically-based and empirically-verified, conceptual and heuristic model of teaching and learning in higher education, they began to examine several emerging teaching and learning issues. In the process, they extended our understanding of university teachers' experiences of teaching and learning and also tested the robustness of the model. Topical issues of the time included field of study and discipline variations, teacher- and student-centred teaching and learning strategies, the raising of the status of teaching through the research-teaching nexus, stress and emotional engagement with teaching, and leadership within the academy. Here we focus on the outcomes of that research as it relates to a deepening and broadening understanding of the experiences of teaching and learning.

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. Research by Prosser and Trigwell and that of their colleagues suggest that the broad range of categories of conceptions and approaches described in the previous section apply across broad fields of study, but may appear differently in their practice.

Martin et.al (2000) replicated the earlier qualitative science based study by Trigwell, Prosser and Taylor (1994) with a sample of 26 teachers distributed across four broad fields of study: Social Sciences & Humanities; Business & Law; Science & Technology; and Health Sciences. They found that the underlying intentions of information transfer 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 CCSF 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. Using the ATI and the discipline classifications of Biglan (1973), the study reported 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, Trigwell, Nevgi, & Ashwin, 2006, p. 292)

Turning now to detailed studies within specific disciplines. Leveson 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 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.

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-focussed 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.

Reid (1999), in studying the teaching of music, 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, p. 69, p. 198).

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, focussing on student behavioural activity. The focus of the work reported here, drawing on the 3P model described in Figure 1, 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 and 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 in Section 2, 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 and colleagues (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.

In a series of articles, Ellis and his colleagues have 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.

Emotions in teaching

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

Zhang (2004) investigated relations between stress and teaching approaches using the ATI and an Occupational Stress Inventory. 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 (Trigwell, 2012). In the first part of the analysis he examined the construct validity and reliability of the ETI and identified five emotions variables related to teaching: Pride, Motivation, Anxiety, Embarrassment and Frustration. In the analysis of results of both the ATI and the ETI, he found positive

relationships between CCSF and Pride, Motivation and a lack of Frustration, and between ITTF and Anxiety and Embarrassment variables. 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 focussing 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.

Summary and conclusion

In this section research 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.

6. Changing and developing teachers' approaches to teaching

In this final section we review the literature discussing how teachers change and develop their conceptions and understanding of teaching and their approaches to teaching consistent with the model. Without evidence of change and development, much of the research reviewed would have little practical importance. That is, if the relationship between teachers approaches to teaching and students approaches to learning and learning outcomes is accepted, then the issue becomes, how do we help and support teachers to better adopt CCSF approaches to teaching?

Variation in the Leadership of Teaching and Learning

This section focuses on the experience of leadership in teaching and learning and how that experience of leadership relates to the way academics approach their teaching and their students' learning. The point of departure

in this way of studying leadership is the idea consistent with the 3P model that what is related to approaches to teaching is the way in which leadership is experienced rather than the objective reality of the leadership.

The first paper to be reviewed looked at the relationships between the way subject coordinators experienced or conceived of their leadership, how teachers perceived that leadership and how those perceptions related to the teacher's approaches to teaching (Martin, Trigwell, Prosser & Ramsden, 2003). In this qualitative study of 78 academics, 6 categories of the experience of leadership by subject coordinators were identified. They ranged from one in which the focus was on "the bureaucratic structure of the organisation of the department; this structure and organisation is imposed on the department by the head" (Martin, et al., 2003, p. 250) to a focus on

> teaching and emphasising the students' experience of studying on a changing and developing curriculum … [with] ... 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, p. 251)

The variation in the teachers' perceptions of the leadership of their subject coordinators ranged from one in which 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" to one in which leadership was "taken by individual members of the teaching team without discussion with other members of the team, but within a previously collaboratively agreed framework" (Martin, et al., 2003, p. 253). The analysis of results showed a medium sized relationship between the subject coordinators conceptions of experience of leadership and the teachers' perceptions of that leadership. More importantly, it also showed a large positive relationship between the teachers' perceptions of leadership and their approaches to teaching. So, in summary, those teachers who were more likely to adopt CCSF approaches to teaching had perceived leadership to be more about that leadership focusing on students and their learning and 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 discussion or collaboration.

In a further large, complex, quantitative study of 439 university teachers, using structural equation modelling, Ramsden and colleagues (2007) studied the causal relationship between teachers' perceptions of leadership, their

perceptions of their teaching and learning context and their approaches to teaching. The study showed direct empirical relationships between teachers' perception of leadership and departmental context and their approaches to teaching, consistent with the results described above.

Together with the results of an earlier study by Prosser, Ramsden, Trigwell and Martin (2003), the authors claim to have found direct empirical links between teachers' experiences of leadership and teaching context, their approaches to teaching and to their students' experiences of teaching and learning. In summary, courses in which students reported higher quality learning approaches and learning contexts were ones in which their teachers reported more CCSF rather than ITTF approaches to study, more collaborative management and transformational leadership, stronger departmental commitment to student learning and a more positive context for teaching.

Developing teachers' approaches to teaching

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.

In summary, she concluded that "those teachers who were primarily focussed in their teaching on imparting information to students were at the same time focussed 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,

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

In a comparable study, McKenzie (2003) reached 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. In her conclusions, she states that

> 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 focussing on their students and their students' understanding.

We turn now to two quantitative students 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 the ITTF scores. In contrast for the non-training group there were non-statistically significant declines in the CCSF scores and 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.

While the Gibbs and Coffey paper was similar to the McKenzie paper in that they both included longitudinal studies, the second paper, by Hanbury, Prosser and Rickenson (2008) is similar to the Åkerlind paper in that they both ask respondents to reflect back on their experience over time. Hanbury and colleagues surveyed 388 academics across 32 UK higher

education institutions who had completed a 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. The analysis of results showed large and statistically significant increases in CCSF scores and a smaller and statistically significant decrease in the ITTF scores. The paper concluded that participants perceived that their approaches to teaching were more CCSF and significantly ITTF after completing the programme.

7. Conclusion

This review has shown that teachers with appropriate support can grow and develop as university teachers in ways consistent with a model of the teaching-learning experience that shows how teaching influences student learning. Trying to help new teachers focus less on their content and their teaching strategies and more on their students and their learning strategies can result in more CCSF approaches to teaching. Development programs for teachers in higher education do have an effect, in developing more CCSF and less ITTF approaches to teaching. Together with the results of the synthesis of research on the outcomes of academic development programs on student learning in higher education (Prebble, Hargraves, Leach, Naidoo, Suddaby, & Zepke, 2004) this research offers strong support for extended development programs for teachers in higher education.

In terms of teacher development, there is evidence that teachers can grow and develop as university teachers as long as programs for teachers have a focus on the underlying intentions and conceptions of the experience of teaching/learning rather than the activity or strategy, the relations between variables shown in the 3P model (Figure 1). This suggests an explicit use of the model to help university teachers to understand teaching and learning. With respect to teaching, approaches to teaching are found to manifest in different ways in different disciplines, though in all disciplines studied, there is an observed underlying structure in the experience of teaching, research, subject matter and curriculum design.

Whether this underlying structure extends beyond this experience is a question requiring further study. With respect to student learning, studies in a range of disciplines consistently show that the ways students conceive of their subject matter and their learning tasks is strongly related to their approaches to learning and the outcomes of their learning. In both teaching and learning it is acknowledged that there is individual variation but also that there appears to be an underlying conceptual structure, and it may be that

less sophisticated conceptions limit the nature of the approaches/strategies that can be adopted.

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