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Liisa Postareff

Teaching in Higher Education

From Content-focused to Learning-focused
Approaches to Teaching

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Helsinki 2007

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**From Content-focused to Learning-focused
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Helsinki 2007

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Teaching in Higher Education From Content-focused to Learning-focused Approaches to Teaching

Abstract

The aim of this dissertation was to explore teaching in higher education from the teachers' perspective. Two of the four studies analysed the effect of pedagogical training on approaches to teaching and on self-efficacy beliefs of teachers on teaching. Of the two studies, Study I analysed the effect of pedagogical training by applying a cross-sectional setting. The results showed that short training made teachers less student-focused and decreased their self-efficacy beliefs, as reported by the teachers themselves. However, more constant training enhanced the adoption of a student-focused approach to teaching and increased the self-efficacy beliefs of teachers as well. The teacher-focused approach to teaching was more resistant to change. Study II, on the other hand, applied a longitudinal setting. The results implied that among teachers who had not acquired more pedagogical training after Study II there were no changes in the student-focused approach scale between the measurements. However, teachers who had participated in further pedagogical training scored significantly higher on the scale measuring the student-focused approach to teaching. There were positive changes in the self-efficacy beliefs of teachers among teachers who had not participated in further training as well as among those who had. However, the analysis revealed that those teachers had the least teaching experience. Again, the teacher-focused approach was more resistant to change.

Study III analysed approaches to teaching qualitatively by using a large and multidisciplinary sample in order to capture the variation in descriptions of teaching. Two broad categories of description were found: the learning-focused and the content-focused approach to teaching. The results implied that the purpose of teaching separates the two categories. In addition, the study aimed to identify different aspects of teaching in the higher-education context. Ten aspects of teaching were identified.

While Study III explored teaching on a general level, Study IV analysed teaching on an individual level. The aim was to explore consonance and dissonance in the kinds of combinations of approaches to teaching university teachers adopt. The results showed that some teachers were clearly and systematically either learning- or content-focused. On the other hand, profiles of some teachers consisted of combinations of learning- and content-focused approaches or conceptions making their profiles dissonant. Three types of dissonance were identified.

The four studies indicated that pedagogical training organised for university teachers is needed in order to enhance the development of their teaching. The results implied that the shift from content-focused or dissonant profiles towards consonant learning-focused profiles is a slow process and that teachers' conceptions of teaching have to be addressed first in order to promote learning-focused teaching.

Liisa Postareff

Opetus korkea-asteella – sisältölähtöisestä opetuksesta oppimislähtöiseen opetukseen

Tiivistelmä

Tässä väitöskirjassa tutkittiin yliopisto-opettajien opetusta opettajien näkökulmasta. Kaksi osatutkimusta analysoi yliopistopedagogisen koulutuksen vaikutusta opettajien opetuksellisiin lähestymistapoihin ja pystyvyysuskomuksiin. Osatutkimus I analysoi yliopistopedagogisen koulutuksen vaikutusta poikittaistutkimuksena. Tulokset osoittivat, että lyhyt koulutus vähensi opettajien arvioita opiskelijälähtöisyydestään ja heikensi heidän pystyvyysuskomuksiaan. Pitkäaikaisempi koulutus puolestaan lisäsi opettajien arvioita opiskelijälähtöisyydestään ja vahvisti heidän pystyvyysuskomuksiaan. Opettajälähtöisessä opetustavassa ei tapahtunut suuria muutoksia.

Osatutkimus II tutki yliopistopedagogisen koulutuksen vaikutusta pitkittäistutkimuksena. Tuloksen osoittivat, että opettajilla, jotka eivät olleet osallistuneet yliopistopedagogiseen koulutukseen osatutkimuksen I jälkeen, ei tapahtunut muutoksia opiskelijälähtöisyydessä. Opiskelijälähtöisyys lisääntyi tilastollisesti merkitsevästi niillä opettajilla, jotka olivat osallistuneet pedagogiseen koulutukseen osatutkimuksen I jälkeen. Sillä, oliko opettaja osallistunut koulutukseen osatutkimuksen I jälkeen, ei näyttänyt olevan vaikutusta pystyvyysuskomusten lisääntymiseen. Pystyvyysuskomukset vahvistuivat eniten opettajilla, joilla oli vähiten opetuskokemusta.

Osatutkimus III analysoi opetuksellisia lähestymistapoja hyödyntäen laajaa monitieteistä haastatteluaineistoa. Tavoitteena oli tutkia, miten eri tavoin opettajat kuvaavat opetustaan. Aineistosta nousi kaksi luokkaa: oppimislähtöinen ja sisältölähtöinen lähestymistapa. Tulokset osoittivat, että erottava tekijä luokkien välillä on opettajien opetukselle asettama päämäärä. Tutkimuksen toinen tavoite oli yliopisto-opetukseen liittyvien ulottuvuuksien tunnistaminen. Aineistosta nousi kymmenen ulottuvuutta.

Osatutkimus IV analysoi opetusta yksittäisen opettajan tasolla. Tavoitteena oli tutkia sitä, miten opettajat yhdistelevät opetuksessaan oppimis- ja sisältölähtöisiä lähestymistapoja. Tulokset osoittivat, että jotkut opettajat olivat selkeästi ja systemaattisesti joko oppimis- tai sisältölähtöisiä. Joidenkin opettajien opetuksessa puolestaan yhdistyivät molemmat lähestymistavat.

Neljä osatutkimusta osoittivat, että yliopistopedagogista koulutusta tarvitaan opettajien pedagogisen asiantuntijuuden lisäämiseksi. Tulosten mukaan muutos sisältölähtöisistä tai molempia opetuksellisia lähestymistapoja yhdistelevistä opetustavoista kohti oppimislähtöisyyttä on hidaskäyttöinen prosessi. Opettajien käsitykset opettamisesta pitää muuttua ennen kuin oppimislähtöinen opetustapa on mahdollinen.

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Hämeenlinna, October 15, 2007

Liisa Postareff

To Elli and "Ananas"

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List of original publications

- I Postareff, L., Lindblom-Ylänne, S. & Nevgi, A. (2007). The effect of pedagogical training on teaching in higher education. *Teaching and Teacher Education*, 23 (5), 557–571.
- II Postareff, L., Lindblom-Ylänne, S. & Nevgi, A. (in press). A follow-up study of the effect of pedagogical training on teaching in higher education. *Higher Education*.
- III Postareff, L. & Lindblom-Ylänne, S. (in press). Variation in teachers' descriptions of teaching – Broadening the understanding of teaching in higher education. *Learning and Instruction*.
- IV Postareff, L., Katajavuori, N., Lindblom-Ylänne, S. & Trigwell, K. (in press). Consonance and dissonance in descriptions of teaching of university teachers. *Studies in Higher Education*. <http://www.informaworld.com>

1 Introduction

Research skills and expertise in one's own research field have traditionally been emphasised over teaching skills and pedagogical expertise in higher education, although interest in improving the quality of teaching of academics has been increasing since the late 1960s. It was not until the 1990s that the quality of teaching and learning in higher education began to receive more attention due to a considerable increase in research on teaching and learning in higher education. Since then major advances have been accomplished in recognising and rewarding good teaching in universities in order to improve student learning outcomes. Teaching quality and its enhancement is taken seriously around the world (Biggs, 2003; Knight, Tait & Yorke, 2006).

Teachers' approaches to teaching (i.e., how they teach) and the conceptions they hold about teaching (i.e., what they believe about teaching) have been the focus of several studies in recent years. Studies on approaches to teaching have identified two broad categories, the student- and the teacher-centred approaches to teaching. The *student-centred approach* is described as a way of teaching which sees teaching as facilitating the students' learning processes. The *teacher-centred approach*, on the other hand, is described as a way of teaching in which students are considered to be more or less the passive recipients of information transmitted from the teachers to the students (e.g., Kember & Kwan, 2000; Prosser & Trigwell, 1999). Studies on conceptions of teaching have distinguished between two contrasting conceptions of teaching emphasising either information transmission or conceptual change (e.g., Kember, 1997; Prosser, Trigwell & Taylor, 1994). The student-centred approach to teaching is more likely to be associated with higher quality learning outcomes (Trigwell, Prosser & Waterhouse, 1999). Hence, higher education teachers face pressure to change their teaching practices to be more student-centred in nature (Ramsden, 2003; Vermunt & Verloop, 1999).

A number of units for academic development have been created since the 1970s. As a consequence, many universities in Europe and Australia have developed structured programmes that focus on research-based curricula and pedagogical practices in higher education in order to enhance scholarly practices in teaching (Gibbs & Coffey, 2004; Hubbal & Burt, 2006). For example, new academic staff members in the United Kingdom, Norway and in some Australian universities have been required to complete a teaching certificate in higher education since the 1990s. The Netherlands, Sweden and New Zealand also have similar certificate programmes (Baum & Baum, 1996; Brew & Boud, 1996; Keesen, Wubbels, Van Tartwijk & Bouhuijs, 1996). In most European countries, however, teachers in higher education do not need a certificate of teaching competencies, although the need to improve the quality of teaching is acknowledged to be essential. In Finland, the training is not compulsory, but it is increasingly common that teachers participate in some pedagogical courses. There is not yet a national pedagogical training program for university teachers, but Finnish universities have started to cooperate to build one. The aim of teacher training at the University of Helsinki

should be to change teachers' approaches to teaching to be more student-centred and less teacher-centred (Programme for Development of Teaching and Studies at the University of Helsinki, 2007–2009).

Teachers themselves have reacted to the required teaching improvements in different ways. Some teachers participate in pedagogical courses because they see it as the only way of 'staying afloat' as practices change around them (see e.g., Knight et al., 2006). Many teachers of higher education voluntarily wish to provide instruction that supports student learning while they do not always find it easy to do so (McAlpine, 2004). However, many teachers underestimate the value of teaching since they have to secure employment contracts or promotion through productive research (Reid & Johnston, 1999).

In recent years attention has been directed to evaluating the formal teaching development provision for new academics (Warhurst, 2006) since the lack of research on this field is noticeable, leading to a lack of adequate evidence of the impact of training on teaching. As Gilbert and Gibbs (1999) have highlighted, there is a need to establish the effectiveness of higher education teachers' training in improving university teaching. Evidence of impact is needed to guide educational development units to design their courses (Gilbert & Gibbs, 1999). However, the results concerning the effectiveness of such courses conflict with each other, as some research has found promising results of the effect of such courses while others have shown little or no evidence for improvements in teaching approaches or conceptions (see e.g., Gibbs & Coffey, 2004). Conceptual change plays an important role in attempts to promote high quality teaching (e.g., Ho, Watkins & Kelly, 2001).

Research in the area of teaching in higher education has long been conducted mainly from the perspective of academic development providers. More recently, the perspective of teachers themselves is considered to be important as well. For example, university teaching is examined from the perspective of teachers themselves (Åkerlind, 2003a) and academics' conceptions of and approaches to teaching are the focus of a number of studies (e.g., Kember, 1997; Prosser & Trigwell, 1999; Samuelowicz & Bain, 1992, 2001). These studies highlight the importance of understanding the meanings of teaching, as experienced by university teachers, and the intentional nature with which academics approach their teaching (see Åkerlind, 2003a). Åkerlind (2003a) argues that investigating academic development from the perspective of teachers themselves will enhance our understanding of the nature of academic development, and thus provide insight into improving approaches to academic development.

Since there is contradictory evidence on the effectiveness of pedagogical training organised for university teachers, the present study aims to analyse the effect of such training by applying both cross-sectional and longitudinal settings. Furthermore, the study aims to analyse the phenomenon of approaches to teaching since previous studies have diverse views on the nature of the approaches. Finally, approaches to teaching are explored at an individual level in order to analyse the consonance and dissonance in teachers' approaches to teaching.

1.1 Teaching and learning in higher education

There is a strong need to promote a shift from the less desirable teacher-centred approaches to teaching to the more desirable ones that are student-centred in order to promote high quality teaching and learning in higher education institutions. An outcome of such a shift involves the adoption of 'student-focused academic practice' (Lindblom-Ylänne & Meyer, 1999). However, the teaching-learning relationship is complex and several factors have to be considered when promoting the student-centred teaching culture in universities.

Student- and teacher-centred approaches to teaching

The way academic teachers approach their teaching has been extensively studied since the early 1990s. These studies have identified a range of different approaches to teaching, which vary from teacher-centred approaches to student-centred. Thus, researchers share a similar understanding of the identification of the two broad approaches. For example, when interviewing 17 lecturers in three university departments, Kember and Kwan (2000) identified the two broad approaches to teaching, which they labelled as 'content-centred' and 'learning-centred' (see Figure 1). The authors defined the approaches using a motivation dimension and five strategy dimensions. The motivation dimension separates the approaches in terms of whether a *teacher's motivation* is an extrinsic or intrinsic part of the teaching role. The five strategy dimensions focus on whether *instruction* is about supplying notes or encouraging students to construct knowledge, whether the *teacher's focus* is on the whole class or individual students, whether the *teacher's assessment* is based on frequent tests or on more flexible means, whether *accommodation of student characteristics* occurs or not, and finally, whether the *source of experience/knowledge* is the teacher's own experience or utilises student experience.

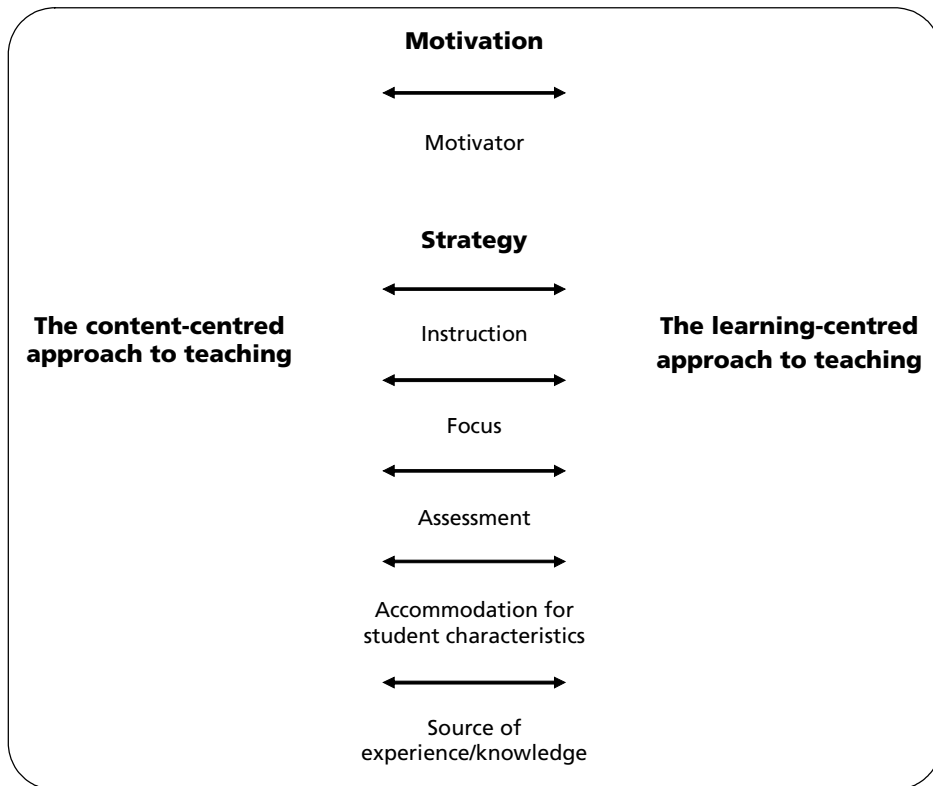


Figure 1. Dimensions of approaches to teaching (Kember & Kwan, 2000)

Trigwell, Prosser and Taylor (1994) detected five approaches to teaching when interviewing 24 physics and chemistry teachers. The approaches were analysed in terms of the strategies the teachers adopted for their teaching and the intentions underlying the strategies. The five approaches ranged from a *teacher-focused strategy with the intention of transmitting information to students* to a *student-focused strategy aimed at students changing their conceptions* (see Table 1). Trigwell and Prosser (1996a) have described approaches to teaching as including elements of teaching *strategies* and *intentions*. Their findings suggested that a student-focused strategy was associated with a conceptual change intention, while a teacher-focused strategy was associated with an information transmission intention.

Table 1. Approaches to teaching (Trigwell, Prosser & Taylor, 1994)

1.	A teacher-focused strategy with the intention of transmitting information to students.
2.	A teacher-focused strategy with the intention that students acquire the concepts of the discipline
3.	A teacher/student interaction strategy with the intention that students acquire the concepts of the syllabus
4.	A student-focused strategy aimed at students developing their conceptions.
5.	A student-focused strategy aimed at students changing their conceptions.

These two studies show a similar categorisation of approaches to teaching: Kember and Kwan (2000) use the terms “learning-centred” and “content-centred”, while Trigwell et al. (1994) talk of *conceptual change/student-focused* (CCSF) and *information transmission/teacher-focused* (ITTF) approaches. These categorisations are very similar despite the different terms applied: the one category focuses on students’ active knowledge construction and aims to enhance students’ deep learning processes, while the other category focuses on teachers’ performance and on the content of what is to be taught. More specifically, *teacher-centred* teaching is described as a way of teaching in which students are considered to be less active recipients of information which is transmitted from the teacher to the students. Thus, it is argued that knowledge is constructed by the teacher and the students are expected to learn factual knowledge. The existing prior knowledge of students is not taken into account when planning teaching. Learning outcomes are expressed in quantitative rather than qualitative terms, without a concern for the students’ understanding of knowledge. Teachers might try to make learning easier for students by organising their teaching thoroughly and structuring the knowledge in a way that is easier to remember (Biggs, 2003; Kember & Kwan, 2000; Prosser et al., 1994; Prosser & Trigwell, 1999; Samuelowicz & Bain, 1992, 2001; Trigwell & Prosser, 1996b; Vermunt & Verloop, 1999).

On the other hand, *student-centred* teaching is described as a way of teaching which sees teaching as facilitating students’ learning processes. Students are encouraged to construct their own knowledge and understanding and to strive towards becoming an independent learner. Transmission of knowledge and course contents may be a component of teaching, but the aim is to promote students’ own knowledge production processes. Teaching is interactive in a way that takes into account students’ existing conceptions. A student-centred teacher tries to recognise students’ differing needs and take these as the starting point when planning the course (e.g., Biggs, 2003; Kember & Kwan, 2000; Prosser & Trigwell, 1999; Trigwell & Prosser, 1996b; Trigwell et al., 1999; Vermunt & Verloop, 1999). Teachers who approach teaching in a student-centred way have been found to use a wider repertoire of teaching methods than teachers who adopt a teacher-centred approach to teaching (Coffey & Gibbs, 2002). Furthermore, teachers who adopt a student-centred approach were more likely than teachers who adopt a teacher-centred approach to report that their departments valued teaching, that their class sizes were not too large, and that they had control over what was taught and how it was taught (Prosser & Trigwell, 1997).

Teachers representing hard disciplines have been found to be more likely to adopt an information transmission/teacher-focused (ITTF) approach to teaching, while teachers who represent soft disciplines are more likely to take a conceptual change/student-focused (CCSF) approach to teaching. Lindblom-Ylänne, Trigwell, Nevgi and Ashwin (2006) confirmed these results, and showed more specifically that teachers from the *pure hard* sciences (such as chemistry) scored significantly lower on the CCSF scale than teachers who represented the *pure soft* (such as history) and *applied soft* sciences (such as education). Furthermore, teachers from *applied hard* sciences (such as medicine), scored significantly higher on the ITTF scale than teachers from pure soft and applied soft sciences. Richardson (2005)

notes that surveys of university teachers in the United States have found that beliefs about teaching vary markedly across different disciplines, and that these variations are related to the teachers' beliefs about the nature of the discipline in which they teach. Norton and her colleagues (2005) found that conceptions of teaching varied across different disciplines, but that teachers teaching in the same disciplines at different institutions had relatively similar conceptions of teaching. The nature of the disciplines probably explains such results. Neumann, Parry and Becher (2002) note that hard pure courses are based on large group lectures, especially in the early years. The lectures are supplemented by laboratory sessions and sometimes by field activities. In soft pure fields the countervailing practice is to organise students in face-to-face settings into smaller groups.

Teaching is a relational activity, influenced by a range of factors (McAlpine, Weston, Berthiaume & Fairbank-Roch, 2006; Prosser & Trigwell, 1999; Ramsden, 2003) such as the teaching context. Approaches to teaching have been shown to vary from one teaching context to another (Prosser & Trigwell, 1999; Samuelowicz & Bain, 1992), and these results were confirmed by Lindblom-Ylänne et al. (2006). They showed that teachers were more likely to adopt a CCSF approach to teaching when teaching in an atypical teaching context. They suggested, therefore, that teachers should be encouraged to teach in diverse contexts in order to promote the adoption of a student-centred approach to teaching. Some researchers would consider this ineffective since they argue that the approaches are stable constructs (Kember & Kwan, 2000). Berliner (2001) notes that experts attend more to atypical than typical events during instruction compared to novices. Furthermore, unusual events are recalled with clarity, while other events are recalled at a very general level.

Some teachers have been found to apply simultaneously elements of both approaches in their teaching while some teachers approach teaching purely in either student-or teacher-centred terms. In a quantitative study, Prosser, Ramsden, Trigwell and Martin (2003) investigated dissonant forms of university teaching and their relation to student learning. They found that for courses in which students reported lower quality learning experiences (poorer teaching, higher workloads, less clear goals), the approaches to teaching of their teachers were dissonant (high scores on *both* student- and teacher-focused intentions and strategies). This was particularly so for less senior teachers. For courses in which students reported higher quality learning experiences, the reported approaches to teaching of their teachers were not dissonant. Furthermore, these consonant approaches to teaching were coherently related to teachers' perceptions of the teaching and learning context (especially for more senior teachers), meaning that they perceived that they had more control over their teaching, that their class sizes were not too large, that their workloads were not too heavy and that their department valued their teaching. Biggs (1996; 2003) highlights the importance of compatibility within the curriculum, between the learning outcomes of a course, the teaching and learning activities, and the assessment. He emphasises that these should all be "aligned"

Researchers have discussed the role of interaction in teaching. Sometimes interaction has been placed between the student- and teacher-centred conceptions marking the transition from the teacher-centred category to the student-centred category (Kember, 1997; Samuelowicz & Bain, 1992). However, more recent re-

search has not found evidence of such an intermediate category. For example, Samuelowicz and Bain (2001) found that the intermediate category split into two major clusters, teaching-centred and learning-centred, with no evidence of a category positioned between them. They emphasised that it is the purpose and nature of the interaction that differentiates between the two orientations, not its mere presence or absence.

There are different views about the relationship between the two approaches or conceptions. Researchers have discussed whether the student-centred and teacher-centred approaches and conceptions are two ends or exclusive poles of a continuum (e.g., Kember, 1997; Samuelowicz & Bain, 1992) or whether they are two separate categories (Prosser & Trigwell, 1999; Samuelowicz & Bain, 2001; Åkerlind, 2003b). The first view emphasises that the teacher is either student- or teacher-centred in his or her conceptions and approaches. Moreover, the underlying beliefs or approaches are considered to be resistant to change, or at least enormous efforts are needed to change or switch the underlying beliefs concerning teaching. According to the latter view a student-centred teacher might sometimes use features typical of teacher-centred teaching depending on the teaching context, but a correspondent relationship to the opposite direction is not possible; teacher-centred conceptions of, or approaches to teaching, cannot be combined with student-centred elements. Åkerlind (2003b) suggests that the 'either/or' relationship should be reconceived as an 'and' relationship because more recent research has shown that shifts from teaching-centred to learning-centred approaches are possible. The view of separate categories is further strengthened by the results showing a negative correlation between the conceptual change/student-focused (CCSF) approach and the information transmission/teacher-focused (ITTF) approach when using the Approaches to Teaching Inventory (ATI) (Trigwell, Prosser, & Taylor, 1994). However, Meyer and Eley (2003) criticised this finding, based on their own quantitative analyses, and suggested that the nature of the two approaches might better be interpreted as two mutually exclusive poles along a single continuum.

The roots of the student-centred approach to teaching lie in constructivism. Several common features can be identified in constructivism and the student-centred approach to teaching. Firstly, learning is not seen as passive reception of information, but as a cognitive activity in which students actively construct knowledge by interpreting their perceptions in the light of their prior knowledge, existing beliefs and learning history. Thus, the student activity comes into focus in any learning situation. Secondly, learning is understood as a continual process of reconstructing the individual's conception of the world. Attention is paid to learners' metacognitive and self-regulative skills. Thirdly, diversity of learning leads to individually different outcomes even in the same learning situations and when the same content is being learned. The importance of variety and diversity in learning situations and learning processes is recognised. Fourthly, interactive forms of learning in which individual interpretations, reflections and understandings meet each other are emphasised. These characteristics are important in the acquisition of future expertise (Lueddeke; 2003; Tynjälä et al., 1997; Tynjälä, 2001).

Before constructivist views of learning, educational practices were grounded on an objectivist epistemology and on a view of teaching and learning as knowl-

edge transmission. This view sees knowledge as existing independently of the knower and teaching as a matter of transmitting this knowledge from the teacher to students. Hence, learning is seen as the reception and storage of knowledge and assessment is seen as based on quantitative measures. As the student-centred approach to teaching has its roots in constructivism, the teacher-centred approach to teaching is clearly rooted in the objectivist epistemology and is based on behaviouristic learning principles (Lueddeke, 2003; Tynjälä, 2001).

Conceptions of teaching and their relation to approaches to teaching

While teachers approach teaching in diverse ways, they also hold different conceptions of teaching. Interview-based studies have identified a number of different conceptions of teaching (e.g., Kember & Kwan, 2000; Prosser et al., 1994; Samuelowicz & Bain, 1992). Kember (1997) conducted a review of such studies and combined the conceptions suggested in them into five ones (see Figure 2). Trigwell and Prosser (1996a) identified six similar conceptions (see Figure 2). Kember and Kwan (2000) identified two major categories of conceptions: “teaching as transmission of knowledge” and “teaching as learning facilitation”. The former consists of sub-categories “teaching as passing information” and “teaching as making it easier for students to understand” and the latter includes sub-categories “teaching as meeting students’ learning needs” and “teaching as facilitating students to become independent learners”.

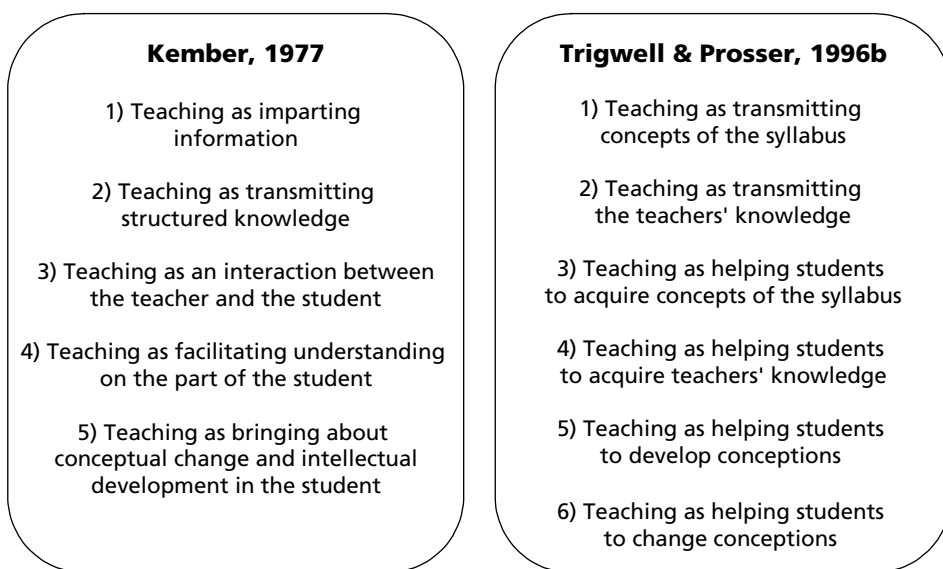


Figure 2. Conceptions of teaching held by higher education teachers

The research on student learning showed the importance of focusing on conceptions of learning associated with particular approaches to learning already in the 1980s (e.g., Marton & Säljö, 1984). Following this tradition, research in the field

of teaching in higher education began to address conceptions associated with particular approaches (Ramsden, 2003; Trigwell & Prosser, 1996a). Teachers' conceptions of teaching have been shown to affect the way teachers approach their teaching (Eley, 2006; Kember and Kwan, 2000; Prosser et al, 1994; Samuelowicz & Bain, 1992; Trigwell & Prosser, 1996a). Trigwell and Prosser (1996a) compared approaches to teaching and conceptions of teaching and showed consistency in teachers' conceptions and approaches. They found that teachers who held a particular conception of teaching tended to adopt a corresponding approach to teaching. Thus, teachers who held a student-centred conception of teaching were more likely to adopt a student-centred approach to teaching while teachers holding a teacher-centred conception of teaching were more likely adopt a teacher-centred approach to teaching. However, teachers tended to describe approaches to teaching that were less student-centred and more teacher-centred than would have been expected from their reported conceptions of teaching.

Enhancing student learning in higher education

The ultimate aim of teaching improvements is to enhance the quality of student learning. Teaching and learning are not two distinct phenomena, but continuously interact with each other. Furthermore, teaching does not automatically lead to learning or other changes as a result (Kansanen et al., 2000). Research on the relations between teaching and learning in school context has been examined more profoundly (e.g., Briscoe, 1991, Marland & Osborne, 1990), but in the field of higher education such research is scarce. Kember and Gow (Gow & Kember, 1993; Kember & Gow, 1994) found a correlation between teachers' conceptions of teaching and students' approaches to learning at the departmental level. In departments with a greater propensity towards learning facilitation, students were more likely to adopt a deep approach to learning than a surface approach. However, the only study reporting on the relations between approaches to teaching adopted by an individual teacher and approaches to learning adopted by his/her students is the one by Trigwell et al. (1999), in which they studied first-year chemistry and physics classes. They found that if a teacher's focus was on what he or she does or on transmitting knowledge, students were more likely to adopt a surface approach to learning and focus on the reproduction of knowledge. If a teacher adopted a more student-centred approach to teaching, the students were more likely to adopt a deep approach to learning and focus on a deeper understanding of the phenomena they were studying. Thus, a more sophisticated view of teaching amongst teachers seems to be associated with a more sophisticated view of learning amongst students. However, there is little evidence to show that quality teaching actually improves students' learning outcomes.

McAlpine (2004) reminds us that the results of learning are often observable, but the processes are less obvious and frequently invisible. What teachers see of the process is largely what is viewed in class (e.g., students writing and asking questions). These observations provide little insight into the invisible aspects of the learning process. Teachers cannot know exactly how students conceive of the learning tasks for a course, or of the strategies students adopt to carry out

these tasks (McAlpine, 2004). However, research on approaches to learning provides direction on how to foster more effective learning experiences for students. Approaches to learning vary within individual students. Studies on approaches to student learning have reported the differences between deep approaches and surface approaches to learning. A deep approach is one in which students seek meaning in order to understand and see learning as something that they themselves do. It is based on an interest in the subject matter of a task. Deep approaches have been shown to be related to higher quality learning outcomes. A surface approach is one in which students attempt to cope with the course requirements and reproduce factual knowledge. Students take a passive role and see learning as something that just happens to them. This approach is related to lower quality learning outcomes (Biggs, 1978; Entwistle & Ramsden, 1983; Marton & Säljö, 1984; Trigwell & Prosser, 1991; Van Rossum & Schenk, 1984). Reproductive learning styles are promoted by highly structured forms of teaching and assessment such as lectures and written examinations, as well as by a heavy workload. In contrast, a deep approach to learning is promoted by student choice of subject matter, flexible approaches to teaching and learning, reasonable workload and a variety of forms of assessment (Brown, Bull & Pendlebury, 1997). Although students may favour a particular approach, they will be influenced by the expectations in a course as well as the general teaching and learning culture in their department. Teachers can only attempt to support the adoption of a deep approach, because the approach adopted is dependent on the individual student (McAlpine, 2004).

Approaches to learning are relational in a way that students' awareness of their learning environment is related to the approach to learning they adopt. Students' perceptions that they are experiencing 'good teaching' correlate with a deep approach to learning. Thus, perceived environments which encourage deep approaches are likely to facilitate high quality learning. Such an environment is one in which the lecturer gives adequate feedback, makes clear the objectives and the assessment criteria, demonstrates the relevance of the course, creates opportunities for questions, makes an effort to understand students' difficulties and gives the students the opportunity to decide what and how they learn. By focusing on improving these aspects of the learning environment, teachers can improve the quality of learning. (Ramsden, 2003; Trigwell & Prosser, 1991).

Reid and Johnston (1999) showed that students and teachers conceptions of good teaching in higher education are not identical. For example, students were more likely to identify 'interest' as a characteristic of good teaching than their teachers, while the teachers were more likely to emphasise 'participation' and 'active involvement' of students in the teaching process. This probably reflects teachers' desire to empower students to take more responsibility for their own learning, but requirements for such involvement may make students feel uncomfortable. Students' and teachers' perceptions of what is required do not always coincide. In their efforts to improve their teaching, teachers need to be aware of students' perceptions, and that to facilitate student learning students need to be more aware of why particular teaching techniques are preferred by their teachers (Reid & Johnston, 1999).

Just as teachers' approaches to teaching are closely related to their conceptions of teaching, students' approaches to learning are related to their conceptions of learning. Conceptions of learning vary from: 1) learning as the increase of knowledge; 2) learning as memorising; 3) learning as the acquisition of facts and procedures; 4) learning as the abstraction of meaning, to 5) learning as an interpretative process aimed at the understanding of reality (Säljö, 1979). A sixth category was identified by Marton, Beaty and Dall'Alba (1993) – learning as a change in the person.

An awareness of constructivist theories of learning has increased the use of activating teaching methods and new assessment methods. Assessment has an important role in student learning, since it defines what students regard as important. The use of multiple choice questions promotes reproductive styles of learning while projects and open-ended assessment promote deeper strategies. Some students have been shown to reject deeper approaches to learning because the assessment in their courses is directed to measure reproductive learning so that deeper approaches are not worth learning. When it comes to teaching methods, problem-based or inquiry-based approaches are thought to be often more beneficial for learning than fact-centred lessons. (Brown et al., 1997; Ramsden, 2003). For example, students following problem-based curricula were found to adopt a deep approach to learning and were less likely to adopt a surface approach to learning (Sadlo & Richardson, 2003). Collaboration and interaction with other students have been found to be beneficial, especially for students who have motivation problems (e.g., Hakkarainen, Lonka & Lipponen, 1999). Teachers often fail, however, to ensure that students learn in a deep manner that is active, transitive and constructive in nature despite applying the new methods in their teaching. Struyven, Dochy, Janssens & Gielen (2006) found that students' approaches to learning were not deepened by the student-activating teaching/learning environment, nor by the new assessment methods such as case-based evaluation, peer and portfolio assessment. They seek explanations for these findings in the perceived quality of the teaching/learning environment. Some students pointed to problems caused by the student-activating setting such as high workloads, lack of feedback and structure, fragmented knowledge and fellow students profiting from the group's work efforts. Students made the suggestion for the future to combine student-activating assignments with more formal lecture-directed activities. Trigwell and Prosser (1991) have argued similarly that a perceived heavy workload and less freedom in learning are related to a surface approach.

Changing teaching to a student-centred direction requires motivation and capacities from both teachers and the students. Many teachers have been shown to have reservations about the student-centred approach to teaching because they do not believe in students' abilities and motivation to perform self-regulated activities. The teachers felt, in addition, that their institutions did not support the idea of a student-centred teaching culture (Van Driel et al., 1997). From a student's perspective, the student-centred approach requires good self-regulatory skills. However, not all students are capable of or motivated to take responsibility for their studies. Many students prefer the traditional form of lecturing in which the teacher delivers the knowledge and guides their learning processes (Lonka & Aho-

la, 1995). Boekaerts (1997) showed that students who are not able to regulate their own learning may profit from adequate instructional support given by teachers. Thus, teaching should support self-regulated knowledge construction rather than encourage students to memorise facts (Boekaerts, 1997; Lonka & Ahola, 1995). Furthermore, teaching and learning strategies should be in *congruence* with each other or teaching should offer students opportunities to develop their learning strategies by generating constructive *frictions* (Vermunt & Verloop, 1999).

While some teachers have been shown to combine both student- and teacher-centred elements in their teaching, students have, similarly, been shown to develop dissonant learning styles where the approaches adopted to learning do not fit together theoretically. These studies have applied the term ‘study orchestration’ to refer to university students’ combinations of deep and surface approaches to learning in relation to the learning environment (e.g., Lindblom-Ylänne & Lonka, 1999; Lindblom-Ylänne, 2003). These studies have identified coherent and dissonant study orchestrations of students. A *dissonant study orchestration* refers to unexpected and uninterpretable linkages between approaches to learning and perceptions of the learning environment. A *coherent study orchestration*, conversely, includes approaches which fit together theoretically. Sometimes *friction* between the individual learning style and the learning environment might lead students to develop dissonant ways of dealing with their learning environment. Lindblom-Ylänne (2003) identified different kinds of dissonant subgroups when examining law students. *Clearly dissonant study orchestrations* included elements from both the surface and deep profiles. *Slightly dissonant study orchestrations* were dominated by elements either from the deep or surface profile, but they also contained theoretically atypical combinations of scale scores. Further, *unclear dissonant study orchestrations* were found among a few students.

Self-efficacy beliefs of teachers

Bandura defines self-efficacy as “generative capability in which cognitive, social, emotional, and behavioural sub skills must be organized and effectively orchestrated to serve innumerable purposes” (Bandura, 2000, p. 36–37). Perceived self-efficacy is a belief that one can perform using one’s skills and abilities adequately in a certain circumstance. When applied in teaching-related contexts, a teacher’s self-efficacy belief is used to describe a judgment about his/her abilities to perform academic tasks, or more precisely, to get students engaged in the learning process to achieve the desired outcomes of student engagement and learning (Bandura, 2000; Trigwell et al. 2004; Tschannen-Moran & Hoy, 2001).

Bandura (1977) was the first to show that teachers’ self-efficacy is related to the efforts they invest in teaching, the goals they set for students’ learning, and their own persistence to continue when confronting obstacles. Studies since have confirmed these results. Ashton and Webb (1986) found that teachers with a high sense of efficacy not only believe that they are capable of motivating and instructing students successfully but also that their students are capable of mastering curricula objectives. On the other hand, teachers with a low sense of efficacy believe either that no teachers could have important effects because of the students’ back-

grounds, or that some teachers could have such effects, but that they personally could not. Tschannen-Moran and Hoy (2001) added to Bandura's outcomes that the teachers' sense of efficacy is related to their behaviour in the classroom and student achievement outcomes. In addition, Hoy and Spero (2005) proved that teachers with a strong sense of efficacy tend to spend more time on plans and organisation of teaching, to be more enthusiastic and more open to new ideas, willing to experiment new methods in order to better meet their students' needs and spend more time in teaching. Similarly, Gordon and Debus (2002) showed that teachers with high self-efficacy beliefs are likely to engage in a wide range of more productive teaching practices than teachers with low self-efficacy. However, these studies have focused on the teacher efficacy beliefs of pre-service and in-service school teachers, but the research focusing on university teachers' efficacy beliefs is scarce. Bailey (1999) conducted research focusing on academics' motivation and self-efficacy concerning research and teaching. He found that gaining higher qualifications increased academics' motivation and self-efficacy for doing research, but not teaching. The low success in research was correlated with higher motivation in teaching.

Novice teachers have been shown to score lower in teacher self-efficacy than career teachers. However, the novice and career teachers did not differ in their self-efficacy belief concerning student engagement in learning (Tschannen-Moran & Hoy, 2007). In academic environments, Bailey (1999) found no differences in self-efficacy beliefs for teaching according to academics' position, faculty, and level of engagement. Furthermore, he did not find any differences in female and male teachers' self-efficacy beliefs on teaching (Bailey, 1999). Lindblom-Ylänne et al. (2006) studied disciplinary differences in teachers' self-efficacy beliefs, but no differences between disciplines were found.

Little attention has been focused on how teachers' self-efficacy beliefs might be changed. However, research has shown that as teachers become more able to understand and use different ways of teaching, their sense of self-efficacy increases and different student achievement goals might appear more obtainable (Timperley & Phillips, 2003).

1.2 Pedagogical training of teachers in higher education

Universities around the world have begun to monitor their teachers' pedagogical competence. Pedagogical courses are aimed to improve the teaching practices and skills of university teachers. Teachers should be helped to apply student-centred approaches instead of teacher-centred approaches (e.g., Gibbs & Coffey, 2004; Samuelowicz & Bain, 2001; Trigwell & Prosser, 1996b) because the student-centred approach to teaching is likely to have a positive effect on student learning (Trigwell et al. 1999) if carried out properly. Thus, a central aim of such courses is to foster the change from teacher-centred approaches to more student-centred approaches.

Researchers have, however, different views of the effectiveness of formal pedagogical training. For example, in a recent review, Richardson (2005) reminds us that there is very little evidence of the effectiveness of formal training. Ho et al.

(2001) reported on a conceptual change workshop, which resulted in little change in teacher conceptions. Respectively, Norton et al. (2005) found no differences in teaching beliefs and intentions between teachers who had participated in a pedagogical programme and teachers who had no training. Furthermore, Martin and Lueckenhausen (2005) showed that changes are likely to happen even without developmental programmes. Of thirty-one teachers in their study, two thirds showed small or significant changes, both in teaching practices and their understanding of subject matter, when they taught over one semester.

With regard to formal training, Gibbs and Coffey (2004) showed, by using the Approaches to Teaching Inventory (ATI; Prosser & Trigwell, 1999), that teachers became more student-centred after a sustained training process. A training group of teachers and their students were studied at the beginning of teachers' training, and one year later. The training group became less teacher-centred and more student-centred by the end of the four to 18 months training. In addition, their teaching skills improved significantly after the training as judged by students. They found that students adopted a surface approach to a significantly lesser extent after their teachers had been trained. The students also adopted a deep approach to a greater extent, but this change was not statistically significant. According to the authors, possible reasons for this relative lack of change in students' deep approach include a ceiling effect (deep approach scores were already high at the start) and the fact that a delay before changes in teachers' approach to teaching can significantly affect their students approach to study. Similarly, Coffey and Gibbs (2000) found positive effects of pedagogical training on academics' teaching. After completing two- and three-semester long training programmes teachers showed significant improvements in scores measuring learning, enthusiasm and organisation. Wood (2000) notes the individual differences in the outcomes of pedagogical programmes. A two-semester programme designed to change postgraduate student teachers' understanding of teaching had an effect on most student teachers' understanding of teaching. However, some student teachers did not change their understanding of teaching during the year, and two teachers appeared to regress.

Many researchers emphasise that a change in conceptions of teaching is considered to be a prerequisite to a change in teaching practices (e.g., Ho et al., 2001; Oosterheert & Vermunt 2003). Tillema (1997) showed among student teachers that their initial views about teaching and learning appeared to be deeply held and difficult to challenge. Conceptions of teaching change slowly, and hence, teachers should be made aware of the possible delay in adopting more sophisticated conceptions (see e.g., Oosterheert & Vermunt, 2003). Farrell (2001) suggests that teachers need to employ reflection as a means of understanding the relationship between their own thoughts and action.

Some researchers have emphasised that understanding teachers' conceptions cannot fully explain the actions of teachers (teaching strategies) since there are a number of intervening variables between conceptions and actions (Eley, 2006; Murray & MacDonald, 1997). McAlpine et al. (2006) suggest that in supporting new teachers to become effective teachers, we need to understand various types of teacher thinking that influence teaching actions. Their study linked teacher thinking to specific teaching actions and revealed that these are not always aligned. This

may be due to lack of appropriate knowledge or skill, fear, or constraining factors such as departmental expectations about behaviour. They concluded that the explicit thinking underlying the decisions of the teachers at the class and course levels represents an intermediary level between teaching conceptions and teaching actions.

Warhurst (2006) examined the pedagogic learning of a group of new lecturers who were participants on a formal teaching development programme. He reported that learning requires participation in communities of practice and emphasised that social learning processes are highly significant in newcomers' development of pedagogic skills. He found that new pedagogic meaning and new pedagogic practice emerged through dialogue. He suggests that developers should work to seed teaching development communities of practice. Also Fanghanel (2004) emphasises that novice lecturers should be enabled to become involved in their communities of practice.

In academic teaching development, the reflective practice of an individual teacher is a key function in promoting learning. Learning should be viewed as a process of personal and collaborative knowledge construction and thus, it is important to recognise the local contextuality of academic teaching (Van Eekelen, Boshuizen & Vermunt, 2005; Warhurst, 2006). However, to be effective, individual change (micro level) must run parallel with organisational changes and support (macro level). Guskey (2000) states that professional development considers both individual and organisational development, both of which are necessary for development. Organisational variables can be the key to the success of any professional development effort. They also can hinder or prevent success, even when individual aspects of professional development are accomplished right (Guskey, 2000). Fanghanel (2004) found that the transferability of knowledge on teaching and learning acquired by novice lecturers was often problematic once they had returned to their primary community of practice. Nevertheless, the universal accreditation policy presupposes that new generations of better-trained lecturers will gradually improve teaching and learning and the quality of the student learning experience in higher education. Novice lecturers will not automatically become reflective practitioners and act as innovators after participating in pedagogical courses. Thus, the individual and the organisational levels should merge into each other (Trowler, Fanghanel & Wareham, 2005).

The social practice theory (Engeström, 2001; Wenger, 1998) addresses the meso-level and the social and affective dimensions of change. According to this theory, the most significant aspects of change processes in teaching, learning and assessment involve social interaction at the level of the workgroup. Workgroups develop a common discourse, a unique way of using the tools available to them and a context-specific understanding of aspects of the project in which they are engaged.

All in all, research strongly suggests that there needs to be some salience between individual innovations and the priorities and plans of the institution of the faculty or department. However, innovations associated with teaching and learning are generally accorded low status and even treated with suspicion in higher education institutions (Hannan & Silver, 2000). Trowler et al. (2005) suggest that

one way to enhance teaching, learning and student experience is to ‘encourage reflective practice within reflexive departments that are situated in learning universities’ (p. 440). Knight et al. (2006) state that heads of departments are key people in the development of the institutions’ educative capability. Department-related initiatives offer a means by which leaders can affect everyone’s educational practice. Further, the training itself should be supplemented with additional follow-up activities to provide feedback and coaching necessary for the successful implementation of new ideas (Guskey, 2000).

Conceptual change

Researchers broadly agree on the importance of conceptual change in attempts to improve teaching practices. For example, Ho et al. (2001) showed that a change towards more sophisticated forms of teaching is possible if conceptions of teaching are addressed first. Similarly, Trigwell and Prosser (1996a) argue that teaching strategies will not necessarily change if associated conceptions and intentions are not the primary focus of change. Guskey (2000), however, has presented a contradictory view emphasising that a change in teaching strategies is a prerequisite to a change in beliefs.

The term *conceptual change* is used to characterise the kind of learning required when new information to be learned comes in conflict with the learners’ prior knowledge usually acquired on the basis of everyday experiences. Such prior knowledge usually includes intuitive or naïve ideas about scientific phenomena, which have been labelled as “misconceptions” in the literature. Since the 1970s, research has focused on changing these ideas in ways that can lead students to a correct understanding of scientific concepts (Limón & Mason, 2002). Nevertheless, old conceptions do not necessarily have to be abandoned, but changes have to be made in the conceptual network to discriminate which concepts or representations are appropriate to which situations (Vosniadou, 1994). The cognitive conflict does not involve confronting students’ initial beliefs, concepts or theories with the new ones and replacing them. Awareness of conflict would be the first step of a process of integrating the new information (Limón, 2001). For students to be able to achieve a deep revision of their prior knowledge that radical conceptual change entails, they must also modify other aspects such as their beliefs about knowledge, their motivation, achievement goals and learning attitudes (Linnenbrink & Pintrich, 2002). Motivation is an important factor that has to be taken into consideration, and one that was ignored in conceptual change research until the late 1990s (Linnenbrink & Pintrich, 2002; Vosniadou, 1996).

Although the nature of conceptual change has been discussed for several decades, the literature does not offer a clear picture of what constitutes conceptual change and why it is difficult to achieve (Chi & Roscoe, 2002; DiSessa, 2002). More recently, the relevance of intentional learning for conceptual change processes has been pointed out. When conceptual change is difficult, it is often because students lack awareness of their misunderstanding, or they lack an alternate category into which they can shift concepts. To achieve conceptual change individuals should be intentional, that is, they should be aware of the need to change their conceptions

and beliefs, as well as willing to change their process of knowledge revision (Chi & Roscoe, 2002; Limón & Mason, 2002; Linnenbrink & Pintrich, 2002).

Conceptual change is a process of achieving structural insight, accommodating learning, understanding relations, deeply learning and building mental models (Mayer, 2002). Furthermore, during the process the learner seeks to construct knowledge that is coherent and useful (DiSessa, 2002, Chi & Roscoe, 2002; Mayer, 2002). The process of conceptual change is a strenuous, gradual and time-consuming process. Research has shown that teaching instructional interventions designed to promote conceptual change is not often very successful (e.g., Mason, 2001).

Researchers have discussed how conceptual change could be fostered in educational settings. It has been suggested that instructional strategies should increase students' capabilities to apply their cognitive and metacognitive strategies and self-confidence in accomplishing their tasks. Students should be assisted in how to resolve cognitive conflict through both modeling and scaffolding (Limón, 2001). Moreover, conceptual change requires a climate that promotes reflection and values questioning. Instruction should utilise activities such as writing personal reflections or conducting inquiries. Different instructional activities grounded in writing assignments such as brief learning tasks and broader essays combined with group discussions have also proved promising (Tynjälä, 2001). Furthermore, conceptual change requires multiple experiences with new conception, opportunities to reflect and time for students to modify their understandings. Furthermore, cooperative and peer learning has been shown to be powerful in promoting conceptual change (Sinatra, 2002). One of the most common instructional strategies implemented in the classroom was to induce cognitive conflict through presenting anomalous data or contradictory information (Limón, 2001; Timperley & Phillips, 2003). Finally, Pintrich (1999) suggested that self-efficacy could function as a potential mediator of the process of conceptual change.

The role of reflection in developing teaching

Reflection has a central role in fostering high quality teaching among individual teachers. Boud, Cohen and Walker (1993) defined reflection as a generic term that describes the process involved in exploring experience as a means of enhancing understanding. Through reflection experience can be turned into knowledge about teaching. Metacognition is a higher-level concept of reflection, which is often simply defined as the process of "thinking about thinking" (Cowan, 1998). Flavell (1979; 1987) defined metacognition as the ability to understand and monitor one's own thoughts and the assumptions and implications of one's activities.

Schön (1983) highlighted the value of reflection in helping professionals learn about and improve their practices. An ongoing process of reflection is essential for knowledge building. Increasing knowledge increases one's ability to use reflection effectively and to develop as a teacher (McAlpine & Weston, 2000). A reflective teacher compares his or her teaching against experience and knowledge of educational theory that predicts what might happen. Reflection is, however, difficult and often it is painful for teachers to be self-analytical and self-critical. Reflection is highly important in developing teaching, since reflection leads to self-knowledge

and this is fundamental to the development of professional practice (Kuit, Reay & Freeman, 2001). Reflection can take place prior to (reflection for action), concurrent with (reflection in action), and retrospective to teaching (reflection on action) (Cowan, 1998; Schön, 1983; see also McAlpine & Weston, 2000). McAlpine & Weston (2000) believe that reflection-on-action provides the opportunity for dramatic and extensive structural changes.

Reflection does not, however, always lead to improvements in teaching, and moreover, not all teachers are able to engage in reflection about their teaching. Without knowledge of teaching it is difficult for inexperienced teachers to begin reflecting on their teaching, because having actual experience upon which to reflect is of critical importance. Furthermore, fear of taking risks and lack of motivation may also be barriers for reflection. Even though reflection may occur, not all teachers can make improvements in their teaching. Moreover, some teachers are unable to carry out successfully the decisions they make. Thus, better teaching knowledge does not necessarily lead to better teaching, if one builds knowledge about teaching to expand understanding of the discipline, but does not link it to previous experience or future teaching action (McAlpine & Weston, 2000).

1.3 Developing as a university teacher

Teachers' professional expertise and development

Examination-based studying does not seem to be particularly effective in promoting expert learning. Instead, the development of expert knowledge may be studied as conceptual change, which means, for example, examining the changes undergone in the presuppositions of experts' basic conceptions in the field (Tynjälä et al., 1997). Professional development needs to address simultaneously the teachers' beliefs and conceptions as well as the improvement in their practices (Timperley & Phillips, 2003).

Educational researchers are constantly discovering new knowledge about the teaching and learning process. As this professional knowledge base expands, new types of expertise are required of educators at all levels. There is a growing recognition of education as a dynamic, professional field. To keep abreast of this new knowledge, educators at all levels must be continuous learners throughout the entire span of their professional careers. However, training is not the only opportunity to keep up with professional development, but daily work experiences present a variety of learning opportunities. These opportunities occur every time a lesson is taught, a professional journal is read, a classroom activity is observed or a conversation takes place with another teacher. Non-formal learning is common, important and lifelong, and is likely to be a more significant response than formal learning when confronting professional obsolescence (Guskey, 2000). Knight et al. (2006) showed that the most common way of learning to teach among Open University teachers was simply doing the job of teaching in higher education, reported by the teachers themselves. It was considered a more common way of learning to teach than workshops, conversations with colleagues or formal courses. Thus,

Knight et al. (2006) suggests that workplaces should evoke learning since much of professional learning occurs on a non-formal basis. Shared understandings, peer professional dialogue – ways to make explicit the professional learning that is relevant and important in a workplace – become essential. Implicit knowledge could be made more explicit through encouraging collegiality (Knight et al., 2006). These findings suggest that event-based approaches to educational professional development are challenged by situated social learning/non-formal learning. Tynjälä et al. (1997) consider both important. According to their view, the prerequisites for expertise are created in educational contexts, but professional expertise develops mainly in authentic working life.

The development of expertise is a slow process. Berliner (2001) suggests that a reasonable time for expertise to develop in teaching, if it ever does, appears to be five or more years. Furthermore, the development of expertise is not a linear continuum. Instead, experienced teachers' professional identity may experience conflicts in cases of educational change or change in their immediate working environment (Beijaard, Meijer & Verloop, 2004). The development of expertise has often been understood as a process of moving from being a less experienced novice to a more experienced expert. The limitations of such expert-novice comparisons and stage models have been discussed in research on expertise since the 1990s (Bereiter & Scardamalia, 1993; Tynjälä et al., 1997). These studies emphasise that the acquisition of experience does not automatically denote expertise (Berliner, 2001). After a certain minimum length of work experience, the scope and versatility of experience seem to be more important than length of practice (Tynjälä et al., 1997). Thus, Bereiter and Scardamalia (1993) emphasise that not all experienced people act as experts. They defined expertise as a process of progressive problem-solving in which people continuously rethink and redefine their tasks. Working at the limits of their competence and continuously surpassing themselves are activities peculiar to experts. Thus, it is more useful to examine the differences between experts and experienced non-experts than the differences between experts and novices.

While Bereiter and Scardamalia (1993) emphasise the significance of problem-solving as a tool for pursuing expert knowledge, Kolb's (1984) experiential learning model emphasises the role of reflective thinking and the conceptualisation of personal experiences. The model perceives learning as a continuous process grounded on an individual's experiences and integration with his or her environment. Reflective thinking also plays a central role in Mezirow's (1991) transformative learning theory, which emphasises that through reflective thinking learners become more conscious of the assumptions underpinning their beliefs and perceptions of the world and finally become able to change their views. According to Leinhardt, McCarthy & Merriman (1995), professional knowledge is best fostered when university students transform abstract theories and formal knowledge for use in practical situations and use their practical knowledge to construct principles and conceptual models. Tynjälä (2001) points out similarly that practical and theoretical knowledge are central elements of expert knowledge. Formal and theoretical knowledge is declarative and explicit in nature and is mainly learnt during education. Practical knowledge, 'knowing-how', is procedural in nature, learnt in

practical situations and often informal and implicit. High-level expertise demands the integration of theoretical and practical knowledge (Tynjälä, 2001).

Åkerlind (2003b) explored ways of understanding development in university teaching. She described teaching development as an increase in teachers' *comfort with teaching, knowledge and skills* and finally, *learning outcomes*. Furthermore, she found that more teacher-centred understandings of teaching were associated with more teacher-centred understandings of teaching development or change while more student-centred understandings of teaching were associated with more student-centred understanding of teaching development or change.

In a recent study, Åkerlind (2007) identified five qualitatively different *approaches to growing and developing as a university teacher*: 1) building up a better knowledge of one's content area, in order to become more familiar with what to teach; 2) building up practical experience as a teacher, in order to become more familiar with how to teach; 3) building up a repertoire of teaching strategies, in order to become more skilful as a teacher; 4) finding out which teaching strategies do and don't work for the teacher, in order to become more effective as a teacher, and 5) continually increasing understanding of what works and does not work for students, in order to become more effective in facilitating student learning. Each category includes awareness of the dimensions of growth and development highlighted in the previous categories.

Further, approaches to teaching development reflect *conceptions of teaching development*. Less sophisticated conceptions of teaching development are related to less sophisticated approaches to teaching development, while more sophisticated conceptions of teaching development are accompanied by more sophisticated approaches to teaching development. For example, a conception of teaching development as increasing student learning is accompanied by approaching teaching development by continually increasing understanding of what works and does not work for students in order to be able to be more effective in facilitating student learning (Åkerlind, 2007).

Scholarship of teaching

As presented above, the quality of teaching and learning in higher education has received much attention since the 1990s and there has been a debate about what sort of teaching encourages effective learning (e.g., Biggs, 1996, 2003; Ramsden, 2003; Prosser & Trigwell, 1999). A slightly different agenda arose when Boyer (1990) introduced the idea of 'teaching as scholarship'. Boyer suggested that teaching should be viewed as a part of the larger whole of academic work, and that the traditional opposition of research and teaching should be replaced by the idea that scholarship exists in all aspects of academic work. Boyer suggested that research and teaching should be put on a more equal footing. The pursuit of scholarship of teaching should be a means through which a) the status of teaching may be raised, b) teachers may come to teach more knowledgeably and c) the quality of teaching may be assessed (Trigwell & Shale, 2004).

After Boyer's proposal for the scholarship of teaching, several suggestions have been presented for clarifying the original concept. Studies on the scholarship of

teaching have emphasised somewhat different values in the scholarship of teaching, and the precise meaning of the concept will remain indefinable as various scholars espouse different definitions. In general, the models of scholarship of teaching have as their core values reflection, communication, pedagogic content knowledge, scholarly activity and pedagogic research (Trigwell & Shale, 2004). The scholarship of teaching includes both ongoing learning about teaching and the demonstration of teaching knowledge (Kreber & Cranton, 2000).

Kreber (2002b) differentiates between teaching excellence, teaching expertise and the scholarship of teaching. She suggests that teaching excellence requires a solid understanding of how to help students grow within and beyond the discipline. Excellent teachers know how to motivate their students and how to help students overcome difficulties in their learning. Expert teachers are excellent teachers, but excellent teachers are not necessarily experts. Experts go beyond their own experience and personal reflections and reflect also on the extent to which educational theory and previously-reported educational practice explain and inform their experience. Those engaged in the scholarship of teaching go further in that they make their knowledge public. Similarly, Trigwell et al. (2000) point out that the aim of scholarly teaching is to make transparent how we have made learning possible. For this to occur, teachers should be made aware of the theoretical perspectives and literature of teaching and learning in their discipline and help to collect and present evidence of their effectiveness.

Kreber (2002a) has described four differing *conceptions of scholarship of teaching*. The first concerns the process by which teachers conduct and publish research on teaching. The second concerns the scholarship of teaching as teaching excellence. The third conception concerns scholarly processes in which teachers make use of the literature of teaching and learning to inform their own practice. The fourth conception combines elements of the other three conceptions, but includes one or more essential scholarly elements, such as reflection or communication. Trigwell et al. (2000), on the other hand, identified five categories of *approaches to the scholarship of teaching* when interviewing 20 university teachers. These approaches varied from considering the scholarship of teaching as knowing the literature on teaching to improving student learning within the discipline generally, by collecting and communicating the results of one's own work on teaching and learning within the discipline. In addition, they showed that teachers who are unlikely to engage in the scholarship of teaching are more likely to be teacher-centred than student-centred. Furthermore, they are less likely to engage in reflection on what they do in teaching, and if they do reflect, they focus on their own actions, not on what their students experience. In addition, they are likely to keep their ideas on teaching and learning to themselves and to see teaching as a private activity. On the other hand, teachers who are more likely to engage in the scholarship of teaching seek to understand teaching by consulting and using the literature on teaching and learning, by investigating their own teaching, by reflecting on their own teaching from the perspective of their intention in teaching and by communicating their ideas and practices to their peers.

Scholarly approaches to teaching and learning engage faculty members and the faculty as a whole in reflecting upon and initiating positive changes to curricula

and pedagogical practices. Such approaches are central for understanding learning, developing responsive curricula, enhancing the quality of student learning experiences, and assessing which practices are effective in specific circumstances. The scholarship of teaching can be demonstrated in a variety of ways including, for example, the development of a learning-centred course syllabus (Hubball & Burt, 2006). Advances in the scholarship of teaching will occur more readily if they are closely aligned to the conceptual structure and epistemology of the discipline (Lueddeke, 2003).

Summary of the theoretical framework

The theoretical framework of the study is summarised in Figure 3. Reflection has a central role in promoting conceptual change. Reflection can be fostered in pedagogical courses or by encouraging teachers to discuss teaching with their peers. Through conceptual change, teachers' conceptions of teaching and learning might develop towards being more student-centred. A change in conceptions of teaching is a prerequisite to a change in approaches to teaching. A student-centred approach to teaching is a central component of the scholarship of teaching. The development of teaching is, at best, a continuous process, and thus, teachers should be encouraged to reflect on their own teaching on a continuous basis.

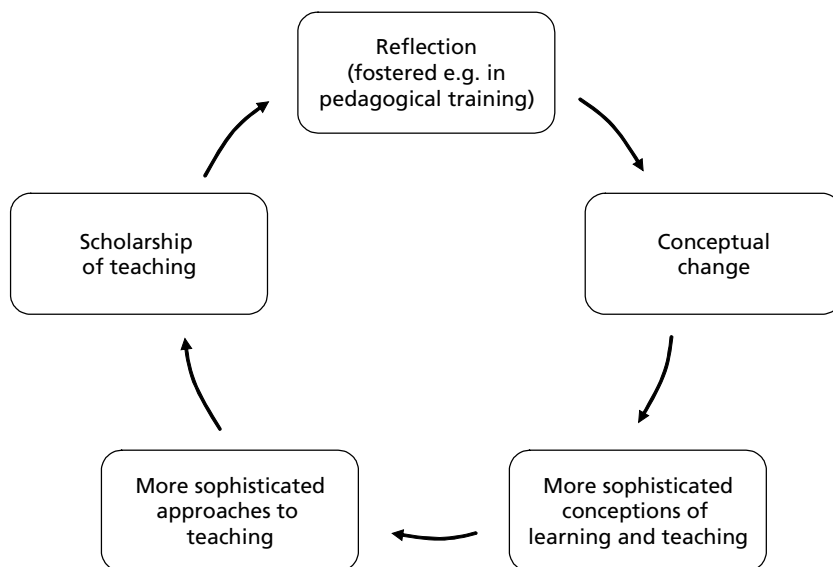


Figure 3. The development of teaching of higher education teachers

2 The aims of the studies

Studies I and II

Since there is a lack of evidence of the effectiveness of pedagogical training on teaching in higher education and furthermore, researchers do not agree on the effectiveness of such courses, Studies I and II aimed to analyse the effect of pedagogical training on approaches to teaching and on self-efficacy beliefs of teachers in higher education. The topic is of current interest since the Programme for Development of Teaching and Studies at the University of Helsinki for the years 2007–2009 (University of Helsinki, 2006) notes that every new teacher should have the opportunity to participate in an introductory seminar on university teaching in order to improve teachers' pedagogical thinking and skills. According to the programme, an essential aim of the pedagogical training of university teachers is to enable a shift from a teacher-centred approach towards a more student-centred approach to teaching.

To be more precise, Study I aimed to analyse the effect of the length of pedagogical training on the measured scales by applying a cross-sectional setting among four groups of teachers who differed from each other in terms of the amount of pedagogical training they had completed. Furthermore, the effect of the amount of teaching experience on each scale was examined, and finally the unique effect of pedagogical training on each scale was examined by holding constant the effect of teaching experience.

Study II was conducted two years after Study I and was grounded on the results of Study I. The aims of Study II were twofold. Firstly, the aim was to analyse the long-term effect of pedagogical training on approaches to teaching and on self-efficacy beliefs among teachers who had not participated in pedagogical courses after Study I. Secondly, the study aimed to explore, by applying a longitudinal setting, the effect of pedagogical training on teaching among teachers who had acquired more pedagogical training after Study I.

Study III

The aim of Study III arose from two facts concerning previous studies on approaches to teaching and conceptions of teaching of higher education teachers. Firstly, these studies have applied either quantitative methods (inventories) with large samples or qualitative methods (interviews) with a limited number of participants from only a few disciplines. Secondly, researchers do not agree on the nature of the approaches, since some emphasise the view of a continuum while others talk of two separate categories. Thus, approaches to teaching were examined qualitatively by using a large and multidisciplinary sample of academics in order to capture the variation in teachers' descriptions of their teaching in more detail and more broadly than in previous studies and to create categories of description which account for the variation. It was hypothesised that more than the two broad approaches identified in previous research (e.g., Kember & Kwan, 2000; Trigwell et

al., 1994) would be identified, considering the differential teaching in the various disciplines. Secondly, the study aimed to identify detailed aspects of teaching in higher education through the analysis of the topics of teaching mentioned by the teachers in the interviews. More specifically, the aim was to identify variation in approaches to teaching rather on an individual level than on a general level.

Study IV

Study IV was grounded on the results of Study III. While Study III focused on identifying variation in approaches to teaching on a general level, Study IV focused on the individual level. The aim of the study was to analyse the combinations of teaching approaches and conceptions university teachers adopt in their teaching to identify consonance and dissonance in their teaching profiles. More specifically, the focus was on analysing different types of dissonance and consonance involving teachers' conceptions of teaching, their teaching strategies, or both. The topic of the study arose from the lack of research on profiles of individual teachers. Consonance and dissonance has been analysed profoundly in profiles of university students, but research on consonance and dissonance in teaching is scarce.

Summary of the aims

To sum up, Studies I and II focused on analysing the effect of pedagogical training on approaches to teaching and on self-efficacy beliefs of higher education teachers by applying a cross-sectional setting (Study I) and a longitudinal setting (Study II). Study III aimed to capture the variation in teachers' descriptions of their teaching and to identify detailed aspects of teaching in higher education on a general level. Study IV focused on analysing variation in approaches to teaching on an individual level in order to identify consonance and dissonance in profiles of university teachers.

3 Methods

3.1 The research context

The Finnish higher education system and the University of Helsinki

Higher education in Finland is provided by universities and polytechnics. Finland has one of the most comprehensive university networks in Europe, consisting of twenty universities and thirty polytechnics. The universities carry out research and offer education based on that research. Tertiary education in Finland is free which makes it possible for students from diverse socioeconomic backgrounds to enter the university. The students are selected through demanding entrance examinations. The annual number of participants is nearly sixty-eight thousand. However, only twenty-eight thousand candidates are admitted each year. All Finnish universities are state-run. The Bologna Declaration had a profound impact on the degree structure in Finland. Earlier, almost all university students aimed directly for a Master's degree. By autumn 2005, all universities in Finland had adopted a system based on two main cycles. The bachelor level studies are designed to last three years, and after these studies, the second two-year cycle leads to a Master's degree (Lindblom-Ylänne, 2006).

The Finnish Higher Education Evaluation Council (FINHEEC) is responsible for evaluating the quality of education and other activities in higher education institutions. FINHEEC organises audits of quality work and supports the institutions in designing their quality assurance systems. Furthermore, FINHEEC selects around twenty national high-quality units every third year. Each high-quality unit receives extra yearly funding, which may be used for development of teaching and learning (Lindblom-Ylänne, 2006).

The University of Helsinki is the oldest and largest of Finnish universities. It has thirty-eight thousand students and seventy-five hundred staff members. The number of degrees awarded each year is over 4.000. Of these, nearly 10% are doctoral degrees. The university consists of eleven faculties; the Faculty of Theology, Faculty of Law, Faculty of Arts, Faculty of Medicine, Faculty of Biosciences, Faculty of Science, Faculty of Behavioural Sciences, Faculty of Social Sciences, Faculty of Agriculture and Forestry, Faculty of Veterinary Medicine and Faculty of Pharmacy. The University of Helsinki is a research intensive university and it is a member of the League of European Research Universities (LERU). Every teacher at the University of Helsinki is expected to both do research and teach (Lindblom-Ylänne & Hämäläinen, 2004; Lindblom-Ylänne, 2006).

The university has a program for development of teaching and studies, which is renewed every three years. The current program emphasises the creation of a stimulating atmosphere for teaching and learning and furthermore, the enhancement of a student-centred approach to teaching. The program gives an important role to research-based teaching as well. This means that the academic staff is expected to do research and teach as well, that teaching is linked with the latest research

and that students should be given the opportunity to develop their research skills and participate in the work of research groups (Programme for Development of Teaching and Studies at the University of Helsinki, 2007–2009; Lindbom-Ylänne, 2006).

The university has a pool of teaching posts consisting of fifteen senior lecturers who have broad experience in educational development in higher education. They are key persons in developing teaching and learning in the disciplines and in conducting research on educational development in their faculties. They cooperate with teachers and students in the faculties and develop discipline-specific approaches to learning and teaching (Lindblom-Ylänne, 2006).

Pedagogical courses at the University of Helsinki

At the University of Helsinki, the four campuses have their own development units which organise their own basic teacher-training courses. The majority of courses is, however, organised and designed by the Centre for Research and Development of Higher Education (Lindblom-Ylänne & Hämäläinen, 2004). The training is not compulsory; thus, the teachers participate in the courses on the basis of their own interest. When teachers apply for positions at the university, pedagogical training usually enhances their chances to be selected. For these reasons, they are highly motivated and therefore there are hardly any drop-outs. The aim is to take all the teachers who are inclined to participate in pedagogical courses. Pedagogical training at the University of Helsinki is not a training program, but, rather, the courses are separate so that a teacher may select only the first shortest course and it is not compulsory to continue to the next course.

The short courses on learning and instruction in higher education (approximately 10–12 ECTS, one ECTS being approximately 27 hours of work) organised by three development units, may be considered as the basic teacher-training courses, which aim to give teachers the basic skills to plan, instruct and assess teaching and learning in their courses. These basic courses focus on general theoretical principles of learning and instruction. The aim is to help university teachers become aware of themselves as teachers and of their way of teaching, and to become aware of and capable of using student-centred ways of teaching. These courses last approximately from four to six months.

After taking the short course, the teacher can apply for the next course, which is the longer (30 ECTS) one-year course organised by the Centre for Research and Development of Higher Education. It aims at deepening teachers' understanding of theoretical principles of learning and instruction in higher education. Furthermore, during the one-year-long process, there are more opportunities to affect teachers' pedagogical thinking and conceptions of teaching and learning, than during the shorter courses. In these courses the teachers reflect on their learning during the course in their portfolios. Furthermore, a short practicum is also included in this course. The teachers are instructed to apply the teaching methods dealt with in the course to their own teaching and to investigate and develop their teaching practices. Finally, at the end of the course, they include in their portfolios a report, in which they reflect on their development process and on the results

they achieved by developing their teaching practices. Learning portfolios and the development of individual teaching practices are also applied in the short courses. Teachers apply for both 10–12 ECTS and 30 ECTS courses by sending an application in which they give their reasons for participating in these courses and describe themselves as university teachers.

After having completed both the short course of 10–12 ECTS and the 30 ECTS course, teachers achieve a diploma of university teaching and the teacher can apply for a two-year 70 ECTS course. The aim is to give the teachers the skills to develop their own teaching as well as more broadly their departments' teaching. Furthermore, the aim is to give the teachers the skills to conduct pedagogical research concerning teaching in their own disciplines. During the course the teachers conduct research concerning teaching in higher education. In addition, the teachers participate in a practicum both in their own work and in some other training institution. The participants are selected through teaching portfolios and interviews. However, only a few teachers had to be omitted from the 70 ECTS course. The selection was made on the basis of how motivated and committed they were to developing their teaching, not on the basis of their student-centredness. Most of the participants are lecturers but a few professors have also participated in the 70 ECTS course.

3.2 Participants

The participants included lecturers, professors and also a few assistants and researchers who had some teaching duties as well. In all studies the teachers represented broadly the eleven faculties at the University of Helsinki. The participants from the Helsinki School of Economics and Business Administration represented commercial sciences. Each of the faculties comprises several disciplines. Thus, the teachers representing the Faculty of Arts came, for example, from the Institute for Asian and African Studies, the Department of English, the Department of History, and the Department of Translation Studies. The teachers representing the Faculty of Science came, for example, from the Department of Chemistry and the Department of Computer Science. The disciplines were divided into “hard” and “soft” sciences by applying “pure hard”, “pure soft”, “applied hard” and “applied soft” categories. Becher (1989) divided disciplines into these four categories by modifying Biglan's (1973) originally sixfold classification, which is made on the basis of disciplines' cultural and epistemological differences.

Studies I and II

In Study I, the participants consisted of 200 teachers. Of these teachers, 197 came from different disciplines at the University of Helsinki and three teachers from the Helsinki School of Economics and Business Administration. Ninety-eight of these teachers had participated in courses for university teachers. One hundred-and-two of the teachers did not have credits from pedagogical courses organised for university teachers, but 66 of them had just started on one of these courses. Thus, the number of teachers, who did not have any credits from pedagogical courses and

who had not even begun their studies was 36. Some teachers had other kinds of pedagogical courses, but those courses were ignored because the intention was to concentrate on pedagogical training meant only for university teachers.

Of the 200 participants in Study I, 80 participated in *Study II* in order to conduct a follow-up study. The profile of teachers' age, gender, teaching experience and disciplines was similar in Studies I and II, so the sample of Study II was representative of Study I.

The contexts of teaching varied considerably in both studies. Class sizes varied from a few students to over a hundred. Most of the participants taught students who study for a Master's degree, and the level of students varied from the first to sixth year of study. Teaching methods varied from lecturing to discussions, demonstrations and counselling.

Studies III and IV

Of the 200 teachers who had completed the inventory, 71 teachers' interviews were analysed for *Study III*. Of these, 69 came from the University of Helsinki and two from the Helsinki School of Economics and Business Administration. Forty-eight teachers had participated in pedagogical training organised for university teachers, while 19 had no such training and four teachers did not report whether or not they had had such training.

The same 71 teachers' interviews were analysed for *Study IV*. In addition, 26 teachers' interviews were included in the analysis. Furthermore, inventories (the Approaches to Teaching Inventory with the additional part) of 80 teachers were included in the analysis. Of the total 97 participants, 95 were teachers at the University of Helsinki and two teachers came from the Helsinki School of Economics and Business Administration. Fifty-six teachers had participated in pedagogical courses organised for university teachers while 37 teachers had no such training. Four teachers did not report whether or not they had participated in such training.

3.3 Materials

The materials of the studies consisted of either an inventory or interviews or both as illustrated in Table 2. Methodological triangulation was used to explore teaching from diverse perspectives and to improve the validity of the study (see Cohen, Manion & Morrison, 2000).

In Study I, 200 inventories were analysed. For Study II, the inventory was re-collected from 80 teachers. In Study IV, 71 inventories of the teachers who were interviewed for the study were analysed. In addition, nine teachers who participated in the interviews at this point completed the inventory, the total number of inventories analysed being 80.

For Study I, 23 interviews were analysed. Study III analysed 48 additional interviews, the total number of interviews being 71. For Study IV, 26 additional interviews were analysed, so that altogether 97 interviews comprised the qualitative data of the study.

Table 2. Materials of the four studies

	Study I	Study II	Study III	Study IV
Inventory	N=200	N=80		n=80 (Study I 71 + 9)
Interviews	n=23		N=71 (Study I 23 + 48)	N=97 (Study I 23 + Study III 48 + 26)

The four studies reported here are parts of a larger research project aimed to analyse teaching in higher education from various perspectives. All studies in the research project have utilised the same inventory and interview data. The other studies have focused, for example, on the disciplinary and contextual differences in approaches to teaching.

Inventory

The inventory used (see Appendix A) consists of two parts: The first part, the Approaches to Teaching Inventory (ATI), is designed by Keith Trigwell and Michael Prosser (see Trigwell & Prosser, 2004, 1996a; Prosser & Trigwell, 1999). The purpose of the inventory is to measure the ways teachers approach their teaching and to explore the way that academics go about teaching in a specific context or subject. The inventory contains two scales. The scales represent two different approaches to teaching identified in a phenomenographic study of Australian university teachers of first-year chemistry and physics (Prosser & Trigwell, 1999; Trigwell et al., 1994). It is composed of 16 items, of which eight items measure the conceptual change/student-focused (CCSF) approach (see Table 3). As described by Trigwell et al. (1994), the CCSF approach is one which has the student as the focus of activities. To the teacher adopting this approach it matters more what the student is doing and learning than what the teacher is doing or covering. The teacher encourages self-directed learning, makes time for students to interact and discuss the problems they encounter, assesses conceptual change, provokes debate, questions students' ideas and develops conversations with students in lectures. The other eight items of the inventory are designed to measure the information transmission/teacher-focused (ITTF) approach to teaching (see Table 3), in which it is assumed that students do not need to be active in their learning process. The teacher focuses on his/her own teaching and believes students have little or no prior knowledge of the subject they are teaching.

Table 3. The inventory items measuring the CCSF and ITTF approaches to teaching

Items measuring the CCSF approach to teaching:	
1.	In my interactions with students in this course I try to develop a conversation with them about the topics we are studying.
2.	I feel that the assessment in this course should be an opportunity for students to reveal their changed conceptual understanding of the subject matter.
3.	I set aside some teaching time so that the students can discuss, among themselves, the difficulties that they encounter studying this course.
4.	I encourage students to restructure their existing knowledge in terms of the new way of thinking about the subject that they will develop.
5.	In teaching sessions for this course, I use difficult or undefined examples to provoke debate.
6.	I make available opportunities for students in this course to discuss their changing understanding of the subject matter.
7.	I feel that it is better for students in this course to generate their own notes rather than always copy mine.
8.	I feel a lot of teaching time in this course should be used to question students' ideas.
Items measuring the ITTF approach to teaching:	
1.	I design my teaching in this course with the assumption that most of the students have very little useful knowledge of the topics to be covered.
2.	I feel it is important that this course should be completely described in terms of specific objectives relating to what students have to know for formal assessment items.
3.	I feel it is important to present a lot of facts to students so that they know what they have to learn for this course.
4.	In this course I concentrate on covering the information that might be available from a good textbook.
5.	I structure this course to help students to pass the formal assessment items.
6.	I think an important reason for running teaching sessions in this course is to give students a good set of notes.
7.	In this course, I only provide the students with the information they will need to pass the formal assessments.
8.	I feel that I should know the answers to any questions that students may put to me during this course.

The second part, which explores teachers' motivational aspects to teaching and the regulation strategies they use, is designed by Keith Trigwell, Paul Ashwin, and Sari Lindblom-Ylänne. However, the development of the second part begun together with the late Paul Pintrich from an experimental perspective (Professor Keith Trigwell and Professor Sari Lindblom-Ylänne, personal communication, June 2006). The purpose of this development was to reinterpret ideas of learning motivation so that they fit with teaching motivation. Items of the Motivated Strategies for Learning Questionnaire (MSLQ; Pintrich, Smith & McKeachie, 1989) were modified in order to develop correspondent items for teaching (see Trigwell & Ashwin, 2003). From the second part, a four-item scale measuring *self-efficacy beliefs* was

analysed in this study (see Table 4). Originally, the self-efficacy scale included more than four items, but the reliability of the four-item scale has been shown to be better when the reliability has been tested in English and Finnish contexts (Professor Keith Trigwell and Professor Sari Lindblom-Ylänne, personal communication, June 2006). The self-efficacy scale is adapted for teaching from the motivation model for learning by Pintrich and colleagues (1989, see Table 4). They see motivation as an integral part of a teacher's awareness, which changes according to their perception of the situation rather than a comparatively stable mental characteristic that is relatively separated from action. Thus, self-efficacy beliefs are seen to change according to the context (Trigwell & Ashwin, 2003).

Table 4. The inventory items measuring the self-efficacy beliefs, and origins of those items

Items measuring the self-efficacy beliefs with teaching (Trigwell & Ashwin, 2003)	Items measuring the self-efficacy beliefs with learning (MSLQ, Pintrich et al., 1989)
1. I am confident that my knowledge of this subject matter is not a barrier to teaching it well.	I am confident I can understand the most complex material presented by the instructor in this course.
2. I am confident that students will learn from me in this course.	I am confident I can learn the basic concepts taught in this course.
3. I am certain that I have the necessary skills to teach this course.	I am certain that I can master the skills being taught in this class.
4. I am confident that my knowledge of teaching is not a barrier to teaching well.	I am certain I can understand the most difficult material presented in the readings for this course.

When answering the inventory, the teachers were asked to select the most typical course they teach. The Approaches to Teaching Inventory has been designed to measure approaches to teaching from a relational and contextual perspective (see Prosser & Trigwell, 1999). In this study the inventory was used to measure the approaches in the most typical teaching context. The teachers were asked to describe the teaching context they thought of in the inventories before answering the items. More specifically, they described the name of the course, the number of students and the nature and key elements in the course.

All scales were measured with a 5-point Likert scale. Sum scales of the items measuring the conceptual change/student-focused (CCSF), information transmission/teacher-focused (ITTF) and self-efficacy beliefs were calculated. The reliability of all the scales (CCSF, ITTF, self-efficacy) was acceptable in both Studies. The Cronbach's Alpha varied between .70 and .77. For the eight-item CCSF approach scale, the Alpha was .77 (N=189) in Study I and .75 (N=78) in Study II. For the eight-item ITTF approach scale, the Alpha was .70 (N=191) in Study I and similarly .70 (N=76) in Study II. Finally, for the four-item self-efficacy scale, the Alpha was .70 (N=197) in Study I and .72 (N=79) in Study II.

Interviews

The interviews were designed in co-operation with Sari Lindblom-Ylänne and Anne Nevgi. The themes of the semi-structured interviews (see Appendix B) focused broadly on issues related to teaching, but for this study the analyses focused on teachers' descriptions of: a) themselves as teachers, b) their teaching strategies, c) the most important elements in their teaching and d) teachers' experiences of the effect of pedagogical training on their own teaching. These themes took up approximately one third or one half of the whole interview, the whole interviews lasting from 26 to 95 minutes. The interview questions were the same for all the teachers who participated in the interviews. The teachers participated in the interviews on a voluntary basis. Most of them had completed the inventory and they noted it if they wanted to participate in an interview. The open-ended questions allowed the teachers to talk freely and openly about their teaching and to answer the questions in their own way and in their own words. Thus, the research is responsive to participants' own frame of reference (Cohen, Manion & Morrison, 2000). The interviews focused on teachers' teaching on a general level; they reflect how teachers usually teach and what they consider important in their teaching. The interviewers clarified the questions or asked the teachers to describe some aspects in more detail if something remained unclear to the interviewer or if the responses lacked detail. The structure of the interviews as well as the strategy of interviewing was negotiated together with the interviewers to make sure that all interviews followed the same principles and guidelines. The interviews were conducted in Finnish, and were recorded and transcribed verbatim.

Altogether 97 teachers were interviewed between the years 2003 and 2005. First, 23 interviews were conducted in order to deepen the results obtained through quantitative analysis of the inventories in Study I. For Study III, 48 additional interviews were conducted in order to capture the variation in the teachers' descriptions of their teaching broadly. For Study IV, the existing interview data of 71 teachers was extended by conducting 26 additional interviews. Thus, the total number of interviews analysed for Study IV was 97. The 26 additional interviews were conducted, because the unit of analysis was individual teachers' teaching profiles, and the existing data of 71 teachers included mostly teachers from the soft sciences and teachers who had participated in pedagogical courses. To make the sample less biased, 26 teachers from the hard sciences, most of them with no pedagogical training, were interviewed.

3.4 Methods and procedures

Studies I and II: Quantitative analysis of the effect of pedagogical training on teaching

Study I analysed the effect of pedagogical training and teaching experience on approaches to teaching and on self-efficacy beliefs of university teachers by applying a cross-sectional setting. A cross-sectional study produces a 'snapshot' of a population at a particular point in time (Cohen et al., 2000). The main results

were obtained through a quantitative analysis of the inventories, but the qualitative analysis of the interviews deepened and exemplified the results of the inventory data. The 200 participants of the study completed the inventory in 2003. For those who participated in pedagogical training, the inventory was given during a course meeting or mailed after the course. For those who had participated in the courses before spring 2003, the inventory was mailed during spring 2003. Teachers who had not participated in these courses at all received the inventory by mail at the end of 2003. These teachers were selected randomly, so that half of them represented soft sciences and the other half hard sciences. From every faculty of the University of Helsinki, one or more departments were randomly selected, and the inventory was mailed to all lecturers and professors, assistants and researchers of the selected departments. The responses of assistants and researchers could be included in the analysis if they had some teaching experience. Almost all teachers who participated in pedagogical courses returned the inventory. Because the inventory was collected on various occasions and not all who received it had teaching duties, the response rate could not be calculated.

The participants were divided into four groups depending on how much pedagogical training for university teachers they had. Thirty-six teachers did not have any pedagogical training for university teachers and they had not even begun their studies (Group 1). Seventy-five teachers had had short courses for less than 10 ECTS (European Credit Transfer System), or they had no credits yet, but they had just begun their studies in pedagogical courses (Group 2). These teachers were not placed in the previous group (Group 1) because they had already reflected on their own teaching at the beginning of the pedagogical courses. Fifty-eight teachers had completed a short course of 10–12 ECTS (6 months) or had continued their studies even further, but had less than 30 ECTS (Group 3). Thirty-one teachers had completed 30 ECTS (one year) or more (Group 4). Thus, the division of the groups was conducted on the basis of the structure of the pedagogical courses at the University of Helsinki.

Analyses of variance (ANOVAs) were used to explore the differences between the four groups' scores on CCSF and ITTF approaches to teaching and on the self-efficacy scale. ANOVA was used to find out how the length of pedagogical training relates to the way teachers approach their teaching and to the self-efficacy beliefs of teachers. Furthermore, Tukey's post hoc test with its significant difference procedure ($\alpha = .05$) was used for comparisons among the four groups in each scale.

Because teaching experience might affect the results found when examining pedagogical training, the same statistical procedures were carried out in four different experience groups, as in the four training groups. To analyse the effect of teaching experience on approaches to teaching and on self-efficacy beliefs, the teachers were divided into four groups depending on the amount of teaching experience they had: forty-one teachers had no more than two years of teaching experience (Group A); 65 teachers had from three to seven years teaching experience (Group B); 35 teachers had from eight to 12 years of teaching experience (Group C), and the rest 52 teachers had teaching experience of 13 years or more (Group D).

To find out the unique effect of pedagogical training on each scale, the effect of teaching experience was held constant by conducting two-way 4 (length of

training) x 4 (amount of experience) ANOVA with a main effect model. In order to describe graphically the connection between pedagogical training and scales measuring approaches to teaching and self-efficacy beliefs, a standardised residual was used, when the part coming from teaching experience was removed. The plots were connected to each other with a line to make the figures easier to interpret. The lines between plots are usually applied in longitudinal studies, but in Study I the lines were used to clarify the findings.

Furthermore, 23 interview transcripts were analysed. When study I was conducted, the collection of the interviews was in a process, and at that time 23 interviews were conducted and transcribed. The method of content analysis was applied in analysing the interviews (see Patton, 1990; Flick, 2002). From the interviews, themes concerning the pedagogical training and its effects on teaching were analysed. Comparisons between the 23 interviewed teachers and the 200 teachers who completed the inventory showed that the interviewed teachers did not differ from the teachers who had completed the inventory in any aspects. The analysis focused on teachers' experiences of the effect of pedagogical training on their teaching.

As in Study I, *Study II* analysed the effect of pedagogical training and teaching experience on approaches to teaching and self-efficacy beliefs of teachers, but by applying a longitudinal setting. In a longitudinal study measures are taken at different points in time from the same respondents. This enables the identification of typical patterns of development (Cohen et al., 2000). Of the 200 participants in Study I, 135 teachers received the inventory by mail at the end of 2005. The contact information of the 65 teachers who did not receive the inventory had changed and new contact information was not available or they no longer held a teaching position at the university. Of the 135 teachers, 80 returned the inventory. Hence, the response percentage was 59. Cohen et al. (2000) note that during the course of a long-term study, subjects inevitably drop out. Such attrition makes it unlikely that those who remain in the study are representative of the original population. However, the profile of the teachers' age, gender, teaching experience and disciplines was similar in Studies I and II. When answering the inventory, the teachers selected the most typical course they teach, so the selected course was not necessarily the same as in Study I, but however, the most familiar way of teaching.

The research setting of Study II was challenging, because some teachers had participated in pedagogical courses after Study I and others had not, and because the amount of pedagogical training of the teachers during Study I had to be acknowledged as well. A hierarchical multilevel model and a t-test turned out to be the most suitable methods of analysis. A hierarchical multilevel model was applied to analyse the changes on the scales measuring the CCSF and ITTF approaches to teaching and on self-efficacy beliefs between Studies I and II. This kind of model is used in longitudinal studies to separate changes within one individual. The model does not compare the whole data between the measurements as such, but instead compares the measurements at an individual level (Raudenbush & Bryk 2002). The participants were divided similarly as in Study I into four groups depending on the amount of pedagogical training. A paired sampled t-test

was used to compare the mean scores of each scale of the four groups between Studies I and II.

A variable indicating the relative increase of teaching experience since Study I was created. Every teacher had approximately two years more of teaching experience in Study II; the inventories of Study I were collected during 2003, while the inventories of Study II were collected at the end of 2005. The new variable indicates the relative increase of teaching experience when compared to the amount of experience at the time of the first measurement. The scatter plot with smooth curve fitted by loess was applied to visualise the effect of the relative increase in teaching experience on each scale. One-way analysis of variance was used to analyse the differences between the training groups in the amount of the relative increase in teaching experience.

Studies III and IV: Qualitative analysis of approaches to teaching (and conceptions of teaching)

Study III analysed the interviews of 71 university teachers from several disciplines in order to capture the variation in teachers' descriptions of their teaching. The analysis focused on teachers' descriptions of: a) themselves as teachers, b) their teaching strategies, and c) the most important elements in their teaching. The interview data were analysed using inductive content analysis, which involves a process of identifying and classifying data. The themes and classes emerge from research data through the process of data reduction, grouping and conceptualisation (Patton, 1990; Flick, 2002). To capture the variation in the teachers' descriptions of their teaching, all teaching-related descriptions from the transcripts were listed and then any variation in these descriptions was explored. Two broad categories of description clearly emerged from the data. However, a third category of unclear descriptions was created because not all descriptions could easily fit into either of the two categories. After a closer analysis most of these unclear descriptions could be categorised as representing either of the two broad categories. However, some descriptions could not be categorised into either category because they were not seen as defining the approaches to teaching, but instead concerned, for example, motivation and interest in teaching. Furthermore, if the descriptions were not clear enough they were omitted from the results. The descriptions categorised into the two categories were not quantified, because the purpose was to identify variation in the descriptions broadly on a general level.

The analysis of the interview transcripts was conducted by both authors of the study. The first author analysed independently all the interviews, while the second author analysed 30 randomly selected interviews (42% of the 71 interviews). Both authors identified similar categories of description, which were labelled as learning-focused and content-focused approaches to teaching. The inter-rater agreement was over 90%. Furthermore, all unclear descriptions were analysed together. The decisions to categorise these descriptions into either of the two categories or omit them from the results were arrived at together.

Next, the categories of description identified were analysed in detail in order to identify different aspects of teaching. Both authors identified different aspects of

teaching, but the final form and the labels were developed together. Finally, the ten aspects were grouped under four broader aspects in order to clarify the structure of the findings in co-operation.

While Study III explored variation in descriptions of teaching on a general level, *Study IV* analysed variation in the descriptions on an individual level in order to identify different teacher profiles. Study IV utilised the findings of Study III by using as a tool for analysis the aspects of teaching identified in Study III. The same 71 interviews were analysed as in Study III, plus 26 additional interviews of teachers from hard sciences. The data was analysed electronically with ATLAS.ti.

Firstly, the original 71 interviews were analysed by the first author independently. The interview transcripts were read through several times and the method of content analysis was used to determine which aspects emerged from each interview and whether the descriptions reflected the learning- or content-focused approach to teaching. All the profiles deemed to be dissonant or unclear were analysed by the third author to check reliability. Because, on a few occasions, the third author had a different view of a suitable aspect or approach for a description, the third author analysed the rest of the data to check reliability. However, the authors agreed over the consonant profiles totally.

Secondly, 26 additional interviews were analysed by the first and the second author independently. The criteria for analysing the profiles were negotiated together in detail. Agreement on the coding between the authors was high; on only two occasions did the authors have different opinions on the coding. To check the reliability of the analysis, the coding of the first author was compared to the coding of the second and the third author. The value of Cohen's Kappa was .89.

A profile was categorised as being dissonant if it included any elements that were theoretically inconsistent. For example, if a profile consisted mainly of learning-focused conceptions, but in addition, included one content-focused conception, the profile was categorised as being dissonant. A consonant profile included only elements that were theoretically consistent. At this point of analysis, four profile groups were identified. However, it soon became apparent that classification of teachers' profiles into the four groups did not do justice to the variation in the data and a more detailed categorisation of teachers' profiles resulted from a subsequent analysis. This detailed categorisation was created in co-operation with all the authors.

Beside the qualitative analysis of the interviews, the Approaches to Teaching Inventory (ATI) was used to explore the differences between the profile groups' scores on CCSF and ITTF approaches to teaching by conducting analyses of variance (ANOVAs). This was done in order to verify the validity of the qualitative analyses of the profiles. In addition, the Chi-Square test was used to explore whether there were statistical differences in terms of teachers' age, gender, teaching experience and discipline between the profile groups.

All in all, the four studies reported here are based on the teachers' self reports of their teaching; university teaching was investigated from the perspective of the teachers themselves. Thus, the results reflect the teachers' subjective descriptions of their teaching. Furthermore, the results present the researchers' subjective interpretation of the interview transcripts.

4 Results

In the following, the most valuable findings of the four studies are presented. The results are described in more detail in the journal articles.

4.1 Studies I and II: The effect of pedagogical training and teaching experience on approaches to teaching and self-efficacy beliefs

Studies I and II examined the effect of pedagogical training on approaches to teaching and on teachers' self-efficacy beliefs by applying quantitative methods. In addition, Study I utilised interview data in order to illustrate the findings obtained through the quantitative analysis. Study I was a cross-sectional study, while Study II applied a longitudinal setting. In general, the results of both studies showed that pedagogical training enhanced the adoption of a student-centred approach to teaching. In the following, the results are dealt with in more depth.

In Study I, the participants were divided into four groups depending on how much pedagogical training they had, as described in the Methods section. The one-way ANOVA design was applied to examine the effect of the length of pedagogical training on approaches to teaching and on self-efficacy beliefs. The results revealed a significant main effect for the conceptual change/student-focused (CCSF) approach [$F(3, 196) = 4.63, p = .004$] and self-efficacy beliefs [$F(3, 196) = 2.90, p = .036$], but not for the information transmission/teacher-focused (ITTF) approach. When analysing the effect of pedagogical training on each three scales in more detail with Tukey's post hoc test, it was noticed that the effect of the amount of pedagogical training was not linear in any of the scales, except the teacher-focused scale, as Figure 4 shows.

In the *CCSF approach* scale, teachers who had 30 ECTS or more (Group 4), scored significantly higher than those who had just begun their studies or who had short courses for less than 10 ECTS (Group 2) and those who had 10 ECTS or more, but less than 30 ECTS (Group 3). In addition, those who had no pedagogical training, also scored higher than these two groups, but the difference did not reach a significant level.

Self-efficacy scores were significantly higher among those who had pedagogical training of 30 ECTS or more (Group 4), than among teachers who had just begun their studies or who had had short courses for fewer than 10 ECTS. Compared to the CCSF approach scale, the same phenomena occurs again: Those who had no pedagogical training at all (Group 1), scored higher than those who had had pedagogical training for fewer than 30 ECTS (Groups 2 and 3), but yet again, the difference was not significant.

The *ITTF approach* scores did not vary between the groups on a statistically significant level. However, teachers who had 30 ECTS or more of pedagogical training (Group 4), scored lower on this scale than the other three groups, whose scores were almost the same (see Figure 4).

Because it was assumed that teaching experience might have an effect on these results, the effect of teaching experience was statistically held constant in order to

find out the *unique* effect of pedagogical training on each scale. The results remained, however, rather similar after this procedure (see Figure 4). Again, a significant main effect was found for the scale measuring the student-focused approach [$F(3, 185) = 4.166, p = .007$]. A significant main effect was not found, however, for the self-efficacy scale. However, the self-efficacy scores were significantly higher among teachers, who had had 30 ECTS or more of pedagogical training for (Group 4), than among those who had just begun their studies or who had short courses for fewer than 10 ECTS (Group 2). Although the differences between the groups were not as strong after the effect of experience was held constant, similar differences between the groups could still be found. Teachers who had the most pedagogical training scored highest on CCSF and self-efficacy scales. Teachers who had no pedagogical training at all, scored second highest, while teachers between these groups scored lowest.

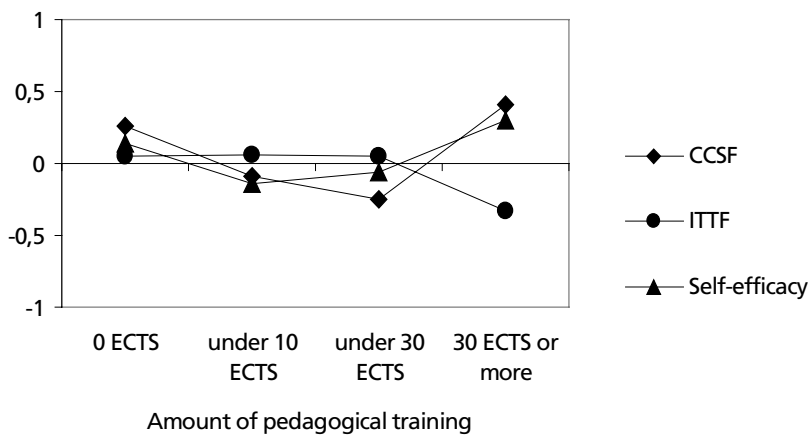


Figure 4. Scores for the CCSF approach, ITTF approach and self-efficacy beliefs of the four training groups when examining the unique effect of the amount of pedagogical training

The aims of *Study II* were twofold. Firstly, the study analysed the long-term effect of pedagogical training on approaches to teaching and on self-efficacy beliefs among teachers who had not participated in pedagogical courses after Study I. Secondly, Study II explored, by using a longitudinal setting, the effect of pedagogical training on teaching among teachers who had acquired more pedagogical training since Study I two years earlier. Furthermore, the results of results of Studies I and II were compared.

The four training groups formed in Study I were the starting point when analysing the data of Study II. The data of Study II split into two, because some teachers had acquired more pedagogical training after Study I while others had not. Thirty-five teachers' training group had not changed since the first measurement, so they still belonged to the same training groups as in Study I (see Table 5). Forty-five teachers had participated in additional pedagogical training after Study I so that their training group had changed (see Table 5).

Table 5. Division of Study I and II participants into the four training groups

	Study I (n)	Study II Teachers with further pedagogical training (n)	Study II Teachers with no further pedagogical training (n)
Group 1: 0 ECTS	9	3 (from Group 1 to 2)	6
Group 2: 1–9 ECTS	24	23 (from Group 2 to 3)	1
Group 3: 10–29 ECTS	32	12 (from Group 3 to 4)	20
Group 4: 30 ECTS or more	15	7 (70 ECTS)	8
TOTAL	80	45	35

In general, the results showed that the individual participants scored significantly higher on the scales measuring the CCSF approach to teaching ($p=.006$) and self-efficacy beliefs ($p=.014$) in Study II than in Study I. When background variables gender, discipline, teaching experience and the amount of pedagogical training (ECTS) were held constant, the significance of the self-efficacy scale became even more favourable ($p=.003$). When comparing the results of Studies I and II, it was noticed that the results of the cross-sectional study did not remain similar when conducting the longitudinal study. In the following, these findings are presented in more detail.

Among the teachers with no further pedagogical training there were no statistical differences between Studies I and II on scales measuring the CCSF and the ITTF approaches to teaching on the part of any of the groups. Teachers who had fewer than 30 ECTS (Group 3) in both studies scored significantly higher in Study II than in Study I on the scale measuring self-efficacy beliefs ($t[19] = -3,1$, $p = .006$).

Among the teachers with further pedagogical training there were, however, more changes on the measured scales. Teachers who had under 10 ECTS in Study I, but in Study II had under 30 ECTS (from Group 2 to 3) scored significantly higher in Study II than in Study I on the scales measuring the CCSF approach to teaching ($t[22] = -2,05$, $p = .05$) and self-efficacy beliefs ($t[22] = -3,16$, $p = .005$). Teachers who had under 30 ECTS in Study I, but in Study II had 30 ECTS or more (from Group 3 to 4), scored significantly higher in Study II than in Study I on the scale measuring the CCSF approach to teaching ($t[11] = -2,15$, $p = .05$).

In order to find out whether the results of Study I, which was a cross-sectional study, remain similar when applying a longitudinal setting, the results of Studies I and II were compared. It was noticed that the results did not remain similar. In terms of the *CCSF approach* to teaching, the results of Study I implied that at the beginning of pedagogical training the scores decrease and only after 30 ECTS are the scores higher than among teachers who do not have pedagogical training or among those who had only a few ECTS of pedagogical courses. The results of Study II, however, implied that the scores increased with all the training groups (see Figure 5). An exception was the new training group of teachers who had completed the 70 ECTS course of university pedagogy. Their scores on the CCSF approach decreased, but the difference between Studies I and II was not significant.

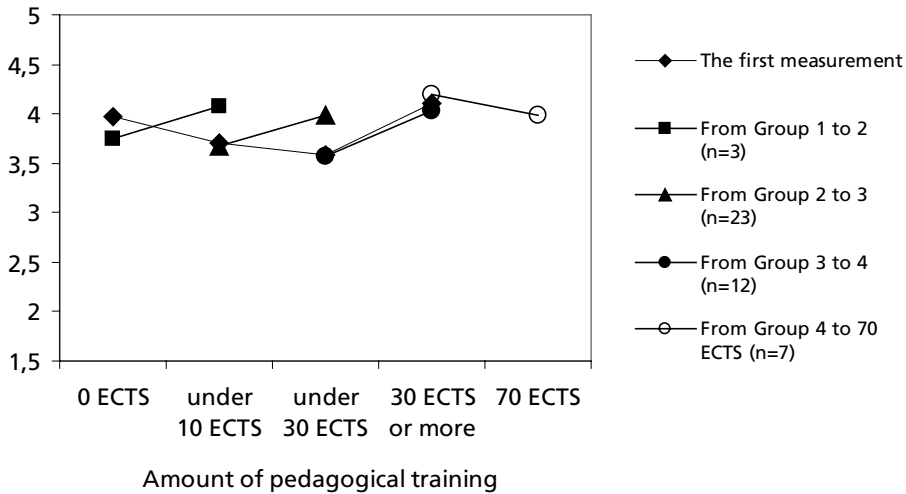


Figure 5. Scores for the CCSF approach to teaching of the training groups in Study I and Study II (scale 1–5)

In Study I the scores on the *ITTF approach* to teaching were similar among the training groups. Teachers who had 30 ECTS or more scored lowest on this scale, but the difference was not significant when compared to the other groups. The results of Study II showed as well that the scores on the *ITTF approach* to teaching were rather similar among all the training groups between the first and the second measurement and no statistical differences were found (see Figure 6). However, the scores did not decrease among those who had completed 30 ECTS or more as in the first measurement.

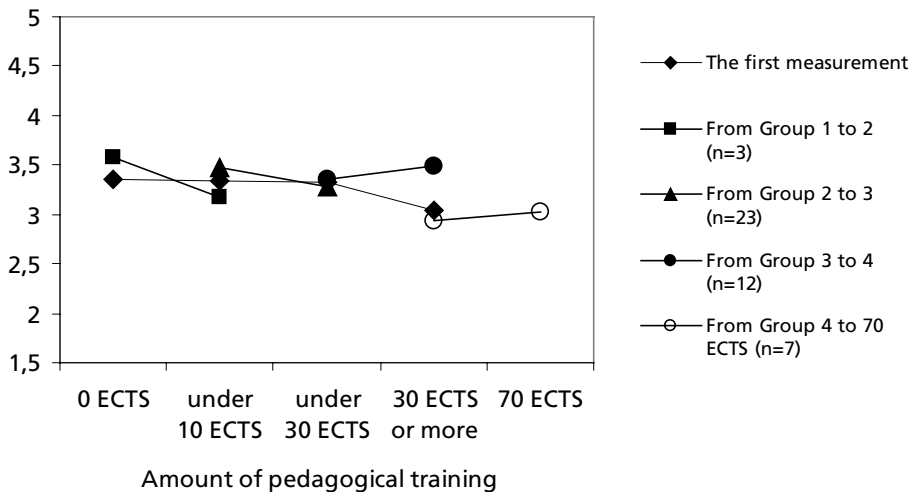


Figure 6. Scores for the ITTF approach to teaching of the training groups in Study I and Study II (scale 1–5)

In Study I the results of the cross-sectional study showed that at the beginning of pedagogical courses the scores measuring the *self-efficacy beliefs* decrease. After 10 ECTS the scores increased, but only after 30 ECTS or more were the scores higher than among teachers who had no pedagogical training. In Study II the results of the longitudinal study showed, however, that after 10 ECTS the scores on this scale increased. After 30 ECTS the scores slightly decreased and teachers who had completed the 70 ECTS course scored lowest of all groups on the self-efficacy scale (see Figure 7).

The differences in the results between Studies I and II are dealt with in more depth in the Discussion.

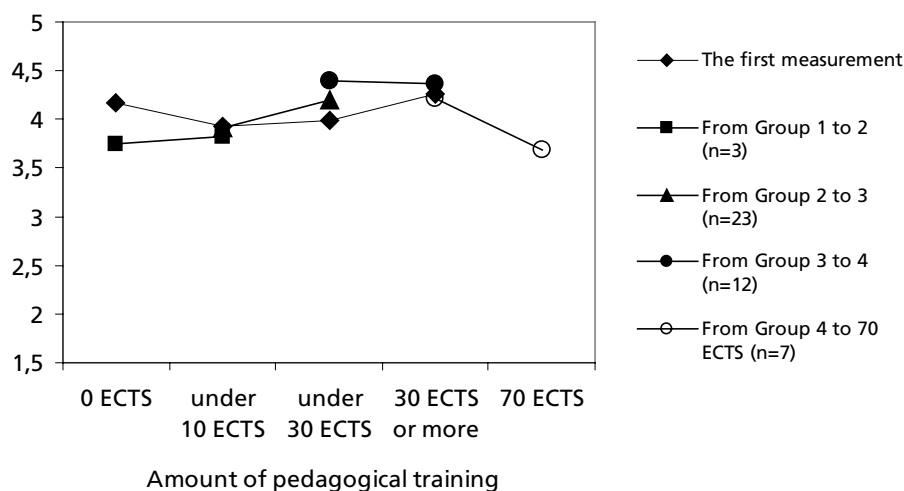


Figure 7. Scores for self-efficacy beliefs of the training groups in Study I and Study II (scale 1–5)

Interview results of the effect of pedagogical training on approaches to teaching

For Study I, 23 teachers' experiences of the effect of pedagogical training on their own teaching were analysed. In general, the teachers mentioned only positive effects of pedagogical training on teaching. However, two teachers felt that it was too early to evaluate the effect of the training because the course had just ended and they had not taught after the course.

Most teachers felt that participation in the pedagogical training had made them more aware of their approach to teaching and of their teaching methods. These teachers further believed that their reflective skills had developed during the training. Some teachers considered that they received theoretical knowledge, new ideas, advice as well as new viewpoints from participation in the pedagogical training. Others evaluated that their willingness to develop as teachers and their motivation to apply new teaching methods increased. Furthermore, some teachers enjoyed

meeting teachers from other faculties, discussing teaching and comparing experiences with them. Finally, some teachers thought that their self-confidence as a teacher had increased due to the course.

The effect of teaching experience on approaches to teaching and on self-efficacy beliefs

In Study I, the effect of teaching experience on approaches to teaching and on self-efficacy beliefs was analysed. The teachers were divided into four groups depending on how much teaching experience they had. A significant main effect was found for the CCSF approach [$F(3, 189) = 3.191, p = .025$] and self-efficacy [$F(3, 189) = 5.194, p = .002$]. Teachers who had the most, 13 years or more, teaching experience (Group D), scored highest on the ITTF scale and on the self-efficacy scale. Teachers who had teaching experience from 8 to 12 years (Group C), scored highest on the CCSF scale. Teachers who had no more than two years teaching experience (Group A), scored lowest on the ITTF scale.

Tukey's post hoc test was used for comparisons among the four experience groups in each scale. In the *CCSF approach* scale, teachers who had teaching experience from eight to 12 years (Group C), scored significantly higher than those who had from three to seven years of experience (Group B). In addition, teachers who had experience of teaching 13 years or more (Group D), scored significantly higher in the *self-efficacy* scale than teachers who had from three to seven years of teaching experience (Group B).

In Study II, the relative increase in the amount of teaching experience did not have an effect on approaches to teaching or self-efficacy beliefs. The relative increase in teaching experience was highest among teachers who had fewer than 30 ECTS (Group 3) in Study I and in Study II, and among teachers who had under 10 ECTS in Study I, but in Study I under 30 ECTS (from group 2 to 3). These two groups scored higher on the self-efficacy scale in Study I than in Study II on a significant level. Hence, the scores on the self-efficacy scale increased the most among teachers whose relative increase in teaching experience was highest.

4.2 Study III: Variation in teachers' descriptions of their teaching

In Study III, the aim was to capture the variation in teachers' descriptions of their teaching and to identify aspects of teaching in higher education through the analysis of the topics of teaching mentioned in the interviews of 70 teachers. Two broad categories of description clearly emerged from the data when analysing the variation in the descriptions of teaching: 1) *the learning-focused approach* in which the purpose of teaching was to improve students' learning, and an emphasis was placed on continuously improving the teacher's own teaching and 2) *the content-focused approach* in which the purpose of teaching was on transmission of knowledge and repetition of traditional and familiar ways of teaching.

The two categories of description were analysed in detail in order to find different aspects of teaching. As a result, ten aspects of teaching were identified from both the learning- and content-focused approaches. The ten were further grouped

under four broader aspects to clarify the structure of the findings. These broad aspects were the following: 1) teaching process including planning of teaching, teaching practices, and assessment practices; 2) learning environment including teachers' role, students' role, interaction, and atmosphere; 3) conception of learning, and 4) pedagogical development, including development of one's own teaching and pedagogical awareness.

Although clear variation was found between the two approaches, some common elements to both learning- and content-focused approaches were also identified. Such similar characteristics included careful design of teaching, the need to make students familiar with the course content, the use of varying teaching methods, the aim of creating a good atmosphere, the use of interactive elements and some sort of development of one's own teaching. However, after deeper analysis it was noticed that the similarities mirrored mere action, but variation could be found when considering the *purpose* of teaching. The 'purpose' of teaching was defined as the end or aim that steers teachers' actions.

Teaching process

Planning of teaching was categorised as reflecting on the learning-focused approach to teaching, if the purpose behind it was to improve student learning through taking students' previous knowledge, needs and expectations into account when planning the course. Conversely, descriptions which reflected the content-focused approach to teaching revealed that the purpose was to get through the course by making an exact plan.

Teaching practices were categorised into the learning-focused approach when teachers wanted students to construct the new information and reflect on it in order to gain a deep understanding of the phenomena. The use of varying teaching methods was selected to support students' deep approach to learning and to activate them in constructing their knowledge. In contrast, teaching practices in the content-focused approach to teaching revealed that the teaching method was selected on the basis of what was most comfortable for the teacher without consideration of what enhances student learning. The focus was rather on the teachers' own constructions of the phenomena.

In some descriptions which reflected the learning-focused approach, *assessment* was used to measure students' deep understanding of the phenomena through the use of various evaluation methods. A few descriptions concerning assessment practices reflected the content-focused approach to teaching. These descriptions revealed that more traditional forms of assessment were used because teachers did not know how to use other kinds of assessment methods. Assessment methods were selected on the basis of what was most comfortable for the teacher.

Learning environment

The *teacher's role* reflected in the learning-focused approach to teaching was associated with the importance of an equal relationship between teacher and student. In many descriptions it was mentioned that the teacher's role was to motivate stu-

dents and encourage them to critically construct their own knowledge. In the case of the content-focused approach to teaching, a more traditional teacher role was emphasised in the sense that a more distant and authoritative relationship with the students was considered more comfortable than an equal relationship. In these descriptions the teachers' own expertise and their role as the source of information was emphasised.

The *students' role* reflected in the learning-focused approach to teaching is one in which students are individuals and active participants with a capacity to find answers and to construct knowledge. The students' responsibility for their own learning was emphasised. Descriptions concerning the students' role in the content-focused approach to teaching suggest that students were seen as less active recipients and listeners. In a few descriptions it was emphasised that teachers must be responsible for their students' learning because not too much can be expected from the students.

In many descriptions concerning *interaction*, which reflected the learning-focused approach to teaching, it was emphasised that knowledge is constructed in interaction through discussions and activating teaching methods. In these descriptions the purpose of interaction was emphasised, which was to deepen the students' understanding. Other descriptions concerning interaction reflected the content-focused approach to teaching. Furthermore, in some descriptions teachers expressed a fear of using interactive elements in their teaching or did not know how to use them. However, many descriptions revealed that interactive elements were widely used, but the impact of interaction on students' learning was not considered.

The desire to *create a good atmosphere* during the course was indicative of the learning-focused approach if an equal relationship with the students was emphasised in order to create an atmosphere that supported deep learning. In many descriptions it was emphasised that a good atmosphere supports learning and encourages students to present their views and express differing and critical comments. Only a few descriptions were present in the content-focused approach to teaching. In these descriptions there was an attempt to create a good atmosphere through a good performance or by being humorous, but whether this supported students' learning or not was not considered.

Conception of learning

Many of the descriptions revealing a *conception of learning* in the learning-focused approach to teaching emphasised that learning is about insights and about the development of different and individual views of a phenomenon. Application of knowledge in varying contexts and critical thinking were considered important in gaining a deep understanding of phenomena. Some descriptions showed that learning was seen as a process in which students construct their own views of the phenomena. On the other hand, descriptions in the content-focused approach to teaching mentioned that the right answers can be found simply through reading the course literature. It was emphasised that the students need to remember the course content and facts which are important from the point of view of the teacher.

Pedagogical development

The *development of the teachers' own teaching* was central to the learning-focused approach to teaching. A number of teachers had participated in pedagogical training and the descriptions showed that some had made other kinds of efforts to improve their own teaching in order to enhance student learning. The descriptions showed that they had acknowledged the elements in their teaching that should be developed, and that they had a desire to become better teachers. Some descriptions concerning the developmental aspects of teaching in the content-focused approach to teaching showed that some teachers did not know how to change their teaching practices and they had not made any effort to improve their teaching. In a few descriptions participation in pedagogical training in order to obtain a better position or a wage increase was mentioned, but the purpose of developing teaching was not to enhance student learning.

Finally, some descriptions revealed that some teachers were very *aware of their pedagogical skills* and they had elaborated their conceptions of teaching and learning over a long period. These descriptions reflected the learning-focused approach to teaching. The descriptions showed that some teachers talked about their teaching analytically and reflected on it rather deeply. Some descriptions, on the other hand, indicated that teachers had not reflected on their own teaching that much. These descriptions reflected the content-focused approach to teaching, and in them the teachers' own expertise and teaching experience were emphasised.

4.3 Study IV: Profiles of university teachers

On the basis of the results of Study III, the results of Study IV could be formed. Each teacher's descriptions were analysed in order to see whether the descriptions reflected only the learning- or content-focused approach to teaching or both. Six profile groups were identified, which were grouped under four broader groups: 1) consonant content-focused profiles; 2) dissonant profiles; 3) towards learning-focused profiles, and 4) consonant learning-focused profiles.

Table 6. Profiles of university teachers.

Consonant content-focused profiles (n=6)	Dissonant profiles (n=29)	Towards learning-focused profiles (n=22)		Consonant learning-focused profiles (n=40)	
Systematically content-focused profiles (n=6)	Systematically dissonant profiles (n=29)	Contextually varying profiles (n=10)	Developing profiles (n=12)	Systematically learning-focused profiles (n=19)	Reflectively learning-focused profiles (n=21)

1) *Consonant content-focused profiles*

Six teachers described their teaching conceptions by using consistently content-focused expressions of teaching. Hence, their profiles were labelled as *Systematically content-focused profiles*. These teachers could be characterised as extremely content-focused both in terms of their teaching strategies and conceptions of teaching. They had difficulties in describing themselves as teachers which was consistent with their inability to reflect on their own teaching. They were oriented towards doing research, and teaching was an obligatory duty for most of them. They had no real desire to develop their teaching strategies. Their interviews mirrored several aspects of teaching which could be clearly categorised as being content-focused.

2) *Dissonant profiles*

A dissonant profile consisted of theoretically incompatible combinations of descriptions of teaching, where there was evidence that learning- and content-focused descriptions of teaching conceptions and strategies were combined in one way or another.

The subgroup *Systematically dissonant profiles* comprised 29 teachers who described their conceptions of teaching and learning in either completely content-focused terms or in both content- and learning-focused terms. These teachers' teaching strategies were both learning- and content-focused. However, they applied more content- than learning-focused strategies, and for most teachers, only one or two aspects of their teaching strategies reflected the learning-focused approach to teaching. They emphasised their roles as authorities as well as their own expertise, and were more oriented towards doing research. Most of them were not enthusiastic about teaching, and they had no real desire to develop themselves as teachers. The few that reported having an interest in the development of teaching wanted to learn new teaching methods without any desire to learn what lies behind these methods. They were interested in learning new "tricks" for their teaching. Teachers in this subgroup did not express having problems in their teaching, they had not reflected on their own teaching deeply and they seemed unaware of their pedagogical skills. Most importantly, these teachers applied the content- and learning-focused approaches without consideration of what kind of teaching would enhance student learning.

3) *Towards learning-focused profiles*

These profiles consisted mainly of consonant learning-focused descriptions of teaching, but the learning-focused descriptions of teaching strategies were combined with some content-focused ones. Because of the strict rules set for the coding, the profiles were deemed to be dissonant, although these teachers' conceptions of teaching were systematically learning-focused, and they were clearly moving towards consonance in their teaching strategies as well.

The subgroup *Contextually varying profiles* consisted of ten teachers, whose conceptions of teaching and learning were categorised as being clearly learning-focused. However, their descriptions of their teaching strategies reflected both learning- and content-focused approaches. These teachers expressed applying different teaching styles in different teaching contexts. With small groups they used more activating

and interactive teaching methods, but with larger groups they changed their teaching style to be less interactive and used less activating forms of lecturing, because they did not know how to apply alternate teaching methods with larger groups. Hence, these teachers' profiles vary according to the situation; with small groups the profiles are consonant, but with larger groups dissonance occurs. These teachers were reflective about their teaching and aware of their own teaching styles and of themselves as teachers. Their profiles were clearly developing towards consonant learning-focused profiles, but they did not yet have tools enough to totally change their teaching strategies with large groups. However, they applied the different strategies consciously, so the dissonance in their teaching is rather positive than negative.

The subgroup *Developing profiles* consisted of 12 teachers. These teachers' conceptions of teaching and learning were categorised as being clearly learning-focused. Their teaching strategies were both learning- and content-focused. Hence, their profiles were similar to those categorised as having 'Contextually varying profiles', but their profiles were clearly developing towards consonant learning-focused profiles. Teachers in the other profile groups might also be in a process of development, but teachers having a 'developing profile' explicitly mentioned that they were in a developmental phase; they had acknowledged the elements of their teaching that needed to be developed, and they had a positive attitude towards developing themselves as teachers. Most of these teachers experienced having some problems in their teaching, but they did not necessarily know how to improve their teaching. However, they were motivated to improve their teaching strategies. They had reflected on their own teaching deeply and they seemed to be very aware of their own pedagogical skills. These teachers applied the different teaching strategies consciously, as the group of teachers having *contextually varying profiles*. Thus, the dissonance can be considered as being rather positive than negative.

4) *Consonant learning-focused profiles*

The subgroup *Systematically learning-focused profiles* consisted of 19 teachers whose profiles reflected a logical combination of learning-focused aspects of teaching. Their profiles did not include any content-focused elements, but they did not, however, describe their teaching in a reflective manner.

The subgroup *Reflectively learning-focused profiles* comprised 21 teachers whose interviews reflected a theoretically logical combination of learning-focused aspects. These teachers could be characterised as extremely learning-focused both in terms of their teaching strategies and conceptions of teaching. Even with large group sizes they described using activating and learning-focused strategies. They had deeply reflected on their own teaching and seemed to be aware of their teaching strategies and of themselves as teachers. They had considered the purpose of their actions, which was to enhance student learning.

Statistical analysis of the profiles

Teachers whose profiles were consonant and learning-focused represented more often soft sciences than hard sciences, but teachers whose profiles included dissonant elements or were systematically content-focused, represented more often

hard sciences than soft sciences. A Chi-Square test showed that the disciplinary differences between the six profile groups were statistically significant ($\chi^2=16.9$, $p=.005$).

In the groups Contextually varying profiles, Systematically dissonant profiles and Systematically content-focused profiles, half of the teachers had participated in pedagogical courses organised for university teachers. However, in the groups Reflectively learning-focused profiles, Systematically learning-focused profiles and Developing profiles, the majority of the teachers had participated in such courses.

From the inventory, conceptual change/student-focused (CCSF) and information transmission/teacher-focused (ITTF) sum scales were calculated. Analyses of variance (ANOVAs) were used to explore the differences between the six profile groups' scores on CCSF and ITTF approaches to teaching. The results revealed a significant main effect for the CCSF approach [$F(5, 79) = 5.49, p = .000$]. Teachers who were categorised as having a Reflectively learning-focused profile or a Systematically learning-focused profile scored highest on the CCSF approach scale. Conversely, teachers in the Systematically content-focused profiles and Systematically dissonant profiles groups scored lowest on this scale. The results did not reveal a significant main effect for the ITTF approach scale, but teachers who were categorised as having a Reflectively learning-focused profile scored the lowest on this scale and teachers in the Systematically dissonant profiles group scored the highest.

5 Discussion

5.1 The effect of pedagogical training on teaching

Studies I and II analysed the effect of pedagogical training on teaching in higher education. The results showed, in general, that the courses enhanced the adoption of the conceptual change/student-focused (CCSF) approach to teaching. The results of the cross-sectional study (Study I) showed that the scores measuring the CCSF approach and the self-efficacy scales collapsed among teachers who had just begun their pedagogical courses, and increased only after intensive, long-lasting pedagogical training. These results were obtained immediately or shortly after the pedagogical courses. Furthermore, the results of the follow-up study (Study II) similarly showed that among teachers who had not participated in pedagogical courses after Study I, the scores on the measured scales had remained approximately the same. On the contrary, teachers who had participated in further pedagogical training after Study I scored significantly higher on the conceptual change/student-focused (CCSF) approach scale in Study II. On part of the information transmission/teacher-focused (ITTF) approach to teaching, the results confirmed the finding suggested in previous studies about the more stable nature of the ITTF approach to teaching. Thus, there is evidence that it is more difficult to have an effect on the ITTF approach to teaching. Research has further shown that as teachers become more able to understand and use different ways of teaching, their sense of self-efficacy increases and different student achievement goals might appear more obtainable (Timperley & Phillips, 2003). This might explain the similarities in the changes on part of the CCSF approach to teaching and the self-efficacy beliefs; when teachers learn to understand and use varying ways of teaching (improvements in the CCSF scores), their self-efficacy beliefs are more likely to change as well.

Gibbs and Coffey (2004) found that university teachers became less teacher-centred and more student-centred by the end of the 4 to 18 months training. The results of Study I implied that the CCSF approach to teaching and self-efficacy beliefs change slowly as a result of pedagogical training, and intensive pedagogical training is needed to promote that change. However, the results of Study I suggested that the process of development is not linear. Since the study applied a cross-sectional setting, the results do not imply a *change* within a group of teachers, but *differences* between different groups. The ‘collapse’ in the CCSF approach and self-efficacy beliefs could be explained by changes in the teachers’ conceptions of themselves as teachers. Those teachers, who participated in the courses, have probably experienced problems in their teaching or wanted to improve their teaching. At the beginning of the pedagogical courses they become aware of their limitations as teachers and they might evaluate themselves as less student-centred than before. At the same time teachers feel more uncertain about their ability to perform their academic tasks (self-efficacy). Thus, the training makes teachers more aware of the problems they have in their teaching, and after a longer training process they

become more aware of an ideal way to teach. When teachers have not participated in any kind of pedagogical training organised for university teachers, they might not be aware of better teaching practices and might therefore evaluate themselves as student-centred teachers. Thus, pedagogical training needs to promote teachers' conceptual change. First, conceptions of teaching, and moreover, of education and other social issues attached, have to change, and after this a change in teaching practices and techniques is possible. The training probably does not make teachers less student-centred or make worse their self-efficacy beliefs but, rather, the change is in the teachers' beliefs about themselves as teachers.

Another possible explanation for the 'collapse' concerns the 'intermediate phase' of expertise. Lueddeke (2003) notes that those in their 'mid-career' have a conscious or unconscious desire to avoid change or they have a fear of choosing or making commitment. Beijaard et al. (2004) report similarly that experienced teachers' professional identity may be challenged in cases of educational change in their immediate working environment. Also Boshuizen (2004) found that the process of the development of expertise is not continuous and uninterrupted. Although there is strong evidence in favour of a continuous process of knowledge integration and encapsulation, other findings suggest a discontinuity in the development. Research shows that the development processes are less smooth than theoretical models predict and that disturbances may occur. Furthermore, development required from academic teachers and experienced stress could account for this delay. Secondly, the 'collapse' also reminds us of processes in child development, in which a child may move from one stage of skill mastery to the next, but before the next level is reached goes through a period during which performance is lower than before and after. A process like this may be based on complete reorganisation of the knowledge base. Thirdly, the developing knowledge structure might not fit the requirements set for the teachers in practice (see Boshuizen, 2004).

The content and intention of the three courses organised by the University of Helsinki varies, and therefore might affect the results. The 10 ECTS course focuses on general theoretical principles of learning and instruction, while the 30 ECTS course challenges teachers' underlying conceptions of teaching and learning. The 70 ECTS course is more practical since the teachers participate in a practicum and conduct research concerning teaching or learning in higher education. These differences between the nature of the courses might partly explain the results as well. Furthermore, since the study represents a case study of the pedagogical courses offered by the University of Helsinki, the generalisability of the findings is dependent upon the similarity with courses offered by other universities.

The longitudinal study (Study II) did not, however, support the view of the 'collapse' in the CCSF approach and self-efficacy scores. Instead, the results implied that the scores increased with all the training groups. An exception was the new training group of teachers who had completed the 70 ECTS course on university pedagogy. Their scores on the CCSF approach decreased, but the difference between the first and the second measurement was not significant. Respectively, the self-efficacy scores did not decrease after beginning the pedagogical courses, but after 30 ECTS the scores slightly decreased. Furthermore, teachers who had completed the 70 ECTS course scored lowest of all groups on the self-efficacy scale.

One explanation for not identifying the collapse in Study II could be that the results of the previous study were taken into account in the pedagogical courses organised by the Centre for Research and Development of Higher Education. The teachers have been made aware of the possible collapse and negative effect of the training at the beginning of the training. Oosterheert and Vermunt (2003) have emphasised that teachers should be made aware of the possible delay in the development of more sophisticated conceptions of teaching. Secondly, the teachers of Study II might have been more devoted to developing their own teaching since they voluntarily participated in the follow-up study. Previous research has shown that teachers with a more sophisticated understanding of teaching and learning are more likely to change their understanding of teaching and teaching practices (Martin & Lueckenhausen, 2005). Teachers who are motivated to develop pedagogical knowledge have been shown to engage in reflection that leads to higher quality teaching. Furthermore, they have a willingness and an ability to take risks in their actions, to do things differently (McAlpine & Weston, 2000). Thirdly, the differences in the research settings might have had an effect on the differences in the results of the two studies. Study I was a cross-sectional study, while Study II applied a longitudinal setting. One group among teachers with further pedagogical training consisted of only three teachers so the increase in their scores on the CCSF approach and self-efficacy scales has to be ignored.

The group of teachers who had 30 ECTS or more in Study I, but in Study II had completed 70 ECTS of pedagogical courses (from group 4 to 70 ECTS) scored lower on the CCSF approach and self-efficacy scales in Study II. This phenomenon is interesting, although the differences between the measurements were not significant (the group consisted of only seven teachers). The decrease in their scores could be explained by their increased awareness of their own teaching. In Study I their scores were on an extremely high level, and after applying the information gained from the training to practice and after an intensive pedagogical training of 70 ECTS, their awareness of teaching might have resulted in a decrease. The scores returned to a realistic level after a 'hype'.

The original scores on the measured scales were somewhat different between the 200 participants of Study I and the 80 teachers who participated in Study II. For example, the scores on the self-efficacy scale of teachers who had under 30 ECTS was much lower in Study I than the scores of the teachers who participated in Study II. The assumption presented earlier that the teachers of Study II would be more motivated and committed to developing their teaching than the participants of Study I might explain these differences.

The results of Study II showed that no changes in the measured scales are expected to occur without further pedagogical training. The only exception was an increase on the self-efficacy scores among teachers who had from 10 to 29 ECTS. Among these teachers the relative increase of teaching experience was highest of the teachers with no further pedagogical training. In other words, the self-efficacy beliefs increased on a statistically significant level among teachers who had the least teaching experience. Thus, pedagogical training seemed to have a strong long-term effect on self-efficacy beliefs among teachers with little teaching experience. This seems logical, since teachers with little teaching experience gain more

confidence to complete their teaching tasks after they acquire pedagogical knowledge. Similarly, among a group of teachers who had acquired more pedagogical training after Study I and scored significantly higher on the self-efficacy scale in Study II than in Study I, the relative increase in their teaching experience was highest of the groups among teachers with further pedagogical training. These results imply that when teachers complete more pedagogical courses, it has the strongest effect on their CCSF approach to teaching. An increase in the scores measuring the CCSF approach to teaching did not emerge among teachers who had not participated in pedagogical courses after the first study. However, an increase in the self-efficacy scores was found among a group of teachers who had not gained more ECTS as well as among a group of teachers who had gained more ECTS. Among both of these groups the relative increase in teaching experience was highest of all groups. Hence, it could be suggested that participation in pedagogical courses after the first study does not have a profound effect on the self-efficacy scale, but rather the high relative increase of teaching experience does.

Most importantly, the results of Studies I and II showed that pedagogical training enhances the adoption of a student-centred approach to teaching and strengthens teachers' self-efficacy beliefs. The results of previous studies have been contradictory, while some studies have showed a positive effect of pedagogical training on conceptions of teaching or approaches to teaching and others have found no effect of such training. The present study showed that the training needs to be more systematic and continuous in order to be effective. However, a short-term training might have positive effects on teaching among teachers who already have a more sophisticated conception of learning and teaching and are motivated and committed to developing their own teaching.

5.2 Variation in approaches to teaching on a general level

When examining teaching in higher education with a qualitative approach by using a large and multidisciplinary sample, it was assumed that the variation in descriptions of teaching could be captured in more detail and more broadly than in previous studies. Hence, it was hypothesised that more than the two broad approaches, the student- and the teacher-centred, identified in previous research (e.g., Kember & Kwan, 2000; Trigwell et al., 1994) could be identified. In line with previous research this study identified two approaches to teaching: the learning- and the content-focused approaches to teaching. The results, however, broadened our understanding of the approaches to teaching since an important finding of the study was that the variation in descriptions of teaching could be identified in detail only after considering the purpose of teaching practices. Berliner (2001) has suggested similarly that judgements of successful teaching are concerned not with the tasks of teaching or professional behaviour, but with the achievement of ends.

Furthermore, ten aspects of teaching within both of the two approaches were identified, which were further grouped into four broader ones. Specifically, first, there was variation in how teachers described the *teaching process*, including planning of teaching, teaching practices, and assessment practices. Second, variation could be found in how teachers described the *learning environment*, including the

teacher's role, students' role, interaction, and learning atmosphere. Third, there was variation in the ways teachers described their *conceptions of learning*. Fourth, variation could be identified in the ways teachers described their own *pedagogical development* including the development of their own teaching and pedagogical awareness. The large and multidisciplinary sample of the study, as it was hypothesised, made it possible to identify such detailed aspects of teaching.

Another finding worth discussing concerns the role of *interaction* in teaching. In previous research (Kember, 1997) student-teacher interaction was placed between the student- and teacher-centred *orientations* providing a link between these two *orientations*. However, in other studies evidence of this bridging 'student-teacher interaction' conception was not found (Kember & Kwan, 2000); instead it was argued that the nature of the interaction differentiates the orientations, not interaction 'per se' (Samuelowicz & Bain, 2001). The latter view is in line with the results of Study III; it was found that interaction could be categorised into either the learning- or content-focused category after considering the purpose of interaction.

One of the aims of Study III was to identify the relationship between the two approaches to teaching. Previous research has suggested that the learning- and content-focused approaches are separate categories (Trigwell & Prosser, 2004) and have their own special characteristics. Other research, however, argued that the two approaches are poles of a continuum (Samuelowicz & Bain, 1992; Kember, 1997; Meyer & Eley, 2003). According to the view of separate categories, a student-centred teacher might sometimes use features typical of a teacher-centred approach depending on the teaching context, but a correspondent relationship in the reverse direction is not possible; teacher-centred conceptions of, or approaches to teaching, cannot be combined with student-centred elements. The view of a continuum defines the content-focused approach to teaching as 'not a learning-focused approach'. The view emphasises that the teacher is either student- or teacher-centred in his or her conceptions and approaches. Moreover, the underlying beliefs or approaches are considered to be resistant to change, or at least enormous efforts are needed to change or switch the underlying beliefs concerning teaching. Åkerlind (2003b) suggests that the 'either/or' relationship should be reconceived as an 'and' relationship because more recent research has shown that shifts from teaching-centred to learning-centred orientations are possible.

The results of the present study do not support the idea of a continuum with two mutually exclusive poles with few possibilities for change. Studies I and II showed that conceptions and approaches are changeable. Study III implied that the relationship between the two approaches is a combination of the two opposite views presented above: there were characteristics typical only of either learning- or content-focused approaches, but on the other hand, the results revealed that the content-focused approach lacked some elements that were typical of the learning-focused approach. Thus, the learning-focused approach is, as Prosser and Trigwell (1999) have described, a more complete approach to teaching when compared to the content-focused approach. In a sense, the learning-focused approach goes further. Previous research has described the learning-focused approach to be more *desirable* (McKenzie, 1996) or more *sophisticated* (Entwistle & Walker, 2000) than the

content-focused approach, which is described as more *limited* (McKenzie, 1996) than the learning-focused approach. Furthermore, Study IV showed that not all teachers approach their teaching in either learning- or content-focused terms, but some combine elements of both approaches. In developing the quality of teaching in higher education, the complex relationship between the two approaches should be considered. A strong opposite positioning of the approaches does not do justice to the nature of the phenomenon. Instead, the learning-focused approach should be considered as a richer and more pedagogically aware approach to teaching than the content-focused approach, because teachers who adopt a learning-focused approach to teaching are able to adopt elements typical of content-focused approach where they judge it appropriate. The content-focused approach can be developed to be more complete and learning-focused through pedagogical training.

5.3 Variation in approaches to teaching on an individual level

Different types of consonance and dissonance and their relation to student learning

Prosser et al. (2003) suggested that higher quality learning outcomes can be expected from courses in which teachers' approaches to teaching can be diagnosed as consonant. In addition, they suggested that lower quality learning outcomes can be expected from courses in which there is substantial dissonance in teachers' approaches to teaching. They argued that dissonant and incoherent perceptions of and approaches to teaching are associated with poorer teaching outcomes, i.e., lower quality student learning outcomes. This seems logical, since teachers' approaches to teaching have been shown to be related to students' approaches to learning (see Trigwell et al., 1999). A conceptual change/student-focused approach to teaching was associated with students adopting more of a deep approach to learning while a transmission/teacher-focused approach was associated with more superficial approaches to learning. Furthermore, Vermunt and Verloop (1999) emphasised the importance of *congruence* between students' learning strategies and teachers' teaching strategies. This implies that a consonant learning-focused teacher may not always be in congruence with different types of student study practices, although in this case a constructive friction is likely to challenge students to increase their learning and thinking skills.

The teachers of the present study, who were developing towards consonant learning-focused profiles, were seen to be shifting their approaches as part of developing their teaching activities. While their learning-focused conceptions of teaching enhanced their development towards applying more learning-focused strategies, their teaching strategies were both learning- and content-focused. They were able to consider which strategy was appropriate in a certain situation, so the teaching is likely to have a positive influence on student learning. Furthermore, it is possible that in certain contexts their teaching is completely learning-focused.

Teachers who were categorised in the group Systematically dissonant profiles seemed to have a negative attitude towards the development of teaching. These

teachers had no real desire to develop their own teaching. Their teaching strategies were either completely dissonant or included more content-focused than learning-focused aspects. However, the teachers themselves did not consider this problematic.

Possible explanations for dissonance

It is worth considering what causes dissonance in teachers' profiles. For those teachers categorised as having a contextually varying profile or a developing profile, dissonance may be due to a recent change in their teaching strategies, and due to some confusion associated with that change. They are already describing learning-focused conceptions of teaching and a desire to develop as teachers, so the dissonance might be short-lived. Similar findings have been made with studies on dissonance in student learning: Students expressing dissonant study orchestrations had recently noticed a change in their study practices (Cano, 2005; Lindblom-Ylänne & Lonka, 1999). Dissonance may also be due a conscious choice, since teachers who approach teaching in learning-focused terms are able to use elements from the content-focused approach if they judge it appropriate. However, in the interviews the teachers described their teaching on a general level, not in a certain teaching context.

For the teachers who were categorised as having a systematically dissonant profile, the dissonance could be explained by their inability to reflect on their own teaching. Similarly, Lindblom-Ylänne (2003) found that some students expressing a dissonant study orchestration seemed to lack the metacognitive skills to evaluate their study practices and the quality of learning. In addition, teachers having a systematically dissonant profile seemed to lack the intrinsic motivation to develop their approaches to be systematically learning-focused. In some cases their focus was on their research and their profiles are likely to remain dissonant if they lack interest in teaching. However, further research should be focused on the causes and stability of dissonance.

This study showed that there were disciplinary differences between the profile groups. Teachers representing hard sciences were mainly categorised as having dissonant or consonant content-focused profiles, while teachers representing soft sciences were mainly categorised as having consonant learning-focused profiles. Prosser et al. (2003) suggested, on the basis of their analyses on dissonance in teaching, that there may be more dissonance in the teaching of science and engineering than arts and social science. These results are in line with reports of a correlation between hard disciplines and a more information transmission/teacher-focused approach to teaching, and respectively, a correlation between soft sciences and a more conceptual change/student-focused approach to teaching (Lindblom-Ylänne et al., 2006; Lueddeke, 2003). However, the limitations of the quantitative methods in the present study have to be acknowledged, since the group Consonant content-focused profiles comprised only six teachers.

5.4 Discussion of the study terminology

Previous studies have used various concepts of the two main contrasting approaches. For example, Trigwell and his colleagues (e.g., Prosser & Trigwell, 1999; Trigwell & Prosser, 1996a,b) have used the concepts *student-* and *teacher-focused*, while Kember and Kwan (2000) applied the concepts *content-* and *learning-centred*. The findings of Study III suggested that what differentiated these two approaches was the *purpose* of teaching. Some teachers' purpose was to improve student learning, meaning that their focus was on individual students. On the other hand, other teachers' primary focus was on the course content and they aimed at delivering the content to the students. Thus, the concepts *learning-focused* and *content-focused* were considered to best describe the nature of the two approaches to teaching.

Despite the distinction between *approaches to teaching* and *conceptions of teaching*, they seem to be overlapping concepts. Trigwell and Prosser (1996a) defined them separately, but showed how they were internally related. They also described approaches to teaching as including elements of teaching *strategies* and *intentions* (Trigwell & Prosser, 1996b). Their findings with 24 first-year science teachers suggested that a Student-focused Strategy was associated with a Conceptual Change Intention, while a Teacher-focused Strategy was associated with an Information Transmission Intention. Thus, *intention* as an element of an approach to teaching shares some similarities with *conception of teaching*. The 'purpose of teaching' that arose when analysing the data of Study III is seen as the end or aim that steers teachers' actions. It differs from *intention* (Trigwell & Prosser, 1996b) in the sense that intention is about what teachers think and feel about teaching. The purpose of teaching is understood as a broader concept including teachers' intentions. Presumably, teachers' underlying conceptions of teaching define their purposes of teaching.

5.5 Methodological discussion

Because Study I applied a cross-sectional setting, Study II was conducted in order to measure change. However, the setting of Study II was challenging. Firstly, the data split in two because some teachers had participated in pedagogical training after the first measurement and others had not. Hence, the number of participants in each group was rather small and not all groups could be included in the statistical analyses. Secondly, the results of Studies I and II were compared, and the number of credits in Study I had to be taken into account in the comparisons. Hence, it was not reasonable to compare the whole data of Study I to the whole data of Study II, since the results of Study I were not linear. This setting made it challenging to find a suitable analysis method. Rogosa (1995) suggests that to measure the change, the basic solution is to calculate the difference between the first and second measurement, and to use the difference quotient, the change score, as an estimate for the change. In Study II, a paired sampled t-test turned out to be the most suitable method when comparing the results of Studies I and II, and this model was accompanied by a hierarchical multilevel model which gave us information of the change between the two measurements at a general and individual level. This kind

of model is used in longitudinal studies in separating changes within one individual. The model does not compare the whole data between the measurements as such, but instead compares the measurements at an individual level (Raudenbush & Bryk 2002, pp. 160–202).

The use of both quantitative and qualitative methods made it possible to investigate the phenomenon of approaches to teaching from diverse perspectives. Studies I and IV combined both quantitative and qualitative methods, while Study II was purely quantitative and Study III purely qualitative. In Study I, the interview results partially deepened the findings obtained through the inventory data. In Study IV, qualitative and quantitative methods were integrated to improve the validity of the qualitative classification procedure. The results of the comparison between the six profile groups' scores on conceptual change/student-focused approach (CCSF) and the information transmission/teacher-focused approach (ITTF) to teaching supported the results of the qualitative classification. The teachers who were categorised as having consonant and learning-focused profiles scored highest on the CCSF scale while the teachers categorised as having systematically dissonant or consonant content-focused profiles scored lowest on this scale. These results should, however, be treated with some scepticism, firstly since, the results may be partly due to disciplinary variation between the six profile groups. Secondly, the interviews focused on teaching on general level, but the nature of the Approaches to Teaching Inventory is rather contextual. However, the teachers thought of the most typical course they teach while completing the inventory. Thirdly, 17 teachers had not completed the inventory. The use of qualitative methods in Study IV was important since previous studies on dissonance on student learning have shown that without the use of qualitative methods individual dissonant responses may easily remain undetected (see Lindblom-Ylänne, 2003; Meyer, 2000). In Study III, the use of qualitative methods was needed to analyse the variation in descriptions of teaching in more detail than in previous studies which have applied either quantitative methods or qualitative ones with a limited number of participants.

The Approaches to Teaching Inventory (ATI) which was applied in Studies I, II and IV, assumes a negative correlation between the conceptual change/student-focused (CCSF) approach and the information transmission/teacher-focused (ITTF) approach. Thus, the two approaches are considered as two separate variables and a linear relationship between these variables is not expected (Trigwell & Prosser, 2004; Trigwell, et al., 1994). However, Meyer and Eley (2003) criticised this underlying assumption of the ATI, and suggested that the dimensionality of the ATI might better be interpreted as two mutually exclusive poles along a single continuum. As mentioned before, the results of the present study support the view of two separate categories.

The ATI has been criticised for representing a methodologically-flawed and conceptually-limited framework to approaches to teaching (Meyer & Eley, 2006). Meyer and Eley note that the phenomenographic study (Trigwell & Prosser, 1994) that represents the ATI's historical origins had no expressed purpose to develop an inventory based on the findings. They claim that the range of variation captured in the phenomenographic study was deliberately restricted when designing the ATI. Moreover, the sample size of the phenomenographic study was only 24 and the

data were collected from teachers teaching first year chemistry and physics courses. Furthermore, majority of the teachers were male. Meyer and Eley (2006) suggest that the use of the ATI should be questioned in other fields of disciplines. However, the ATI has been successfully applied in several studies conducted in contexts removed from its original foundations (see e.g. Lindblom-Ylänne et al, 2006; Gibbs & Coffey, 2004). For example, the study by Lindblom-Ylänne et al. (2006) analysed the inventories of 340 teachers from a variety of disciplines.

5.6 Limitations of the study

A limitation of the present study was that the majority of the participants had participated in voluntary pedagogical training organised for university teachers. Teachers who are more motivated to improve their teaching practices may take more pedagogical courses. Teachers' desire to participate in pedagogical courses and their wish to become better teachers might lead to better teaching outcomes, not participation in pedagogical courses alone. In addition, all teachers voluntarily participated in the interviews. Hence, the sample was somewhat biased since the participants were interested in developing their own teaching. More descriptions of content-focused teaching would have probably emerged from the data if the sample had been more representative of university teachers. Furthermore, the university promotes student-centred teaching, and thus, the participants of the study might have answered more positively to the conceptual change/student-focused approach scale since social desirability might affect their answers.

Moreover, the interviews were conducted in Finland in Finnish. The interview quotations were translated into English, and some parts of them could not be translated exactly due to differences between the languages. Teaching/learning cultures vary between countries and the results may reflect the features that are more typically Finnish and thus, the results may not be sustained in other countries. In addition, the problems relating to the language and the teaching/learning culture concern the inventory applied in the present study as well. The original inventory is in English and is translated into Finnish by an expert in the field of teaching and learning in higher education and independently translated back to English by another expert. However, despite the thorough translation process, the translations could not have been made word to word due to the differences between the languages and the teaching/learning cultures.

The most significant limitation of Study I concerned the cross-sectional setting applied in the study. Thus, the results revealed changes between different groups of teacher who differed from each other in terms of the amount of pedagogical training, not within a particular group of teachers. Therefore, in Study II, the aim was to explore the differences within particular groups of teachers. However, not all groups could be taken along in the analyses since some groups consisted of only a few teachers. This made the measurement of change challenging as well. In studies I and II the teachers were asked to complete the ATI by selecting the most typical course they teach. Therefore, the courses were not necessarily the same ones. If the teachers would have been asked to select the same courses in both studies when completing the inventory, the response rate of Study II would have been too low

for any statistical analyses. However, both courses represented the most familiar way of teaching, so that it was considered appropriate to compare the inventory results of Studies I and II. Furthermore, the teachers were asked to describe the selected courses in detail before completing the inventory.

Studies III and IV were grounded on the qualitative analyses of the interviews which were primarily directed to explore teachers' approaches to teaching. Teachers brought up also their conceptions of teaching from time to time, and thus, conceptions of teaching needed to be taken into account in the analyses. However, the descriptions of conceptions were rather narrow. An interview design involving more detailed aspects of conceptions of teaching would have allowed a more intensive analysis of the conceptions as well as approaches. On the other hand, the primary focus of the present study was on approaches to teaching.

A summary of the results of the present study is illustrated in Figure 8. Study III identified detailed elements of teaching and furthermore, the two broad approaches to teaching. After considering the purpose of teaching, variation could be found in the teachers' descriptions. These results represent variation in teaching on a general level. The consonant and dissonant profiles of university teachers identified in Study IV represent variation in teaching on an individual level. The results of Studies I and II implied that pedagogical training for university teachers enhances the adoption of a learning-focused approach to teaching and that conceptual change is a prerequisite for changes in teaching practices.

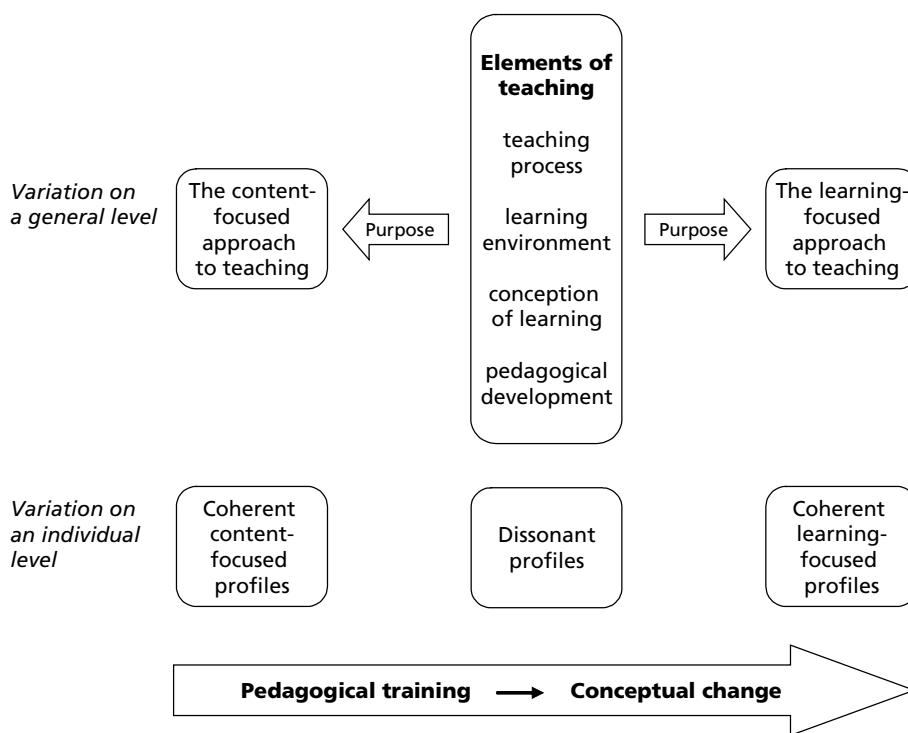


Figure 8. Summary of the main results of the study

6 General discussion

6.1 Suggestions concerning pedagogical training of teachers in higher education

Higher education teachers should be helped to develop more consonant and learning-focused ways of teaching since it is likely to have a positive influence on the quality of student learning. Prosser et al. (2003) emphasise that the development of a consonant student-focused approach could be helped through involving teachers in studying teaching and learning in higher education. Similarly, the results of the present study suggest that pedagogical training enhances the adoption of a learning-focused approach to teaching. However, numerous points need to be considered in order for the training to be effective.

Since the results implied that the content-focused approach is more resistant to change, the training should be directed primarily to affect the learning-focused approach to teaching. Most likely, the adoption of a more learning-focused approach to teaching can be fostered through conceptual change, since the approaches are not likely to change without initial changes in the conceptions. The term conceptual change is used to characterise the kind of learning required when new information to be learned comes in conflict with the learners' prior knowledge usually acquired on the basis of everyday experiences. In order for the conceptual change to occur, higher education teachers should be helped to become aware of themselves as teachers and of their own ways of teaching through intensive reflection. Furthermore, teachers should be made aware of what kind of teaching enhances student learning and of how learning occurs in order to help them set their goals for the training. Without knowledge of teaching it is difficult for inexperienced teachers to begin reflecting on their teaching. Hence, besides theoretical information about learning and teaching the training should include reflection on their own teaching and on teachers' conceptions of what good teaching and learning consists. The training should be based on reflection especially with experienced teachers, but inexperienced teachers might need more theoretical knowledge about teaching and learning and linkages between theoretical knowledge and future teaching action.

If pedagogical training does not offer opportunities for reflection and conceptual change, but focuses on changing the teaching strategies of teachers, it is likely to only affect teaching on a superficial level. Learning new teaching "tricks" is likely to be of limited usefulness if there is a lack of pedagogical knowledge or if the teachers' intention and purpose is not to improve teaching to promote the quality of students' learning outcomes, but to improve teaching for the teachers' own comfort (see also Trigwell & Prosser, 1991; Åkerlind, 2007). Thus, teachers applying the same teaching or assessment methods may do so with quite different intentions, and teaching and assessment methods are not likely to be successful and lead to desired learning outcomes for students if carried out inappropriately.

The value of pedagogical courses is gradually being accepted in many countries, although opposite views of the value of such courses are presented at the

same time by some academics. As Åkerlind (2007) suggests, the polarised nature of the current debate may be explained by the different understandings of teaching development. Academics who believe that the best route to improving teaching is to focus on becoming more familiar with what and how to teach, through increasing content knowledge and acquiring practical experience, probably see no use for such courses. On the contrary, academics who see the best route to improving their own teaching through building up a repertoire of teaching strategies and finding out which of these strategies work best for them may value such courses, but only if they focus on teaching methods in an instrumental fashion. The only academics likely to value a theoretically-oriented course are those who see the best route to improving as a teacher as becoming more effective in facilitating student learning. Nicholls (2005) also showed that teachers who associated teaching with transmission of knowledge were most likely to develop more sophisticated skills to facilitate transmission, while those who associated teaching with facilitating learning were anxious to understand and conceptualise the learning process in order to help their students. Thus, it is highly important during pedagogical courses to emphasise the importance of facilitating student learning in the development of teaching.

The results found in this study suggest that pedagogical training, of the form used in the University of Helsinki, enhances the adoption of a consonant learning-focused approach when training is an intensive process. Trigwell and Prosser (1996a) underline that when supporting teachers' development towards consonant learning-focused profiles, it should be acknowledged that dissonance may emerge before a consonant profile can be achieved. McAlpine et al. (2006) found that teacher thinking and specific teaching actions are not always aligned. This may be due to a lack of appropriate knowledge or skill, or due to fear or constraining factors such as departmental expectations about behaviour. Thus, possible uncertainty and confusion of own teaching skills and the possible fear of applying new methods should be dealt with during the introductory courses. An awareness of what good teaching and deep learning is about promotes change during or after the introductory courses. Trigwell and Prosser (1996a) note that if staff reject the higher level approaches to teaching because of a lack of congruence with their conceptions of teaching and learning, then hoped-for improvements in the quality of student learning are unlikely to occur. The introductory courses are likely to be most effective among inexperienced teachers, at least when it comes to self-efficacy beliefs of teachers. Overall, pedagogical courses should be recommended to all new teachers in order to shape their teaching beliefs and strategies from the beginning. With more experienced teachers the training should offer opportunities to reflect on prior experiences and gradually build new knowledge with respect to their prior understandings and experiences. It should also be acknowledged that not all experienced teachers act as experts, but sometimes inexperienced teachers might be more experts than 'experienced non-experts' (see Bereiter & Scardamalia, 1993). Therefore, an introductory course (10 ECTS) is useful for all higher education teachers, regardless of their teaching experience, if carried out effectively.

During the course the teachers should be able to set individual goals and focus on themes they find important for themselves. Learning leads to individually different outcomes even in the same learning situations and when the same content

is being learned (Tynjälä, 1997). Thus, besides the general and common goals of the courses, individuality should be respected as well. However, in asking teachers themselves what they want to learn during the courses, it does little to generate new fields of interest in professional development (see Knight et al., 2006). Thus, combining the teachers' own interests and needs with the goals set by the developers of the courses might work best.

In most European countries pedagogical training of higher education teachers is optional. The literature suggests that intrinsic motivation is needed for successful learning while extrinsic motivation may lead to a reproductive orientation in studying (Bowden & Marton, 1998; Purdie & Hattie, 1995). Thus, higher education teachers should be made aware of the benefits of such training. Some teachers might not always realise the benefits of such improvements and thus do not value pedagogical courses. However, teachers who lack intrinsic motivation are likely to benefit from pedagogical courses as well if the purpose and meaning of such courses is made explicit. At least they will become aware of what kind of teaching enhances student learning, even if they did not consciously want to change their own ways of teaching. When understanding of teaching and learning becomes more sophisticated, a change is more likely, both in conceptions and strategies (see Martin & Lueckenhausen, 2005).

During the pedagogical courses teachers should gain a broader picture of teaching and learning in higher education. A central tool to foster this goal is the use of discussions with other teachers. Since there have been shown to be disciplinary differences in approaches to teaching, the discussions are likely to be most useful if carried out in multidisciplinary groups. Furthermore, experienced and inexperienced teachers can offer many insights to each other. Previous research shows that teachers working together in pairs or larger groups can develop their understanding (see e.g., I'anson, Rodriques & Wilson, 2003). Moreover, peer-assisted learning offers several benefits for learning, such as the development of metacognitive skills, more active learning, immediate feedback and greater student ownership of the learning process (Topping, 1996; Trigwell, 2005). Furthermore, cooperative and peer learning has been shown to be powerful in promoting conceptual change (Sinatra, 2002). Another central tool to develop an understanding of teaching is teachers' own projects during the course which deal with teaching and learning in general and their own teaching as well. Such projects promote reflection and thus improve conditions for conceptual change. All in all, pedagogical training should promote teachers' reflection, communication, pedagogic content knowledge and an awareness of pedagogic research. These skills are the core ideas of the models of scholarship of teaching and thus, pedagogical training has a crucial role in developing scholarly teaching.

The primary aim of pedagogical courses should be to help the participants of the courses to become more effective in facilitating student learning. If this is to happen, the aims of the courses should be designed to foster this goal. However, Gibbs and Coffey (2000) found that not all programmes aimed to develop academics' understanding of teaching and learning as a means to improve student learning. Some programmes aimed at helping academics to develop key behavioural skills for teaching competence. Thus, educational developers' understand-

ing of what developing as a university teacher can mean should be fostered as well. Åkerlind (2007) highlights that matches and mismatches between academics' and developers' views of how best to approach teaching development are obvious, since understandings of what developing as a university teacher can mean vary.

In Finland teaching merits should be taken into account when filling academic posts in order to enhance high quality teaching. This would motivate the teachers to participate in pedagogical courses and to develop their teaching skills. Another challenge in Finland concerns the national pedagogical training program, which is currently under consideration.

Developing as a university teacher after pedagogical courses

The results from Study II implied that changes are not likely to occur after the pedagogical courses if the teacher does not continue his/her studies. Furthermore, pedagogical courses may cause dissonance in teachers' approaches to teaching or between conceptions and approaches. Berliner (2001) suggests that a reasonable time for expertise to develop in teaching appears to be five or more years. Therefore, it is highly important to consider how teachers could be helped to continue the development of pedagogical thinking and skills after the pedagogical courses. The courses should provide tools for continuous development.

Guskey (2000) suggests that training sessions should be supplemented with additional follow-up activities to provide the feedback and coaching necessary for the successful implementation of new ideas. If the continuous development of teachers is desired, occasional meetings could be arranged after the courses where the supplementation of new ideas as well as other current issues related to teaching and learning could be discussed. In addition, the peer groups could be encouraged to continue their meetings after the courses since reflection is difficult when done in isolation. Discussions with colleagues after the training could foster reflection of individual teachers (see Kuit, Reay & Freeman, 2001). Teachers should be encouraged to continue reflection after pedagogical courses because reflection leads to self-knowledge which is fundamental to the development of professional expertise. Furthermore, teaching portfolios are a concrete tool in developing an individual's teaching. During the courses the use of such portfolios could be elaborated so that after the courses the teachers would be able to continue the development of their own teaching with the help of their portfolios. Finally, the teachers could be supported to spread new ideas to their own departments. Most importantly, teachers should feel free to apply new ways of teaching after the courses in their departments and the atmosphere should be open and encouraging for the new implementations. Heads of departments have a central role in creating such an atmosphere in their own units.

Moreover, every day presents a variety of learning opportunities. These opportunities occur every time a lesson is taught, a professional journal is read, a classroom activity is observed or a conversation takes place with another teacher (see Guskey, 2000). Thus, the courses should be designed to encourage the teachers to realise and utilise these multiple learning opportunities. Knight et al. (2006) stated that simply doing the job of teaching in higher education was considered a more

common way of learning to teach than workshops, conversations with colleagues or formal courses. However, the present study suggests that formal pedagogical training is needed to support the daily tasks of teachers in higher education.

6.2 Approaches to teaching and student learning

In developing teaching in higher education, the overall aim is to enhance student learning. Learning-focused teaching has been taken for granted in improving student learning. There is, however, only one study showing a relationship between approaches to teaching adopted by a teacher and approaches to learning adopted by his/her students (Trigwell et al., 1999). Furthermore, the participants of the study were only first-year chemistry and physics students and their teachers. The results showed that if a teacher adopts a teacher-focused approach to teaching, the students are more likely to adopt a surface approach to learning. If a teacher adopts a more student-centred approach to teaching, the students are more likely to adopt a deep approach to learning. It should be remembered, however, that activating methods are not the same as learning-focused teaching and lecturing is not the same as content-focused teaching. What makes teaching learning-focused, is the larger whole of teaching conceptions and strategies, and the teaching-learning culture of the department and university has a central role in facilitating the learning-focused teaching of an individual teacher as well. The purpose of such learning-focused teaching is about teaching 'for the students' and about activating students' own thinking and reflection. Therefore, learning-focused teaching, as understood as a 'mode of thinking', not as a set of methods, is most likely to have a positive effect on student learning. In order for learning-focused teaching to have a positive effect on learning, it should be carried out systematically and holistically from the beginning of the course to its end.

For meaningful learning to occur, students should favour a deep approach to learning. However, not all students are able to adopt a deep approach, but continue to learn new information superficially if that was their way of learning before university studies. Thus, students should be made aware of the benefits of adopting a deep approach to learning. Higher education teachers have a central role in promoting that change. To increase the probability that students will favour a deep approach, teachers should demonstrate the potential relevance for the learning, offer students choices and structure a reasonable student workload (see McAlpine, 2004). Furthermore, research has shown that teachers who approach teaching in learning-focused terms are likely to have students who adopt a deep approach to learning (Trigwell et al., 1999). On the other hand, when instruction concentrates on detailed and specific knowledge, it is difficult for students to form a coherent whole of the studies (Brown, Collins & Duguid, 1989). However, it is possible that some teachers adapt their approach to teaching in response to the requests of students, for example, to go through problems in a teacher-focused manner. Overall, the teaching-learning relationship is complex, since teachers do not experience the same world as students do. Furthermore, teachers can only strive to reinforce a deep approach, because the approach adopted is dependent on the individual student (see McAlpine, 2004). However, teachers need to be aware that desired stu-

dent learning is more likely when students see information in relation to their own experiences, than when the teacher aims for a direct transfer of information to students (see Prosser et al., 2003). To promote deep learning of students in higher education, teachers must be aware of the relationship between teaching and learning and to develop their teaching from 'teaching for the teacher' to 'teaching for the students'. Furthermore, the overall atmosphere in the departments affects student learning. In departments with a greater propensity towards learning facilitation, students adopted a deep approach to learning more likely than a surface approach (Kember & Gow, 1994). Promoting self-efficacy beliefs of teachers in pedagogical courses is essential, since teachers with a high sense of efficacy not only believe that their students are capable of mastering curricula objectives, but also that they are capable of motivating and instructing students successfully (see Ashton & Webb, 1986). Research has shown that as teachers become more able to understand and use different ways of teaching, their sense of self-efficacy increases (see Timperley & Phillips, 2003). Thus, if pedagogical training enhances the adoption of a learning-focused approach to teaching, it is likely to have a positive effect on the self-efficacy beliefs of teachers as well.

6.3 Enhancing pedagogical development outside pedagogical courses

Although pedagogical training is highly important in developing the pedagogical expertise of teachers, the value of authentic work should not be underestimated. Pedagogical courses could at best function as a 'mirror' for the actual work of teachers and support their teaching investments. Bereiter and Scardamalia (1993) defined expertise as a process of progressive problem solving in which people continuously rethink and redefine their tasks. Working at the limits of their competence and continuously surpassing themselves are peculiar to experts. Therefore, pedagogical courses should provide opportunities for such rethinking and redefining, as well as challenge the teachers to 'surpass' themselves.

In the UK, some educational development units have paid less attention to formal courses and begun to address working collaboratively with academic departments. There is a tension between those who see that pedagogical development should develop individual skills at helping students to obtain good learning outcomes, and those who are concerned to enhance the systems' capacities to promote a range of achievements (Knight et al., 2006). The benefit of formal courses is the wide range of participants from various departments, which is most likely to widen to a perspective of participants in teaching-related issues. Furthermore, such courses give teachers the opportunity to think about and reflect on their own teaching quietly. Individual teaching skills and thinking are, after all, a sensitive and personal matter. Collaboration with departments can, however, offer tools for the development of the department as a whole. On the other hand, while training is a more short-term practice, departments can offer a more long-term basis for pedagogical development. There might be cultural differences in which way works better in enhancing teaching and learning. However, improved perspectives and approaches to teaching of individual teachers should be bridged in the depart-

ments. Departments can support the development of their teachers in many other ways as well. For example, novice lecturers' could be enabled to become involved in the departments' 'community of practice' through social interaction (see Fanghanel 2004). All in all, innovations related to teaching and learning should be given a high priority in departments or other units.

Although the development of teaching is highly important among higher education teachers, it should be kept in mind that for many academics doing research is a major part of their work. In order to improve student learning in higher education, the traditional opposition of research and teaching should be replaced by the idea that scholarship exists in all aspects of academic work. Teaching should be viewed as a part of the larger whole of academic work, where teaching and research support each other (see Boyer, 1990). For example, research-based teaching is an effective way of combining research and teaching. Teachers can teach their own research topics, support their students to engage in the teachers' research projects or even conduct research on their own teaching or on teaching and learning in general.

6.4 Future research

The most important field of research in the future should be profound research on the relations between teachers' approaches to teaching and students' approaches to learning. The research setting is challenging, however, since teachers teaching similar courses with a large number of students should participate in such a study in order to be able to compare the learning outcomes of both learning- and content-focused teachers or those adopting a dissonant profile. Furthermore, the teaching/learning situation should be observed in order to compare the approaches adopted by the teachers, since self-reports of teachers of their own approach to teaching are not objective. It would be highly important to listen to the students' voices in exploring the effect of approaches to teaching on learning.

In addition, future research should focus on the representativeness of the two approaches to teaching in higher education, since most of the participants of the present study were interested in developing their own teaching. If teachers with a high interest in research and with low or no interest in teaching could be examined, the proportion of content-focused teachers might be higher and furthermore, we could find some totally new phenomena about the content-focused way of teaching.

Furthermore, qualitative analysis of the effect of pedagogical training on teaching should be explored in order to deepen the understanding of the effect of pedagogical training on teaching. Such investigation could give us more information on the most effective form of pedagogical training. The analysis should focus, for example, on how pedagogical training affects teaching among novice teachers and experienced teachers. Further research in this field of pedagogical training in higher education is needed, as stated by many researchers (Gilbert & Gibbs, 1999; Coffey & Gibbs, 2002; Gibbs & Coffey, 2004; Norton et al., 2005) since pedagogical training in higher education is a relatively new phenomenon in most countries and it is becoming more common around the world. Furthermore, previous stud-

ies on the effect of pedagogical training on teachers' approaches to teaching or conceptions of teaching conflict with each other. The different outcomes may be due to different research settings or different course designs. Further research is needed to clarify what kind of pedagogical training is most effective in promoting change.

An important research question is how departments and other surrounding structures could effectively support the development of pedagogical expertise of teachers. For example, the cognitive apprenticeship could be applied in higher education contexts so that excellent teachers model examples of their best practices in teaching and learning environments to teachers who seek to improve their teaching.

Most importantly, the development of teaching in higher education needs to be research-based. Extensive research on various topics concerning teaching and learning in higher education is needed in the future to enhance the quality of teaching and learning. Moreover, it would be highly important to give opportunities for individual teachers to conduct pedagogical research on teaching and learning in their own disciplines.

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Appendices

Appendix A

THE INVENTORY

Background information

The aim of our international research group is to explore university teachers' approaches to teaching. We ask you to choose a teaching context that represents your principal way of teaching.

1. Describe the teaching context below (subject, course, number of students, learning situation, teaching methods)

2. Name: _____

3. Age: _____ years

4. Gender: 1 male 2 female

5. Your discipline: _____

6. How would you describe your academic expertise? In the following list we have described different kinds of levels of expertise. Please choose the alternative which is closest to your own conception of yourself as an expert.

1 novice / Ph.D. student / I have published only a few articles

2 I have published some articles / I have a doctoral degree / I am involved in a research project as a senior researcher

3 I have published several articles or books / I supervise Ph.D. students / I have an own research project / I have international contacts

4 I am a nationally and internationally known researcher / I have supervised several Ph.D. students

5 I don't recognise myself from the list above, I would describe my expertise in the following way: _____

7. How many years of experience do you have from university teaching? _____ years

8. Have you participated in pedagogical courses for university teachers? 1 yes 2 no

9. If you have, would you tell what and how many credits?

10. Estimate how much your work consists of

- | | | |
|----|----------------|---------|
| a) | teaching | _____ % |
| b) | research | _____ % |
| c) | administration | _____ % |
| d) | other tasks | _____ % |
| | | 100 % |

Think about the teaching context, which you described in the first page. Answer Parts 1 and 2 keeping in mind this teaching context. Please describe here the course that is the subject of your response:

PART 1 of the inventory is designed to explore 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 courses or subjects.

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

- 1 – this item was **only rarely** 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** 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	I design my teaching in this course with the assumption that most of the students have very little useful knowledge of the topics to be covered.	1	2	3	4	5
2	I feel it is important that this course should be completely described in terms of specific objectives relating to what students have to know for formal assessment items.	1	2	3	4	5
3	In my interactions with students in this course I try to develop a conversation with them about the topics we are studying.	1	2	3	4	5
4	I feel it is important to present a lot of facts to students so that they know what they have to learn for this course.	1	2	3	4	5
5	I feel that the assessment in this course should be an opportunity for students to reveal their changed conceptual understanding of the subject matter.	1	2	3	4	5
6	I set aside some teaching time so that the students can discuss, among themselves, the difficulties that they encounter studying this course.	1	2	3	4	5
7	In this course I concentrate on covering the information that might be available from a good textbook.	1	2	3	4	5
8	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
9	In teaching sessions for this course, I use difficult or undefined examples to provoke debate.	1	2	3	4	5
10	I structure this course to help students to pass the formal assessment items.	1	2	3	4	5
11	I think an important reason for running teaching sessions in this course is to give students a good set of notes.	1	2	3	4	5
12	In this course, I only provide the students with the information they will need to pass the formal assessments.	1	2	3	4	5
13	I feel that I should know the answers to any questions that students may put to me during this course.	1	2	3	4	5
14	I make available opportunities for students in this course to discuss their changing understanding of the subject matter.	1	2	3	4	5
15	I feel that it is better for students in this course to generate their own notes rather than always copy mine.	1	2	3	4	5
16	I feel a lot of teaching time in this course should be used to question students' ideas.	1	2	3	4	5

PART 2 of the inventory is designed to explore aspects of motivation and interest in teaching a specific course. Please circle the number that best fits your response on a scale from strongly disagree (1) disagree (2) neutral (3) agree (4) strongly agree (5).

		strongly disagree				strongly agree
17	I am confident that my knowledge of this subject matter is not a barrier to teaching it well.	1	2	3	4	5
18	In this course it is difficult for me to know whether I have taught successfully.	1	2	3	4	5
19	I am confident that students will learn from me in this course.	1	2	3	4	5
20	When I am not satisfied with my teaching in this course, I try to analyse how I could improve it.	1	2	3	4	5
21	I am certain that I have the necessary skills to teach this course.	1	2	3	4	5
22	Teaching on this course has been a very satisfying experience.	1	2	3	4	5
23	I make use of my teaching experiences from other courses when teaching this course.	1	2	3	4	5
24	I am very interested in the content of this course.	1	2	3	4	5
25	I am often uncertain about how I should teach this course.	1	2	3	4	5
26	I like teaching the subject matter of this course.	1	2	3	4	5
27	I tend to teach all my courses in the same way.	1	2	3	4	5
28	It is important to me that my teaching of this course leads to student learning.	1	2	3	4	5
29	I have not learned anything myself during the teaching of this course.	1	2	3	4	5
30	I am confident that my knowledge of teaching is not a barrier to teaching well.	1	2	3	4	5
31	It is important to me that students learn about the subject matter of this course.	1	2	3	4	5
32	I feel that the tradition of teaching in my department largely determines how I teach.	1	2	3	4	5

If you would like to make any written comments, please include them here.

Request for an interview

In the future we will conduct an interview research based on this survey. If you are interested in participating in this research, we ask you to write here your contact information.

I am willing to participate in an interview

Name:

Address:

Tel:

E-mail:

Appendix B

THE INTERVIEW THEMES

1. Describe yourself as a teacher.
2. Describe your teaching strategies.
3. What are the most important elements in your teaching? How do you acknowledge these in your own teaching?
4. What kind of experiences do you have as a student? How have you been taught when you were studying? How do these experiences affect your own teaching?
5. Describe your teaching history. What have you taught and how? Why have you taught the way you described?
6. How does your teaching experience affect you way of teaching? How have your teaching methods changed since you started teaching?
7. If you have participated in pedagogical courses organised for university teachers, how has it affected your teaching? OR
If you have not participated in such courses, what kind of challenges you have in your teaching and what kind of pedagogical training or support you would like to have?
8. Describe the teaching traditions of your discipline. How does your own discipline and its' teaching traditions affect your teaching?
9. What is the relationship between research and teaching in your own work? How do you combine these in your work? How do you utilise your research in your teaching?