The research-teaching nexus in the humanities : variations among academics

Visser-Wijnveen, G.J.

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The research-teaching nexus in the humanities: Variations among academics

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Gerda Jessica Visser-Wijnveen

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Promotores
Prof.dr. N. Verloop
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Overige leden
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Dr. D.E.H. Tigelaar, Universiteit Leiden

Voor mijn Wilfred

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Chapter 1

Introduction

1. Introduction

1.1 Relevance

Universities worldwide are struggling with their identity (Barnett, 1999, 2003). They consider themselves knowledge institutions, but what kind of knowledge is it they focus on and to what end? What is their main aim, what do they contribute to society and why are they organised as they are organised? As the variety in universities increases these questions play an even more important role. In 2002 twelve leading European research universities took the initiative to start the League for European Research Universities (LERU) by which they wanted to establish themselves at the forefront of European higher education policy. This league is focused on promoting fundamental research as the ultimate source of innovation in society, and also stresses the value of high-qualitative teaching in an environment of internationally competitive research (Boulton & Lucas, 2008). The increasing expectations put on universities and other higher education institutes, including the general recognition of their importance for the knowledge society, caused the need for universities to redevelop and rethink their own place in society and consequently their internal organisation (Leisyte, Enders, & De Boer, in press).

Most western universities are based on the university model of Wilhelm von Humboldt, who promoted the unity of research and teaching (Boulton & Lucas, 2008; Simons, 2006). Schimank and Winnes (2000), however, state that this unity was never truly established. In today's universities the main element is that academics do both research and teaching, but at different times and in different situations instead of simultaneously. Many researchers stress the important shift in higher education in recent decades, during which the universities changed from elite, small-scale institutions to large open institutes: the so called 'massification' of higher education (Barnett & Griffin, 1997; Brew, 2003; Elen, Lindblom-Ylänne, & Clement, 2007; Robertson & Bond, 2001; Schimank & Winnes, 2000; Smeby, 2003). In the 1950s only about 5% of each cohort went to higher education institutes in Europe, but this figure increased to about 20-30% in the 1990s (Schimank & Winnes, 2000). In the Bologna Declaration 29 European countries agreed on aiming at even greater percentages of each cohort entering higher education institutes by 2010 (European Ministers of Education, 1999). This enormous increase in student numbers led to increasing demands of the university as a whole, and especially of individual academics. These academics are expected to accomplish teaching tasks, carry out research activities, be involved in

administration, and preferably also serve society by disseminating their research in various ways. We see a worldwide increase of scientific publications, leading to higher expectations from and demands on individual scholars (Smeby, 2003). Furthermore, staff/student ratios increased, while at the same time international attention to teaching and student learning increased. This trend is reflected in the Scholarship of Teaching and Learning movement (Kreber, 2007) and the tightening of qualifications required for teaching in universities worldwide. In the Netherlands this trend is visible in the recent agreement between all universities regarding the Basic Teaching Qualification (Basis Kwalificatie Onderwijs) (VSNU, 2008).

One of the most important issues regarding the identity of the university is the link between research and teaching. Elen and Verburgh (2008), for example, studied the link between research and teaching in eight LERU-universities from an educational perspective and showed that academics consider a close link between research and teaching to be the heart of these research-intensive universities. However, many universities are moving to a post-Humboldtian pattern in which research and teaching are driven apart because of separate roles of staff, separate funding mechanisms, and partly organisational distinctions (Leisyte et al., in press; Schimank & Winnes, 2000). Therefore, many universities are looking for (new) ways of uniting research and teaching, that may benefit both research and teaching, and academics as well as students.

1.2 Theoretical framework

1.2.1 Quantitative and qualitative studies into the research-teaching nexus

The studies into the research-teaching nexus can be divided into two main streams. The first stream is focused on empirical correlations between research and teaching, the second on academics' and students' perceptions of the relationship between research and teaching. In 1996 Hattie and Marsh conducted a meta-analysis regarding the first stream. To prove or disprove the relationship between the individual academics' research quality as measured by citation indexes, and teaching quality as measured by student satisfaction they analysed the many studies conducted in the 1970s and 1980s. They conclude that 'the common belief that research and teaching are inextricably entwined is an enduring myth. At best, research and teaching are very loosely coupled' (Hattie & Marsh, 1996). However, they claim that universities should aim for the improvement of the research-teaching nexus, by looking for ways to create supportive circumstances in which teaching and research meet. This claim is,

among other things, based on the finding by many researchers (Elton, 1986; Jensen, 1988; Neumann, 1993) that academics value the link between research and teaching and have a great belief in the existence of the link. However, according to administrators and academics the status and position of these tasks in the university are different. Normally, research is given a higher status than teaching, which might be due to problems identifying quality teaching; there are standards for research, although these are not undisputed (Rowland, 1996). This difference is expressed for instance by differences in reward systems (Serow, 2000). Strengthening the nexus should therefore include both university policy (Colbeck, 1998; Stoecker, 1993) and approaches to research, scholarship and teaching (Barnett, 2005). The latter is the focus of this research project.

As stated above, the second stream of the literature focuses on academics' and students' perceptions of the link between research and teaching (Jenkins, Breen, Lindsay, & Brew, 2003). The overwhelming belief among academics in a symbiotic relationship has already been noted (Jensen, 1988; Neumann, 1993; Robertson & Bond, 2005). What, then are the perceived benefits and why do these not show up in the meta-analysis by Hattie and Marsh (1996)? With regard to the latter question, a number of researchers (Brew & Boud, 1995; Elton, 1986; Griffiths, 2004) emphasise that most correlational research restricts itself to very narrow definitions of research and teaching. Moreover, the various conceptions of research and scholarship prevalent among academics are not taken into account (Brew, 2001; Moses, 1990; Neumann, 1993), and neither are important conceptions such as the conceptions of teaching (Kember, 1997; Prosser, Martin, Trigwell, Ramsden, & Middleton, 2008) or knowledge (Robertson & Bond, 2003; Rowland, 1996), which mean different things to different academics. The meanings academics attribute to these concepts are important mediators of what the link between these concepts might be and should, therefore, not be neglected. So, these conceptions need to be included to gain a better understanding of the perceived or desired symbiosis of research and teaching.

In general, academics are in favour of a strong link between research and teaching, although they notice that both activities are increasingly breaking apart (Leisyte et al., in press). The perceived benefits are largely one-directional, namely going from research to teaching, although benefits going in the opposite direction are reported as well (Coate, Barnett, & Williams, 2001; Jensen, 1988). Jensen (1988) found that research is supposed to raise the level of teaching by introducing complex problems, building bridges towards the developments in the

field, and creating research-like learning environments for the students. Teaching primarily contributes to research in broadening academics' views, and scholarly vitality is maintained by the interaction with the students (Neumann, 1992). Perceived problems concern interference of interest, an imbalance in the appreciation of research over teaching, and lack of time (Colbeck, 1998; Stoecker, 1993). The advantages and disadvantages as perceived by students reflect the scholars' perceptions. Teachers' lack of time and interest is seen as problematic (Healey, Jordan, Pell, & Short, in press; Lindsay, Breen, & Jenkins, 2002), while students value being taught by a researcher as more intellectual challenging (Neumann, 1994; Robertson & Blackler, 2006). In Chapter 5 the perceived benefits and disadvantages perceived by the students will be discussed in detail. This research project can be considered part of the second stream of research-teaching nexus studies, in which the views of academics are taken as the point of departure.

1.2.2 The importance of variety

In the last decades several researchers have come up with models to characterise the research-teaching nexus. Most models or categorisations present ways to use research for the benefit of the students. Teacher-student interactions are seen as important features of a successful link between research and teaching (Elsen, Visser-Wijnveen, Van der Rijst, & Van Driel, 2009). However, there is an enormous variety in the ways in which academics connect research and teaching, including explicit or more implicit relations between aspects of research and teaching. Several researchers (Griffiths, 2004; Healey, 2005; Neumann, 1992; Robertson, 2007) have suggested models or categorisations to point out the different forms that the research-teaching nexus can take. An extensive discussion of these categorisations can be found in Chapter 3. In the humanities and social sciences more opportunities to link research and teaching are reported than in the natural sciences, but this distinction is only present in undergraduate education (Smeby, 1998). Furthermore, Brew (2003) argues that the university tradition of disciplinary divisions hinders the establishment of a strong connection. She suggests leaving these boundaries behind us and start working towards communities in which students and academics learn together (Brew, 2006).

The diversity shows that there is not just one single way to link research and teaching. Actually, the fact that we speak about the research-teaching nexus might cause confusion as this might suggest that there is an optimal way of connecting the two. Until now, no evidence has been found that suggests one

optimal way; on the contrary it is argued that different forms of linking research and teaching offer different gains to academics and students (Elsen et al., 2009; Zamorski, 2002). Hence, variety should be encouraged instead of striving for one specific form of the relation. As many authors argue the potential influence of disciplinary variation (Barnett, 2003; Robertson, 2007) it seems wise to be aware of disciplinary characteristics when designing studies regarding the research-teaching nexus. In Chapter 4 the disciplinary variety is specifically addressed.

1.2.3 The importance of beliefs

Several authors (Brew, 2003; Robertson & Bond, 2001; Rowland, 1996) emphasise the importance of taking academics' conceptions of research and teaching into account in the discussion about the research-teaching nexus. These conceptions are fundamental to scholars' attempts to link research and teaching. A variety of conceptions of research (Brew, 2001) and teaching (Samuelowicz & Bain, 1992) are reported, and these various inevitably lead to different forms of linking research and teaching. For example, when research is seen as group work and a highly qualified job, and teaching as the transmission of knowledge, there is little common ground, and linking research and teaching might consist of transmitting the results of this group work to the students. However, if research is seen as mainly integrating various data sources and teaching as engaging students in thinking skills, the link might be to include students in parts of the research process. So, these different views on research and teaching greatly affect the potential relations between the two as seen by academics. Moreover, these influence the way the actual link is perceived and implemented.

From a more general point of view beliefs are considered important factors in academics' actions. The terms 'beliefs' and 'conceptions' are used interchangeably in this manuscript, as in general the former is used in the literature about teacher education, while the latter is more common in higher education literature, due to its long phenomenographic tradition (see also Hativa & Goodyear, 2002). Academics are supposed to base their practices to some extent on the theories they hold (Samuelowicz & Bain, 1992). Beliefs colour how individuals experience phenomena and how they interpret and recall situations (Pajares, 1992). This is the adaptive function of beliefs: allowing individuals to relate to the world around them. Furthermore, beliefs are considered not easily changeable. This first of all applies to core beliefs, less to peripheral beliefs (Pajares, 1992). In the debate about the research-teaching nexus academics' conceptions of knowledge, research, and teaching are regarded as core beliefs.

These are considered central to the meaning academics yield to academic practice, while their view on the nexus itself is seen as following from these conceptions (Robertson & Bond, 2001; Rowland, 1996), and therefore as more peripheral.

1.3 Context and research questions

The research project central in this thesis consisted of two studies, the first focusing on academics' beliefs and the second on academics' practice. Both studies were carried out in the Faculty of Humanities of Leiden University. Our approach of looking in one area in depth was advocated by Becher (1994), who warned against the risk of overlooking certain features of the nexus by focusing only on comparative studies regarding disciplines in different academic areas. However, in recent years most studies into the research-teaching nexus have focused on the sciences or have provided comparisons between a few subjects from various academic fields. Concentrating on one faculty, that in itself contains great variety, might uncover specific features of the research-teaching nexus for this part of the academic world. An in-depth study in one area might raise new issues concerning the research-teaching nexus, which then make it necessary to pay attention to related aspects in other academic areas.

Before we turn to the research questions we will briefly explain the specific features of the faculty in which the research was conducted. The Faculty of Humanities, formerly the Faculty of Arts, of Leiden University is a broadly oriented faculty and known for the great variety of languages and regions studied. In the years our data was collected (2006 – 2008) the faculty had three main disciplines: history and art history, linguistics, and literature and culture. These disciplines are subdivided into a wide variety of regions including Latin America, Africa, Asia, and most parts of Europe. Because of the rich diversity of languages and cultures studied, many departments are relatively small and so are the student numbers: the average staff/student ratio is 1:9. However, student numbers vary largely depending on the subject. History and Chinese are popular, for example, while languages and cultures from the Middle East or Southern Asia attract only a small number of interested students. The great majority of staff appointments include both research and teaching tasks. Formally, 30-40% of their time should be devoted to research, but many academics report spending far more than half of their time on teaching and administration. So, many academics experience a great teaching load, at the expense of research. A small number have been appointed only to teach language courses. During the research project reorganisations were

taking place in which research institutes were rearranged and extensive discussions about reorganising educational programmes were held.

Our main interest concerned academics' conceptions of the research-teaching nexus in the Faculty of Humanities, and how these conceptions were related to other views they hold and to their practice. Therefore, our study focused on the following questions:

- Chapter 2: What are the relations between the conceptions of knowledge, research, and teaching held by academics in the humanities?
- Chapter 3: What variations in ideal images of the research-teaching nexus can be found among academics in the humanities?
- Chapter 4: How is the preferred research-teaching nexus related to conceptions of knowledge, research, and teaching, and to (disciplinary) background?
- Chapter 5: In what ways do academics in the Faculty of Humanities integrate research in their teaching when encouraged to, and what learning outcomes do their students report?
- Chapter 6: What change patterns occur in academics' conceptions of the research-teaching nexus when they intentionally integrate research in their teaching?

1.4 Outline

1.4.1 First study

Chapters 2, 3, and 4 are based on the first study. In this study 30 academics in the Faculty of Humanities, evenly distributed over the various disciplines, were interviewed. The interviews were conducted in June and July 2006 and consisted of three parts. The first part included questions related to the participants' backgrounds, the second part consisted of metaphors related to knowledge, research, and teaching, and the last part focused on ideal images of the research-teaching nexus. In Chapter 2 the metaphor study is discussed in which academics' conceptions of knowledge, research, and teaching are investigated and related to each other. In Chapter 3 ideal images academics in the faculty hold about the research-teaching nexus are described, and five forms of linking research and teaching are distilled from these. In Chapter 4 the conceptions of knowledge, research, and teaching from the metaphor study are related to the ideal images study, and to academics' backgrounds regarding their disciplines, sexes, ages, and positions.

1.4.2 Second study

Chapters 5 and 6 are based on the second study. In this study twelve academics from the Faculty of Humanities were followed for the duration of one term, more precisely September 2007 until January 2008, focusing on one course they taught in which they strengthened the link between research and teaching. Their main task was to enhance the research-teaching nexus in the way they thought most fruitful, both for themselves and their students. The design of the study is graphically represented in Figure 1.1. In Chapter 5 the focus is on the courses themselves: course design as investigated via course goals and course programmes and course practice as investigated via weekly logs and group interviews with students. In Chapter 6 academics' beliefs are the centre of attention, measured at the start and end of the term with the use of Q-sorts, the focus is on any changes that occurred during the intervention.

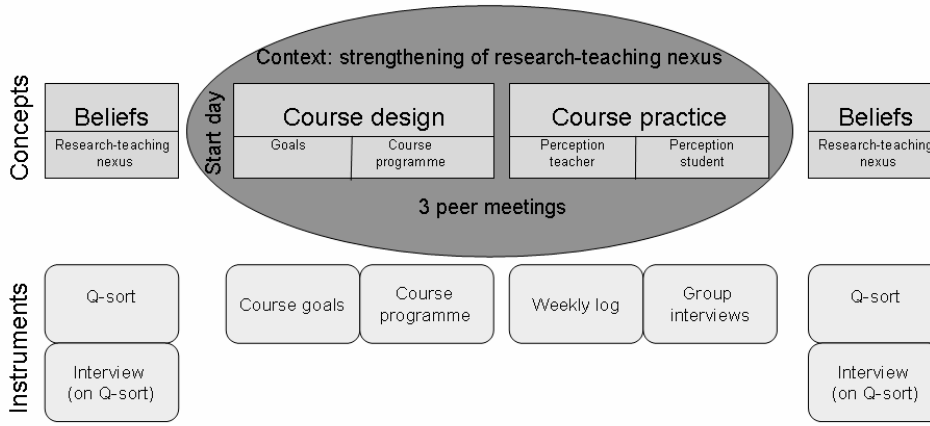

Figure 1.1 Conceptual representation of study 2

Chapter 2

The relationship between academics' conceptions of knowledge, research, and teaching – a metaphor study

2. The relationship between academics' conceptions of knowledge, research, and teaching – a metaphor study[1]

Universities are supposed to be institutes where research and teaching are closely related. To understand this relationship fully it is necessary to learn how academics perceive these key components. Different conceptions among academics may stem from varying conceptions of knowledge. Thirty academics were interviewed by means of metaphors about their conceptions of research, teaching, and knowledge. Academics' conceptions of knowledge ranged from knowledge as facts in an external world to knowledge as a personal construction. Their conceptions of research ranged from research as disclosing patterns to research as creating patterns. Their conceptions of teaching ranged from teaching as knowledge transmission to teaching as encouraging critical thinking. Regarding the relationships between these conceptions, academics' conceptions of knowledge and research were shown to be closely linked, while their conceptions of teaching had a weaker association with their conceptions of knowledge and research.

[1] Accepted in adapted form as Visser-Wijnveen, G.J., Van Driel, J.H., Van der Rijst, R.M., Verloop, N., & Visser, A.. The relationship between academics' conceptions of knowledge, research and teaching – a metaphor study. *Teaching in Higher Education.*

2.1 Introduction

2.1.1 Research-teaching nexus

Research and teaching are the two main tasks of universities. They are supposed to be closely related, at least since universities adopted the Humboldtian idea about the purpose of the university. According to Wilhelm von Humboldt, the essence of the university is the common pursuit of knowledge by teacher and student (Simons, 2006). This implies a unity of research and teaching. As universities have been going through significant changes in recent decades, this relationship has been a popular theme in higher education research. Besides the common pursuit of knowledge, which refers to the idealistic approach, there are many reasons to strengthen the research-teaching nexus from a functional approach (Simons & Elen, 2007). Rowland (1996), for example, stated that closer relationships between research and teaching can provide the basis for improving the quality of university teaching. A strong link between research and teaching is seen as an essential part of academics' job satisfaction. A closer relationship between research and teaching would offer a solution for the clash of interests now encountered by academics. Furthermore, students perceive a strong link between research and teaching as conducive to their learning process. When academics incorporate research into their teaching, students perceive these courses as up to date, stimulating intellectual curiosity, and giving the impression that staff are enthusiastic about what they are teaching (Jenkins et al., 2003).

The studies into the research-teaching nexus can be divided into two main streams: correlational research on the one hand, and qualitative research into academics' beliefs and experiences on the other. The results of many correlational studies were brought together by Hattie and Marsh (1996) in their meta-analysis of 58 studies on the research-teaching nexus in all kinds of higher education institutes worldwide. They concluded that there is little or no relationship between research and teaching. However, what they actually found was no relationship between research productivity and teaching effectiveness (Brew & Boud, 1995). It can be concluded that the approach to the research-teaching nexus in correlational studies has been narrow, and based on a limited interpretation of both research and teaching, so that the assessment of the relationship has been incomplete. In order to understand the research-teaching nexus better, several researchers have used other definitions and indicators of research and teaching than ratings, and have looked at this nexus in a qualitative way. Coate, Barnett, and Williams (2001) describe many different ways in which the relationship between research and teaching can be perceived by academics,

namely as being integrated or independent, and influencing each other positively or negatively. Most qualitative studies indicate that among academics the belief in a symbiotic relationship is very strong (Neumann, 1992).

2.1.2 Conceptions

One of the problems that has arisen in identifying the research-teaching nexus is that the nexus and its components are understood differently by different academics, in other words, they have different beliefs (Brew, 2003). Understanding academics' beliefs is essential if we want to improve educational practice (Pajares, 1992). The question how academics perceive the linkage should therefore be the starting point when researching the research-teaching nexus. In addition to academics' views on the nexus, the underlying concepts also need clarification (Brew, 2003): we need to know more about academics' conceptions of research (one part of the nexus) and their conceptions of teaching (the other part). However, there is a more fundamental concept which might be of great importance, namely knowledge. Individuals' epistemological beliefs greatly influence their conceptions of teaching and research (Brew, 2003). Robertson and Bond (2003) imputed this to the research-teaching nexus, as follows:

> Wherein lies the cause of this difference? We suggest that it is our participants' epistemological and ontological beliefs that shape their understandings of the research, teaching, learning experiential field and hence of the research/teaching relation. In particular, beliefs about the nature of knowledge - what it is, how we create it, how we share it - determine the spatial relationship of research to teaching. (Robertson and Bond, 2003, p. 13)

There is a long tradition of research into teachers' conceptions of teaching in the field of higher education (Norton, Richardson, Hartley, Newstead, & Mayes, 2005). Kember (1997) reviewed 13 empirical studies and concluded that there was a striking overlap between the different studies. The studies showed a high degree of commonality in the categories found. These categories could be placed on a continuum ranging from teacher/content to student/learning. Based on these studies, Kember (1997) suggested a two-level-model in which 'imparting information' and 'transmitting structured knowledge' form the 'teacher-centred/content-oriented' part of the spectrum, followed by a transition category 'student teacher interaction/apprenticeship', and leading to the 'student-centred/learning-oriented' part of the spectrum in which the categories

'facilitating understanding' and 'conceptual change/intellectual development' reside.

The number of studies conducted into conceptions of research is much smaller. Åkerlind (2008a) offered a synthesis of 10 key studies on the broader concept of 'academics' ways of understanding research'. She describes four different aspects that were taken into account in these studies: research intentions, outcomes, questions, and process. Regarding conceptions of research, Brew (2001) distinguishes two dimensions: one concerned with the awareness of the researcher (present or absent), the other with the orientation of research (external products or internal processes). Prosser and others (2008) have paid attention to the nature of the research question, focusing on internal structure or on the relationship with the field of study. Furthermore, they distinguished between working towards facts, concepts, or theories.

Conceptions of knowledge are the object of study in the epistemological tradition. In their review Hofer and Pintrich (1997) considered two features to be important when discussing conceptions of knowledge: the nature of knowledge and the nature of knowing. The nature of knowledge concerns the certainty and simplicity of knowledge: is knowledge fixed or fluid, and are the elements atomistic or integrated? The nature of knowing concerns the source of knowledge and the justification for knowing. According to Rozendaal, De Brabander, and Minnaert (2001) this refers to the origin of knowledge and is closely related to the question of truth. The continuum ranges from whether knowledge exists outside the knower to whether knowledge resides inside the knower.

2.1.3 Metaphors

Academics' conceptions are hard to measure. An important problem is that they cannot be assessed directly, as they are often held unconsciously. Teachers do not always have language to describe their conceptions, or are not willing to describe them, if they hold a view that they believe may be unpopular. Another problem is that conceptions are contextualised (Kagan 1990, 420). Researchers have used many different methods in their attempts to approach them indirectly, depending on the kind of cognition they were trying to capture (Calderhead, 1996). We decided to use metaphors to investigate academics' conceptions. This method was successfully used in the research by Oolbekkink-Marchand, Van Driel, and Verloop (2006a) into teachers' conceptions of teaching and learning.

Metaphors help people to express thoughts which are difficult to express otherwise. The metaphor can be used as a vehicle to say what is actually meant but is difficult to explain. This is due to the fact that experiences do not arrive in single and separate units, but flow from one state to another (Ortony, 1975). Metaphors help people to become aware of their own implicit beliefs and to explicate those beliefs. Another advantage in this research context is that metaphors contain multiple meanings within one image, although they can never embrace the whole phenomenon (Lakoff & Johnson, 1980). Each respondent gives his or her own interpretation of the metaphor, so answers are not limited to categories constructed by the researcher.

2.1.4 Research aim

This research project focused on the way different conceptions of important concepts in the research-teaching nexus, i.e., knowledge, research and teaching, relate to each other. The guiding research question for this research project was: *What are the relations between the conceptions of knowledge, research, and teaching held by academics in the humanities?* Taking our cue from the research by Robertson and Bond (2003), we hypothesised strong relationships between knowledge and research and between knowledge and teaching, and a slightly weaker relationship between research and teaching.

2.2 Method

2.2.1 Sample

Data were collected by semi-structured interviews with 30 academics in a Faculty of Humanities. The purpose of the interview study was to investigate variation, which meant that we needed considerable diversity between our respondents. Previous interviews with staff members of the Faculty of Humanities (formerly the Faculty of Arts) had uncovered three main disciplines in the Humanities; furthermore, the interviewees had reported differences in research tradition and disciplinary culture between the Western and the non-Western language and culture studies. We therefore selected our respondents by stratified sampling. The strata, as indicated by the staff members, were:

- History and Art History:
  - Western;
  - Non-Western;
- Linguistics:
  - Western;
  - Non-Western;

- Literature and Culture:
  - Western;
  - Non-Western.

We also controlled for gender and position. A final condition for selection was the requirement to have both research and teaching obligations. This meant that language skills teachers were excluded, as they do not have a research role. All 30 academics that were invited agreed to participate in the interview study. Each stratum contained five respondents. 43% of the respondents were female. Ages ranged from 30 to 58 years. The respondents included 15 assistant professors, 5 associate professors and 10 full professors.

2.2.2 Interview protocol

Each interview started with some introductory questions about the respondent's background. The respondents were given a few metaphors about the concept 'university' in order to practise the use of metaphors. This allowed the interviewer to explain more about the type of answer expected, especially the level of detail, and the respondents to get comfortable with the method. The respondents were asked to read each metaphor aloud and respond to the notion it evoked with them. Separate metaphors were formulated for the areas of knowledge, research, and teaching. The metaphors were formulated on the basis of other studies which had used metaphors, and on conception studies conducted in other ways. A major criterion for deciding which metaphors to use was the wish to have the metaphors encompass the different aspects or conceptions of the concept, as explained below. The metaphors were presented as clear statements, saying that a concept was 'like' something else, followed by an explanation. This is what is usually referred to as a 'simile', but is widely used under the concept of 'metaphor' in educational research (Martinez, Sauleda, & Huber, 2001) and can be seen as a variant form of the metaphor (Ortony, 1975). Some respondents chose to omit the word 'like' in order to stay closer to the concept of metaphor. After they had responded to all metaphors in a set, the respondents were asked to indicate which metaphor appealed most to them, and why. Finally, they were asked to describe any differences in their conceptions of that concept since they entered the university.

In order to capture variation the knowledge metaphors had to differ on the nature of knowledge and knowing (Hofer & Pintrich, 1997). Some metaphors referred to the nature of knowledge, others to the nature of knowing, more specifically the source. To avoid 'missing' aspects in respondents' answers, we

ensured that most aspects relate to more than one metaphor. As we aimed to stay close to metaphors that are familiar to academics, the chosen metaphors were initially based on knowledge metaphors in Robertson and Bond (2005), who questioned academics on the research-teaching nexus,. The metaphors that emphasised the nature of knowledge were 'pyramid', 'work of art', and 'cloud'. Metaphors that emphasised the source are 'treasure', 'conversation' and 'smell'. The final list of metaphors we used for conceptions of knowledge was as follows:

- Knowledge is (like) a pyramid: stone by stone it is built up to a great height.
- Knowledge is (like) a work of art: it encompasses several meanings.
- Knowledge is (like) a treasure: it is waiting to be found.
- Knowledge is (like) a conversation: it exists only by the grace of interaction.
- Knowledge is (like) a cloud: it changes constantly and has a variable appearance.
- Knowledge is (like) a smell: it is volatile and experienced differently.

Most of the research metaphors in our study were based on Brew's study (2001) on research conceptions, although we sometimes used slightly different terms to create recognisable metaphors. The conceptions she found were: 'domino' (research as synthesizing separate elements) [our puzzle metaphor], 'layer' (research as uncovering underlying meanings) [our excavation metaphor], 'trading' (research as the exchange of products) [our market metaphor], and 'journey' (research as a personal journey) [our journey metaphor]. Her dimensions focus on cognitive and social aspects of research. However, Robertson and Bond (2005) discovered that for some academics 'passion' is something that is strongly associated with research. We therefore added a metaphor for passion [mountain expedition]. We also wanted to create more opportunities to react to the social aspect, and therefore added a metaphor on this theme [hermit's life]. This resulted in the following metaphors for research:

- Research is (like) a puzzle: the parts of the puzzle gain their meaning from being part of a whole.
- Research is (like) a market: you exchange products with each other.
- Research is (like) a mountain expedition: you climb full of adrenaline to a new summit.
- Research is (like) an excavation: underlying patterns are uncovered.
- Research is (like) a journey: you are changed by the experiences you gain.
- Research is (like) a hermit's life: you are alone within your environment.

In many studies teachers and/or students are asked to formulate metaphors themselves (Gurney, 1995; Martinez et al., 2001). The results of these studies form a rich source of metaphors on teaching. Gurney (1995) detected four categories into which teaching metaphors can be divided: 'delivery', absorption by the student, also referred to as 'transmission' [our transport metaphor]; 'enlightment', appealing to the learner's potential [our gardening metaphor]; 'change', growth through journeys [our survival trek metaphor]; and 'human interaction' [our forum metaphor]. However, two teacher roles are not mentioned in these categories, namely that of the facilitator, often represented by a building metaphor (Fox, 1983) [our studio metaphor], and the teacher as performer or role model (Stofflett, 1996) [our demonstration metaphor]. This resulted in the following metaphors for teaching:

- Teaching is (like) transport: the packages are delivered to the recipients.
- Teaching is (like) a demonstration: a matter of showing and imitating.
- Teaching is (like) gardening: every plant gets what it needs.
- Teaching is (like) a survival trek: the participants are challenged.
- Teaching is (like) fitting up a studio: you make sure that the materials are available.
- Teaching is (like) a forum: thoughts are exchanged.

2.2.3 Analysis

The analysis consisted of several phases. In order to do justice to the use of metaphors during data collection, evoking statements of approval, disapproval, or indifference, we decided to use an interpretative analysis (Erickson, 1986). First, we identified the key statements that best reflected the ideas of the respondents. In practice on average two key statements were identified by the first author for every set of metaphors per respondent. Only those statements that met one of the following criteria were designated as key statements: ideas respondents extensively endorsed in response to one specific metaphor; ideas they mentioned with several metaphors; or ideas designated by the respondents as most important. All these elements served to show that a particular idea was essential to the respondent. The key statements were discussed in a research team until consensus was reached.

Secondly, categories were extracted from the data and ordered hierarchically. This was an iterative process; focusing alternately on the characteristics of individual transcripts, characteristics of groups of similar transcripts, and differences and similarities between the groups (Åkerlind, 2005). To be more

precise, all key statements on one specific concept - knowledge, research, or teaching - were compared with each other, separately from the other concepts. Similar transcripts, consisting of the key statements of one respondent, were combined into small groups of two to four transcripts and compared with groups of slightly different transcripts. Individual transcripts were reconsidered and small groups were combined into bigger ones if ideas were closely related. During the iterative process of comparing groups and individual transcripts, underlying dimensions became apparent. In particular those transcripts that did not clearly belong to one group, but shifted from one to another and back again, pointed to a specific dimension on which the groups might be ordered.

Thirdly, Somers' *d* was calculated for the associations between the conceptions of knowledge and research, knowledge and teaching, and research and teaching (Prosser et al., 2008). Somers' *d* is a measure of association in directional (asymmetric) hypotheses, and more specifically represents the likelihood that the pair is concordant minus the likelihood that the pair is discordant. It is especially suitable if the independent variable has been arbitrarily selected a priori (Liebetrau, 1983). This measure was relevant since we hypothesised a directional association between the conception of knowledge and the conception of research and teaching. Its values range from -1 to 1. A value close to 1 indicates a strong correlation between two variables, and a value close to 0 indicates independence.

2.3 Results

First we will describe the variance in the different conceptions and then move on to the calculation of their correlations. The categories are ordered hierarchically.

2.3.1 Conceptions of knowledge

The following five categories of knowledge could be distinguished. Their relationships are represented in Table 2.1.

A: Knowledge is understood as isolated facts in an external world. Knowledge exists without the observer. It is formed out of several small pieces and forms a solid construction. It is so important that it needs to be found.

B: Knowledge is understood as a continuing growing body of understanding of the external world. Knowledge is seen as non-static and always evolving, a process in which the earlier parts form essential elements to build on. This category differs from the first in stressing the developmental character of knowledge.

C: Knowledge is understood as an answer to a specific question. It depends on the question asked what knowledge is revealed. Knowledge is not stable, new knowledge leads to new 'not knowing', and thus to a need to know more. This category differs from the second in changing the focus from the external world in which knowledge resides to the acknowledgement of the importance of the seeker of knowledge. However, knowledge still refers to the external world.

D: Knowledge is understood as individually constructed relations between objects. Knowledge is individual instead of a shared body. Although knowledge can be shared, it only exists in the persons among whom it is shared. Growth is therefore defined as an increase in somebody's personal understanding. This category differs from the third in seeing knowledge as personal instead of general.

E: Knowledge is understood as a personal construction. Knowledge does not exist, but is created by the knowledge seeker. Knowledge is produced by someone in interaction with others. It is highly changeable and never complete. This category differs from the fourth in turning away from the idea that an external knowable world exists at all, which completes the shift from external to internal world.

Table 2.1. Knowledge conceptions

World	Facts		General	Personal
	Isolated	Growing Body	Answer to question	Construction
External	A	B		
External/Internal			C	D
Internal				E

2.3.2 Conceptions of research

The following five categories of research could be distinguished. Their relationships are represented in Table 2.2.

A: Research is understood as an activity in which patterns are disclosed. Research is an analytical process leading to the disclosure of knowledge, of something that was hidden before. Coherence between elements that were not previously related is indicated.

B: Research is understood as the search for patterns. Doing research means putting effort into a quest-like activity, striving to find patterns by putting together the right sources, including primary and secondary data. This category

differs from the first in its emphasis on the research process instead of the research products. However, it still involves searching for patterns in the outside world.

C: Research is understood as an activity in which patterns are explained. Research does not end when you 'find something', but continues until you are able to explain what you have found. Theory-building is the final goal of every research activity. This category differs from the second in adding the interpretation of the researcher. Still, the basic assumption is that a phenomenon can be captured.

D: Research is understood as an activity in which the researcher points out patterns in the data. Research depends heavily on the researcher as it is his or her individual interpretation that produces insights. The researcher creates meaning, and this meaning also influences the researcher. This category differs from the third in putting more emphasis on the person of the researcher. Although the former category already acknowledges the influence of the researcher, here the attention switches to the person instead of the process or product.

E: Research is understood as an activity in which patterns are created by the researcher. Research is a personal construction and means something different to everyone. Patterns are only there after the researcher has created them, and they are determined by the question that was posed. This category differs from the fourth in stressing the importance of the question more than the data. It puts an even stronger emphasis on the importance of the person of the researcher as the creator of the outcomes.

Table 2.2. Research conceptions

Patterns	External		Internal
	Researcher absent	Researcher present	Researcher present
Disclosure	A		
Search	B		
Interpretation		C	D
Creation			E

2.3.3 Conceptions of teaching

The following five categories of teaching were manifest. Their relationship is represented in Table 2.3.

A: Teaching is understood as an activity in which knowledge is transmitted to the students. The main goal of teaching is raising the students' knowledge level. The teacher is the expert, who has a message and aims to deliver this message to each student, taking account of individual differences.

B: Teaching is understood as interaction between teachers and students leading to student activity. Teaching should be focused on activating and challenging the students to participate actively in discussions, and to practice their analytical skills. Students learn best by active involvement instead of just listening to their teacher. This category differs from the first in the emphasis on student activity. There is a shift in focus from knowledge to skills. There is a strong notion that learning requires students' active involvement besides the teachers' lectures.

C: Teaching is understood as an activity in which the teacher shows the students what to do and what not to do with the topic under discussion. The teacher is experienced and therefore knows how to deal with knowledge. Teaching is about demonstrating and discussing how to deal with the topic by sharing your own experiences in what went well and what went wrong. This category differs from the second in emphasising the importance of discussion. Furthermore, it includes the notion of how to expand your knowledge.

D: Teaching is understood as showing how to deal with knowledge. The teacher is a role model for his students in showing a certain disposition towards knowledge. The goal of teaching is not reached until the students start imitating this disposition by making the knowledge their own and preferably even disagreeing with their teachers. This category differs from the third in stressing that teaching is not only about knowledge and skills, but also about disposition, which is modelled by the teachers and internalised by the students.

E: Teaching is understood as an activity in which the main goal is to teach students to think critically and possibly to change students' conceptions. Teaching is about giving students the freedom to think for themselves and hopefully to come up with new ideas. It should focus on critical and creative thinking by first breaking down earlier prejudices. This category differs from the fourth in the perspective that teachers offer their students. They should find new ways instead of repeating what others already had done.

Table 2.3. Teaching conceptions

Aim	Teacher focused	Teacher/student interaction	
	Deliver message	Student activity	Discussion
Acquisition of knowledge	A		
Acquisition of knowledge and skills		B	C
Conceptual development			D
Conceptual change			E

2.3.4 Relationships between conceptions

Table 2.4 shows a substantial and statistically significant (d = .501, p < .001) correlation between academics' conceptions of knowledge and their conceptions of research. This suggests that academics with a conception of knowledge as *facts* tend to see research more in terms of *disclosing patterns*, while academics with a conception of knowledge as *a personal construction* tend to see research more in terms of *creating patterns themselves*.

Table 2.4. Distribution of transcripts by knowledge and research conception

Knowledge conception	Research conception					Total
	A	B	C	D	E	
A	3	1	0	2	0	6
B	0	5	1	0	0	6
C	1	1	1	2	2	7
D	0	1	2	3	0	6
E	0	0	0	3	2	5
Total	4	8	4	10	4	30

The Tables 2.5 and 2.6 show a weak, but statistically significant (d = .345, p < .01; d = .355, p = .01) correlation between academics' conceptions of knowledge and of teaching, and academics' conceptions of research and of teaching. This suggests that academics with a conception of knowledge as *facts* tend to see teaching more in terms of *knowledge transmission*, while academics with a conception of knowledge as *a personal construction* see teaching more as *an activity in which students need to learn to think*. Furthermore, these results suggest that academics who see research as *disclosing patterns* are more likely to see teaching as *knowledge transmission*, while academics who see research more as *creating patterns* see teaching as *an activity in which students need to learn to think*.

Table 2.5. Distribution of transcripts by knowledge and teaching conception

Knowledge conception	Teaching conception					Total
	A	B	C	D	E	
A	1	2	1	2	0	6
B	1	3	1	0	1	6
C	2	1	1	3	0	7
D	0	0	1	2	3	6
E	0	1	1	1	2	5
Total	4	7	5	8	6	30

Table 2.6. Distribution of transcripts by research and teaching conception

Research conception	Teaching conception					Total
	A	B	C	D	E	
A	2	1	1	0	0	4
B	2	2	1	1	2	8
C	0	1	0	2	1	4
D	0	3	2	4	1	10
E	0	0	1	1	2	4
Total	4	7	5	8	6	30

2.4 Conclusion and discussion

2.4.1 Conclusion and discussion

Before turning to the relationship between academics' conceptions of knowledge, research, and teaching, we will first discuss the individual concepts. The various knowledge conceptions can be seen as various positions on a continuum ranging from knowledge residing in the external world to knowledge residing in the internal world. The knowledge conceptions were first and foremost distributed according to the source of knowledge. This is in line with certain schools in epistemology, such as the study of women's way of knowing (Hofer & Pintrich, 1997).

Concerning the research conceptions, several aspects were important in defining the categories, namely whether the focus was on the external or internal world. Furthermore, the person of the researcher increased in importance. Our categories seemed to be on a diagonal similar to that defined by Brew's (2003) dimensions ranging from external, product-focused, and researcher absent to internal, process-focused, and researcher present. A comparable division was

found by Robertson and Bond (2005). Their categories might also be considered to lie on this dimension.

The dimension behind the categories for teaching conception was strongly related to the kind of student learning academics were aiming at. Their aims varied from a focus on knowledge, via skills, to conceptual change. From the perspective of the work of Kember (1997) we recognised a continuum ranging from knowledge transmission to conceptual change. However, the teacher-focused to student-focused dimension was not found in the same way in our data, because interaction between teacher and student was deemed important by most academics.

It is noteworthy that our results were based on the assumption that it is possible to extract a certain order from the various categories. The assignment of respondents to categories and the calculation of the Somers' *d*, in particular, depended on this assumption. Our results supported earlier findings that there are dimensions underlying these categories rather than inclusive relations, as assumed in phenomenography (Åkerlind, 2005). The idea of inclusiveness suggests a growth in the complexity of ideas. However, in our data we saw a shift in ideas which is common to dimensions (Kember, 1997). Ideas that were prominent and highly valued with academics in some categories at one end of the dimension were rejected by those at the opposite end of the dimension.

A substantial correlation was found between academics' conceptions of knowledge and of research. Both range from an external to an internal view. The correlation between teaching and research, and between teaching and knowledge was weaker, but it did exist. The view that teaching was about the transmission of knowledge was associated with the external orientation of both the research and knowledge conceptions, and the view that teaching is about making students think critically was associated with the internal orientation of both the research and knowledge conceptions. Our finding that the knowledge conception is related to the research conception, and to a lesser extent to the teaching conception differs from the results of Robertson and Bond (2005) and Bond (2007), who found an integral relationship between conceptions of knowledge, research, teaching, and learning. They suggest that these conceptions are all part of the 'experiential field' which means that the various conceptions give meaning to each other. The assumption by Robertson and Bond (2003) that the knowledge conception shapes academics' understanding of research and teaching could not

be confirmed in this study. It should be noted that, on the basis of a qualitative meta-synthesis, Bond (2007) later stated that none of the conceptions of knowledge, research, teaching, and learning can possibly be given a superordinate status.

2.4.2 Methodological considerations and implications

The use of metaphors has proved a useful way of investigating academics' conceptions of knowledge, research, and teaching. Respondents talked freely about the topic under investigation. The combination of first discussing all metaphors and then selecting one metaphor or combining metaphors at the end proved extremely important. Only two respondents indicated that they did not like to react to metaphors; their problem, however, was not the use of metaphors itself, but the fact that they preferred to create metaphors themselves. Regarding the use of metaphors in different domains, we did not notice differences between the different sub-disciplines in the humanities in the types of responses. Moreover, Oolbekkink-Marchand and others (2006a) used this method on teachers and academics from a wider range of disciplines and encountered no specific problems concerning the use of metaphors in any discipline.

The finding that research and teaching conceptions were only weakly correlated has implications for the strengthening of the research-teaching nexus. As a specific research conception is not by definition connected to a teaching conception, it is necessary to pay attention to academics' conceptions and the possible discrepancies between them in any attempt to strengthen the nexus. A consistent set of conceptions in knowledge, research, and teaching, might lead to a stronger focus on linking research and teaching.

Chapter 3

The ideal research-teaching nexus in the eyes of the academics – building different profiles

3. The ideal research-teaching nexus in the eyes of academics – building different profiles[2]

Strengthening the connection between research and teaching has been in popular theme in higher education research. However, it is unclear what form this relationship can take. Several authors have presented categories and dimensions to clarify this relationship, and the aim of this project was to contribute to this discussion by understanding what academics' ideal research-teaching nexus would look like. The ideal images of thirty academics were investigated using a mental visualisation assignment. Respondents were encouraged to describe in detail what for them the linkage between research and teaching would look like in the ideal situation. Five profiles of the research-teaching nexus could be distinguished: teach research results, make research known, show what it means to be a researcher, help to conduct research, and give students research experience. These profiles are related to dimensions proposed earlier in the literature on the research-teaching nexus.

[2] Accepted in adapted form as Visser-Wijnveen, G.J., Van Driel, J.H., Van der Rijst, R.M., Verloop, N., & Visser, A.. The ideal research-teaching nexus in the eyes of academics – building different profiles. *Higher Education Research and Development.*

3.1 Introduction

Strengthening the connection between research and teaching has been a popular theme in higher education research (Barnett, 2005; Jenkins et al., 2003), as universities have been going through significant changes in recent decades - one of the most important being the massification of higher education (Smeby, 2003). The old ideal of Wilhelm von Humboldt - the common pursuit of knowledge by teacher and student (Simons, 2006) - is still an important image of what universities should be: a place where research and teaching are united. However, this unity is not easily realised, and many universities and academics struggle with the issue. One of the main problems in the discussion about the research-teaching nexus is that the term is used for many different kinds of 'activities' in the university, and that many different words are used for the same activity. Several authors (Brew, 2003; Griffiths, 2004; Healey, 2005; Neumann, 1992; Robertson, 2007) have recently come up with categories or dimensions to help the academic community get to grips with the variety of meanings inherent in the concept of the research-teaching nexus. Our point of departure is that there is no one or best way of relating research and teaching (Elsen et al., 2009); the richness is in the diversity of ways in which research and teaching might be linked. We will discuss several models that demonstrate that diversity; consequently, models that do not differentiate between various forms of the research-teaching nexus are not taken into account.

3.1.1 Categorisations of the research-teaching nexus

One of the researchers trying to understand the different ways of linking research and teaching is Neumann (1992). She conducted an interview study among academic administrators from several disciplinary backgrounds and distinguished three different ways of relating research and teaching: the tangible nexus, the intangible nexus, and the global nexus. The tangible nexus focuses on the transmission of current knowledge, i.e., recent outcomes of the teacher's research, to the students. The intangible nexus focuses on influencing students' perception of the status of knowledge and on their disposition towards knowledge. The global nexus is at a different level: instead of focusing on the individual level attention is paid to the departmental level, more precisely to the impact of the department's research programme on the curriculum. We would argue that the global nexus is closer to the tangible than the intangible nexus, as both are focused on content.

Griffiths (2004) paid attention to different characteristics of the relationship. In his attempts to grasp the different forms the relationship between research and teaching could take, he was strongly influenced by Boyer's ideas (1990). Griffiths (2004) described three dimensions. First, the relationship can be specific, directly related to concrete projects of the teacher, or diffuse, consisting of a more general way of thinking based on the academic's research experience. Second, the research can be embedded weakly or integrated strongly in the teaching. In the first case research results merely function as input for the curriculum, while in the second case the approach to teaching is influenced as well: more attention is paid to the process of knowledge production with students more or less becoming partners in research. The third and last dimension is the direction of the relationship; it is either unidirectional, flowing from research to teaching, or reciprocal, with research and teaching profiting from each other. Bearing these dimensions in mind, Griffiths (2004) identified four different forms of the research-teaching nexus: research-led, research-based, research-oriented, and research-informed. However, he does not explain how these four forms were related to the earlier presented dimensions. Interestingly, Griffiths (2004) also included pedagogical research (research-informed), next to three forms of discipline-based research.

Healey (2005) built on Griffiths' ideas (2004) by putting these different forms into a model. From a curriculum perspective he distinguishes three dimensions. In his model the dimensions student-focused vs. teacher-focused and students as participants vs. students as audience form one axis, and emphasis on research content vs. emphasis on research processes and problems the other. In this way four different ways of shaping to the research-teaching nexus can be distinguished: research-led (research content & students as audience), research-tutored (research content & students as participants), research-based (research processes & students as participants), and research-oriented (research processes & students as audience). Later, Healey deleted the first dimension (Jenkins et al. 2007, 29), a decision we will follow in this chapter.

Robertson (2007) produced a categorisation based on the intensity of the linkage between research and teaching. Category A is labelled weak, symbolising the almost non-existence of a relationship between research and teaching. Research and teaching are separate tracks. Category B is labelled transmission: both research results and enthusiasm are transmitted to the students. Category C is labelled hybrid as it comprises aspects from both sides, such as emphasis on basic

knowledge, but also the first steps in some kind of research participation. Category D is labelled symbiotic: research and teaching are separable, but strongly related; the process of teaching links student learning with academics' learning. Category E is labelled integrated as it sees research and teaching as inseparable. In D and E an important place is attributed to 'learning' as a mediator of research and teaching, a view that was earlier expressed by Brew & Boud (1995).

From all the different notions these authors bring forward a few things can be observed. We will focus on discipline-based research, thus excluding Griffiths' concept research-informed. Only Neumann (1992) explicitly distinguishes between the individual and the department level. Most authors stick to the individual level, although Robertson's (2007) weak might be seen as relating to the global level, namely to keep research and teaching separate. Griffiths' (2004) second dimension touches this notion as well, as he describes the weak link as the input of research outcomes in the curriculum, whereas the strong link also influences the way of teaching. His dimension captures two aspects, the first being the distinction between students as an audience receiving the outcomes of the research, and students as participants engaging in research, a way in which research greatly influences the way of teaching. This distinction is incorporated by Healey (2005). The other aspect of Griffiths' (2004) second dimension is the basis for a distinction mentioned by all researchers, namely the focus on the research output, recognisable in the tangible nexus and the categories research-led, research-tutored, transmission, and hybrid, versus the focus on the research process, recognisable in the categories research-oriented, research-based, symbiotic, and integrated. This dimension is part of Healey's model as well (2005). Robertson (2007), however, stresses that in symbiotic and integrated the notion that the research process includes a certain epistemological view is important. This aspect is covered by the distinction Neumann (1992) makes in her tangible versus intangible nexus. In her later work (Neumann, 1994) she includes the process skills in the tangible nexus, making it a dimension that is more than just another representative of the outcome-process dimension. Griffiths' (2004) dimension of specific versus diffuse goes slightly unnoticed by the other authors, as most of them focus on specific forms of linking teachers' own research to teaching. However, one could argue that the intangible nexus is diffuse, as it might not refer explicitly to particular research projects but to the broader notion of being a researcher. Robertson (2007) is the only author to pay attention to Griffiths' (2004) third dimension, i.e., the difference between a unidirectional relationship versus a reciprocal one. Her 'weaker half' is focused on the direction

'research towards teaching', while her more 'integrated half' also includes the direction 'teaching towards research' as well. The other authors seem to assume a unidirectional relationship. In sum, we see several dimensions behind the various categories: tangible-intangible, specific-diffuse, unidirectional-reciprocal, output-process, and audience-participants.

It is also important to note that the models are based on different principles. The models presented by Griffiths (2004) and Healey (2005) are theory-based. The others are based on empirical studies: interview studies with administrators (Neumann, 1992) and academics holding different university positions (Robertson, 2007), respectively. Besides, the models not only investigate authors' or academics' preferred linkages, but also include those that they view less favourably. Healey (2005) and Robertson (2007) mention this explicitly. Furthermore, the reciprocal character of the research-teaching nexus is not incorporated into all models, even when this could improve research and especially academics' satisfaction with their work at the university. Jensen (1988) stresses the importance of this factor, because he found that most academics would not like to work at an institution devoted exclusively to research, and even less at institution devoted exclusively to teaching.

3.1.2 Research aim

The present study was an attempt to provide an empirical basis for a categorisation which captures the variety of potentially powerful linkages between research and teaching. We wanted to pay attention both to the categories that might come up and to the dimensions underlying them, taking the academic's perspective as our point of departure. From earlier research (Robertson & Bond, 2001; Rowland, 1996) we know that the research-teaching nexus and its components are understood differently by different academics. A deep understanding of how academics perceive this relationship is therefore required. The differences that arise might be partly caused by disciplinary differences, which are related to differences in epistemology, truth criteria, and culture (Becher, 1989; Donald, 1986; Robertson & Bond, 2005). In this study we focused on one area of scholarship, namely the humanities, containing a variety of disciplines.

A frequently reported problem affecting the realisation of a strong linkage between research and teaching is the presence of limiting pre-conditions, especially the preference given to research over teaching. This comes to light, for

instance, in reward systems and time allocation problems, as research time is frequently subordinated to teaching time (Coate et al., 2001; Colbeck, 1998). To avoid these kinds of problems in our search for qualitatively different but powerful forms of the research-teaching nexus, this study used an unconventional way of questioning, namely concentrating on academics' ideals. Academics' visions, understood as their images of ideal practice, strongly shape their professional lives, and any incongruence between their vision and everyday reality can even cause them to leave their profession (Hammerness, 2003). These images represent what academics try to work towards, in the conviction that they themselves and the students will benefit from them. Academics' purposes are expressed in these visions or images, whose role is that of intuitive guides (Husu & Tirri, 2007). Therefore, ideal images are important mediators between conceptions and daily practice (Feiman-Nemser & Floden, 1986). Furthermore, images are a rich source of information, as they contain a whole set of ideas around a persistent thread, based on personal experience (Johnston, 1992). Concentrating on ideal images therefore has the advantage of avoiding possible constraints, while the ideal images are yet related to academic practice. In short, this study aimed to investigate the variation in ideal images held by academics from the field of the humanities in order to gain an understanding of the different ways in which the research-teaching nexus could be shaped.

3.2 Method

3.2.1 Sample

Data were collected via semi-structured interviews with 30 academics from the Faculty of Humanities of Leiden University. These academics also participated in the metaphor study reported in Chapter 2 (see Section 2.2.1 for sample characteristics). An important condition for selection as a respondent was the requirement to have both research and teaching duties. This meant that language skills teachers were excluded, as they do not have a research role.

3.2.2 Procedure

The academics were interviewed using a mental visualisation assignment as part of a larger interview on the research-teaching nexus. This larger interview consisted of background information (see Chapter 4), a metaphor study into academics' conceptions of knowledge, research, and teaching (see Chapter 2), and the present study (this chapter). The interviews were conducted in Dutch and the visualisation assignment took about 20-30 minutes. All interviews were audio-taped and transcribed verbatim. Respondents were encouraged to describe what

the linkage between research and teaching would look like in the ideal situation, by answering the following basic question: 'Please tell me what the research-teaching nexus would look like in the ideal situation, when you do not have to take into account any practical constraints?' Questions used to facilitate this description and support a detailed blueprint included: 'What is your most important goal?', 'What kind of students do you have?', 'What roles do the various participants have?', and 'What activities are undertaken by your students?'. By means of these questions we wanted to encourage the academics to provide a detailed blueprint of their ideal situation. However, the respondents did not need to answer all the questions one by one; these were mainly used if needed to encourage the respondent to describe the situation in more detail. For example, in answer to the basic question one of the respondents said (as part of a 3300-word description):

> After the students have attained a basic knowledge of the field most of the time needs to go to the exemplary demonstration. This means that students and teachers work together in research. In our discipline we have informers work with somebody who speaks a language relatively unknown. As a group of students, led by the teacher, you try to find the structure of the language. This is even more than just a demonstration of research; it is a form of research cooperation under supervision.

3.2.3 Analysis

The analysis comprised three phases: 1) the development of a code book, 2) applying the code book in a holistic way, and 3) searching for patterns among respondents' answers. In the first phase, the aim of the analysis was to do justice to the variation in ideal images of the research-teaching nexus, so every single idea in each of the ideal images needed to be covered. We therefore used an inductive approach, in which the codes emerged from the transcripts by breaking down each interview into phrases that represented an idea (Strauss & Corbin, 1990). This process was repeated until all diversity seemed to have been captured, i.e., until saturation was reached (Guest, Bunce, & Johnson, 2006). The codes were combined into a number of steps in order to arrive at a code book with several layers. For every code short definitions and demarcation rules were formulated. An example will illustrate this part of the analysis process (see also the code book below): one of the respondents said 'Well, I think that the main goal is that you can use all your knowledge and experience acquired as researcher in educating the students to be able to think critically'. This was coded as *critical thinking*. Together with three other codes it was combined into the general code

academic disposition, which was part of the category *towards teaching* within the theme *orientation*. In the demarcation rule for *academic disposition* all codes that made up this general code were included.

In the second phase all the transcripts were coded, with the complete description of the ideal situation of one individual as a unit of analysis. In this way it was possible to do justice to the holistic character of each description. This phase involved using an independent coder who was not familiar with the data. After independent coding, the interviews were discussed extensively in three consecutive sessions in order to ensure agreement on the interpretation and allotment of every code in the code book.

The third phase of the analysis focused on finding patterns in the codes. In the search for these patterns we followed three routes: 1) an explorative hierarchical cluster analysis (quantitative method), 2) a case-variable matrix (qualitative method), and 3) a comparison of the results of both methods. First, a hierarchical cluster analysis was carried out on all ideal images (at code level) to explore whether there were homogeneous clusters of cases within the data. Average linkage within groups was used to calculate the mean distance between all possible cluster pairs, as this method focuses on homogeneity within clusters, which was the most important feature in clustering. The clustering method selected was DICE (or Czekanowski or Sorensen measure). This measure excludes joint absences and accords a double weight to matches (Everitt, Landau, & Leese, 2001), and therefore is best suited to accommodate the disadvantage of having a large number of codes and substantial differences between the numbers of codes for the different cases, which causes a large amount of joint absences and a small number of matches.

As the hierarchical cluster analysis only takes into account code level and therefore ignores the fact that the codes are nested in a number of layers, i.e., categories and themes, we considered it necessary to conduct a second analysis in order to take this nested coding (especially the categories) into account. Several cross-case matrices were constructed for this purpose (Miles & Huberman, 1994), consisting of rows containing the interviews, i.e., cases, and columns containing the variables at code level, embedded in their categories. Several analyses were conducted, each with one theme as base. Clusters were identified in several steps. First, all cases sharing the same codes in the base theme were put together into a set. Second, the characteristics of each set were defined by their dominant codes.

Third, cases that occurred in a number of sets were granted to the set that best fit the characteristics. Fourth, the final characteristics of each set were decided upon. The results of these different cross-case analyses were compared; using a meta-matrix a final classification of the set, from now on called clusters, was determined. The final step was to compare and integrate the results of the hierarchical cluster analysis and the matrix analyses. The differences between the two results were analysed. For every case that ended up in two different clusters we decided on the basis of the dominant codes in each cluster which would be the most appropriate place. The final clustering was analysed again regarding the occurrence of the codes. A code was seen as a central aspect of a cluster only if it occurred in a majority of the cases.

3.3 Results

3.3.1 Code book

We were able to distinguish essential themes that are important in giving meaning to the research-teaching nexus, namely: orientation, approach, curriculum, and teacher role. Each theme contained two to four categories, and each category was based on two to four codes. In this section we will first provide a general overview of the variation that was mapped. Next we will present the full code book (see Table 3.1) with a short description of each code, as these codes were the level of further analysis.

Regarding the first theme, *orientation*, a distinction needs to be made between an orientation *towards research* or *towards teaching*, in other words: what are the benefits for research and for teaching? Regarding the theme *approach* four different stages could be described, with each subsequent stage also covering the previous. The first stage was *learning about research*. The second stage was starting to learn in a research-like way: *inquiry learning*. The third stage involved incorporating the earlier phases into an environment that completely captured the whole research process: *simulation*. The final stage was to become a member of the research community through *participation*. For the theme *curriculum* two phenomena were important, first the question whether the curriculum was based on *disciplinary research* or the *teacher's own research*, and secondly whether it focussed on *research process* or *research content*. Besides, the stage of the research was also important, was it recent or not. The last theme, *teacher role*, included roles that were inseparable from the dual mode of being both a researcher and a teacher, and roles that qualify as more general teaching roles.

Table 3.1. Code book for characterising research-teaching nexus

Themes	**Categories**	**Codes**	**Definition** This code is allotted if:
Orientation	Towards teaching	Academic disposition	… the teaching is focused on students developing a research or academic disposition.
		Divulge research	… the teaching is focused on students learning what it means to do research, including making them enthusiastic about research.
		Train researcher	… the teaching is focused on students being trained to become researchers.
		Academic knowledge	... the teaching is focused on students being filled with academic knowledge.
	Towards research	Input of students	… the teacher's research profits from the student's input.
		Reflection	… the teacher's research profits from the preparation or the teaching itself because it stimulates reflection and broadens his perspective.
		Broadening research scope	… the teacher's research profits from teaching as it is broadened by the teaching topic being broader than his research topic.
Approach	Learning about research	Literature reading	… the students learn about research by reading research literature.
		Listening to researcher	… the students learn about research by listening to researchers who speak explicitly about their research.
	Inquiry learning	Analysing	… the focus is on the process of analysis.
		Studying	… the focus is on understanding of the content by research assignments.
		Discussing	… the focus is on the discussion between teacher and students.
		Reporting	… the focus is on reporting the research findings, oral or written.
	Simulation	Group work	… the course is planned as a research simulation, the group of students is invited to go through the whole research process during the course.
		Individual work	… the individual student does a research project which takes him/her through the whole research process.
	Participation	Teacher's own research	… students participate in their teacher's research.
		Academic world	… students participate in the academic world by publishing or attending conferences.

Table 3.1 (continued)

Curriculum	Disciplinary research	Current research	… it is about recent research from the field.
		Research content	…it is about the content of the whole disciplinary field that students need to know.
		Research process	… it is about the common research process in the field.
	Own research	Ongoing research	… it is about the teacher's research in progress.
		Research content	… it is about the teacher's research results or themes.
		Research process	… it is about the research process that the teacher went through.
Teacher role	General	Developer	… the teacher designs his own teaching, on the course and the curriculum level.
		Manager	… the teacher manages the classroom process.
		Confidant	… the teacher wants the students to be able to confide in him/her.
	Research-related	Tutor	… the teacher coaches the individual students in their learning/research process.
		Expert	… the teacher operates as expert in the field.
		Guide	… the teacher guides the research process, combining the functions of tutor and expert.
		Motivator	… the teacher fans the students enthusiasm and gets them fascinated.
		Partner	… the teachers strives for an equal relationship with his students.
		Role model	… the teacher shows what it means to be a researcher.

3.3.2 Classification

The initial hierarchical cluster analysis showed five clusters with a meaningful difference. The number of clusters was determined by the requirements that every case had to be included in a cluster and that there should be a reasonable increase in distance. A first division was made between clusters 1-3 and clusters 4-5. The main difference here was found in *approach*: whether students *participated in research* (4-5), or did *inquiry learning* and were *learning about research* (1-3). A second division was made between clusters 1-2 and cluster 3. In cluster 3 the *teacher's own research process* is an important curriculum element, while clusters 1 and 2 tend towards a focus on *content* and *disciplinary research*, respectively. A third division was made between clusters 4 and 5. The main difference between these was in *orientation*: cluster 4 focuses on *towards*

teaching, more specifically *academic disposition* and *train researcher*; cluster 5 on *towards research*, more specifically the *input of students*. The last division was made between cluster 1 and 2. The main difference here was again in *orientation*: the dominant presence of *academic knowledge* in cluster 1, and an absence of *academic knowledge* in cluster 2.

The various matrix analyses each time resulted in 5-6 clusters. The cluster-code matrix, which had been constructed to see whether there were similarities between the clusters in each of the analyses, showed a relatively stable group of 5 clusters. Sometimes one of the five was split up into two clusters. The theme *orientation* was found to be strongly related to specific codes in other categories and thus served as an important distinguishing factor between the clusters. Some respondents had more than one orientation; on the basis of their codes in the other categories they could also be easily placed in any one of these. Only the orientation *towards teaching-academic disposition* needed to be split up into two different groups based on the different teacher role. The clusters were named A-E, matching their counterparts 1-5 in the hierarchical cluster analysis.

Cluster A was clearly different from the others regarding *orientation* and *teacher role*. Central aspects in this cluster were *academic knowledge* and *expert*. The approach included both aspects of *learning about research*. Cluster B was the only one focussing on *divulge research*. The common approach was *inquiry learning*, especially *discussing* and *reporting*. The enthusiasm aspect of the orientation was represented in the teacher role: *motivator*. Cluster C focused strongly on the role of the teacher, namely that of a *role model*. Other elements here are an orientation towards *academic disposition*, and the *teacher's own research process* being used for illustration. Like cluster C, cluster D focused on *academic disposition*, but the teacher's role here was a different one, namely that of *tutor*. *Inquiry learning* was an essential part of this cluster. Cluster E was orientated towards both teaching and research. Training students to become researchers was combined with the *students' input* in the *teacher's own research*. It always involved the *teacher's ongoing research*, with the teacher functioning as a *guide* to the students.

Comparison of the two different clustering methods showed that three of the five clusters were very similar (1/A, 3C, 4/D). Clusters 2/B and 5/E were a little different. The final clusters were established on the basis of the highest degree of homogeneity. They can be summarised as follows in Table 3.2:

Table 3.2. Profiles of the research-teaching nexus

Themes	Profiles				
	Teach research results	Make research known	Show what it means to be a researcher	Help to conduct research	Provide research experience
Orientation	Towards teaching: academic knowledge; Towards research: reflection	Towards teaching: academic disposition & divulge research	Towards teaching: academic disposition	Towards teaching: academic disposition & train researcher	Towards research: input of students; Towards teaching: train researcher
Approach	Learning about research: listening to researcher & literature reading; Inquiry learning: discussing	Inquiry learning: discussing & reporting; Learning about research: literature reading	Learning about research: listening to researcher	Inquiry learning: studying & reporting; Participation: academic world	Participation: teacher's own research
Curriculum	Disciplinary research content	Own research content	Own research process	Own ongoing research	Own ongoing research
Teacher role	Expert	Motivator	Role model	Tutor	Guide

The five profiles of the research-teaching nexus are described in detail below, illustrated by quotes from the interviews (translated from Dutch). The labels refer to the disciplinary backgrounds of the respondents (C means literature & culture, L means linguistics, and H means history & art history). We would like to emphasise that it was not our purpose to assign respondents to specific profiles in order to be able to relate background variables to the different profiles. The profiles should rather be seen as proto-types. Furthermore, we would like to stress that not all codes were included in a profile, as some codes were not distinctive enough to contribute to a definition of the profiles.

1. Teach research results

The first profile focuses on the teaching of research results: academic knowledge is transferred to students by direct communication from the teacher or by reading literature, which leads the teacher to reflect on the discipline. L9 explained: 'The goal is twofold. It is important for the researcher to be able to test his own ideas, including testing them out with his students. Yes, whether he is able to explain it

clearly and simply and whether students can see any simple disadvantages in the theory that he has just thought up. For students it is a way to become informed about the state of play in the research field, so that they are completely up-to-date on the most recent developments in the field.' Furthermore, the students participate in discussions on the topics proposed. This means that the focus is on content and the teacher acts as an expert. As expressed by H6: 'In the ideal situation the students are taught by the expert in the international field, because he has been doing this type of research for years.'

2. Make research known

The second profile focuses on making research known: it is oriented towards divulging research. The crucial nature of this is clarified by L3: 'If you don't bring students into contact with current research and set them up to do research themselves or give them the resources to understand current research, you should not be called a university.' Part of this familiarisation with research is stimulating academic dispositions in students. This goal is reached by ensuring that students discuss and report research. Furthermore, the teacher is able to display his/her enthusiasm by using examples (content) from his/her own research, while focussing on the research process in general. H10 explains: 'To me it is important to use my own research experience in the courses; the way you talk about certain things. It is important to show the students some of that, including what's exciting about doing research.'

3. Show what it means to be a researcher

The third profile focuses on showing what it means to be a researcher. Central to this profile is the attention paid to academic disposition and the research process. H3 is quite clear about this: 'In the end, at university it is all about picking up and imitating a critical attitude from me, learning to look at things critically, questioning things, meta-thinking.' The researcher functions as a role model by relating his/her own experiences and incorporating research practice into his/her teaching, for example: 'the students see me thinking aloud (...) I develop that knowledge at that moment and I show them how I do it' (C8).

4. Help to conduct research

The fourth profile focuses on helping students to conduct research. The teacher is like a tutor to the students and aims at academic disposition and broader research competencies. L7 emphasises: 'You should not just impart knowledge to them, you need to teach them research skills as well, and you do that by making them

do all kinds of things themselves, by making them do research. Actually, in the way it has always been done at university.' The students are challenged by being given small research assignments. Additionally, they are invited to participate in the academic world in some capacity. The teacher uses his/her own ongoing research in teaching. C10 suggests taking them to conferences: 'In the year before the conference I am organising with some colleagues, I run a research seminar for the students to prepare for the conference. The students can join me at the conference if they promise to participate actively in discussions.'

5. Provide research experience

The fifth and last profile focuses on providing students research experience. The teacher's current research plays a central role in his/her teaching, using this ongoing research as a teaching setting in which students are trained to become researchers and the teacher, who is a researcher as well, profits from the work of the students. C7 puts it as follows: 'The ideal is of course that you are able to work with a group of students on the research you are currently occupied with (…) It would be fine if the research group were as diverse as possible.' Furthermore, the teacher is a guide to his/her students, based on his/her expertise in the research topic and coaching competencies. To H9 this means: 'I am aware of the outline of what is to be researched; I also know exactly which questions are at stake. Furthermore I have a fairly precise idea of what materials need to be studied.'

3.4. Conclusion and discussion

3.4.1 Conclusion

The main goal of this study was to capture the variation in ideal images of the research-teaching nexus held by academics in the humanities, in order to gain an understanding of the different ways in which the research-teaching nexus can be shaped. We found that these various ways could be described in several profiles. The essential themes for each profile were orientation, approach, curriculum, and teacher role. For *orientation* the central question was whether a profile is unidirectional (teaching profits from research) or reciprocal. Another important theme was whether the focus should be on knowledge, skills, and/or disposition. In *approach* the question was whether the focus was on learning about research and inquiry learning, or on simulation and participation. For *curriculum* the questions whether disciplinary research or the teacher's own research, and whether the focus should be on research content or research process were important. Each profile had its own distinctive *teacher role*: expert, motivator, role model, tutor, or guide.

Five profiles were found in the data: teach research results, make research known, show what it means to be a researcher, help to conduct research, and provide research experience. We related these profiles to the dimensions discussed earlier. The dimension tangible - intangible nexus (Neumann, 1992) can be recognised in an *orientation towards teaching*, namely *academic disposition*, which is considered intangible, versus other orientations towards teaching, which are considered tangible. Furthermore, the dimension unidirectional – reciprocal (Griffiths, 2004) relies on the theme *orientation*, i.e., taking only the teaching part into account (unidirectional), or including the research part as well (reciprocal). The audience - participants dimension (Healey, 2005) is to be found in the theme *approach*. 'Audience' is linked to *learning about research* and *inquiry learning*, while 'participants' implies *simulation* and *participation*. However, we prefer to use the terms 'learning about research' and 'participation in research' in order to have positive names for both ends of the dimension. The content - process dimension (Healey, 2005) is easily recognisable in the theme *curriculum*, in which the focus can be on either *research content* or *research process*. The diffuse - specific dimension (Griffiths, 2004) is also related to the theme *curriculum*, indicating whether the teacher's ongoing research is at stake (specific), or research in general (diffuse). The first of the five profiles could be considered diffuse, for it does not rely on specific research activities on the part of the teacher, the fourth and fifth profiles could be considered specific as they rely on the teacher's ongoing research. The second and third profiles do rely heavily on teachers' own experiences as a researcher, but are not related to specific research projects. Therefore, it is unclear where to put these profiles on this dimension. For that reason we suggest to split this dimension into a dimension general research - current research, in order to differentiate between research that is currently going on and research in general, and a dimension disciplinary research – teacher's own research, in order to differentiate between research carried out by the teacher and research in the same discipline carried out by other academics. In this way, justice can be done to both differences, that between the first and other profiles and that between the fourth and fifth and the others. So we end up with six dimensions that need to be considered when talking about linking research and teaching: intangible - tangible, disciplinary research - teacher's own research, research in general – current research, research content - research process, learning about research – participation in research, and unidirectional – reciprocal. Table 3.3 shows the positions of all profiles on the dimensions mentioned above.

Table 3.3. Profiles of the research-teaching nexus related to dimensions

Dimensions	Profiles				
	Teach research results	Make research known	Show what it means to be a researcher	Help to conduct research	Provide research experience
Tangible - Intangible	Tangible	Tangible & Intangible	Intangible	Tangible & Intangible	Tangible
Unidirectional - Reciprocal	Reciprocal	Unidirectional	Unidirectional	Unidirectional	Reciprocal
Content - Process	Content	Content	Process	-	-
Learning about research - Participation in research	Learning about	Learning about	Learning about	Learning about & Participation	Participation
Research in general – Current research	General	General	General	Current	Current
Disciplinary research – Teacher's own research	Disciplinary	Teacher's own	Teacher's own	Teacher's own	Teacher's own

The profile *teach research results* is the only one on the disciplinary side of the disciplinary research – own research dimension. This aspect characterises this profile as it is considered of the utmost importance that students learn about the discipline, and more specifically about the results of the research in the field. From this notion most positions on the other dimensions follow. Only the position reciprocal might be surprising, but this might stem from the focus on content which plays an important role in the reflection process: the academic has to rethink the field in preparing his/her teaching. The profile *make research known* combines the focus on research content and general research of the first profile with a focus on both the tangible and intangible aspects characteristic of the fourth profile. It relies heavily on the teacher's own research as an illustration of the research in the field. The profile *show what it means to be a researcher* has its basis in the intangible nexus as perceived by the teacher, and from this the positions on the other dimensions, such as a focus on the research process, follow. The profile *help to conduct research* is the only profile combining learning about research and participation in research. This characterises this profile as both participation, leading to a focus on current and teacher's own research, and learning about, leading to a unidirectional focal point in which the tangible and intangible aspects of the nexus are inextricably combined. The profile *provide research experience* differs from the others by its singular focus on participation.

Students participating in the teacher's research form the heart of this profile from which the other positions originate.

3.4.2 Methodological considerations

The interview method chosen for this research was unconventional. Instead of being asked about real situations the respondents were encouraged to describe their ideal images. A great majority of the respondents showed that they were able to discriminate between the real and the ideal situations, as became evident in the sections of the interviews where they described their real situation. Furthermore, in some cases the respondents explicitly said that they were describing a utopia, and others even asked the interviewer a few times whether it was still appropriate to describe their ideal images, so it was clear that they were describing their ideal. However, a small minority of respondents easily fell back into talking about reality. These academics were then encouraged by the interviewer to distance themselves from daily practice and again reflect on the ideal situation. In the coding we tried to separate the ideal images from the real world, but in a few cases these were closely linked. So we may conclude that most academics were able to describe ideal images and sometimes even felt privileged in not being limited by institutional constraints for once. Therefore, the images evoked came closer to desirable research-teaching nexus than in other types of research.

3.4.3 Implications

In this study we were able to distinguish several ways to arrange the diversity of the research-teaching nexus. All categorisations and dimensions are in their own way useful for academics to help them to rethink their teaching. The advantage of the presented categorisation is that it excludes the non-preferred variants of linking research and teaching. When one searches for powerful forms of the linkage, as suggested by Hattie and Marsh (Hattie & Marsh, 1996), the profiles distinguished in this study might provide an instrument for educational developers and university teachers to determine what they actually have in mind when talking and thinking about strengthening the research-teaching nexus. We would like to stress that although the different profiles might look like developmental phases, this was not the way the majority of the academics talked about them. Depending on personal insight or preferences these profiles and their underlying dimensions could be used in several ways. Academics or departments might want to use the different profiles throughout their various courses, depending on content or level; others might have a strong preference for one

profile because of their teaching conception or the traditions in their discipline. In our opinion it would be desirable to use many different ways of relating research and teaching, as the different profiles have different advantages for students and academics (Elsen et al., 2009). From the perspective of the academic, it is noteworthy that there is not one ideal way of realising the research-teaching nexus. The different profiles could, therefore, be used as a way to stay in touch with academics and to find ways for each of them to relate their research and teaching tasks to each other. Most important, however, is that academics and other stake holders in higher education decide what they want to define as the desirable way(s) of strengthening the link between research and teaching.

Chapter 4

The role of the discipline in the debate about the research-teaching nexus

4. The role of the discipline in the debate about the research-teaching nexus[3]

In higher education the nature of the link between research and teaching is a major subject of discussion, with an ongoing debate on the role of the discipline in this relationship. Some researchers emphasise that research and teaching are conceived differently in different disciplines and therefore result in different ideas on the ways in which research and teaching can be linked. Others argue that the disciplinary influence is strongly overestimated. This study, conducted in a Faculty of Humanities, reports findings about relationships between academics' disciplinary backgrounds, the types of research-teaching nexus they prefer, and their conceptions of knowledge, research, and teaching. Academics' disciplinary backgrounds were found to be related to their knowledge and research conception rather than their teaching conception. However, it is the teaching conception that is related to the preferred research-teaching nexus. So, this study stresses the importance of academics' teaching conceptions above academics' disciplinary backgrounds when it comes to linking research and teaching.

[3] Submitted in adapted form as Visser-Wijnveen, G.J., Van Driel, J.H., Van der Rijst, R.M., Verloop, N., & Visser, A.. The role of the discipline in the debate about the research-teaching nexus.

4.1 Introduction

A prominent theme in the literature concerning the research-teaching nexus is whether academics' particular disciplines affect the way they link and would like to link research and teaching, in other words, whether the way the link between research and teaching is made or can be made differs between disciplines. In this chapter, we will highlight both positions in the debate; i.e., 'discipline is essential to the research-teaching nexus', and 'discipline is not that important'.

4.1.1 Disciplinary differences

Many researchers (Barnett, 2003; Colbeck, 2004; Neumann, 1993; Robertson & Bond, 2005; Smeby, 1998) have noticed distinctions between the disciplines in the way research and teaching are related. Barnett (2003, p. 154-155), for instance, states that research and teaching are both complexes of activities that take different forms across disciplines, for example empirical research involving large teams versus the work of an individual scholar, or laboratory-based teaching as opposed to text-based teaching. So, when trying to establish the link between research and teaching it seems meaningful to distinguish between disciplines. The distinction is found in academics' conceptions of research as well as in conceptions of teaching. Robertson (2007) reports differences in conceptions of the research-teaching nexus itself. Academics from the hard disciplines were overrepresented among those conceptions of the nexus she characterises as 'weak' and 'transmission', indicating a view in which research and teaching have only a tenuous link, while academics from the soft disciplines could be found in the area of conceptions characterised as 'symbiotic' and 'integrated', meaning a view in which teaching and research are strongly related or even integrated. Before looking at the differences identified in these particular aspects, we will discuss the phenomenon of discipline, or academic area, in general.

The most cited work on disciplines is Becher's study (1989) on academic tribes and territories. He focuses on the relationship between the distinctive cultures within academic communities and academic ideas in these communities. Cultures are formed by taken-for-granted values, attitudes, and ways of behaving, articulated and reinforced within a group of people in a certain context. Disciplines are formed by the ideas they explore. Donald (1986) also mentions the different ways in which ideas are explored, and points towards disciplinary differences in four elements: the nature of the concepts, logical structure, truth criteria, and methods employed. However, even within one discipline there can be different epistemological beliefs. A true entity, therefore, is formed at the level

of specialism or even sub-specialism. However, this is considered not a useful level of analysis because of the instability of the specialisms (Becher, 1989, 1994). Regarding the relationship between epistemology and culture Becher and Trowler (2001, p. 23-24) explain:

> In practice, academic cultures and disciplinary epistemology are inseparably intertwined. The flow of causation is not one way; rather the relationship is mutually infused: disciplinary knowledge forms are to a large extent constituted and instantiated socially. Meanwhile their constitution has a reciprocal effect on the cultures from which they spring (…) In attempting to explore the characteristic features of their relationship it is nevertheless necessary to separate culture analytically from the epistemological properties of disciplines.

According to Becher (1989), academic communities in general can be divided into 'urban' or 'rural'. The qualification 'urban' is used for small territories; research fields, in which many researchers are active. 'Rural' are those research communities in which few researchers are active in large territories. This dissimilarity creates many differences in academics' social environment. The most important feature here is the competition in the urban communities. As many research groups search for answers to the same questions, it is important to produce and publish results very fast. Researchers in rural territories, by contrast, take their time with their studies and hence produce longer and more balanced articles. Since the research density is low, academics in rural territories cite researchers from a period that may stretch far into the past. In rural communities researchers are used to working independently, while in urban communities research groups are the standard (Becher, 1989).

On the basis of the work by Biglan (1973), Becher (1989) distinguishes four areas which each have a different field of intellectual enquiry ('territory') and a corresponding different academic culture ('tribe'). These areas are distinguished on two dimensions: *hard-soft* and *pure-applied*. Biglan (1973)has described the hard-soft dimension as the degree to which one single paradigm is present in the discipline: one dominant paradigm (*hard*) or several coexisting paradigms (*soft*). The pure-applied dimension refers to the degree to which the discipline is concerned with practical application. The list below gives an indication of which discipline is situated in which area (Becher & Trowler, 2001):

- Hard-Pure area: natural sciences.
- Soft-Pure area: humanities and pure social sciences.

- Hard-Applied area: technologies.
- Soft-Applied area: applied social sciences.

Since Becher's publication (1989) many researchers have adopted his division and found meaningful differences in social and intellectual levels. Stoecker (1993) tried to find evidence for the allocation of disciplines in specific quadrants. Besides the characteristics mentioned above, she found significant differences regarding the time allocated to research and to teaching. In the hard disciplines more time was given to research, while in the soft disciplines more time was reserved for teaching. Becher (1994) questions the practice of only comparing disciplines across different academic areas and pleads for paying attention to disciplines within one academic area, as this might provide indicators or elements that would otherwise be overlooked.

In studies into the research-teaching nexus (Moses, 1990; Robertson, 2007) discipline-related differences have been found, for instance regarding academics' conceptions of the nature of research as well as their approach to teaching. We will here limit ourselves to research and teaching, as they are essential from the perspective of the research-teaching nexus. However, it is important to notice that disciplinary differences are also found in related areas; such as students' approaches to learning (North, 2005), pedagogic culture (Jenkins, 2004), and funding and publishing habits (Stoecker, 1993).

4.1.2 Disciplinary differences in research

Regarding the definition of research, three features are endorsed by all academics. Research should first include a search for new knowledge, second adopt an enquiring method, i.e., a continuous, sceptical reflection on knowledge, and third result in the publication of results and views (Neumann, 1993). The disciplines differ in what they consider to be 'new' knowledge. A critical issue is the question whether synthesising and refining existing knowledge and offering new interpretations constitute 'new' knowledge and hence should be considered research. This is a common form of research in the humanities, but some academics in the natural sciences call it scholarship instead of research (Neumann, 1993). Besides, some researchers see scholarship as a mediator between research and teaching (Boyer, 1990; Moses, 1990). Nevertheless, it remains unclear what counts as research and what as scholarship. The concept 'scholarship' is used in many different ways but dominantly as a term that covers all academic work (Moses, 1990; Nicholls, 2005). This also goes for Boyer (1990),

who distinguished 4 different types of scholarship: discovery (advancing knowledge), integration (synthesising knowledge), service (advancing and applying knowledge) and teaching (advancing and applying knowledge about how to teach and promote learning). Neumann (1993) notes that research traditions vary in the different academic areas. Consequently, using the term 'research' only for the scholarship of discovery is a disciplinary judgment.

4.1.3 Disciplinary differences in teaching

Studies on teaching have mostly focused on general aspects of teaching and thus ignored the disciplinary aspects. Hativa and Marincovich (1995) break through this imbalance by describing significant teaching differences between the varying disciplines. Hativa and Marincovich (1995) also showed that the differences are related to epistemology as well as the culture of the disciplines. Aspects related to epistemology are curriculum, assessment, and cognitive purpose. Curriculum differences echo the nature of knowledge as the cumulative nature of the hard disciplines, in which a large amount of 'basic knowledge' is deemed necessary before students can grasp the 'higher-order knowledge', contrasts with the holistic nature of the soft disciplines, in which knowledge construction is seen as a spiral process (Neumann, Parry, & Becher, 2002). Furthermore, assessment methods and cognitive goals also reflect the disciplines: reproduction of knowledge or knowledge integration and application in the applied areas, a focus towards logical reasoning in the hard-pure areas, and appreciation of creativity in the soft-pure areas. Regarding the cultural aspects, willingness to cooperate in teaching occurs more in the hard disciplines than in the soft disciplines, which reflects the various research settings in which academics work. Furthermore, the different natures of the disciplines result in different teaching settings: lectures and laboratories in the hard-pure disciplines and study groups in the soft-pure counterparts (Neumann, 2001; Neumann et al., 2002). Lindblom-Ylänne and others (2006) use the Approaches to Teaching Inventory to distinguish disciplinary differences among academics. The hard science teachers were found to score significantly higher on the information transfer/teacher-focused scale and the soft science teachers scored significantly higher on the conceptual change/student-focused scale. Comparable results were obtained by Lueddeke (2003) in a different context. This seems to indicate that teachers in the natural sciences are concentrate more on the transfer of information, for instance research findings or the huge body of 'basic' knowledge, while teachers in the humanities are more focused on students' conceptual change.

4.1.4 Disputing the importance of disciplinary differences

Other researchers argue that the importance of the discipline is overestimated. Brew (2008) questions the proposition that discipline is a central construct by doubting the prerequisite that academics have a disciplinary identity at all. Her research shows that although some academics are strongly embedded in their discipline, most academics have a nested or confluent rather than a firm and fixed disciplinary identity. Many academics do not work in one disciplinary area, but on the borders of different disciplines or feel affiliated with both the mother discipline and their specific (sub)specialism. This ties in with the observation that the distinctions between disciplines can not easily be made. The core disciplines can still be recognised, but the borders are fluid (Brew, 2008). According to Pinch (1990) disciplines are in the first place rhetoric. Disciplines are used by academics to identify themselves and others, even though they do not adequately describe reality and might even have a confusing effect as soon as diffuse borders between them are passed. So, it seems that the dispute regarding 'discipline' depends on the question whether academics' perceptions of a discipline or observed differences between the disciplines are taken into account.

In contrast to the studies on the disciplinary differences in research mentioned above, Brew (2001) found in her phenomenographic study on the conceptions of research among senior researchers, that none of their conceptions could be attributed exclusively to one of the disciplines. Her finding that 'discipline' did not matter, might have been affected by the presence of researchers who are exceptional (for instance because of their sub-specialisms) in their discipline. Regarding teaching, Stes and others (2008) did not find a relationship between the conceptual change/student-focused approach and discipline, despite using the same instrument as Lindblom-Ylänne and others (2006); they point out that their results might have been distorted by the low mean score for all disciplinary groups. Another argument against the importance of the discipline is the finding that the differences within disciplines are many times as large as the differences between them. Quinlan (1999), for example, identifies key differences concerning historians' beliefs, orientation towards the discipline and approaches to teaching. She indicates that these differences run along generational and gender lines. So, from this perspective looking at the concept of discipline might be interesting to come to grips with certain phenomena, but the disciplines in themselves are certainly no explanation; differences need to be attributed to academics' backgrounds (Huber, 1990) and institutional characteristics (Ylijoki, 2000).

Regarding the importance of the discipline for the research-teaching nexus, Brew (2003; 2006) states that the disciplinary structure of Academia corresponds to the 'old knowledge', while the merging of disciplines is congruent with the 'new knowledge'. From her point of view society needs an integrated, not a fragmented Academia. This would mean that research and teaching take up completely new positions within the university, as they are no longer opposing each other, but instead together create communities of learners. In her new concept of the university, learning is the key in bringing research and teaching together (Brew & Boud, 1995).

4.2 Context and research questions

In this study we focused on one specific academic area. In 1994 Becher already urged researchers to conduct more in-depth studies concerning one academic area instead of the general ones more common in this type of research. Ylijoki (2000) stressed that significant differences can be found among disciplines in the same academic area. Still, closer looks at just one of these areas are rare. Our research project, therefore, was intended to unravel the special features of the research-teaching nexus as perceived in the pure-soft area, concentrating on the different disciplines within the Faculty of Humanities. In the Biglan classification (1973) culture & literature and history & art history are considered really soft; linguistics is also considered soft, however much closer to the hard disciplines. For that reason differences between culture & literature and history & art history on the one hand and linguistics on the other are expected in case the discipline proves to be of influence.

We aim to contribute to the discussion on the relevance of 'discipline' for the research-teaching nexus by relating academics' preferred types of research-teaching nexus to disciplinary differences within the area of humanities. The differences in preferences regarding the research-teaching nexus are generally expected to be related to academics' conceptions of the underlying concepts, namely knowledge, research, and teaching (Brew, 2003; Robertson & Bond, 2005). These differences between preferred nexus and various conceptions might or might not be related to the discipline. Therefore, we investigated how conceptions of knowledge, research, and teaching are related to the preferred types of research-teaching nexus as well as to the disciplines. It is unclear whether background variables other than discipline are related to the preferred research-teaching nexus. Smeby (1998) reported insignificant connections regarding age and position based on a survey study, however, in his interview study he noticed

that different groups emphasised different aspects of the relationship. Therefore, we considered it worthwhile to investigate the relations between preferred research-teaching nexus on the one hand and age, sex and position on the other.

The metaphor study revealed five different conceptions of knowledge, research, and teaching for 30 respondents from the Faculty of Humanities (see Chapter 2). These three types of conceptions were each positioned on a continuum. Knowledge conceptions ranged from knowledge as (I) facts in the external world, via (II) a continually growing body of understanding of the external world, via (III) an answer to a certain question, via (IV) individually constructed relations between objects, to (V) a personal construct. Research conceptions ranged from research as (I) disclosing patterns, via (II) searching for patterns, via (III) an explaining patterns, via (IV) the researcher pointing out the patterns in the data, to (V) the creation of patterns by the researcher. Teaching conceptions ranged from teaching as (I) knowledge transmission to the students, via (II) interaction between teachers and students leading to student activity, via (III) a teacher showing what to do and not to do with the topic under discussion, via (IV) showing how to deal with knowledge, to (V) teaching students to think critically.

As a next step, all 30 respondents were given a mental visualisation assignment to make them articulate their ideal image of the research-teaching nexus, or preferred research-teaching nexus (see Chapter 3). Five different profiles of the research-teaching nexus became apparent, namely (A) teach research results, (B) make research known, (C) show what it means to be a researcher, (D) help to conduct research, and (E) provide research experience.

In line with our aim to contribute to the discussion on the relevance of 'discipline' to the research-teaching nexus, the following research questions are posed. See Figure 4.1 for their mutual relationships.

1. Is the preferred research-teaching nexus related to discipline?
2. Is discipline related to conceptions of knowledge, research, and teaching?
3. Is the preferred research-teaching nexus related to conceptions of knowledge, research, and teaching?
4. Is the preferred research-teaching nexus related to age, sex, and position?

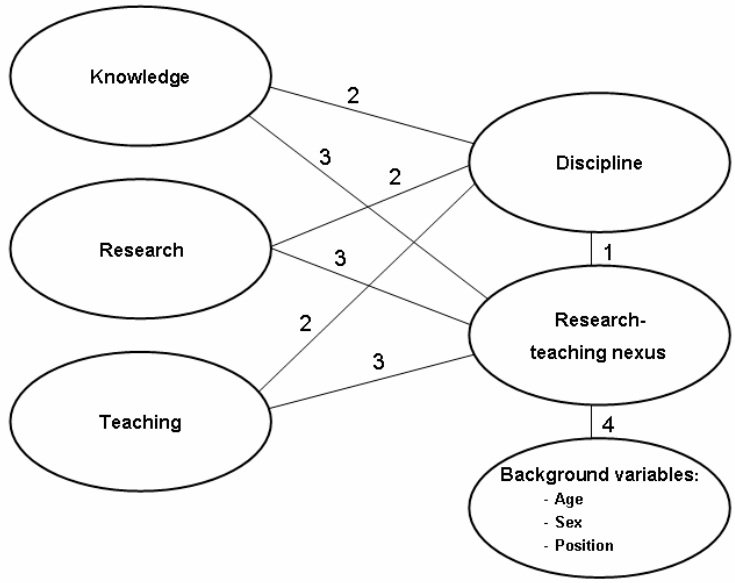

Figure 4.1. Graphical representation of research question

4.3 Method

The sample for this study consisted of 30 academics from the Faculty of Humanities (see Section 2.2.1): 15 assistant professors, 5 associate professors, and 10 full professors. They were equally distributed over the following disciplines: culture & literature, history & art history, and linguistics. All academics were asked what they considered to be their discipline to see whether our preliminary classification corresponded with their personal view (Brew, 2008). Only 3 out of 30 did not immediately associate themselves with the preliminary classification, but in their explanation of their own practice associated themselves with the disciplinary area they had been assigned to. All disciplines are considered to be soft-pure disciplines, however linguistics is considered 'harder' than culture & literature and history & art history. Ages ranged from 30-58, and 43% of the respondents were female. Besides these background variables, for every respondent the following data were available from previous studies, as reported in Chapters 2 and 3: scores on knowledge conception (I-V), research conception (I-V), teaching conception (I-V) and preferred research-teaching nexus (A-E).

First, we calculated chi-square in order to test whether the discipline was related to the preferred research-teaching nexus. Second, we used the Kruskall-Wallis

test to identify relations between disciplines and conceptions of knowledge, research, and teaching. As this technique only tests for differences that are collectively significant (Chan & Walmsley, 1997), we carried out Mann-Whitney tests between the pairs of disciplines that showed plain differences in mean ranks. Both tests are suitable for asymmetric analysis of nominal and ordinal data (De Heus, Van der Leeden, & Gazendam, 1995). Third, we used Kruskall-Wallis tests to determine whether the preferred research-teaching nexus was related to knowledge, research, and teaching conception. In case of significant differences between the medians of the different groups we carried out multiple comparisons between groups, based on Bonferroni inequalities (Gibbons, 1993, p. 49). Fourth, we explored other possible relations between the preferred research-teaching nexus and respondents' sex, age, and positions, using chi-square tests.

4.4 Results

4.4.1 Disciplinary relations

The distribution of the profiles among the three disciplines is shown in Table 4.1. 'Culture & literature' has been shortened to 'culture' and 'history & art history' are shortened to 'history'. The Chi-square test showed no overall significant differences between discipline and preferred research-teaching nexus.

Table 4.1. Distribution of profiles among the disciplines

Discipline	Nexus					Total
	A	B	C	D	E	
Culture	1	3	2	2	2	10
History	3	2	1	0	4	10
Linguistics	2	1	2	3	2	10
Total	6	6	5	5	8	30

The calculation of Kruskall-Wallis between the discipline and the conceptions of knowledge, research, and teaching showed no significant differences. In Table 4.2 the distribution of the disciplines among the conceptions is displayed. However, when we look at the mean ranks the difference between culture and history on the one hand and linguistics on the other attracts attention. As we noticed that this technique only tests for differences that are collectively significant, for all conceptions Mann-Whitney tests were carried out with the pairs culture vs. linguistics and history vs. linguistics. These results showed significant differences for most comparisons. For the knowledge conception a significant difference on the 5% level ($Z = -1.739$, $p = .041$) was found between culture and linguistics and

on the 10% level (Z = -1.625, p = .052) between history and linguistics. A knowledge conception closer to *knowledge as a personal construct* was found within culture & literature and history & art history, and a knowledge conception closer to *knowledge as facts* was found within linguistics. For research conception a significant difference on the 5% level (Z = -1.739, p = .041) was found between culture and linguistics and on the 10% level (Z = -1.625, p = .065) between history and linguistics. Academics within the disciplines of culture and history professed conceptions closer to *research as patterns created by the researcher*, while a conception of *research as disclosing patterns* was more typical of academics within the linguistic discipline. No significant differences were found for teaching conceptions.

Table 4.2. Distribution of conceptions among the disciplines

Conception	Conception score					Mean ranks
	I	II	III	IV	V	
Culture						
Knowledge	2	0	3	2	3	18.40
Research	2	0	1	5	2	18.40
Teaching	1	2	1	4	2	16.80
History						
Knowledge	1	2	3	2	2	17.15
Research	1	2	2	3	2	17.00
Teaching	0	1	5	2	2	17.10
Linguistics						
Knowledge	3	4	1	2	0	10.95
Research	1	6	1	2	0	11.10
Teaching	3	3	0	2	2	12.60

4.4.2 Relations concerning the preferred research-teaching nexus

No associations were found between academics' knowledge or research conceptions and their preferred type of the research-teaching nexus. A significant association (H = 12.973, df = 2, p = .011) was found between teaching conception and the preferred research-teaching nexus. The distribution of the preferred nexus and teaching conceptions is shown in Table 4.3. Academics with profiles D and C differed significantly from each other with respect to their teaching conceptions. Profile D was associated with a conception of teaching as *knowledge transmission* and *interaction leading to student activity*, while profile C was

associated with a conception of teaching as *showing how to deal with knowledge* and *teaching students to think critically*.

Table 4.3. Distribution of teaching conceptions among profiles

Nexus	Teaching conception					Total	Mean ranks
	I	II	III	IV	V		
A	0	1	2	1	2	6	18.33
B	0	1	2	3	0	6	16.00
C	0	0	0	3	2	5	23.30
D	3	2	0	0	0	5	4.50
E	1	2	2	1	2	8	15.00
Total	4	6	6	8	6	30	15.50

No significant differences were found between the preferred research-teaching nexus and sex or age. Yet, a significant correlation was found between position and the preferred research-teaching nexus (Pearson chi square = 12.633, p = .013). Full and associate professors were over-represented in the profiles B (make research known) and C (show what it means to be a researcher), and assistant professors were overrepresented in A (teach research results) and D (help to conduct research), as shown in Table 4.4.

Table 4.4. Distribution of profiles among positions

Position	Nexus					Total
	A	B	C	D	E	
Assistant Professor	5	1	0	4	5	15
Associate Professor & Full professor	1	5	5	1	3	15
Total	6	6	5	5	8	30

4.5 Conclusion and discussion

4.5.1 Conclusion

The question whether there is a relationship between disciplinary background and preferred research-teaching nexus can be answered in two ways. First, we can state that no relation was found between academics' preferred research-teaching nexus and their disciplinary backgrounds. A closer look at the conceptions of the underlying concepts, namely knowledge, research, and teaching nevertheless showed that there was a relation between knowledge and research conceptions and disciplinary backgrounds. The differences found were comparable to earlier findings by, among others, Becher and Trowler (2001), but contrasted with Brew's

findings (2001) on the research conception. The harder discipline, in our study linguistics, was related to a conception of knowledge as *facts* and of research as *disclosing patterns*. The softer disciplines, in our study history & art history and culture & literature, were related to a conception of knowledge as *a personal construct* and of research as *creating patterns*. Teaching conception was found not to be related to the disciplines, which diverged from earlier results by Neumann and others (2002). Interestingly it was this conception that was related to respondents' preferred research-teaching nexus. Profile C, *show what it means to be a researcher*, was related to a conception of teaching as *showing how to deal with knowledge* (IV) and *teaching students to think critically* (V). This connection might be explained by the importance these academics assign to the person of the knowledge producer. They want their students to understand the importance of the way they deal with knowledge and research. This aspect is central in teaching conceptions IV and V and in profile C. Profile D, *help to conduct research*, on the other hand, was found to be related to the conception of teaching as *knowledge transmission to the students* (I) and *interaction between teachers and students leading to student activity* (II). A possible explanation for this might be that these academics want to introduce their students to what is happening in the university, but still rely strongly on themselves as the experts.

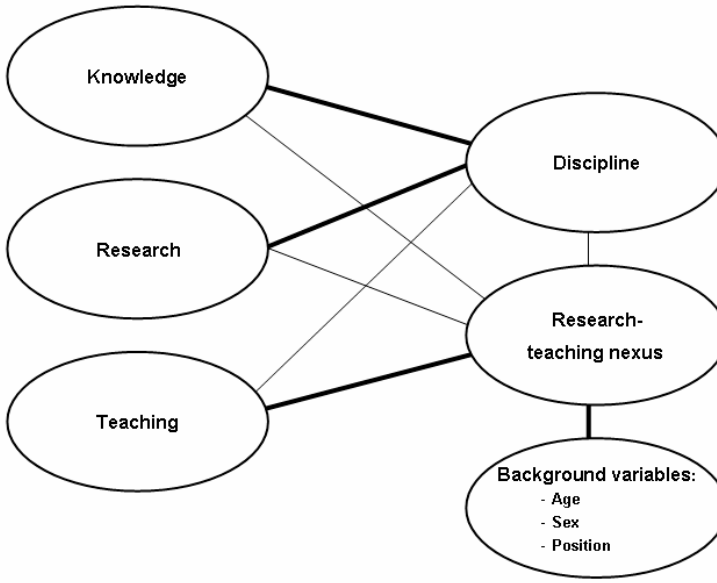

Figure 4.2. Graphical representation of the studied relationships

Thus, although the disciplinary association with the conceptions of knowledge and research is apparent, it is the teaching conception that is related to the preferred research-teaching nexus, and as this conception is not related to discipline, neither is the preferred research-teaching nexus. See Figure 4.2 for a graphical representation. However, we would like to recall that this study was conducted solely within the pure-soft disciplines. Further research needs to be done to find out whether this conclusion could be generalised to other academic areas. Finding disciplinary differences within the same academic area suggests that we might expect even greater differences between disciplines from different academic areas.

4.5.2 Discussion

An issue that we want to pay attention to is the different ways educational researchers decide whether disciplinary influence is involved. Some researchers (Åkerlind, 2008c; Brew, 2001) use the criterion that certain conceptions need to be found exclusively among academics in one specific discipline. In their opinion, if there are examples contradicting the prevalent linkage between a certain discipline and a related conception, a disciplinary relationship should not be assumed. However, other educational researchers (Lindblom-Ylänne et al., 2006; Stes et al., 2008), including ourselves, search for correlations between disciplinary backgrounds and certain conceptions. In this view an exclusive relationship between discipline and conception is not required, as a strong tendency towards a combination of a certain discipline and a related conception is what is looked for. This difference in view might be one of the explanations for the contradictory results found in the literature.

Besides relationships between disciplines on the one hand and preferences and conceptions on the other, we found an association between academics' positions and their preferred types of research-teaching nexus. The differences found between assistant professors on the one hand, and associate and full professors on the other, can be compared with previous research on differences between novices and experts. Hereby we have to note that the position within a university is not primarily based on teaching competence, but on research competence, so academics' position does not by definition reflect their teaching competence or experience. Most novice-expert studies in education are carried out in primary and secondary education. Regarding higher education, Dunkin and Precians (1992) compared novice university teachers to award-winning university teachers. They found that the essential difference between the groups was that excellent

teachers have a more complex and complete conceptional repertoire than novice university teachers, and are better able to decide which strategy to use at what moment. Athanases and Achinstein (2003) pointed to the ongoing discussion in teacher education about development models in which novice teachers pass through several stages of development. A comparable principle might occur in higher education, in which the focus of attention in their preferred type of nexus shifts from explicitly highlighting research to implicitly including it. Assistant professors have a preference for explicitly introducing research, by telling students about research results (profile A) or helping them to conduct their own research (profile D), while associate and full professors like the implicit and reflective way better, by focusing on understanding what the research process involves (profile B) and focussing on the necessary academic disposition (profile C).

4.5.3 Implications

Academics' teaching conceptions were found to be related to their preferred research-teaching nexus. This seems to indicate that in the discussion concerning the research-teaching nexus more attention should be paid to academics' teaching conceptions, especially since previous research by Prosser and Trigwell (1999) has shown that academics' teaching conceptions greatly affect students' learning; they influence particularly whether students adopt a surface or a deep learning approach. This becomes even more important when we realise that teachers in higher education normally have no or only very little pedagogical training, and therefore might not be aware of the impact of their conceptions on students.

Furthermore, we found that the preferred research-teaching nexus does not differ over the disciplines. However, as our research focused on preferences rather than actual practice, this does not automatically imply that all preferred linkages are put into practice in all disciplines likewise. As Neumann and others (2002) found differences in university teaching in the different disciplines, this may mean that some profiles occur more often in certain disciplines than in others. Therefore, we suggest that future research also includes university practice. Meanwhile we consider it worthwhile to discuss the research-teaching nexus beyond disciplinary boundaries, as academics' preferences do not seem to differ across the disciplines.

Our last suggestion considers the departments in which the educational programmes are being developed. As the preferred research-teaching nexus was not related to the discipline in this study, we assume that in most departments the views on this connection differ among the academics, especially as we have seen that assistant professors prefer other linkages than associate and full professors. It is necessary that the department head be aware of these differences of opinion. Instead of guiding everyone in the same direction, it is advisable to discuss the research-teaching nexus with all academics involved and look for complementary and conflicting opinions. For example, a department might want to engage students in research in the following ways: helping them to conduct research (profile D) and showing what it means to be a researcher (profile C). Although all teachers pay attention to these different goals, assistant professors might want to put most emphasis on the former and full professors on the latter. Knowing all academics' preferences enables departments to develop diverse programmes in which students develop research skills as well as an academic disposition. So, discussing the different preferences within the departments may make it possible to construct educational programmes in such a way that the advantages of the different linkages preferred are used to maximum effect, and the disadvantages are limited.

Chapter 5

Relating academics' various ways of integrating research and teaching to their students' perceptions

5. Relating academics' various ways of integrating research and teaching to their students' perceptions[4]

A wide variety of studies has been carried out regarding the way academics view the research-teaching nexus, while other studies focused on the students' experiences of research-intensive environments. This study relates these two research streams and describes how twelve staff members in a Faculty of Humanities integrate research into their teaching, and how their students perceive these learning environments. Data were gathered from both teachers and students. The twelve teachers opted for different ways of integrating disciplinary research into their teaching. The study produced some unexpected benefits as the attained learning environment yielded more and other outcomes than intended, especially regarding the dispositional level and awareness of research. It was possible to attribute dispositional learning outcomes to students bringing the academic disposition into practice and discussing their efforts with their teachers, while awareness of research increased as a result of getting a close look at the teacher's own research.

[4] Submitted in adapted form as Visser-Wijnveen, G.J., Van Driel, J.H., Van der Rijst, R.M., Visser, A., & Verloop, N.. Relating academics' various ways of integrating research and teaching to their students' perceptions.

5.1 Introduction

The wish to link research and teaching is articulated especially in research universities, although a strong symbiosis is not easily achieved (Boyer Commission, 1998). Zubrick, Reid, and Rossiter (2001) give several reasons for strengthening this nexus. Shifting contexts and expectations lead to uncertainties for universities as organisations and for individual academics. An emphasis on the link between research and teaching stimulates teachers and students to develop a culture of critical enquiry. Other reasons for emphasising this connection include the wish to retain one's status in the competitive field of higher education, to value and reward the diversity of academic work, to improve the quality of both university teaching and research, and to raise the status of teaching as compared to research. Interestingly, only the first reason regards the students; all others are related to academics or the university as a whole. In this chapter we would like to draw attention to both teacher and student perspectives on a strong connection between research and teaching. We will first pay attention to academics' experiences and views and then turn to the students' experiences regarding the research-teaching nexus.

5.1.1 Teacher perspective

On the basis of interviews the studies by Robertson and Bond (2001) and Coate, Barnett, and Williams (2001) report various experiences of the relations between research and teaching. The first study reports a variety of relations, ranging from mutually incompatible activities to sharing a symbiotic relation within a learning community (Robertson & Bond, 2001). The ends of this range coincide with the categories 'independent' and 'integrated' found in Coate and others (2001). Furthermore, Coate and others (2001) add the categories 'negative impact' and 'positive impact' (research to teaching, and teaching to research). Negative influences are related to the higher value assigned to research over teaching. This creates an imbalance not only for some academics, but potentially also for educational programmes, because of conflicts of interest and time. Besides, research might improve teaching. Examples provided by Coate and others (2001) include an increase of the teacher's authority as they are seen as a well-known expert in the field, enthusiasm rubbing off on the students, researchers teaching more relevant and up-to-date, and teaching from their personal experience rather than second-hand knowledge. Coate and others (2001) conclude that is it necessary to distinguish between staff 'teaching their own research' and staff active in research in a relevant field. What types of teacher en teaching yields specific advantages depends on course level and discipline.

5.1.1.1 Goals

From interviews with academics at eight European research-intensive universities Elen and Verburgh (2008) conclude that academics perceive the linking of research and teaching as beneficial for students. A close connection, after all, is expected to result in a specific state of mind. A key element of this state of mind is a critical orientation, or critical thinking. Put more generally, teaching in research-intensive universities is aimed at the development of a mature epistemological disposition in the students. The link between research and teaching is fundamentally based on and directed towards a mature epistemological disposition according to Elen and others (2007). This mature epistemological disposition includes not only critical thinking, but also curiosity and a willingness to take a stance and defend it with reasonable arguments (Elen & Verburgh, 2008). The idea of a mature epistemological disposition resembles the 'scientific research disposition' investigated by Van der Rijst, Van Driel, Kijne, and Verloop (2007) amongst university science teachers. They distinguished six aspects of this disposition, namely an inclination to achieve, to be critical, to be innovative, to know, to share, and to understand. Regarding history McLean and Barker (2004) showed that university history lectures agreeing that becoming a practicing historian is far more desirable than just acquiring transferable skills. The main difference between these two goals is that acquiring an academic disposition, i.e. to be able to form autonomous, well-informed, critical opinions about historians' debates, is an integral part of becoming a historian. Research activity is seen as extremely helpful to pursue this goal. So, linking research and teaching aims at a range of outcomes in the students, but is mostly directed towards their disposition.

5.1.1.2 Learning environment

A wide variety of learning environments in which academics purposefully integrate research into their teaching can be found in the literature. Many studies report some form of inquiry learning. This might entail either a research project in which students work together in a research team, or projects in which individual students carry out and discuss related research activities (Badley, 2002; Clark, 1997; Colbeck, 1998). In these cases students pursuing research is the primary means of learning. Depending on the discipline this might take place in laboratories or in seminars. An individual variation upon this model is the mentor-apprentice relationship in which students operate as research assistants to their professors (Clark, 1997). The Oxford Tutorial might be considered a specific form of this relation (Ashwin, 2006). Another perspective is that of academics bringing

their research and research areas into their teaching and even into the general curriculum (Durning & Jenkins, 2005; Neumann, 1992), with research findings providing the input for the teaching. Yet, another variation were classes focusing mainly on the development of research skills, including modules in which only research methods were taught (Durning & Jenkins, 2005). Several of these distinctions are incorporated in a model proposed by Healey (2005). He distinguishes between a focus on research content versus research process, and students as audience versus participants in research; the former distinction concerns content or curriculum, the latter the approach by which this curriculum is taught to the students.

Several authors mention student level as a serious influence on the potential relationships; at graduate level the ties are usually closer than at undergraduate level (Clark, 1997; Durning & Jenkins, 2005; Neumann, 1992; Smeby, 1998; Zamorski, 2002). However, on the basis of observations of academics Colbeck (1998) found that the purpose of the teaching, i.e., classroom instruction or training students to conduct research, was a far more influential factor. Additionally, she mentions the importance of the discipline. In undergraduate education in the social sciences and humanities the link is easier to realise than in the natural sciences, as the degree of specialisation and the rate of knowledge development are lower in the former (Smeby, 1998). A last aspect that academics consider relevant is class size (Shore, Pinker, & Bates, 1990). This influences a preference for lecturing versus more interactive ways of teaching, and therefore, also implies different possibilities for integrating research and teaching.

5.1.2 Student perspective

Besides the studies on what academics do to enhance the research-teaching nexus, and the advantages and disadvantages they perceive or aim for, several authors have paid attention to how the students experience these research-intensive environments (Healey, 2005; Jenkins et al., 2003; Robertson & Blackler, 2006; Van der Rijst, Visser-Wijnveen, Verstelle, & Van Driel, 2009). Jenkins, Blackman, Lindsay, and Paton-Saltzberg (1998) stressed that the students' voices needed to be heard but was missing in the debate. In recent years the students' voice has come to be heard, although in most studies the focus has been only on final-year undergraduates. Hence, the advantages and disadvantages should be read from that perspective. Among the factors influencing how students perceive the link between research and teaching are nature and level of the discipline, type and purpose of a course, the ability and motivation of the student, and the

opportunity for personal interaction with teachers (Neumann, 1994). Breen and Lindsay (1999) explicitly pay attention to the influence of student motivation. They point out that intrinsically-motivated students appreciate research involvement most, qualification-motivated students are indifferent to research activities; achievement-oriented students approach research negatively. We will discuss both the disadvantages and advantages perceived by the students as reported in the literature.

5.1.2.1 Disadvantages

In the eyes of the students the three main disadvantages of combining research and teaching in the person of the academic are the following.

- Availability is sometimes problematic (Lindsay et al., 2002). Academics are researchers and teachers, which means that they have to divide their time and attention over both activities. In a questionnaire study by Healey, Jordan, Pell and Short (in press) this aspect was reported most often (15% of the students) concerning having a negative impact on their learning.
- A second problem is that staff research sometimes takes priority over teaching (Healey et al., in press; Lindsay et al., 2002). Many academics value research more than teaching, or assume that good subject matter knowledge is a substitute for good teaching. This view is clearly rejected by the students (Neumann, 1994).
- A third disadvantage reported is that the interest of academics might lead to a limited curriculum (Lindsay et al., 2002) or a disproportionate attention paid to teachers' favourite topics, at the expense of the aims of the course (Neumann, 1994) or students' interest (Lindsay et al., 2002).

Another aspect mentioned quite often by students when asked about their experiences with research is that they experience a great distance between themselves and the research being done at university (Lindsay et al., 2002; Robertson & Blackler, 2006; Zamorski, 2002). Robertson & Blackler (2006) indicate that a disciplinary influence can be noticed here: physics undergraduates have far less sense of belonging to a research community than geography and English undergraduates. Zamorski (2002) reports that students perceive both an underestimation and an overestimation of their research abilities: they are expected to be able to write a thesis in their final year, which they often consider an overestimation as they were given little opportunities to practice, while students who would like to participate in their teachers research experience an underestimation because they are often considered 'not good enough'.

5.1.2.2 Advantages

However, students report far more advantages than disadvantages of staff involvement with research (Healey et al., in press; Turner, Wuetherick, & Healey, 2008). The advantages can be summarised as follows:

- Teachers' enthusiasm for their research and henceforth for the subject matter enhances students' motivation (Healey et al., in press; Jenkins et al., 1998). Students enjoy their classes more and are fascinated by activities related to or the outcomes of their teacher's research (Robertson & Blackler, 2006).
- Students see classes taught by teachers who are also researchers as more intellectually stimulating and challenging. This is especially the case if the students are given research assignments, as these are considered different and more challenging than other tasks students get (Neumann, 1994; Robertson & Blackler, 2006).
- Students perceive an increased understanding of and interest in the subject, and an improvement of their own research skills when they are taught or supervised by active researchers (Turner et al., 2008).
- Students value their teacher's expertise (Neumann, 1994). This not only refers to the 'reflected glory of being taught by well-known researchers' (Healey et al., in press), but also raises the credibility of the teacher and hence of the subject matter being taught (Jenkins et al., 1998). Students especially appreciate accurate and up-to-date knowledge, or in other words a solid foundation, which they think these experts provide (Robertson & Blackler, 2006). Other characteristics attributed to these teachers are a competence in supervising project work (Jenkins et al., 1998), using relevant examples (Neumann, 1994), and pointing to useful research methods (Neumann, 1994), all because of the teacher's own experience in research projects.
- The students also appreciate that these kinds of teachers use a critical questioning approach and research findings. Both are thought to enhance students' academic disposition (Neumann, 1994). This leads to the insight that research is still going on and that there is much to be learned by the academic community as a whole too (Turner et al., 2008).

Studies into science students' experiences of undergraduate research summer courses (Hunter, Laursen, & Seymour, 2007; Seymour, Hunter, Laursen, & Deantoni, 2004) show perceived benefits in several spheres: professional and personal gains such as increased confidence and establishing relationships with mentor and peers, thinking and working like a scientist applying knowledge and

skills, gains in various skills such as communication and lab work skills, clarification and confirmation of career plans, enhanced career and graduate school preparation, and a shift in disposition towards learning and working as a researcher.

5.1.3 Research aim

However, in most of these studies the focus has been either on teacher perspective or on student perception, so that it is only partly possible to see relations between the research involvement in teaching and the students' experiences. If we are to better understand the advantages or disadvantages of specific ways of linking research and teaching, there is a need for studies in which attention is paid to both sides: the learning environment that is created, i.e., the way in which research is included, and the students' experience (Neumann, 1996). In our research project we have brought both sides together when we looked in detail at courses from both the teacher and student perspective. In this way we were able to relate certain characteristics of the learning environment as intended and implemented to learning outcomes and student experiences, i.e., the attained learning environment (Van den Akker, 2003). Thus, this research aimed to describe how academics intentionally integrate research in their teaching, and what learning outcomes from these environments their students perceive.

5.2 Method

5.2.1 Sample

Twelve academics in the Faculty of Humanities at Leiden University were willing to participate in this research project (see also Section 6.3.1). This group consisted of academics with a background in (art) history (in some cases of a specific region), linguistics and cultural studies. The group included academics whose field of study was the western world as well as those focusing on the non-western world. Four of them were females and eight males, with ages ranging from 31 – 59, and positions ranging from assistant professor to full professor.

5.2.2 Procedure

During one term all participants were engaged in fostering a stronger link between research and teaching in their courses. The courses ranged from first-year Bachelor's courses to Master's courses. The teachers were encouraged to foster the linkage in the way they thought to be most fruitful. In this way we explicitly refrained from prescribing any direction, but we wanted the teachers to

design their course in a way closest to their view on strengthening the research-teaching nexus. Data were gathered from both the teacher perspective and the student perspective. All activities and data sources for this research project are presented in Figure 5.1. We arranged a varied data collection to ensure a multi-faceted understanding, and included both primary data sources and a few additional data sources in the design of this research project. We will first describe the primary data sources for both the teacher and the student perspective before turning to the additional sources.

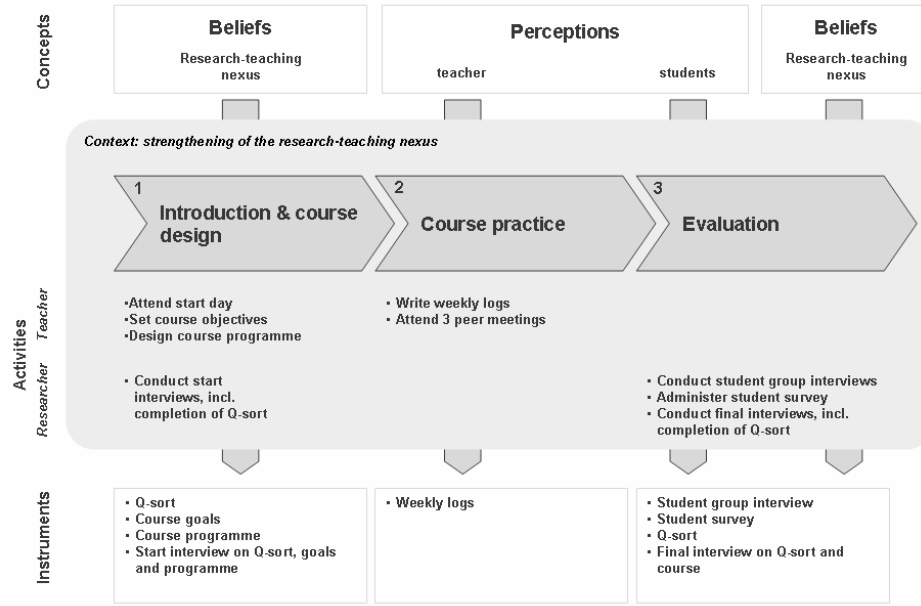

Figure 5.1 Overview of the research project (second study)

5.2.2.1 Teacher perspective

From the teachers we collected course goals, course programmes, and weekly logs. Before the start of the term all teachers were asked to provide course goals in which they explained clearly what they wanted the students to achieve during the course. These course goals needed to be based on a thorough analysis of what the students had already learned in other courses, and what the teacher wanted to achieve by the stronger link between research and teaching. Furthermore, the

teachers were asked to hand in a course programme in which they gave information about what the content of each class would be, what the students were supposed to do in preparation for that class, and how the examination would take place. During the course the teachers kept a weekly log (Clark & Peterson, 1986), in which they reflected on the last class, representing the implemented curriculum, and looked forward to the next class. Their reflection on the last class was based on the following questions: What did you want to achieve? What was the result? In what way did you strengthen the link between research and teaching? What was characteristic for this class? What do you think that the students learned? Their preview of the next class was supported by the following questions: What do you want to achieve? How do you plan to achieve this? In what way will you strengthen the link between research and teaching? What is the rationale behind this?

5.2.2.2 Student Perspective

In order to get to the student perspective, representing the perceived curriculum, we conducted interviews with groups of students of each teacher. These group interviews were conducted at the end of the course, usually just after or just before the last class, to gain insight into what the students learned from the course. The groups consisted of one to six students, depending on the total number of students. The interviews consisted of four parts. The first part focused on the students' backgrounds. In the second part the students were asked individually what they thought were the two most important things they learned during the course: this was then reported and discussed by all participating students. In this part of the interview the students were not made aware of the teacher's goal in order to avoid any influence from that side. Some teachers, however, had stated the learning goals at the beginning of the course, as part of their teaching method. Nonetheless, most students were not able to reproduce the teacher's goals when asked to in the third part. This third part regarded their opinion on whether the goals formulated had been achieved and the contingent difference between this course and other courses. The fourth part focused on the question in what way the students had noticed, either in general or in relation to the specific course, that their teacher was also an active researcher.

5.2.2.3 Additional sources

Several additional sources were deployed to support correct interpretations. Regarding the teacher perspective this included interviews and class visits. Both course goals and course programme were discussed during an interview at the

start of the term; these represented the intended curriculum and were intended to ensure a correct understanding of the two primary data sources by the researcher. Class visits were also conducted; these were additional as we preferred to rely on detailed descriptions in the weekly logs to learn what happened in each class during the whole course. Besides, as many teachers described several stages in their course design the structured observation of classes would need many class visits for every course, and especially since the number of students was rather small in most courses, this would be a considerable intrusion into the established learning environment. However, we did visit most courses once, to improve our understanding of what the teachers wrote. Regarding the student perspective, we also administered a questionnaire in which all students were asked to report on the research intensiveness of their course (Van der Rijst et al., 2009). In this way we were able to gather data from a greater amount of students. These data were less precise and were, therefore, used to verify the results of the group interviews, to see whether there were any discrepancies between the results of the interviews with only a few students compared to the whole class.

5.2.3 Analysis

Like the data collection the analysis consisted of three phases. First, the course was characterised based on the information provided by the teacher. Second, the responses of the students were analysed. Third, the results of these two steps were related to each other.

5.2.3.1 Teacher perspective

For the characterisation of the course we were able to use the code book described in Chapter 3 (see Table 3.1). We relied on the themes *orientation*, *approach*, and *curriculum*, as the *teacher role* was not prominent in our data. All course goals were coded using codes from the *orientation* theme, more specifically the *towards teaching* category. Hence, all goals were characterised as either *academic disposition*, *divulge research*, *train researcher*, or *academic knowledge*. Every teacher had several goals for the course, which might all be covered by the same code or by different codes. The course programme and weekly logs were coded using the categories and codes in the *approach* and *curriculum* themes (see Table 3.1). To cover all variance in the courses a few categories needed to be added in the *curriculum* theme, namely *researcher* and *student research*. First, the course programme was coded as this gave us an overview of the whole course. Next, the weekly logs were coded to obtain a

detailed description of what happened during class, and to note any contingent changes made during the term compared to the original course programme.

5.2.3.2 Student perspective

The heart of our analysis concerned the interview fragments in which students mentioned what they thought were the two most important learning outcomes. This part of the interview consisted of their initial, and therefore most reliable, reactions concerning their learning. To be able to relate the reported learning outcomes to the goals that were set by the teachers, all learning outcomes were coded according to their equivalents in the *orientation* theme. The code *academic disposition* was related to *disposition*, *divulge research* to *research awareness*, *train researcher* to *skills*, and *academic knowledge* to *knowledge*. We will illustrate each code with a quote, as these were not included in the code book developed earlier. The code *disposition*, for example, was given to the quote 'Critical thinking is what I learned most, not to be satisfied too soon'. *Research awareness* was, for example, noted for a quote such as: 'I liked seeing the research process step-by-step, before this course I never thought of where the knowledge came from'. A quote coded as *skills* is, for example 'I learned most about research skills, such as heuristics, the way you search for information'. The learning outcome *knowledge* we found expressed in a sentence like 'and I also learned a lot about the period that was at the heart of the course, in earlier years we did not pay attention to it'.

5.2.3.3 Relationship between course and learning outcomes

Finally, all these elements were brought together to make an overview of every course. The courses were than compared and grouped on the basis of the characteristics of these courses (teacher part) in order to be able to describe the relation between certain features in the course and student learning and experience.

5.3 Results

5.3.1 Characterisation of courses

The courses taught by the participants reflected five ways of linking research and teaching. We will first characterise the course types before we turn to the students' learning. Table 5.1 shows descriptive details of all courses, using fictitious names in order to preserve the anonymity of the participants.

Table 5.1. Course descriptives

Type	Teacher	Area	Year	Students
A	Paula	Cultural studies – Non western	BA 1	10
A	Philip	Cultural studies – Non western	BA 2	7
B	Alexandra	Art History - Western	BA 3	48
B	Charles	History – Non western	MA	6
C	Richard	Linguistics – Western	BA 3	2
C	Sophia	Linguistics – Non western	BA 3	11
C	Harold	History – (Non) western	BA 3	10
D	Henry	History – Western	BA 3	12
D	Diana	Linguistics – Western	MA	8
D	Eric	Cultural studies – Non western	BA 3	3
E	Ian	Linguistics – Non western	BA 3/MA	2
E	Edward	Linguistics – Non western	MA	2

A – Using the teacher's own research to illustrate the subject matter

Two first- and second-year courses were included that focused on the basics of the disciplines in question. The teachers' goals were teaching basic knowledge and in one of the two classes, the basic research skills of that particular domain. Their approach consisted of mainly lecturing about the subject matter during classes with students preparing assignments beforehand, which were discussed during class. Regarding research the focus was on the results, both of research in general, which means referring to other academics in the field, as well as their own research. Some attention was paid to the teacher's own research process and what they encountered while doing research, usually as an illustration of the content.

B – Focusing on the researcher's disposition and position

Two other courses were focusing on teaching academic disposition to their students. The teachers also wanted the students to understand the discipline well, but the most important goal was that the students become critical, and able to independently take and defend their position in a debate. In this approach literature reading had an important place, next to class discussions, during which again specific attention was paid to aspects of an academic disposition. Furthermore, students were asked to write a paper based on secondary literature in the field. The main focus was on the disciplinary research process. Moreover, during class explicit attention was paid to the position of the researcher; this was considered an important part of linking research and teaching.

C – Introducing students to literature, after which students conduct research projects

Three courses can be characterised having a double focus on research skills, and knowledge or disposition. The first part of these courses consisted of classes about the relevant subject matter, while the last part focused on the students' own research projects, as simulations of how research is conducted. Close attention was paid to research methods in the field, as in two courses it was the first time that students did this type of (empirical) research. Because of the twofold design of the course the focus was first on the disciplinary research process, using the teacher's own research theme as a framework, and in the second half the attention switched to the themes and topics of the students' research projects.

D – Follow in the teacher's footsteps

The approach in these three courses has much in common with the courses under C, but here the teacher's own research plays a more central role. The teachers want their students to become independent researchers and therefore provide them with an environment in which they follow in the footsteps of their teacher. This might include coming along to a conference after thorough preparation, commenting on a book chapter written by the teacher, or reproducing the teacher's own research step-by-step. Furthermore, all students were introduced into the relevant literature and conducted their own research project. The focus was on their teacher's ongoing research, by which they were introduced to research results as well as processes. Students' own research projects were related to their teacher's research.

E – Participation in the teacher's research

Two graduate courses were designed as participation in research. A small number of interested students joined the researcher in analysing new research material. The teachers wanted the students to become independent researchers and in this way were able to serve as role models for their students, showing them how they themselves analysed these materials. The students' input was highly valued. Furthermore, the teachers aimed at introducing the students further to the discipline so that they would know all important 'rules' of the discipline. The emphasis was solely on the teachers' ongoing research and especially on the research process, as this was considered the key to come to valuable research results.

5.3.2 Student learning

To stay close to the course characteristics the reported student learning will be described in relation to the course types that produced these outcomes.

A – Using teacher's own research to illustrate the subject matter

The teachers focused on *academic knowledge* and t*raining students to become researchers*, using the example of their own research. The students reported learning outcomes related to these goals. One of Philip's students, whose course was on ancient poetry, explained 'If I needed to give two main lines I would on the one hand emphasise the analytical aspects, like metre and style figures etcetera, and on the other hand literature as a mirror of society and culture' (*skills & knowledge*). One of his fellow students added 'It is not just the poem itself, but also the background (…) you get an idea of how society was at that time, what was going on in their heads (...) so history of literature is also very important' (*knowledge*). In this way they referred to both the main research skill, i.e., analysing, and to knowledge acquisition; i.e., ancient society and poetry as disciplinary source.

B – Focusing on the researcher's disposition and position

The teachers here focused primarily on *academic disposition*, with the use of class discussions. The students in both groups reported that they learned to think critically, such as 'critical thinking, not to be satisfied too soon' (*disposition*), however, one of them said that this was not new to her, as it was a favourite topic of their teacher. In addition to this Alexandra's students became aware of the importance of checking notes and sources 'Always check the notes, many times you might even learn more from the notes than from the text itself' and 'regarding the texts in the textbook, where do they come from, who wrote them', 'and when' (*disposition*) added another student. Furthermore, students learned some practical skills such as where to find what literature, and got an idea about who were the important authors in the field (*knowledge*).

C – Introducing students to literature, after which students conduct research projects

In this type the teachers focused primarily on *research skills*, with *disposition* or *knowledge* coming second, they followed a two-fold approach combining theory and research assignments. All students reported that they learned how to (better) conduct research, such as 'I also learned how to do research, as we saw many different ways of doing research. Furthermore, how to interpret your data, for

example using statistics' (*skills*). Harold's students emphasised that they learned most about doing a research project larger than in earlier years. This included finding more detailed answers to research questions and giving an overview of the topic itself. Related to this were dispositional aspects, as one student explained 'Normally, you are taught "this is the truth", but in this course it was quite clear that is the opposite, it (knowledge) is not finished yet' (*disposition*).

D – Follow in the teacher's footsteps

The teachers here focused primarily on skills and to a lesser extent on knowledge by showing what doing research meant for them. Their students all reported *research awareness*, and some of them also *skills* and *knowledge*. The teacher's research was an important cue for awareness. Diana's students discovered that their teacher also needs to rethink her research several times, and that this is normal in research: 'During her research she had many hypotheses which did not hold after testing. Or that she needed to change tracks, she was very honest about it, how that worked' (*research awareness*). Henry's students reported various outcomes, next to *research awareness*, on *knowledge* 'I learned a lot more about the period, because of the classes, but because of the literature I read for my research project' and on *skills* 'Heuristics. How to search for and order information.'

E – Participation in the teacher's research

The teachers in this type wanted the students to gain *research skills* and *knowledge* by participating in their own research. Their students reported that the classes were very practical and that they learned to do the researchers 'handwork', such as 'preparing a critical edition of a manuscript. Starting with a manuscript and ending with a critical edition and all steps in between' (*skills*). For Edward's students this was neatly interwoven with critical thinking and Ian's student broadened his outlook. Furthermore, awareness was manifest in the importance Edward's students attributed to 'the dialogue between text and a translation'. According to the students the classes were a very good preparation for their future careers as researchers.

5.3.3 Relation between course characteristics and reported learning outcomes

Table 5.2 summarises course characteristics and perceived learning outcomes. In the table we only present characteristics that applied to all courses in the specific type, so that individual differences are not included. Only three of the learning outcomes reported had been aimed at by the teachers. The aim *divulge research*,

which focuses on teaching students what it means to do research, was not incorporated by any of the teachers, while *research awareness* was an important learning outcome for the students in course type D. Furthermore, the students in types B and C report on *disposition*, which was only aimed at by the teachers in type B. The learning outcome *knowledge* was reported by several students, but only in type A all students mentioned this among their two main learning outcomes.

Table 5.2. Overview of course characteristics and student learning

Type	Course			Student
	Orientation	Approach	Curriculum	Learning
A	Academic knowledge & Train researcher	Lecturing & Assignments	Research content	Knowledge & Skills
B	Academic disposition	Literature reading & Discussions & Individual papers	Disciplinary research process	Disposition
C	Train researcher	Literature reading & Discussions & Students' own research projects	Disciplinary research process & Teacher's research content	Skills & Disposition
D	Train researcher & Academic knowledge	Literature reading & Discussions & Students' own research projects	Teacher's current research	Skills & Research awareness
E	Train researcher & Academic knowledge	Participation in teacher's research	Teacher's current research process	Skills

5.4 Conclusion and discussion

5.4.1 The relation between a research-intensive learning environment and student learning

Our aim was to relate the characteristics of courses in which research and teaching were linked to perceived student learning. Five different ways of integrating research and teaching were found: A) using the teacher's own research to illustrate the subject matter, B) focusing on a researcher's disposition and the position, C) introducing students to literature, after which students conduct research projects, D) follow in the teacher's footsteps, and E) participation in the teacher's research. In most courses some form of inquiry learning took place, either by teams or individually. None of the courses focused

only on research methods. Class size in type E, in which participation was realised, was far less than in most other courses, although class sizes were generally small due to discipline and level. Only type A was concerned with first- and second-year students, which definitely influenced the way in which research and teaching were linked. However, in the third and fourth year there still was a variety of ways in which both were linked.

In general the students reported more learning outcomes on academic disposition and research awareness than expected judging from the teachers' goals. However, in the literature the dispositional aspects are considered to be the main benefits of linking research and teaching (Elen & Verburgh, 2008). Especially the students in courses in which the teaching was closely related to the teacher's own research reported research awareness. This means that these students learned what research is about and what it really takes to conduct research. Some students explicitly referred to their teacher as an example of somebody conducting 'real research', and how this changed their view on what research implies. Acquiring an academic disposition was mainly equated with learning critical thinking. The students learned to apply this critical thinking in their own research assignments or projects, and were encouraged by the teacher in dialogues about the students' ability to analyse critically. Hence, our small-scale study indicates that an academic disposition is best learned if students have to apply this in any kind of research assignment, which should also include feedback on their performance, and that awareness of what research entails is best served by a close look at the teacher's own research. This does not necessarily imply students participating in research; real-life stories supported by various ways of introducing students to academic research raises awareness at least as much.

5.4.2 Methodological considerations

This study was characterised by the collection of a variety of data and therefore can be considered a mixed-method approach. Triangulation (P. C. Meijer, Verloop, & Beijaard, 2002) was established by data source (the teachers' perspectives and the students' perspectives), method (individual interviews, group interviews, written materials and additional class visits and a questionnaire), and data type (mostly qualitative, but one additional source was quantitative). The different sources proved to be supplementary to each other and all revealed different aspects of the learning environment and student experience. The intended curriculum was best measured by the course programme and the course goals. The sources offered information on what the teachers intended to do during the

course and to what end. The interpretation of the written sources was simplified by the oral elucidation the teachers gave. These sources provide the bigger picture for the courses. The implemented curriculum was measured by the weekly logs. These provided detailed information on the various classes as perceived by the teachers. So, both types of sources not only provided information on the intended and implemented level (Van den Akker, 2003), but more importantly, provided an overview and its colouring. It appeared necessary for a correct interpretation to interpret the various sources in the light of the others. The weekly logs, especially, could only be interpreted knowing the writers' intentions, as the teachers usually described what happened on a very detailed level without referring to the general picture. For example, the weekly logs often refer to student presentations while the course aim was not in the first place to improve students' presenting skills, but to provide feedback on the students' progress in their research projects. In many cases these projects were not mentioned at all in the weekly logs, while they were an important part of the design of the particular course, as explained in the course goals and programmes. So, this study has shown the strength of combining a set of different data sources.

5.4.3 Discussion

In conclusion we can state that it is worthwhile and important to look in detail at the research-intensive learning environment in which students take part. This reveals interesting relations between learning environment and perceived learning outcomes. Our study revealed some unexpected benefits arising from specific ways of bringing students into contact with research, as the attained learning environment yielded more outcomes than originally intended. Important in that respect is to see that students reported more learning outcomes on the dispositional level than intended by their teachers, although many studies consider this to be the main aim of linking research and teaching, under various labels (Elen et al., 2007; Elen & Verburgh, 2008; McLean & Barker, 2004; Van der Rijst et al., 2007). Further study is needed to see why most teachers are hesitant to bring this up as a course goal. Furthermore, students reported learning on the level of awareness, which was not included in the teachers' course goals at all and only partly discussed by earlier studies (Robertson & Blackler, 2006; Turner et al., 2008); these studies focus mainly on the presence of research rather than the concept of research.

Our study indicates a relation between the development of an academic disposition and courses in which students were stimulated to put this disposition

into practice in research assignments. Feedback on students' performance when putting the disposition into practice proved to be helpful for students. This might be a specific interpretation of the difference in assignments given by research active teachers compared to other teachers, reported by students in earlier studies (Neumann, 1994; Robertson & Blackler, 2006). The students value this kind of intellectually challenging, and disposition-influencing research assignment. Another relationship we found was the link between awareness of research and an encounter with the teacher's research. Awareness of research is enhanced when students observe closely what teachers do when researching. The idea to strive for the 'most integrated' way of relating research and teaching, as put forward by several authors (Brew, 2003; Healey, 2005), is not confirmed for this potential learning outcome. In both course types D and E the students valued the opportunity to get acquainted with their teacher's research and developed an awareness of research. Besides, two major differences between these groups were the number of students, and the fact that especially in group E all students could be characterised as intrinsically motivated (Breen & Lindsay, 1999). Group D (partly) consisted of classes with considerably more students than group E, and not all of them aiming at a research career. Therefore, this approach might be fruitful for teachers of larger classes containing a variety of students, who are willing to stimulate students' awareness of research. It seems that a less integrated way, i.e. not participating in teacher's research (E), but a guided introduction involving 'real research' (D) proved as least as helpful for students in this respect. This might be due to the fact that these teachers designed learning environments which were primarily focused on the students' learning, including a strong introduction into 'real research', while courses in which students participate in research risk focusing too much on the research aspect than on students' learning.

So, this approach of gathering many different data sources on a small number of courses has been fruitful in studying research-integrated teaching, as it exposed interesting relations between the research-enriched learning environment and learning outcomes. Moreover, it thus provided insight into promising ways to integrate disciplinary research in teaching aimed at specific outcomes.

Chapter 6

Change patterns in university teachers' beliefs in the context of linking research and teaching

6. Change patterns in university teachers' beliefs in the context of linking research and teaching[5]

Like other teachers, academics in universities are confronted with educational reforms. In this study we report on an innovation in higher education in which the relation between research and teaching is intensified. The focus is on the belief changes experienced by twelve academics during a project in which they were encouraged to strengthen the link between research and teaching. Five factors that represent different views on the research-teaching nexus were identified. Furthermore, three change patterns were found: no change, change of a less dominant factor, and change of dominant factor. Academics' change patterns were linked with their initial beliefs.

[5] Submitted in adapted form as Visser-Wijnveen, G.J., Van Driel, J.H., Van der Rijst, R.M., Visser, A., & Verloop, N.. Change patterns in university teachers' beliefs in the context of linking research and teaching.

6.1 Introduction

In many professional development trajectories one of the aims, besides influencing teachers' actions, is to influence teachers' conceptions in the direction of educational reforms (Spillane, Reiser, & Reimer, 2002). These innovations are mostly pre-defined by educationalists, governments, or school boards and leave limited space for teachers' own ideas about enhancing student learning. In higher education, professional development programmes are generally focused in a specific direction. This might include certain preferred forms of university practice (Postareff, Lindblom-Ylänne, & Nevgi, 2007) and/or teaching conceptions (Åkerlind, 2008b). There is a growing body of literature in teacher education paying attention to ways of creating space for teachers to experience agency and relate to the innovation (Putnam & Borko, 1997; Van den Berg, 2002). It is considered essential to start from the teachers' own meaning (Cochran-Smith & Lytle, 1999). Furthermore, it is argued that professional development that starts from the teacher's perspective is particularly successful (Van den Berg, 2002) and that curriculum innovation can hardly be successful otherwise (Van Driel, Verloop, Van Werven, & Dekkers, 1997). In this chapter a university project will be described in which the beliefs of the academics involved played a significant role in shaping the reform, focusing on the change in beliefs that occurred during the project.

Richardson and Placier (2001) refer to a long-standing distinction between an empirical-rational and a normative-reeducative approach in teacher change strategies. In the first approach the direction of change is set by someone else than the teacher, and a linear process of change is expected in which the ideas of others, resulting from research and/or educational reforms, should lead to a change in behaviour and a new way of thinking on the teacher's part. Teachers are expected to implement what they are told. The normative-reeducative strategy, on the other hand, emphasises the importance of agency. The change process is understood as teachers reflecting on their own beliefs and practice, and adapting new ideas to their own framework, or rejecting them. Personal growth and development is the main goal, and collaboration is seen as essential. Therefore, dialogue is considered to be an important element of this approach (Richardson & Placier, 2001). So, although the normative-reeducative approach may involve teachers in the formal setting of initial teacher education or educational reform, the main change agent is the teacher. Therefore, the change process here can be considered naturalistic, and usually voluntary and collaborative.

Teachers' beliefs are considered crucial in any long-term change (Putnam & Borko, 1997). Pajares (1992) stresses the difference between core beliefs and more peripheral beliefs. Core beliefs are closely connected to each other, usually rooted in values, and less related to more peripheral beliefs. Furthermore, these core beliefs are less likely to change than newly acquired and more peripheral beliefs (Pajares, 1992). Beliefs about teaching and learning can be considered core beliefs, while beliefs regarding specific class situations and reforms normally are, although related to these beliefs, more peripheral (Oolbekkink-Marchand, Van Driel, & Verloop, 2006b). Hence, beliefs on a certain topic do not stand alone but are related to more central beliefs (Pajares, 1992). See also the Chapters 2 and 4.

Teacher change is regarded as the product of an interaction between teachers' beliefs, their practices, students' reactions, and an external domain that includes staff development programmes. Enactment and reflection are crucial for change, or professional growth as it is called by Clarke and Hollingsworth (2002). The process normally involves confrontation and conflict resolution (Tillema & Knol, 1997). However, change patterns vary with different teachers and contexts (Zwart, Wubbels, Bergen, & Bolhuis, 2007). The order in which teacher change takes place is still under debate (Richardson & Placier, 2001). Guskey (2002) advocates that beliefs change as a result of changes in behaviour and student results, while others suggest that a change in beliefs precedes changes in behaviours (Richardson & Placier, 2001). Zwart et al. (2007) argue that all teachers follow their own pattern, including or excluding external sources for professional development. It is likely that both ways of learning occur in any group of teachers.

Often, changes in teachers' beliefs are reported to either correspond to or contrast with an intended reform (Richardson & Placier, 2001). When analysing changes at group level, researchers may overlook the changes that occur if the individual changes take opposite directions. It is therefore important also to focus on intra-individual changes in teachers (Tillema, 1998). Meirink, Meijer, Verloop, and Bergen (2009) looked at teacher learning activities in the context of an innovation focusing on active and self-regulated student learning, and found three categories of change in teachers' beliefs: 1) a change congruent with the innovation, 2) a change not congruent with the innovations, 3) no change in beliefs over the year. Teachers who did change in the direction of the innovation reported learning activities such as experimenting with alternative methods based on getting to know colleagues' teaching methods. Teachers who changed in the alternative direction reported learning experiences based on dissatisfaction with

their current methods, or disappointing student results. Non-changing teachers reported more spontaneous learning activities such as observation of pupils. This is in line with the study by Hoekstra, Beijaard, Brekelmans and Korthagen (2007), which reported change congruent with the innovation after learning activities that were based on getting ideas from others, and change not congruent with the innovation after experiencing friction. It is important to note that these teachers did not take part in any intervention, but were supposed to learn informally only (Eraut, 2000). Studies that were cautious in directing change explored different forms of teacher change. Henze (2006), for example studied a small number of teachers intensively during three years, without interventions, and reported that teachers became more convinced and explicit in their beliefs over time. They did not switch between beliefs, but became more typical of their specific 'type'. This study was carried out in the context of a national reform that had started only a few years earlier. However, it seems that in the first years a basic set of beliefs and related behaviour had already been established among the teachers, which extended over the years.

6.2 Context and research question

Teachers in higher education differ from teachers in most other educational institutes in three important ways. In the first place, until now in most countries university teachers do not receive initial teacher education, unlike teachers in primary and secondary education. Teachers' experiences as students to a great extent lay down their prior beliefs, but these prior beliefs are largely altered during teacher training (Feiman-Nemser & Remillard, 1996). Therefore, university teachers might be more influenced by their prior beliefs than other teachers are. Secondly, in universities teachers are not only teachers, but also researchers. Academic teachers are appointed as staff at their department primarily because of their expertise in research in a specific field of interest. Although some efforts are made to pay more attention to the teaching component of their academic duties, promotion and rewards are normally still primarily based on research quality and less on teaching quality (Colbeck, 1998). In fact, most academics first of all consider themselves researchers, and teachers only in the second place. Many of them see teaching as time-consuming and distracting from their 'real work', doing research (Macfarlane & Hughes, 2009). Thirdly, teachers experience a high degree of autonomy, and with university teachers this is even higher. They have a lot of freedom in the way they teach their courses (Serow, 2000). Although curriculum plans are made for the whole period of university education, most courses are taught by only one teacher and are based on his/her specific expertise

as an outstanding researcher in the field. Therefore, university teachers are even more on their own than teachers in other forms of education and teach according to their own understanding of both the topic and teaching method.

The educational reform at stake in this study is the strengthening of the research-teaching nexus. In many universities in Europe and around the world research universities are trying to strengthen the link between research and teaching (Elen & Verburgh, 2008). As mentioned above, the duality of academics' work raises questions about what is considered important and what less important. In 1996 Hattie and Marsh presented a review study on the link between research and teaching, in which they concluded that the correlation between research and teaching qualities was about zero. The review made researchers and universities aware of potential constraints and the fact that there was no automatic link between research and teaching. Many universities, from New-Zealand (Robertson & Bond, 2001) to the United Kingdom (Zamorski, 2002), drew up explicit policies on strengthening the nexus (Elsen et al., 2009), as did Leiden University, which stated 'The main characteristic of subjects in Leiden is a disciplinary profundity with a strong research-teaching nexus (…) This applies to both Bachelor and Master levels. The curricula are attuned to recent research results and research questions' (Leiden University, 2005, p. 6).

The implementation of this kind of educational policy, however, depends greatly on the staff involved (Duffee & Aikenhead, 1992). Therefore, a research project was designed in which a small number of academics were challenged to strengthen the research-teaching nexus. The project was first of all concerned with the way in which the link between research and teaching was made. However, an environment was also created in which the academics were facilitated to develop new ways and ideas on how to link research and teaching. This approach can be considered a form of a normative-reeducative approach (Richardson & Placier, 2001). One in which teachers were challenged to give meaning to the reform on the basis of their personal perspectives, which include their personal beliefs (Van den Berg, 2002). The focus of this study is on academics' beliefs, and on whether their beliefs changed as a result of their participation in this innovation project. We were particularly interested in the individual changes (Tillema, 1998), and any resemblances in change patterns between the participants. Unlike most earlier studies (Richardson & Placier, 2001) we did not define any direction for change, but decided to focus on academics' beliefs of the research-teaching nexus and thus stay close to beliefs related to the

innovation itself, as normally this would be the first type of belief to change being the more peripheral (Pajares, 1992). Therefore, this study aimed at answering the following research question: What change patterns occur in academics' conceptions of the research-teaching nexus when they intentionally integrate research in their teaching?

6.3 Method

6.3.1 Sample

Academics from a range of disciplines within the Faculty of Humanities at Leiden University were invited to participate in this project. Prerequisite for participation was the willingness and the possibility to strengthen the relation between research and teaching in one of their courses in the first term of the academic year 2007-2008. The sample consisted of fourteen academics in the Faculty of Humanities of which twelve completed the project; two had to drop out during the term for personal reasons. The final group (see also Section 5.2.1) consisted of four females and eight males, working in various departments concentrating on (art) history, linguists and/or culture. Four were full professors, two were associate professors, and six of them were assistant professors. All academics had at least five years experience in research and teaching.

6.3.2 Procedure

During one term, running from September 2007 to January 2008, all participants were engaged in cultivating a stronger link between research and teaching in their courses. Their courses ranged from first-year Bachelor to Master's courses. The teachers were encouraged to strengthen the link in the way they thought most fruitful. Their task was to re-design one of their courses in such a way that the research-teaching nexus was stronger than in their previous courses, in any way they preferred. In order for them to have enough time to develop their course and pay extra attention to it during term the teachers were offered a student assistant to relieve them of other tasks. This was done as the factor 'time' is considered of great importance in review studies on professional development (Stes, Min-Leliveld, Gijbels, & Van Petegem, in press).

Beside the courses they taught the participants attended a few meetings, one before the start of the term and three during the term (see also Figure 5.1). The meeting that was organised before the term started consisted of two parts. The first part was intended to create awareness of various ways to link research and teaching. Participants discussed various aspects about linking research and

teaching, together with characteristics of the students, such as first year or final year students. In the second part attention was paid to strategies for redeveloping courses, such as defining the target group, setting goals, and rethinking the whole course from the perspective of the students (Out & Groot, n.d.). This meeting was meant to create a clear starting point and to give the participants some tools to facilitate re-designing their courses in any direction as long as it strengthened the research-teaching nexus.

During term every teacher participated in three peer meetings with three to four other teachers to create a powerful learning environment (Cochran-Smith & Lytle, 1999). These peer meetings were organised in three heterogeneous groups, consisting of academics from various disciplines. During every meeting one or two teachers told the others about their course designs and teaching practices, and presented a topic for discussion, one that s/he was still thinking about, regarding the link between research and teaching. The academics were encouraged to ask reflective questions to the presenter. One group member was appointed observer and was asked to summarise the discussion at the end. In this collaborative setting all teachers were stimulated to reflect on their own course and broadened their view about how research and teaching might be linked.

6.3.3 Instruments

All teachers were asked to carry out Q-sorts containing statements about the research-teaching nexus, and were interviewed twice. The first Q-sort was administered at the start of the first meeting, so before any discussion took place. The second Q-sort was administered as part of the final interview.

'Q-sorting' involves the participant ranking Q-items on a fixed-response matrix. Participants were provided with statements which had to be evaluated against all other statements in order to be able to decide where the statement should be ordered within the whole. An important characteristic of Q-methodology is that the subjectivity of the participants is taken as the baseline, it is the holistic points of view that is sought, instead of only participants' scores on individual items (Stainton Rogers, 1995). This methodology is appropriate to be used several times by one respondent, either over time (Block, 1971) or focused on different subjects (Brown, 1996).

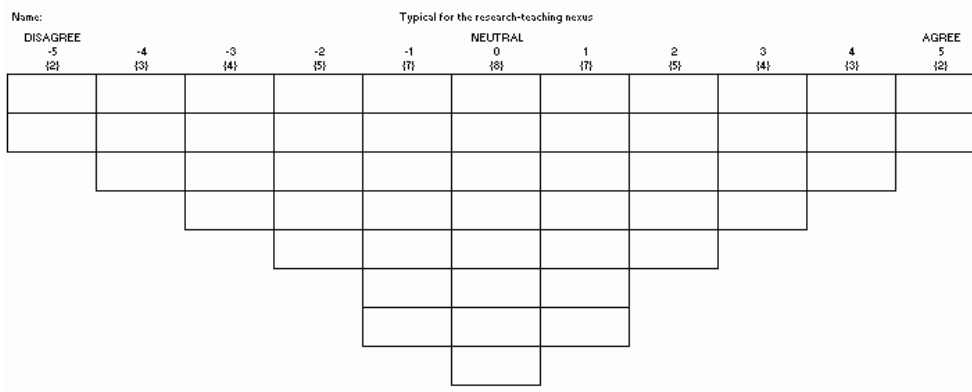

Figure 6.1. Q-sort scheme

Our Q-set consisted of 50 statements derived from earlier interviews with thirty academics from the same faculty (see Chapter 3). The statements had to be placed on a 11-point normal distribution (2,3,4,5,7,8,7,5,4,3,2) ranging from -5 (most disagree) to +5 (most agree); see Figure 6.1. The Q-set consisted of 18 statements about orientation, 18 about approach, and 14 about curriculum, representing (sub)codes from a code book on ideal images of the research-teaching nexus that had been developed earlier (see Table 3.1). An example of each category is given in Table 6.1:

Table 6.1. Examples of Q-items

Theme	Code	Item	Statement
Orientation	Towards Teaching - Academic knowledge	4	Teaching needs to be based on the most recent research findings.
Approach	Learning about research – Literature reading	7	Students need to read a lot of theory; they have to become acquainted with the whole research field.
Curriculum	Teacher's own research – Ongoing research	47	The teacher needs to know the topic very well, but is still researching it and therefore does not know all the answers.

Participants received the following instructions, based on McKeown & Thomas (1988): Bearing the research-teaching nexus in mind, 1) read all statements carefully; 2) divide the statements into three groups: disagree, neutral, agree; 3) start at the extreme ends and work towards the neutral middle, alternating between 'disagree' and 'agree'; and 4) check the positions of all statements and feel free to make changes.

The first interview started by discussing the statements in the Q-sort, the main question being 'why did you put this statement in that position (score)?'. Special attention was paid to the statements at the extreme ends. After discussing the individual statements the participants were encouraged to summarise their views on the research-teaching nexus. In this initial interview course goals and programme were also discussed. The final interview started with the administration of the Q-sort and the discussion of the statements; other questions were also asked to stimulate the teachers to talk freely about their views on the research-teaching nexus and to reflect on their learning experiences. For example, participants were asked to complete the sentence 'the goal of the research-teaching nexus is …' and to imagine a meeting with colleagues outside this research project, describing what their main message would be about linking research and teaching; what did they learn that they wanted to pass on to others?

6.3.4 Analysis

The analysis comprised of three phases. First, the characteristics of the Q-sort were studied. Second, a Q pattern analysis was carried out to study participants' beliefs and changes in beliefs. Third, the interviews were analysed to gain more insight into the meaning of the factors and the change patterns.

First, the Q-sorts and Q-items were analysed. Descriptives of individual item characteristics were studied, and a one-way ANOVA was carried out to see whether any differences could be found in the whole group between the first and second moment (cf. Block, 1971). Test-retest of Q-sorts, assuming no change, normally score at least .80, normally up to .90 (Pease, Boger, Melby, Pfaff, & Wolins, 1989).

Second, a Q-pattern analysis was carried out. This means that, unlike the procedures in other types of analyses (R-methodology), the Q-sorts were put in columns and the items on the rows in SPSS. In this way the total, coherent view of the respondents was qualifying instead of item scores (Stainton Rogers, 1995). A principal component analysis was carried out and rotated to simple structure, using varimax rotation. For each factor an exemplifying Q-sort was created, using all Q-sorts with a loading of .40 or higher on that factor. The Q-sort with the highest factor loading was given weight 1, and proportional weights were then allocated to the other Q-sorts. Next, for each item the score on that exemplifying Q-sort was calculated (Brown, 1980). The factor description was based on a close reading of the final exemplifying Q-sorts, paying most attention to the extreme

scores, both positive and negative, for that specific factor. Furthermore, interview data regarding the highest scoring sorts were used to check the interpretation of the factors (Stainton Rogers, 1995). To decide whether participants' beliefs changed we used the criterion that factors needed to have changed by at least .20, increasing or decreasing. This criterion covered a quarter of the average range of participants in this sample. Furthermore we explored whether these changes regarded change in dominant factors or in factors that were less characteristic for the respondent in question.

Third, interview data of the respondents were transcribed verbatim and analysed. Scripts were made for all respondents summarising their explanations of the positions of the various Q-items, thus resulting in a personal view of the research-teaching nexus including all themes: orientation, approach and curriculum. In the scripts we kept close to the respondents' own words. Separate scripts were made for the first and second interviews. For the second interview teachers' reflections on their own learning were added, so that we could make a qualitative description of the differences between (or sameness of) beliefs before and after the term (Block, 1971).

6.4 Results

6.4.1 Item analyses

The items that scored highest among all respondents were 18, 35, and 2 (see Table 6.2), all discussing orientation aspects related to the academic disposition. The items that scored lowest were 46, 20, and 13 (see Table 6.2). These items referred to three different notions concerning the curriculum and orientation. So, although teachers do not have to be the best scholars in the world, they are allowed to use their own research in teaching, but the main goal is certainly not to make a researcher of every student. In general, 'orientation' items scored on the extreme ends, 'curriculum' in between, and 'approach' relatively neutral. The Q-items that created most variance between the respondents were 34, 22, and 37 (see Table 6.2), disputing the combination of being a researcher and teacher, the goal of the university, and the necessity to train students to become independent researchers.

Table 6.2. Q-Item scores and standard deviations

Item	Mean	S.D.	Statement
			Highest scores
18	3.23	2.23	It is all about learning and copying a critical disposition, that is also present within me, looking critically, doubting, and meta-thinking
35	3.08	1.44	Teaching students the mentality to ask questions of the material and the notion that many things are not found in books, but you have to go and find them yourselves
2	2.77	1.89	Students need to learn that knowledge is changing; it is not that we as teachers deliver a certain set of unchangeable knowledge and analyses to students
			Lowest scores
13	-2.50	1.90	Teachers should focus only minimally on their own research, otherwise students are forced to specialise too early
20	-2.62	2.38	The goal is to attract students to the university
46	-2.65	1.32	Students need to be taught by the best content experts and researchers, so that they get up-to-date knowledge
			Highest variance
34	0.54	3.20	The research-teaching nexus is incorporated in every course, ranging from first year to Research Master, since the teacher is a researcher as well
22	1.04	2.87	The research-teaching nexus is a goal in itself, it is the task of the university, the essence of university teaching
37	-0.27	2.77	The students need to be educated in such a way that, besides many other things, they should be able to carry out academic research independently

The ANOVA showed that two Q-items had a significantly ($F = 6.906$, $r = .015$ and $F = 7.244$, $r = .013$, respectively) more positive score at the second moment than at the first. Q-item 3 (to use research questions from the start, give them puzzles, the most important goal is that they learn research skills), was neutral and became positive (1.75), while Q-item 10 (during class a research question is to be answered by the students using several sources) was slightly negative (-.5) and became slightly positive (1). So it seems that in general by putting their own ideals concerning the research-teaching nexus into practice the respondents considered working with research questions more important than before.

6.4.2 Q-pattern analysis

By means of the eigenvalue and scree test, five factors could be distinguished. We will first describe these five factors, which are ways of interpreting the research-teaching nexus based on the exemplifying Q-sorts. In Table 6.3 some examples of high and low scoring items on the exemplifying Q-sorts are provided. Next we will

discuss the changes in academics' beliefs related to these factors. The idea of enhancing a critical disposition is prominent within almost all factors, but ideas on how this critical disposition can be enhanced and what other aspects are important in linking research and teaching differ between the five factors.

Table 6.3. Sample items for exemplifying Q-sorts

Item	Mean	Statement
		Exemplifying Q-sort factor 1
35	4.30	Teaching students the mentality to ask questions of the material and the notion that many things are not found in books, but you have to go and find them yourselves
18	3.36	It is all about learning and copying a critical disposition, that is also present within me, looking critically, doubting, and meta-thinking
46	-3.35	Students need to be taught by the best content experts and researchers, so that they get up-to-date knowledge
		Exemplifying Q-sort factor 2
14	3.63	When appropriate, the teacher will introduce his/her own research results
39	3.38	The research-teaching nexus is no separate goal, it just exists
41	-2.74	Research should be completely incorporated in teaching, so the students should participate in research projects
		Exemplifying Q-sort factor 3
33	4.29	The students must know that they are part of an open knowledge process; the teacher is not always right and there are still things to discover
2	4.16	Students need to learn that knowledge is changing; it is not that we as teachers deliver a certain set of unchangeable knowledge and analyses to students
38	-3.31	Teaching is an excellent brain exercise for a teacher, to place his/her own research in a broader framework
		Exemplifying Q-sort factor 4
22	4.16	The research-teaching nexus is a goal in itself, it is the task of the university, the essence of university teaching
19	3.64	To get students fascinated by the type of questions asked concerning the world around us
34	-3.59	The research-teaching nexus is incorporated in every course, ranging from first year to Research Master, since the teacher is a researcher as well
		Exemplifying Q-sort factor 5
34	3.08	The research-teaching nexus is incorporated in every course, ranging from first year to Research Master, since the teacher is a researcher as well
37	2.70	The students need to be educated in such a way that, besides many other things, they should be able to carry out academic research independently
13	-2.86	Teachers should focus only minimally on their own research, otherwise students are forced to specialise too early

Factor 1 – Stimulating academic disposition in general

The focus is on stimulating an academic disposition in the students. The students need to realise that they are part of the knowledge process and have their own place in it. It is the teacher's responsibility, by encouraging discussions, to make sure that they start to look critically at research materials. Furthermore, teachers have the advantage of reflecting on their own research when preparing classes. The teachers' own research is not prominent, neither is the specific discipline, in contrast to factor 4. Therefore we refer to this factor as 'stimulating academic disposition in general'.

Factor 2 – Utilising teacher's own ongoing research in teaching

The focus is on using teachers' ongoing research in teaching. The research-teaching nexus depends on teachers being researchers as well. Teachers use their own research as an example to teach students how research is carried out. Besides, students may write papers and give presentations. In this way students will realise the importance of the academic disposition. However, in contrast to factor 5, the students are not supposed to (be able to) contribute to the teacher's research. Therefore we refer to this factor as 'utilising teacher's own research in teaching'.

Factor 3 – Training students to become independent researchers

The focus is on training students to become independent researchers. Students experience the research process actively in various ways. The use of cases and research questions is considered helpful. The most important aspect is that they realise that knowledge is always changing. The teacher is first of all an expert researcher, so experience as a researcher is more important than being knowledgeable about the course content. In contrast to factors 2 and 5 the teacher's own research is not important. Therefore we refer to this factor as 'training students to become independent researchers'.

Factor 4 – Discussing disciplinary research problems

The focus here is on the research process and the problems researchers encounter. The teachers share their own research experiences with the students to give them insight in what research really is about. So, the teacher's research plays a greater role here than in factors 1 and 3, but it is about the experience rather than the research content as such, as is the case in factors 2 and 5. There is a strong notion that the research-teaching nexus needs active involvement on the part of the teacher; it needs to be created. The orientation is discipline-specific, so

students are introduced in the disciplinary field and the specific challenges in that field. However, there is no active role for the students present. It is the teacher who lectures. Therefore we refer to this factor as 'discussing disciplinary research problems'.

Factor 5 – Students participating in research as co-workers

The focus is on the students growing into doing research. Students get acquainted with the teacher's research and his/her research materials. Students are gradually trained to become researchers, with special attention to the way research is done. This is the only view in which it is considered necessary for students to actually participate in research. Additionally, in this way the teacher might also profit from the students' input. Interestingly there is no emphasis on the changeable character of knowledge, as there is in all other factors. Therefore we refer to this factor as 'students participating in research as co-workers'.

6.4.3 Change patterns

6.4.3.1 Identification of change patterns

In Table 6.4 we present the loadings on the five factors for each participant on the first (before) and second (after) moment. Loadings above .40 are in bold; changes of at least .20 are in italics. Pearson correlations show that the average correlation between moment 1 and moment 2 for each respondent is higher than the average correlation of all other Q-sorts; for within subjects the average correlation is .67 (S.D. = .15), while in general the average correlation is .47 (S.D. = .17). However, the difference between these correlations is not significant (Z-diff = 1.51).

Three patterns of change could be distinguished.

- Pattern 1 (no change): Academics' beliefs were stable. They already had a strong idea of what the research-teaching nexus should look like and how they wanted it to be in their classes. Hence, experimenting with new forms of strengthening the relationship did not change their ideas.
- Pattern 2 (change of a less dominant factor): Academics in this pattern started out with one or two dominant factors. These factors remained, but other factors changed considerably in either direction. This means that their main idea was strengthened but they changed their mind on other, less important ways of strengthening the research-teaching nexus.
- Pattern 3 (change of dominant factor): For these academics their main factor became less important than one or more other factors. Their main

factor decreased, while one or two other factors increased to such an extant that they passed the initial main factor and became the dominant factor. This means that these participants changed their focus on strengthening the research-teaching nexus.

Table 6.4. Respondents' factor scores on two moments and their change patterns

Respondent	Moment	Factor score					Change pattern
		1	2	3	4	5	
Sophia	1	**.49**	.36	.00	***.42***	.21	3
	2	**.45**	**.49**	-.16	*.17*	.14	
Charles	1	**.75**	*.00*	.25	.28	.15	2
	2	**.70**	*.24*	.20	.21	.31	
Alexandra	1	.10	.15	**.71**	.24	-.09	1
	2	.02	.15	**.72**	.35	.06	
Ian	1	.04	.26	*-.10*	.16	**.73**	2
	2	-.01	.33	*.17*	.23	**.62**	
Eric	1	-.07	***.59***	*.22*	*.34*	.23	3
	2	.03	*.11*	***.58***	***.58***	.08	
Philip	1	*.31*	*-.22*	.15	-.15	**.71**	2
	2	*.00*	*.10*	.17	-.01	**.64**	
Paula	1	.31	*.23*	***.56***	.04	*.24*	3
	2	.35	***.52***	*.35*	.03	***.47***	
Henry	1	**.76**	.01	.19	.05	*-.23*	2
	2	**.76**	.11	.13	.08	*.02*	
Harold	1	.03	**.87**	.14	-.10	.07	1
	2	.14	**.78**	.19	-.10	.18	
Richard	1	.39	.10	.16	**.70**	.35	1
	2	.39	.06	.14	**.73**	.17	
Edward	1	.39	.12	**.68**	-.05	.22	1
	2	.35	.08	**.74**	-.01	.22	
Diana	1	*.36*	***.61***	.20	*.25*	*-.04*	3
	2	***.58***	*.23*	.35	*-.15*	*.26*	

6.4.3.2 Illustrations

We will illustrate each change pattern by one representative sample.

Pattern 1 – No change: Charles, Harold, Richard, and Edward. We will illustrate this pattern using Edward's case (see Figure 6.2 for his scores).

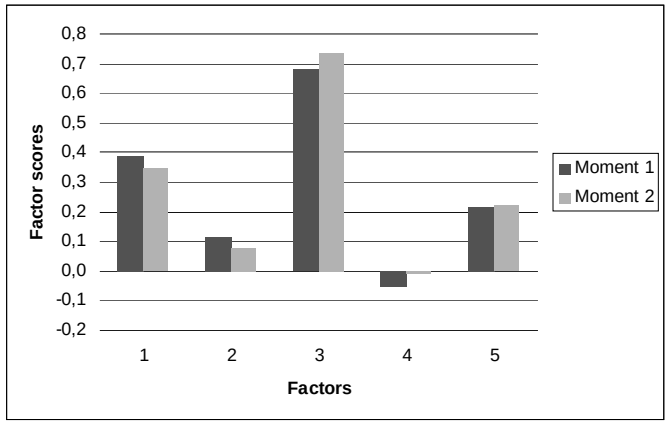

Figure 6.2. Edward's beliefs, representing 'no change'

Edward was the most constant in his beliefs regarding the research-teaching nexus. On all factors he had almost the same scores on the first and the second moment. His dominant factor was factor 3 (1: .68; 2: .74), which is focused on training students to become independent researchers.

Edward's main idea was that if you want to teach students about research, you have to show them how to be a researcher, instead of telling them about research. You are supposed to raise questions instead of providing answers. He said 'I can not stand a teacher just holding forth or explaining how, that is not the way it works. What you need to do is trying to interest students in research problems and the answers will follow.' So, making students experience what the research is about is important: the process is much more important than content or the state-of-the-art knowledge in the field. In Edward's words 'Research needs to be based on recent research methods, much more than on research products'.

Although the teacher's own research is not considered typical for factor 3, Edward did use his own research as the teaching context. However, he explains this process as follows 'In the ideal situation of a strong research-teaching nexus you are studying problems together with your students. It is important to emphasise

that these problems are also real problems for me.' So the fact that students actually take part in research is for him not the most important: what Edward considered essential was that students develop a critical disposition in which asking the 'right questions' plays an essential role. The fact that the teacher is a researcher as well is in this case considered vital, because the teacher is able to ask the right questions and in that sense is considered an expert.

In the second interview Edward expressed that he had learned one important thing, namely how important it is to go beyond the text (which is his research material) you are studying with the students. He wanted the students to do more than just analyse the text carefully, they should also question the assumptions underlying the method of analysing. The fundamental question why are you doing what you are doing, was something that he intended to put into practice during the course. It seems, therefore, that the reason we did not see changes in his beliefs is that before the term started he had already thought extensively about what is important in linking research and teaching. By explicitly paying attention to these ideas and putting these into practice during the course he strengthened his belief that this was a very fruitful way of linking research and teaching more closely.

Pattern 2 – Change of less dominant factor: Alexandra, Eric, Philip, and Henry. We will illustrate this by Henry's beliefs before and after (see Figure 6.3 for his scores).

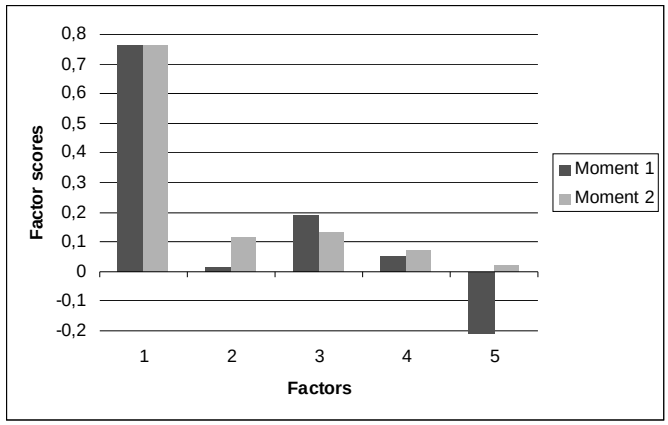

Figure 6.3. Henry's beliefs, representing a 'change of a less dominant factor'

Henry's dominant conception is related to the first factor (.76): he wanted to stimulate an academic disposition within his students. Before the term he opposed factor 5 (-.23), but at the end of the term he was neutral (.02) on this factor. This indicates that he did not reject the idea of students participating in research any longer, but did not support it either.

From the start Henry put the importance of his discipline into perspective by stressing that he is not educating his students for a job: his main goal is to make them academic thinkers. He stated that 'My field of history is my profession, for the students the subject is just a tool'. He emphasised several times that in his field of history only a very limited number of students might find a job as historian. So he felt that he would be treating his students unfairly if he focused on making them specialists in the field. Furthermore, reacting to several statements he explained how important the general skills related to research disposition were to him. He told 'I want to teach them to reflect on history. The skill of distancing oneself, looking, analysing, those are important to me and that general skill is what I want to impart.' And 'It is all about disposition. Sometimes, while reading the newspaper, I think, people need to distance themselves more and think about what happens in the world'.

To Henry the role of research is strongly related to this notion of critical distance. 'Keep asking whether something really is what it seems.' He considered the skill of digging deep into a topic, whatever the topic is, another important aspect of research. This perseverance is part of doing research. Regarding his own research he emphasised that he sees teaching as an excellent opportunity to reflect on what he is doing in his own research. However, he does not want to burden students with his own interests, as, in his eyes, the discipline itself is not what it is all about. He was quite neutral about students doing research; it is nice if they learn how to do research, but it is not the key aspect when talking about linking research and teaching. Henry explicitly rejected the idea of students contributing to teacher's research in the sense that students are subservient to the teacher's research goals. He disregarded the idea of students doing lots of research activity for the teacher. He explained 'I do think that they need to learn the skill of doing research, but these activities should not serve me.'

However, his neutral score after the term suggested that he had changed in this aspect. For Henry the most important feature of his course this term was that during the course he was writing a book chapter about the same topic he taught.

In the last meeting he even discussed his chapter with the students. For him this experience was the main added value, especially 'if students start asking you questions like "you say that right now, but is that really the way it is?"'. So, during the term he experienced that his own interest as researcher could be served during teaching in a more explicit way, and that involving students in his research might even be helpful for the students. Reflecting on the course he said 'I would like to combine writing an article and teaching about the same topic again. It was stimulating for the students, too, that is how they really contribute to research (…) they contribute to something on a higher plane.'

So although Henry's main focus was still the same, and very prominent, during the term he had realised that students contributing to their teacher's research was not by definition negative. The main advantage of teaching for research was still in reflecting and being forced to teach, and therefore talk about and reflect on the research topic, which is part of factor 1. However, his experiences led to a less negative attitude towards students participating in research, a prominent idea in factor 5.

Pattern 3 - Change of dominant factor: Sophia, Ivan, Paula, and Diana. We will illustrate this with by Paula's beliefs before and after (see Figure 6.4 for her scores).

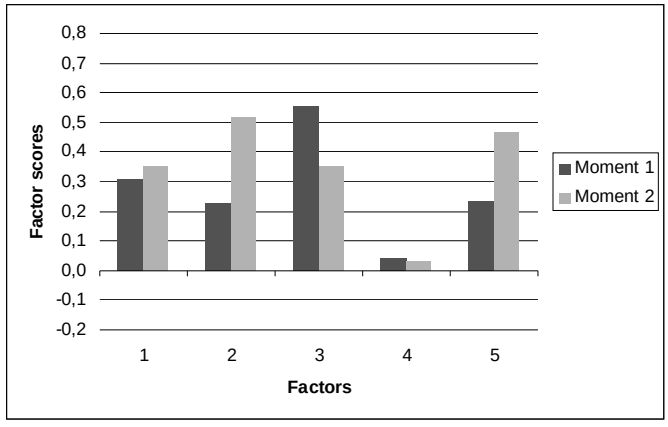

Figure 6.4. Paula's beliefs, representing a 'change of dominant factor'

Paula started with a conception that was most closely related to factor 3 (.56). At the end of the term her views had moved towards factor 2 (1: .23; 2: .52) and factor 5 (1: .24; 2: .47), while factor 3 had decreased (2: .35). So, from a focus on

training students to become independent researchers without emphasising the teacher's own research, she developed an appreciation of utilising the teacher's own research experience in courses.

Although Paula's beliefs showed a change, one main idea was prominent in both her two Q-sorts and the interviews: she strongly favoured a critical disposition towards knowledge, research, and society. Furthermore, this critical disposition was related to the curiosity which forces every researcher, and hopefully every student, to search for answers to unresolved questions. At the start Paula mainly wanted her students to question what they read and learned; she wanted them to have a rich experience at the university in which they met various types of teachers and researchers. This again was intended to challenge her students not to accept ideas of others too easily. She stated: 'the more variety the better, it might not always be pleasant, but it is really worthwhile to meet different people instead of only one'. The content of her research was not that important to her in relation to teaching: for students in the lower years her experience in the field was enough to teach all kinds of related subjects. Her general experience as a researcher was the most important source for her teaching: it was this background that enabled her and other researchers to teach in the critical manner they preferred.

At the end of the term Paula paid more attention to the position of her own research in linking research and teaching. At first she had talked in general terms about using your own research if appropriate, and being a university, not a school, but at the end she was much more specific. She wanted her students to become acquainted with their teachers' research to ensure that they knew what research was about. The easiest and most inspiring way of teaching was considered by her to be teaching about topics of your own research. In her eyes, both teachers and students benefit from courses in which research and teaching are closely linked: the more enthusiastic the teacher is about the topic, the more motivated the students become; furthermore, the teacher is willing to spend more time on the course as it is closely linked to her main task, doing research; finally, the teacher is really up-to-date which means that the students have access to the latest knowledge. During the semester she became more goal-oriented in using her own research in teaching. When asked whether she would do something different in other courses she would teach in future she said 'I like the idea of thinking about how to exploit your research in useful ways in your teaching and especially in a more direct way.'

Paula concluded that in fact in every situation in which the teacher is also a researcher as well, there is a link between research and teaching: the academic. In everything the academic does, including teaching, he or she will approach it in an academic, research-like, way. This obvious link is part of factor 2, as is the importance attached to teachers' own research (see also factor 5). The importance of the changeability of knowledge, which is an aspect of factor 3, was not denied by Paula later on, but loses importance compared to the advantage of teachers' own research. Bringing your own research into teaching, for example by using your own materials was seen as a potentially powerful combination of research and teaching. So, from the idea of training students to become independent researchers (factor 3) she moved towards the importance of strategically using her own research to improve her teaching (factors 2 and 5), in which the transmission of knowledge as well as the critical disposition and the variety of ways of how to deal with knowledge are important aspects.

6.5. Conclusion and discussion

6.5.1 Conclusion

This study focused on the change patterns that occurred in academics' beliefs about the research-teaching nexus when intentionally integrating research and teaching. First we analysed the different views that could be identified, before turning to the change patterns concerning these views. Five views on the research-teaching nexus could be identified, namely 1) stimulating academic disposition in general, 2) utilising teacher's own ongoing research in teaching, 3) training students to become independent researchers, 4) discussing disciplinary research problems and 5) students participating in research as co-workers. All views are concerned with stimulating a critical disposition in students, which is seen as the essence of an academic education. The teachers participating in the research project showed three different change patterns in their beliefs. One third of the group did not change; they generally had a high score on one of the five views distinguished here. Another changed on a less dominant factor. Their main factor remained stable, but one or two of the less dominant factors changed. The last third of the participants changed on their dominant factor, with one of the less dominant factors displacing the former dominant factor. It is remarkable that although the teachers were encouraged to bring their own views into practice, from which one might expect a strengthening of current beliefs, so many changes occurred. This again emphasises the importance of taking teachers' current beliefs as a starting point (Hawley & Valli, 1999; Tillema & Knol, 1997; Van den Berg,

2002; Van Driel et al., 1997), and shows that this certainly does not raise insurmountable hindrances.

Many studies (Henze, 2006; Meirink et al., 2009; Postareff et al., 2007) on change in teachers' conceptions in the context of an educational reform report the first pattern (no change) and the last pattern (change in dominant beliefs). The second pattern, a change on less dominant factors, is seldom reported. This might be due to a lack of possibilities to measure this type of change or a tendency to overlook it. However, we would argue that in many innovation projects it is logical to expect changes of this kind. Like the first group, these teachers start with a strong idea of what, in our case, the research-teaching nexus should look like, but they find that certain outcomes, on whatever level, are different than expected; this experience then results in a minor change in their beliefs (Guskey, 2002). Their main view has not changed, but still something important happened that might influence their teaching practice in future. As opposed to this, the first group was confirmed in their original view, but might have learned new ways to put their views into practice. Our last group is somewhat different. These teachers (at the start) had a slightly weaker notion of what the research-teaching nexus might mean. For many of them, engaging in this innovation project was a way to become acquainted with new ways of teaching and thinking. They appreciated the innovation's opportunities for reflection and changed their beliefs because of various influences they went through. In part the force behind the reported change might be a greater consciousness about the topic and the inevitable development of teachers' beliefs, which might take a different direction than their first assumptions. A conceivable explanation is that their beliefs regarding the research-teaching nexus were less closely connected with their core beliefs (Pajares, 1992). So, our data confirm that it is important to take the original views of teachers into account in any form of professional development, as their 'point of departure' might be very influential for their later development.

6.5.2 Methodological considerations

The Q-sort proved very valuable in detecting teachers' beliefs regarding the research-teaching nexus and teachers' change in beliefs. The strength of this instrument is that participants have to relate all statements to each other; in this way the relative weight of statements is measured rather than only the general importance. This prevents teachers from assigning the same score to many statements and forces them to reflect on each statement, comparing it to other notions they might want to give a similar value. In this way their configurations

might reflect their beliefs more accurately (Stainton Rogers, 1995). However, some teachers did complain that they would have preferred to give higher or lower scores to many statements. This seems to be a personal preference, as both preferences, for higher as well as lower scores, were present in the group. Therefore, this might not be due to the instrument but to participants' dispositions towards this kind of measurements. Forcing all participants into the same framework makes them more comparable, and their disposition towards the Q-sort instrument plays a smaller role. Another advantage is the possibility of repeated measuring: participants are again forced to evaluate all statements in comparison to each other and therefore can not easily fall back into their previous scoring. However, as we had only a small sample, the changes found might have been overestimated, since the factors might not have been fully stabilised. A larger sample would have added to the reliability. However, this research project was primarily designed to gain a detailed view of what would happen in this kind of innovation and therefore included only a small number of participants. Furthermore, the combination of Q-sorting and interviewing proved supplementary and helpful. This enabled us to interpret both the factors itself and the changes.

The results of this study apply to only a small number of participants in one faculty during a relatively short period of only five months. Additional change patterns might have appeared if the number of teachers involved had been greater or if the intervention had continued over a longer period. Other factors might have appeared if more disciplines had been involved, as finite diversity is claimed only after strategic sampling (Stainton Rogers, 1995). However, it is likely that the change patterns that did appear in this study would also be found in a larger study. The most important limitation, therefore, is the small number of participants, which means that the risk of missing views on the research-teaching nexus or overestimating of the differences is higher. However, we may note that there is a degree of resemblance between the various views and earlier profiles of the research-teaching nexus found in Chapter 3, which will be discussed in Chapter 7.

6.5.3 Implications

For teacher educators, staff developers, and educational innovators it is important to be aware of the beliefs held by the teachers they are working with. As is advocated by many others (Duffee & Aikenhead, 1992; Van Driel et al., 1997) teachers' beliefs play a crucial role in any educational reform and in teachers'

classroom practice. Our research again stressed the importance of the initial beliefs of teachers which guided their potential to change. This regards especially gradual changes, which in general occur more often than radical changes (Beijaard & De Vries, 1997). Our results show that awareness of minor changes in beliefs is necessary if we want to do justice to the professional development of teachers in the context of educational reforms. The result of any trajectory does not have to be that all dominant beliefs are changed, but might lead to a deepening of the understanding, which might include small changes in less manifest aspects. Furthermore, teachers who did not have a strong developed idea of the current innovation benefit as well from the challenge of developing their own views and putting it into practice. So, paying attention to teachers' beliefs and finding ways to investigate them, by which Q-sorting might be a beneficial method, is a meaningful way to go in situations in which educational reform and professional development come together.

Chapter 7

Conclusion and discussion

7. Conclusion and discussion

7.1 Overview of the study

One of the central issues in the identity of universities is the connection between research and teaching. The relation between these two key tasks of a university is largely defined by the way academics view research and teaching. Because research and teaching are perceived differently in different disciplines, the shape of the research-teaching nexus might also be expected to differ between faculties. In-depth studies of a small number of related disciplines are rare. In this research project our main interest concerned the question how academics in the Faculty of Humanities view the research-teaching nexus, and how these views are related to their conceptions and practice. We focused on how these various views are related to other conceptions academics hold, such as those of knowledge, research, and teaching. Furthermore, we investigated whether putting these beliefs into practice changed their conceptions, and what student learning resulted from intentionally strengthening the research-teaching nexus.

In order to explore these aspects we conducted two studies. In the first study the conceptions of academics were the centre of attention. In the second study we focused on innovative teaching practice and on the relationship with academics' conceptions and student learning. The first study can be characterised as an interview study with thirty academics from one faculty, evenly distributed over the different disciplines. The interview consisted of three different parts of which the first focused on background characteristics, the second used metaphors to elicit academics' conceptions of knowledge, research, and teaching, and the third part aimed at evoking ideal images of the research-teaching nexus. The second study was a project in which twelve university teachers were asked to strengthen the link between research and teaching according to their own preferences during one term. Data were gathered from both teachers and their students. Academics' conceptions of the research-teaching nexus were investigated by means of Q-sorts, and their teaching practice by looking at course goals, course programmes, and weekly logs. The students were interviewed in groups and a survey on the research-intensiveness of their course was administered.

In this chapter we will first describe the main results of both studies on the basis of the research questions formulated in the Introduction. The outcomes of both studies are discussed. Afterwards, we compare the various categorisations of the research-teaching nexus as presented in the Chapters 3, 5, and 6. In other words,

we will integrate the outcomes of the first study, the profiles of the research-teaching nexus that were constructed based on academics' ideal images, and the second study, the factors that represent academics' views on the nexus and the learning environments they designed. Similarities and differences in these categorisations will be discussed. Finally, we will provide some suggestions for future research and implications for university practice.

7.2 Main results and discussion

7.2.1 First study

7.2.1.1 What are the relations between the conceptions of knowledge, research, and teaching held by academics in the humanities?

Academics' conceptions of knowledge, research, and teaching were investigated in interviews providing metaphors on these three concepts. Thirty academics from the Faculty of Humanities were questioned about their views on knowledge, research, and teaching. For each of these three concepts five qualitatively different conceptions could be identified and positioned on a continuum. These conceptions are displayed in Figure 7.1. The distance between the various conceptions cannot be indicated as only the ranking of the conceptions was studied. Because all conceptions could be placed on dimensions that ranged from a focus on facts (either their disclosure or transmission) and the external world to the importance of personal interpretation or creation, and the internal world, it was possible to study the relations between the conceptions. A substantial and statistically significant correlation was found between academics' conceptions of knowledge and their conceptions of research. Weaker, but still statistically significant, correlations were found between academics' teaching conceptions and their conceptions of knowledge and research.

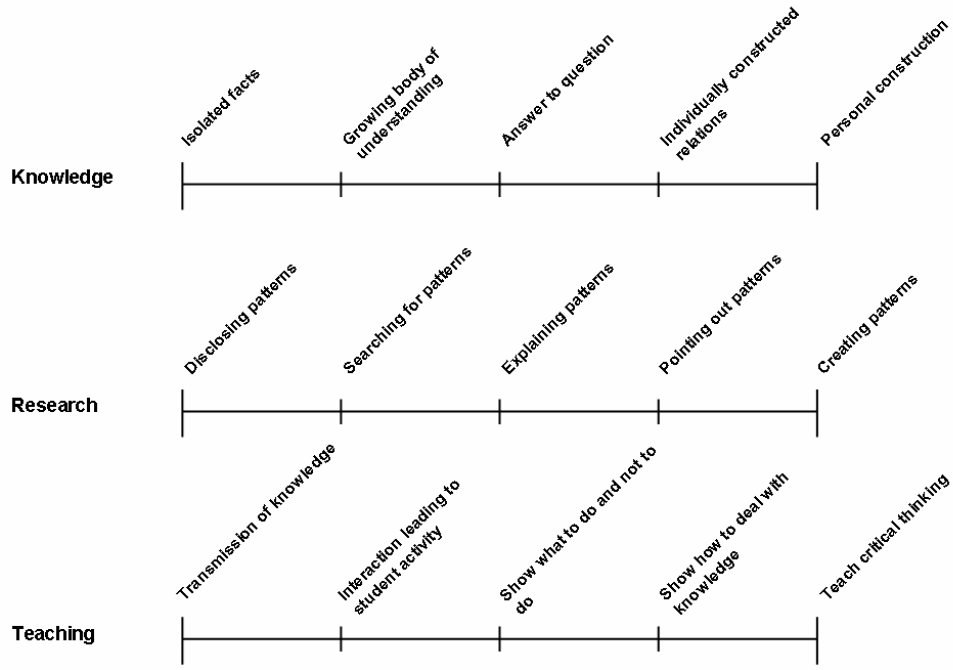

Figure 7.1. Conceptions of knowledge, research and teaching

7.2.1.2 What variations in ideal images of the research-teaching nexus can be found among academics in the humanities?

We investigated the views of thirty academics on the research-teaching nexus by asking them to describe their ideal image of this relationship. Five profiles could be distinguished, namely I) teach research results, II) make research known, III) show what it means to be a researcher, IV) help to conduct research, and V) provide research experience. The first profile, *teach research results*, focuses on the transmission of disciplinary research results to students by lecturing or by assigning literature reading. The teacher is the content expert; his/her research profits from reflecting on the courses, and in this way the research-teaching nexus is reciprocal. The second profile, *make research known*, aims at divulging research. All students need to gain an understanding of what research really is about. By discussions and reporting about research assignments students familiarise themselves with research and with an academic disposition. The teacher's own research is used to give insight into research in general. The third profile, *show what it means to be a researcher*, focuses primarily on encouraging

an academic disposition in students. The teacher is the role model for the students by showing what it means to have an academic disposition. The fourth profile, *help to conduct research*, concerns students conducting research tutored by their teacher. The students are given research assignments by which they grow in research competencies. The fifth profile, *provide research experience*, refers to the situation in which students participate in the teacher's own ongoing research. In this way students gain an authentic research experience. These variations can be explained by six dimensions that need to be considered when addressing the research-teaching nexus: the intangible - tangible nexus, disciplinary research – teacher's own research, research in general – current research, research content – research process, a learning about research – participation in research approach, and unidirectional – reciprocal.

7.2.1.3 How is the preferred research-teaching nexus related to conceptions of knowledge, research, and teaching, and (disciplinary) background?

Several relations between the conceptions of knowledge, research, and teaching, reported in Chapter 2 and the preferred research-teaching nexus reported in Chapter 3 were studied in relation to each other, and to background characteristics such as discipline, age, sex, and position. No association between academics' conceptions of the research-teaching nexus and their disciplinary background was found. Academics' disciplinary background was found to be associated with their knowledge and research conceptions. Academics with a disciplinary background in linguistics had conceptions closer related to knowledge as isolated facts and research as disclosing patterns. The conceptions of academics with a disciplinary background in culture and literature and history and art history were more closely related to knowledge as personal construct and research as patterns created by the researcher. Disciplinary background was not related to teaching conceptions. Yet, academics' preferred research-teaching nexus was related to their conceptions of teaching, and not to their conceptions of knowledge and research. The profile *help to conduct research* was related to a conception of teaching as *knowledge transmission* and *interaction leading to student activity*, and the profile *show what it means to be a researcher* was related to a conception of teaching as *showing how to deal with knowledge* and *teaching students to think critically*. Academics' preferred research-teaching nexus was furthermore related to their position in the university. Full professors and associate professors were overrepresented in the profiles *make research known* and *show what it means to be a researcher*, while assistant professors were overrepresented in *teach research results* and *help to conduct research*. In short,

assistant professors seem to focus more on tangible aspects such as academic knowledge and training students in research skills, while associate and full professors focus on intangible aspects such as the development of an academic disposition and divulging research. Age or sex was not related to the preferred research-teaching nexus.

7.2.1.4 Discussion

In our research we concurred with Kember (1997) and Samuelowicz and Bain (1992) that conceptions of knowledge, research, and teaching should be positioned on a continuum and cannot be considered only an increase of complexity, implying an inclusive relationship between the various conceptions (Åkerlind, 2008c; Marton, 1981). Unlike a hierarchy, conceptions that are ordered on a continuum do not include all aspects of earlier conceptions. The positioning of conceptions on a continuum does not necessarily mean that teachers can only move on this scale by rejecting their prior beliefs before taking a position elsewhere on the continuum. On the contrary, it suggests a gradual shift in which certain aspects of the conception increase in importance, while others decrease. However, the extremes of the continuum are mutually exclusive. For example, regarding knowledge the basic assumption that knowledge refers to something outside the self excludes the assumption that knowledge only exists in the self.

In this study academics' conceptions of the research-teaching nexus were found to be not related to their conceptions of research or knowledge, as was supposed in several studies (Bond, 2007; Brew, 2003; Robertson & Bond, 2001, 2005), but we did find a relation with conceptions of teaching. Apart from this, conceptions of knowledge and research were strongly related, while the teaching conception was only weakly related to knowledge and research conceptions. It might be that academics' conceptions are strongly influenced by their upbringing in their own discipline. These disciplines normally have a strong research tradition and a matching knowledge conception. This might mean that academics' research schooling led to research conceptions and subsequently to knowledge conceptions that are generally shared among the majority of academics in their disciplines. Actually, one would expect the opposite, namely that the research conceptions are based on knowledge conceptions (Robertson & Bond, 2003). Academics' teaching conceptions are most likely formed by their experiences as student, as found in studies about beginning teachers (Feiman-Nemser & Remillard, 1996). As teachers in universities normally have little or no pedagogical training we might expect their teaching conceptions follow largely from their

experiences as students. This explanation is confirmed by the relations we found in Chapter 4. Here we see a strong association between discipline and knowledge and research conceptions, while no association was found between discipline and teaching conceptions. Furthermore, teaching conceptions were found to be related to academics' conceptions of the research-teaching nexus. So, in contrast to several studies that reported disciplinary differences (Barnett, 2003; Colbeck, 2004; Neumann, 1993; Robertson & Bond, 2005; Smeby, 1998) we found no relations between academics' disciplinary backgrounds and their conceptions of the research-teaching nexus. This finding might be explained by the fact that academics' teaching conceptions are what matters for the research-teaching nexus, whereas the knowledge and research conceptions are related to disciplinary background. All relations studied and found are represented in Figure 7.2.

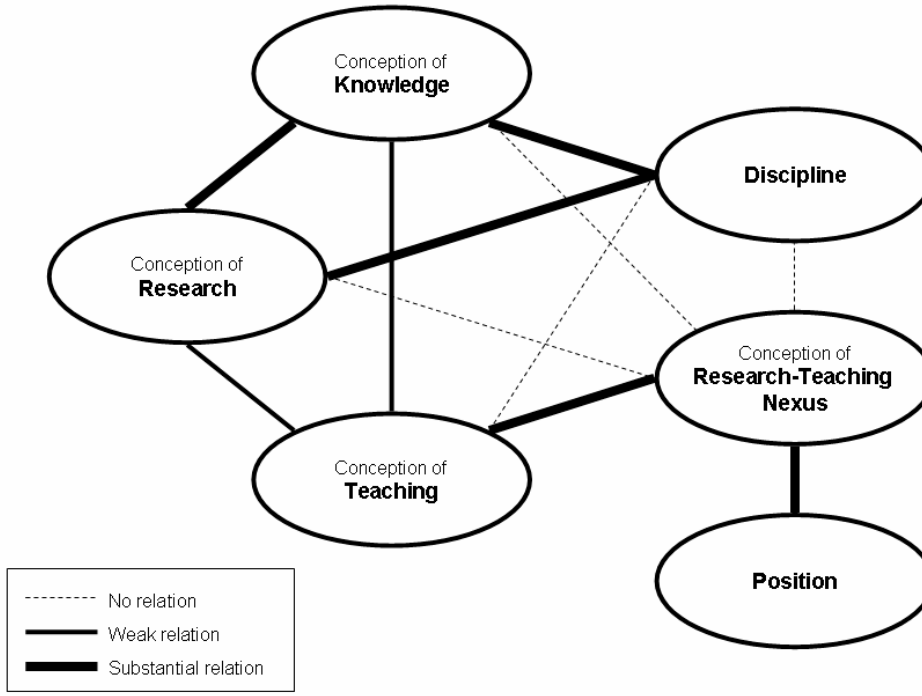

Figure 7.2. Relationships between academics' conceptions and background

7.2.2 Second study

7.2.2.1 In what ways do academics in the Faculty of Humanities integrate research in their teaching when encouraged to, and what learning outcomes do their students report?

We investigated the learning environments created by twelve academics in the Faculty of Humanities when they were encouraged to link research and teaching in the way they thought most fruitful. Furthermore, we examined the learning outcomes as perceived by their students. Five types of courses could be distinguished characterising the different ways research and teaching were integrated: A) using the teacher's own research to illustrate the subject matter, B) focusing on the researcher's disposition and position, C) introducing students to literature, after which students conduct research projects, D) follow in the teacher's footsteps, and E) participation in the teachers' research. Most academics were focusing on training students to become researchers (A, C, D, and E) and on teaching academic knowledge (A, D, and E). A few, among whom the teachers in group B, strongly focused on an academic disposition, such as being critical and being able to position oneself and to defend that position in a debate. In the majority of the courses inquiry learning took place, either in individual student projects or by participation in the teacher's research.

The students reported learning on the intended outcomes, such as knowledge and skills, but some of them also reported learning on unintended outcomes. Students from courses in group D reported awareness of research as the main outcome of their learning. Because of the close look at their teacher's research they were given, they started to understand what research really entailed. Their initial, sometimes naive, views of research were replaced by a view of the research conducted by their teacher: for example that not only students, but also academic researchers might start with hypotheses that do not hold. Furthermore, a growth regarding academic disposition was reported not only students in group B, but also by students in group C, although it was not the goal their teachers were aiming at. It was thought that discussions and reflections on this aspect during doing research assignments could be held accountable for this learning outcome.

7.2.2.2 What change patterns occur in academics' conceptions of the research-teaching nexus when they intentionally integrate research in their teaching?

Academics' views of the research-teaching nexus were investigated just before and after their participation in the research project in which they were stimulated to integrate research in their teaching. Analysis of the Q-sorts revealed five

different factors, representing different views on the research-teaching nexus. The first factor concerns *stimulating academic disposition in general*; the focus is on academic disposition, without any disciplinary focus or emphasis on the teacher's own research. The second factor is named *utilising teacher's own ongoing research in teaching*; the teacher's own research serves as an example for students to learn more about research. The third factor concerns *training students to become independent researchers*; cases and research questions are considered helpful to teach students how to become independent researchers themselves. The fourth factor, *discussing disciplinary research problems*, has a disciplinary orientation and aims to introduce students to the field. The fifth and last factor concerns *students participating in research as co-workers*; students are supposed to participate in the teacher's research and in this way become acquainted with the research process.

Three change patterns were identified, each represented by four academics, namely 1) no change, 2) change on a less dominant factor, 3) change of the dominant factor. Those academics to whom *no change* applied had stable beliefs. Before the term started they had a strong idea of what the research-teaching nexus should look like, and their beliefs did not change with the emphasis put on this topic during the term. The second group of academics also started with a strong idea of the research-teaching nexus. This main idea remained the same although a change occurred on a less dominant factor. So, while their basic view about the research-teaching nexus did not change, on some aspects they changed their views due to the project. The last group changed in their dominant views. Interestingly, these academics started with less outspoken beliefs; at the end of the project another factor had become dominant, while the former dominant factor had decreased in importance.

7.2.2.3 Discussion

When looking at academics' beliefs and their change patterns (see Chapter 6) and the learning environments they designed (see Chapter 5), the most striking observation is that no associations can be found (see Table 7.1, which for each academic lists course type, initial scores on the Q-sorts, increase or decrease of score (+/-), as well as the change pattern). Academics clustered in the same group on the basis of the learning environments they designed, have different views on the research-teaching nexus; academics with comparable views design different learning environments. Regarding the change patterns most changes occur in group A and group D, but these changes are not related to the same factors.

Table 7.1. Overview of participants' beliefs and practice in second study

Course type	Respondents	Factor scores					Change pattern
		1	2	3	4	5	
A	Paula	.31	.23 +	.56 -	.04	.24 +	3
A	Philip	.31 -	-.22 +	.15	-.15	.71	2
B	Alexandra	.10	.15	.71	.24	-.09	1
B	Charles	.75	.00 +	.25	.28	.15	2
C	Sophia	.49	.36	.00	.42 -	.21	3
C	Richard	.39	.10	.16	.70	.35	1
C	Harold	.03	.87	.14	-.10	.07	1
D	Henry	.76	.01	.19	.05	-.23 +	2
D	Diana	.36 +	.61 -	.20	.25 -	.04 +	3
D	Eric	-.07	.59 -	.22 +	.34 +	.23	3
E	Edward	.39	.12	.68	-.05	.22	1
E	Ian	.04	.26	-.10 +	.16	.73	2

This observation suggests that the context in which academics operate might have influenced the type of course they design (Clark, 1997; Zamorski, 2002). Philip, for example, sees the participation of students in his own research as the best way of linking research and teaching. However, he was teaching second year students that were still struggling with the language of the area and had yet to learn the analysis methods of his discipline. Therefore, he designed a course aimed at the acquisition of knowledge and skills by lectures and small research assignments. His own research only served as sample material. So, in this case, the students' level made Philip design a course that was not directly related to his main view. Someone else, who seems not to have designed a course directly related to his views is Edward. While his course is much like factor 5, Students participating as co-workers in research, his main view is factor 3, Training students to become independent researchers. When looking closely at Edward's case we notice that his main goal for his students is to become independent researchers. At the same time his main principle is to show students how to be a researcher, and the perfect way to do that is to enable them to participate in his own research. So, in this case it is the interaction between beliefs (aiming at independent researchers) and the context (students who would like to become researchers and are intrinsically motivated and skilled) that led him to design his course in the way he did. A similar pattern can be identified when looking at the two courses labelled B: Focusing on disposition and the position of the teacher. Both teachers put high

emphasis on academic disposition in their courses, but from two different points of view. Alexandra, like Edward, first of all wants her students to become independent researchers and considers stimulating an academic disposition an essential element of this process. Her class size of 50 students makes organising student research projects quite hard. Therefore she focused on discussion and creating disagreement during these sessions, on the basis of small research assignments. Charles, on the other hand, mainly wants all his students to acquire an academic disposition regardless of whether they become researchers or not. This is why he focused all his teaching, in which discussion of research assignments takes an important place, on acquiring this academic disposition. Although his conception of the research-teaching nexus is rather discipline-independent, his teaching is based in the discipline, as it is part of a curriculum on a specific subject, so the focus on academic disposition can not be completely detached from the discipline. Thus, from different views both teachers ended up with related course designs. For Alexandra the interaction between beliefs and context was crucial, while for Charles his beliefs were decisive.

These four cases show that we need to look at each case closely to unravel the relations between academics beliefs, contexts, and course designs. Furthermore, the distance between academics' beliefs and their course designs might be too great: in earlier research (Murray & MacDonald, 1997; Prosser & Trigwell, 1999) it already proved to be hard to show associations between university teachers' beliefs and actual or reported teaching behaviour, so we can expect it will be even harder to relate conceptions to course designs. Norton and others (2005) point to academics' intentions as the mediators between beliefs and teaching practice. They show that teachers' intentions are related both to their teaching conceptions and to the context in which they operate. Hence, the interaction between conceptions and context might well be the main explanation for our findings.

7.2.3 Integration of the studies

When combining the variations in the research-teaching nexus found in the different studies we notice several similarities and differences. We will first discuss the relations between the two categorisations of beliefs (Chapter 3 and Chapter 6), before turning to the categorisation regarding teaching practice (Chapter 5).

Regarding the relations between the profiles found in the study of ideal images and the factors resulting from the Q-sort, we note that profile V, *provide research experience*, is remarkably similar to factor 5, *students participating in research as co-workers*. Both can be characterised as aiming at a combination of training students to become researchers, with the teachers profiting from the students' input, while a learning environment with students participating in the teacher's research is seen as the best way of linking research and teaching. Profile II, *make research known*, has similarities with factor 2, *utilising teacher's own ongoing research in teaching*. Both aim at stimulating an academic disposition in students and introducing students to research, making sure that they know what research entails. Furthermore, part of the approach is students reporting about research, orally or in writing. The teacher's own research is used to provide vivid examples of what 'real' research looks like. Factor 3, *training students to become independent researchers*, is closest to profile IV, *help to conduct research*. The focus is on training students in research and active involvement in research-like activities, as in profile IV. However, the teacher's own research is less important. In the two other factors, profile III, *show what it means to be a researcher*, is complemented with aspects of profile I, *teach research results*, but the combination of aspects differs. Factor 4, *discussing disciplinary research problems*, is a close representative of profile III, as it focuses on research processes with the teacher as a role model and lecturer, the only difference being the emphasis on the discipline, which is not included in profile III, but is an aspect of profile I. The remaining Factor 1, *stimulating academic disposition in general*, also focuses on the academic disposition, although a greater emphasis is put on discussion and academics expect to profit from teaching because of the reflection necessary in preparing courses. These are both aspects of profile I.

Summarising, the combination of the profiles found in Chapter 3 and the factors found in Chapter 6 lead to the following main characteristics for the variants of the research-teaching nexus:

- Factor 1/ Profile III (& I): The academic disposition is central to this variant. It is acquired by discussions. The teacher, as an experienced researcher, is a role model to the students and benefits from course preparation because this stimulates reflection.
- Factor 2/ Profile II: Students learn about research on the basis of their teacher's research examples. Furthermore, the students are encouraged to discuss, present, and write about research. Among other things this enhances their academic disposition.

- Factor 3/ Profile IV: Training students to become researchers is achieved by providing students with research assignments. Working towards an academic disposition is seen as crucial.
- Factor 4/ Profile III (& I): This is the disciplinary variation of the first variant. The focus is on research processes and an introduction to the field. The aim is for students to get insight into the concept of research in their specific discipline.
- Factor 5/ Profile V: The participation of students in their teachers' ongoing research is at the heart of this alternative. The students are trained to become researchers, and the teacher benefits from their input.

In the distinction above we see that profile I, *teach research results*, is only partly recognisable. The idea of transmitting research results is not seen as a key element in linking research and teaching by the participants in our study. The disciplinary aspect, however, is visible in factor 4, while the reciprocal element of reflection is part of factor 1.

Academics' practices, described as course types in Chapter 5, can be related to the profiles/factors from the Chapters 3 and 6 as follows. Course type A, *using teacher's own research to illustrate the subject matter*, is closely related to profile II/ factor 2. The teachers' own research provides examples to be used in their courses. Course type B, *focusing on the researcher's disposition and position*, shows most resemblance with profile III/ factor 4. The focus is on the academic disposition that students need to attain, so that the research process is at the centre of attention. Course type C, *introducing students to literature after which students conduct research projects*, combines aspects of profiles I (in the first half of the course) and IV (in the second half). Students first need to be introduced to the relevant literature before being able to conduct a small research project themselves. The teachers were available to support their students in doing these projects. Course type D, *follow in the teacher's footsteps*, is strongly related to profile IV, which combines the research projects the students conducted and the introduction in the academic world by means of their teacher's research. Finally, course type E, *participation in the teacher's research*, is to be related to profile V/ factor 5. The idea of allowing students to participate in the teacher's own, ongoing research is clearly different from the others, and is found in every categorisation.

In general, we see that the division between content and process is not a key element, either in the conceptions measured by the Q-sorts (factors) or in the

teaching practice (course types). All factors and course types somehow combined both aspects of research. The difference was only in the emphasis put on one or the other. Often the process was seen as (slightly) more important than the content, but the research process is inevitably based on the research content. Students can only fully understand the research process when they get a complete picture. Furthermore, while the factors are considered to represent a more comprehensive and accurate picture of teachers' conceptions of the research-teaching nexus, teaching practices could be more easily related to the profiles defined earlier. The advantage of the Q-sorts is in the way academics' conceptions are assessed, taking the interrelations into account. Subtle differences in academics' conceptions, in which the academic disposition always plays a role, are done justice, but these are less suitable to identify variations. So, whereas the characterisation of academics' conceptions needs subtleties, characterisations of courses are achieved more easily using more outspoken prototypes such as ideal images. Hence, for identification purposes the profiles resulting from the ideal images might be considered more appropriate; when it comes to research purposes aiming at investigating academics' conceptions, the Q-sort characterisation might be more suitable.

7.3 Main conclusions

The main conclusions resulting from this research can be summarised as follows:

- Academics' conceptions of the research-teaching nexus are related to their conceptions of teaching and not to their conceptions of research and knowledge. Furthermore, the conceptions of research and knowledge are more closely related to each other than to the conception of teaching.
- Disciplinary background of academics is first of all related to knowledge and research conceptions. An association between discipline and view of the research-teaching nexus could not be identified within one faculty.
- The various views on the research-teaching nexus are related to academics' positions. Assistant professors focus on tangible aspects, such as passing on academic knowledge and research skills. Associate and full professors focus on intangible aspects, such as academic disposition and divulging research.
- Students report more learning outcomes on academic disposition and research awareness than their teachers had aimed for in their course designs. Academic disposition is encouraged by discussions and reflection on students' academic disposition while conducting research assignments.

Research awareness is stimulated by a carefully organised close look at their teacher's research.

- Participation of academics in projects that aim to strengthen the link between research and teaching might lead to changes in their conceptions of the research-teaching nexus towards well-elaborated views.
- Variations in academics' views on the research-teaching nexus can be characterised by means of six dimensions: intangible - tangible nexus, disciplinary research – teacher's own research, research in general – current research, regarding research content – research process, learning about research – participation in research approach, and unidirectional – reciprocal. Five main variations could be identified: teach research results, make research known, show what it means to be a researcher, help to conduct research, and provide research experience.

7.4 Strengths and limitations of the study

7.4.1 Strengths

This study set out to contribute to the discussion on the various ways of linking research and teaching in universities. Our approach can be characterised as an open approach in which academics' views were the point of departure. During the whole study we were aware of the potential danger of suggesting the 'correct' meaning of the research-teaching nexus to our participants. Therefore, we were reluctant to answer any questions about the direction in which the nexus should go. Our aim to look for the variety in views entailed that we as researchers did not favoured a specific approach. Therefore, in the interviews we just presented a framework, the mental visualisation assignment, to provide the opportunity to speak about all relevant aspects of the research-teaching nexus. In the second study we again did not favour any specific form of linking research and teaching, but instead encouraged all participants to bring their own preferred research-teaching nexus into practice. Our only intervention concerning content was stimulating the teachers to take a broad view on the possible ways of linking research and teaching in order to prevent narrow-mindedness in linking research and teaching. In this way we managed to provide ample space for academics to colour the outcomes of our study and their own practice.

Furthermore, our study used a great variety of rather unconventional methods. In the first study metaphors and mental visualisation assignments were included. These qualitative data were then analysed with both qualitative and quantitative

methods. The transcripts concerning academics' conceptions of knowledge, research, and teaching were analysed interpretatively and then associated using Somers' *d* as a measure of association. This method is particular suitable for rankings, such as our categorisation of conceptions that were ranked on a dimension (see Chapter 2). The ideal images described in Chapter 3 were analysed both quantitatively, using hierarchical cluster analysis, and qualitatively, using case-variable matrices, after which the results were combined into one categorisation of five profiles. In the second study the Q-sorts were used: Q-methodology is common in the political sciences and pedagogy, but not often used in educational research. Repeated measuring was until now mainly used in psychology. The variety of methods and the combination of quantitative and qualitative measures has enabled us to profit from the strengths of both.

7.4.2 Limitations

There are several issues that limit the conclusions from our study. These limitations particularly concern the sample. In the first place, the sample consisted of academics from only one faculty in one university, which made an in-depth look possible. However, the debate in the literature concerning disciplinary influence on the research-teaching nexus, to which we contribute in Chapter 4, is still going on, this means that we need to reckon with potential disciplinary influences. We did not find relations between academics' disciplinary backgrounds and their conceptions of the research-teaching nexus, but it might be that when other faculties are also included disciplinary influences do come up. It would not be unexpected for disciplinary differences to occur when a wide spectrum of disciplines is analysed. This seems plausible, since we did find relations between the discipline and knowledge and research conceptions. However, in our sample the conceptions of the research-teaching nexus were related to academics' teaching conceptions and positions. In addition, there are many different kinds of universities nowadays, with various emphases either research or teaching or both. This study was carried out in a European research-intensive university, so that findings bear upon this type of university, and might largely differ from the situation in, for example, teaching universities. Therefore, our conclusions primarily regard the humanities in research universities.

In the second place, the samples in both studies were relatively small, which is typical of most qualitative studies. Especially in the second study the number of categories that were found can be questioned. The five categories in Chapter 5 contained only 2 or 3 courses each as the categorisation was based on only twelve

courses. In this type of research a balance needs to be found to do justice to both the individual cases and the larger, expected variation that can occur in the sample. In our study we stimulated the academics to explore freely how they would prefer to link research and teaching, and therefore we decided not limit the number of outcome categories too strictly. However, this means that the findings are first of all indications of potential relations between research-intensive learning environments and students' learning outcomes. Additionally, the factor analysis in Chapter 6, based on 26 Q-sorts, revealed five factors. In factor analysis several criterions can be applied to decide how many factors best represent the data. In our study we used both Kaiser's criterion, which is normally quite liberal, and Cattell's scree plot, which is more strict (Pedhazur & Pedhazur Schmelkin, 1991). The Kaiser criterion suggested using seven factors, with an explanatory power of 74%, while the scree test suggested limiting the number to five, with an explanatory power of 64.5%. A smaller number of factors would diminish more explanatory power even more. So again, we had to balance between doing justice to the variation among academics' beliefs and to the potential explanatory power.

A last limitation concerns our dependency on academics' self-reports. From previous research we know that especially teachers' beliefs are not easily to access (Calderhead, 1996; Kagan, 1990). This might be due to the tacitness of many conceptions and the willingness and unwillingness to report socially non-desirable conceptions. In this study the wish to strengthen the research-teaching nexus was clearly communicated by the Leiden University Board, which gave the study a political connotation that we needed to avoid as much as possible. In our study we tried to minimise these problems by using unconventional instruments to measure academics' beliefs. In the first study we used metaphors to elicit academics' conceptions of knowledge, research, and teaching: the academics were given images to comment on this enabled them to explain how they conceptualised knowledge, research, and teaching. In the same interviews we also focused on academics' ideal images in order to create some distance from problems they encountered in university practice. One of our respondents, for example, came to the interview focused on the intention to talk about the limited research time he had, and how difficult it therefore was to link research and teaching. However, because of the metaphors and the mental visualisation assignment he was steered into a different mind-set and talked freely about his desires, before getting into his story about his problems with the time allocation. In the second study we relied on both teachers' self-reports and students' perceptions. The instruments used differed in their latitude and the options they

offered teachers to steer the outcomes (Meijer, 1999). During the interviews the participants were well aware of what they were explaining and in what direction they pointed, and in addition they had great freedom to explore any element they thought of. The Q-sort, on the other hand, was a much more structured instrument, and therefore limited the participants' freedom, including the possibility to steer the outcomes. The question whether teachers changed during the term was answered primarily on the basis of these Q-sorts, in order to avoid the problems concerning reflective self-reports.

7.5 Implications and suggestions for future research

7.5.1 Future research

Further research on the research-teaching nexus might include both small-scale studies and larger comparative studies. To start with the former, we recommend even closer looks into a few cases. The results of the second study suggest a complex relationship between academics' conceptions and their teaching practice. In-depth case studies of a small number of academics in which data are gathered on conceptions as well as teaching practice might reveal how the contexts in which academics work and their conceptions interact. We suggest including academics' conceptions of knowledge, research, teaching, and the research-teaching nexus on the one hand, and on the other hand include actual practice by gathering data on research and teaching activities (Colbeck, 1998), preferably including self-reports as well as observations. Furthermore, this detailed picture needs to include several courses in order to gain insight into context factors such as size, level, and place in the curriculum. It might be a good idea to include academics' intentions as it is suggested they mediate academics' beliefs and their behaviour (Norton et al., 2005). Furthermore, we also recommend including actual behaviour, preferably measured by observations, as this bridges the gap between teachers' intentions and students' learning (Fishbein et al., 2001). The inclusion of students, as was done in our study, proved valuable and should therefore be continued. In this way the interaction between beliefs and practice can be studied to its full extent.

In our study we focused on one faculty in order to be able to gain an in-depth look into several features of the research-teaching nexus in the field of the humanities. A next step might be to test whether the profiles found are applicable to other disciplinary areas as well, and to what extent. Our expectation would be that comparable profiles are found in other disciplines, but it might be that certain views on underlying concepts result in additional profiles in certain disciplines.

The dimensions mentioned in Chapter 3 (the intangible - tangible nexus, disciplinary research – teacher's own research, research in general – current research, research content – research process, learning about research – participation in research approach, and unidirectional – reciprocal) are likely to be relevant for the identification of various forms of linking research and teaching. Another finding that needs to be studied in other disciplines is the association of the teaching conception with conceptions of the research-teaching nexus. Because of the small scale of our study and the fact that the disciplines were related we were able to distinguish the associations of the teaching conception from those of the conceptions of knowledge and research. It would be interesting to know whether the same pattern can be identified in other disciplines and across disciplines in different academic fields.

A last direction for future research might be to pursue the findings of Chapter 5, in which the students reported learning outcomes on academic disposition and research awareness more frequently than their teachers had intended. This outcome is challenging because of what academics mentioned as the main aim of linking research and teaching, i.e., to develop a mature epistemological disposition (Elen et al., 2007; Elen & Verburgh, 2008; Van der Rijst et al., 2007), and the call in other strands of literature for the development of generic graduate attributes, such as critical thinking (Barrie, 2007; Jones, 2009). One reason for this might be that academics find it hard to assess this kind of learning outcomes, which was confirmed by discussions in the peer meetings, and therefore are reluctant to mention them as their goals for a specific course. This observation is an appeal to the academic community to come up with ways to assess growth in these respects, and to bring together the research traditions regarding generic graduate attributes and the discussion around the research-teaching nexus.

7.5.2 Practical implications

In this research project we identified various classifications by which to capture the variations in views concerning the research-teaching nexus. In the discussion about the relations about these views we found that for identifying various forms of linking research and teaching the profiles that were formulated in the study concerning academics' ideal images (Chapter 3) were most suitable. Furthermore, these profiles can be used in debates among academics and administrators in the university. The profiles offer five clear, different, and distinctive ways of linking research and teaching. A more open, but therefore less conceivable, approach to discussing the research-teaching nexus is formed by the six dimensions we

identified based on the basis of the literature and our findings in Chapter 3. University boards or individual academics might use both approaches to discuss or think up ways in which they would like to link research and teaching. Furthermore, these profiles and dimensions are helpful in defining what the academic community actually means when promoting 'a strong research-teaching nexus'. This discussion needs to be held if we want to get any further with this connection. Especially within universities and their departments it seems necessary to discuss what is meant when a desire to strengthen the link is articulated, and our outcomes might provide a tool to identify the variety of meanings.

The first study made us aware of the importance of academics' teaching conceptions. This finding suggests that both in policy and in professional development it is necessary to pay explicit attention to academics' conceptions of teaching. This becomes even more relevant when we realise that the pedagogical training most academics have received is rather limited. It would be meaningful to see how these conceptions of teaching could be integrated more closely with academics' conceptions of knowledge and research. Furthermore, an emphasis on knowledge and research conceptions might also introduce the disciplinary variation, since we noticed that these conceptions are closely linked to disciplinary background. However, for the moment the teaching conceptions are leading and therefore need our attention.

In the second study we noticed that academics were encouraged to rethink their view of the research-teaching nexus actually and although we did not find direct links between their conceptions and their teaching practice, the majority developed new understandings of the link between research and teaching. Participation in projects like this one, therefore, provides a way to involve academics in the development of stronger connections. After participation in such projects academics might have more explicit and better-considered conceptions of the research-teaching nexus. This, then, might form a fruitful basis for a department to further strengthen the link.

Finally, some recommendations for academics' daily practice remain. We would encourage them to search for new ways of linking research and teaching. Designing courses with the intention to strengthen the research-teaching nexus

might lead to new insights on how to establish such a connection and on potential gains for both teachers and students. Academics might want to set goals regarding academic disposition. Class discussions, asking challenging questions and providing specific feedback might be powerful ways to achieve these. Furthermore, special attention might be paid to initiatives that create research awareness within students. Several students reported that they only acquired a real insight in what doing research entails when academics provided them wide access to their own research experience. This authentic experience might include taking students to conferences, asking for comments on manuscripts in preparation, and discussing all the side-roads that were part of the process that led to that point. These initiatives to connect research and teaching, if carefully designed, need not be limited to only small numbers of students and so might provide an alternative for those in favour of students participating in academic's research. In general, the more real and open the sharing of research experiences the more students are attracted to finding out what happens in academia and where academic knowledge comes from.

References

References

Åkerlind, G.S. (2005). Phenomenographic methods: A case illustration. In J.A. Bowden & P. Green (Eds.), *Doing developmental phenomenography* (pp. 103-127). Melbourne: RMIT University Press.

Åkerlind, G.S. (2008a). An academic perspective on research and being a researcher: An integration of the literature. *Studies in Higher Education, 33*(1), 17-31.

Åkerlind, G.S. (2008b). Growing and developing as a university researcher. *Higher Education, 55*(2), 241-254.

Åkerlind, G.S. (2008c). A phenomenographic approach to developing academics' understanding of the nature of teaching and learning. *Teaching in Higher Education, 13*(6), 633-644.

Ashwin, P. (2006). Variation in academics' accounts of tutorials. *Studies in Higher Education, 31*(6), 651-665.

Athanases, S.Z., & Achinstein, B. (2003). Focusing new teachers on individual and low performing students: The centrality of formative assessment in the mentor's repertoire of practice. *Teachers College Record, 105*(8), 1486-1520.

Badley, G. (2002). A really useful link between teaching and research. *Teaching in Higher Education, 2002, 7*(4), 443-455.

Barnett, R. (1999). *Realizing the university in an age of supercomplexity*. Maidenhead: The Society for Research into Higher Education & Open University Press.

Barnett, R. (2003). *Beyond all reason. Living with ideology in the university*. Buckingham: The Society for Research into Higher Education & Open University Press.

Barnett, R. (2005). *Reshaping the university. New relationships between research, scholarship and teaching*. Maidenhead: The Society for Research into Higher Education & Open University Press.

Barnett, R., & Griffin, A. (1997). *The end of knowledge in higher education*. London: Cassell.

Barrie, S.C. (2007). A conceptual framework for the teaching and learning of generic graduate attributes. *Studies in Higher Education, 32*(4), 439-458.

Becher, T. (1989). *Academic tribes and territories. Intellectual enquiry and the culture of disciplines*. Buckingham: The Society for Research into Higher Education & Open University Press.

Becher, T. (1994). The significance of disciplinary differences. *Studies in Higher Education, 19*(2), 151-161.

Becher, T., & Trowler, P.R. (2001). *Academic tribes and territories. Intellectual enquiry and the culture of disciplines.* (2nd ed.). Buckingham: The Society for Research into Higher Education & Open University Press.

Beijaard, D., & De Vries, Y. (1997). Building expertise: A process perspective on the development or change of teachers' beliefs. *European Journal of Teacher Education, 20*(3), 243-255.

Biglan, A. (1973). Characteristics of subject matter in different academic areas. *Journal of applied psychology, 57*(3), 195-203.

Block, J. (1971). *Lives through time*. Berkeley, CA: Bancroft Books.

Bond, C.H. (2007). *Conceptions of knowledge: Do they have a role in 'shaping' experiences of learning and teaching?* Paper presented at the annual conference of the Society for Research into Higher Education, Brighton, UK.

Boulton, G., & Lucas, C. (2008). *What are universities for?* Leuven: League of European Research Universities.

Boyer Commission (1998). *Reinventing undergraduate education: a blueprint for America's Research Universities*. Stony Brook, NY: State University of New York.

Boyer, E.L. (1990). *Scholarship reconsidered: Priorities for the professoriate*. Princeton: Carnegie Foundation.

Breen, R., & Lindsay, R. (1999). Academic research and student motivation. *Studies in Higher Education, 24*(1), 75-93.

Brew, A. (2001). Conceptions of research: A phenomenographic study. *Studies in Higher Education, 26*(3), 271-285.

Brew, A. (2003). Teaching and research: New relationships and their implications for inquiry-based teaching and learning in higher education. *Higher Education Research and Development, 22*(1), 3-18.

Brew, A. (2006). *Research and teaching. Beyond the divide*. Houndmills: Palgrave Macmillan.

Brew, A. (2008). Disciplinary and interdisciplinary affiliations of experienced researchers. *Higher Education, 56*(4), 423-438.

Brew, A., & Boud, D. (1995). Teaching and research - Establishing the vital link with learning. *Higher Education, 29*(3), 261-273.

Brown, S.R. (1980). *Political subjectivity. Applications of Q methodology in political sciences*. New Haven, CT: Yale University Press.

Brown, S.R. (1996). Q methodology and qualitative research. *Qualitative Health Research, 6*(4), 561-567.

Calderhead, J. (1996). Teachers: Beliefs and knowledge. In D.C. Berliner & R.C. Calfee (Eds.), *Handbook of Educational Psychology* (pp. 709-725). New York: MacMillan.

Chan, Y., & Walmsley, R.P. (1997). Learning and understanding the Kruskal-Wallis one-way analysis-of-variance-by-ranks test for differences among three or more independent groups. *Physical Therapy, 77*(12), 1755-1762.

Clark, B.R. (1997). The modern integration of research activities with teaching and learning. *Journal of Higher Education, 68*(3), 241-255.

Clark, C.M., & Peterson, P.P. (1986). Teachers' thought processes. In M.C. Wittrock (Ed.), *Handbook of Research on Teaching.* (3rd ed., pp. 255-296). New York: Macmillan Publishing Co.

Clarke, D., & Hollingsworth, H. (2002). Elaborating a model of teacher professional growth. *Teaching and Teacher Education, 18*(8), 947-967.

Coate, K., Barnett, R., & Williams, G. (2001). Relationships between teaching and research in higher education in England. *Higher Education Quarterly, 55*(2), 158-174.

Cochran-Smith, M., & Lytle, S.L. (1999). Relationships of knowledge and practice: Teacher learning in communities. *Review of Research in Education, 24 1999, 24*, 249-305.

Colbeck, C. (1998). Merging in a seamless blend - How faculty integrate teaching and research. *Journal of Higher Education, 69*(6), 647-671.

Colbeck, C. (2004). *A cybernetic systems model of teaching and research production: Impact of disciplinary differences*. Paper presented at the International Colloquium on Research and Teaching: Closing the Divide?, Winchester Hampshire, UK.

De Heus, P., Van der Leeden, R., & Gazendam, B. (1995). *Toegepaste data-analyse. Technieken voor niet-experimenteel onderzoek in de sociale wetenschappen*. Utrecht: Lemma.

Donald, J.G. (1986). Knowledge and the university curriculum. *Higher Education, 15*(3-4), 267-282.

Duffee, L., & Aikenhead, G. (1992). Curriculum change, student evaluation, and teacher practical knowledge. *Science education, 76*(5), 493-506.

Dunkin, M.J., & Precians, R.P. (1992). Award-winning university teachers' concepts of teaching. *Higher Education, 24*(4), 483-502.

Durning, B., & Jenkins, A. (2005). Teaching/research relations in departments: the perspectives of built environment academics. *Studies in Higher Education, 30*(4), 407-426.

Elen, J., Lindblom-Ylänne, S., & Clement, M. (2007). Faculty development in research-intensive universities: The role of academics' conceptions on the relationship between research and teaching. *International Journal for Academic Development, 12*(2), 123-139.

Elen, J., & Verburgh, A. (2008). *Bologna in European research universities. Implications for Bachelor and Master programs*. Antwerpen: Garant.

Elsen, G.M.F., Visser-Wijnveen, G.J., Van der Rijst, R.M., & Van Driel, J.H. (2009). How to strengthen the connection between research and teaching in undergraduate university education. *Higher Education Quarterly, 63*(1), 64-85.

Elton, L. (1986). Research and teaching - Symbiosis or conflict. *Higher Education, 15*(3-4), 299-304.

Eraut, M. (2000). Non-formal learning and tacit knowledge in professional work. *British Journal of Educational Psychology, 70*, 113-136.

Erickson, F. (1986). Qualitative methods in research on teaching. In M.C. Wittrock (Ed.), *Handbook of research on teaching* (3rd ed., pp. 119-161). New York: Macmillan.

European Ministers of Education (1999). *The Bologna Declaration of 19 June 1999*.

Everitt, B.S., Landau, S., & Leese, M. (2001). *Cluster Analysis* (4th ed.). London: Arnold.

Feiman-Nemser, S., & Floden, R.E. (1986). The cultures of teaching. In M.C. Wittrock (Ed.), *Handbook of Research on Teaching* (3rd ed., pp. 505-526). New York: MacMillan.

Feiman-Nemser, S., & Remillard, J. (1996). Perspectives on learning to teach. In F.B. Murray (Ed.), *The Teacher Educator's Handbook* (pp. 63-91). San Francisco, CA: Jossey-Bass.

Fishbein, M., Triandis, H.C., Kanfer, F.H., Becker, M., Middlestadt, S.E., & Eichler, A. (2001). Factors influencing behavior and behavior change. In A. Baum, T.A. Revenson & J.E. Singer (Eds.), *Handbook of Health Psychology* (pp. 3-17). Mahwah, New Jersey & London: Lawrence Erlbaum Associates.

Fox, D. (1983). Personal theories of teaching. *Studies in Higher Education, 8*(2), 151-163.

Gibbons, J.D. (1993). *Nonparametric statistics. An introduction*. Newbury Park, CA: Sage.

Griffiths, R. (2004). Knowledge production and the research-teaching nexus: The case of the built environment disciplines. *Studies in Higher Education, 29*(6), 709-726.

Guest, G., Bunce, A., & Johnson, L. (2006). How many interviews are enough? An experiment with data saturation and variability. *Field Methods, 18*(1), 59-82.

Gurney, B.F. (1995). Tugboats and tennis games - Preservice conceptions of teaching and learning revealed through metaphors. *Journal of Research in Science Teaching, 32*(6), 569-583.

Guskey, T.R. (2002). Professional development and teacher change. *Teachers and Teaching: Theory and Practice, 8*(3/4), 381-391.

Hammerness, K. (2003). Learning to hope, or hoping to learn? The role of vision in the early professional lives of teachers. *Journal of Teacher Education, 54*(1), 43-56.

Hativa, N., & Goodyear, P. (2002). *Teacher thinking, beliefs, and knowledge in higher education*. Dordrecht: Kluwer Academic Publishers.

Hativa, N., & Marincovich, M. (1995). *Disciplinary differences in teaching and learning: implications for practice*. San Francisco: Jossy Bass.

Hattie, J., & Marsh, H. (1996). The relationship between research and teaching: A meta-analysis. *Review of Educational Research, 66*(4), 507-542.

Hawley, W.D., & Valli, L. (1999). The essentials of effective professional development: A new consensus. In L. Darling-Hammond & G. Sykes (Eds.), *Teaching as the learning profession: Handbook of policy and practice* (pp. 127-150). San Francisco, CA: Jossey-Bass.

Healey, M. (2005). Linking research and teaching: Exploring disciplinary spaces and the role of inquiry-based learning. In R. Barnett (Ed.), *Reshaping the University: New Relationships between Research, Scholarship and Teaching* (pp. 67-78). Maidenhead: The Society for Research into Higher Education & Open University Press.

Healey, M., Jordan, F., Pell, B., & Short, C. (in press). The research-teaching nexus: a case study of students' awareness, experiences and perceptions of research. *Innovations in Education and Teaching International*.

Henze, I. (2006). *Science teachers' knowledge development in the context of educational innovation.* Leiden: Leiden University.

Hoekstra, A., Beijaard, D., Brekelmans, M., & Korthagen, F.A.J. (2007). Experienced teachers' informal learning from classroom teaching. *Teacher and Teaching: theory and practice, 13*(191-208).

Hofer, B.K., & Pintrich, P.R. (1997). The development of epistemological theories: Beliefs about knowledge and knowing and their relation to learning. *Review of Educational Research, 67*(1), 88-140.

Huber, L. (1990). Disciplinary cultures and social reproduction. *European Journal of Education, 25*(3), 241-261.

Hunter, A.B., Laursen, S.L., & Seymour, E. (2007). Becoming a scientist: The role of undergraduate research in students' cognitive, personal, and professional development. *Science Education, 91*(1), 36-74.

Husu, J., & Tirri, K. (2007). Developing whole school pedagogical values - A case of going through the ethos of "good schooling". *Teaching and Teacher Education, 23*(4), 390-401.

Jenkins, A. (2004). *A guide to the research evidence on teaching-research relations*. York: The Higher Education Academy.

Jenkins, A., Blackman, T., Lindsay, R., & Paton-Saltzberg, R. (1998). Teaching and research: Student perspectives and policy implications. *Studies in Higher Education, 23*(2), 127-141.

Jenkins, A., Breen, R., Lindsay, R., & Brew, A. (2003). *Reshaping Teaching in Higher Education, Linking Teaching with Research*. London, UK: Kogan Page Limited.

Jenkins, A., Healey, M., & Zetter, R. (2007). *Linking teaching and research in departments and disciplines*. York: The Higher Education Academy.

Jensen, J. (1988). Research and teaching in the universities of Denmark - Does such an interplay really exist. *Higher Education, 17*(1), 17-26.

Johnston, S. (1992). Images - A way of understanding the practical knowledge of student-teachers. *Teaching and Teacher Education, 8*(2), 123-136.

Jones, A. (2009). Redisciplining generic attributes: The disciplinary context in focus. *Studies in Higher Education, 34*(1), 85-100.

Kagan, D.M. (1990). Ways of evaluating teacher cognition - Inferences concerning the Goldilocks principle. *Review of Educational Research, 60*(3), 419-469.

Kember, D. (1997). A reconceptualisation of the research into university academics' conceptions of teaching. *Learning and Instruction, 7*(3), 255-275.

Kreber, C. (2007). The scholarship of teaching and learning. *International Journal for the Scholarship of Teaching and Learning, 1*(1), 1-4.

Lakoff, G., & Johnson, M. (1980). *Metaphors we live by*. Chicago: The University of Chicago Press.

Leiden University (2005). *Kiezen voor talent, instellingsplan*. Leiden: Leiden University.

Leisyte, L., Enders, J., & De Boer, H. (in press). The balance between teaching and research in Dutch and English universities in the context of university governance reforms. *Higher Education*.

Liebetrau, A. M. (1983). *Measures of association*. Newbury Park, CA: Sage.

Lindblom-Ylänne, S., Trigwell, K., Nevgi, A., & Ashwin, P. (2006). How approaches to teaching are affected by discipline and teaching context. *Studies in Higher Education, 31*(3), 285-298.

Lindsay, R., Breen, R., & Jenkins, A. (2002). Academic research and teaching quality: The views of undergraduate and postgraduate students. *Studies in Higher Education, 27*(3), 309-327.

Lueddeke, G.R. (2003). Professionalising teaching practice in higher education: A study of disciplinary variation and 'teaching-scholarship'. *Studies in Higher Education, 28*(2), 213-228.

Macfarlane, B., & Hughes, G. (2009). Turning teachers into academics? The role of educational development in fostering synergy between teaching and research. *Innovations in Education and Teaching International, 46*(1), 5-14.

Martinez, M.A., Sauleda, N., & Huber, G.L. (2001). Metaphors as blueprints of thinking about teaching and learning. *Teaching and Teacher Education, 17*(8), 965-977.

Marton, F. (1981). Phenomenography - Describing conceptions of the world around us. *Instructional Science, 10*(2), 177-200.

McKeown, B., & Thomas, D. (1988). *Q methodology*. Newbury Park, CA: Sage Publications.

McLean, M., & Barker, H. (2004). Students making progress and the 'research-teaching nexus' debate. *Teaching in Higher Education, 9*(4), 407-419.

Meijer, P.C. (1999). *Teachers' practical knowledge - Teaching reading comprehension in secondary education.* Leiden: Leiden University.

Meijer, P.C., Verloop, N., & Beijaard, D. (2002). Multi-method triangulation in a qualitative study on teachers' practical knowledge: An attempt to increase internal validity. *Quality & Quantity, 36*(2), 145-167.

Meirink, J.A., Meijer, P.C., Verloop, N., & Bergen, T.C.M. (2009). Understanding teacher learning in secondary education: The relations of teacher activities to changed beliefs about teaching and learning. *Teaching and Teacher Education, 25*(1), 89-100.

Miles, M.B., & Huberman, A.M. (1994). *Qualitative data analysis* (2nd ed.). Thousand Oaks, CA: Sage.

Moses, I. (1990). Teaching, research, and scholarship in different disciplines. *Higher Education, 19*(3), 351-375.

Murray, K., & MacDonald, R. (1997). The disjunction between lecturers' conceptions of teaching and their claimed educational practice. *Higher Education, 33*(3), 331-349.

Neumann, R. (1992). Perceptions of the teaching-research nexus - A framework for analysis. *Higher Education, 23*(2), 159-171.

Neumann, R. (1993). Research and scholarship - Perceptions of senior academic administrators. *Higher Education, 25*(2), 97-110.

Neumann, R. (1994). The teaching-research nexus: Applying a framework to university students' learning experiences. *European Journal of Education, 29*(3), 323-338.

Neumann, R. (1996). Researching the teaching-research nexus: A critical review. *Australian Journal of Education, 40*(1), 5-18.

Neumann, R. (2001). Disciplinary differences and university teaching. *Studies in Higher Education, 26*(2), 135-146.

Neumann, R., Parry, S., & Becher, T. (2002). Teaching and Learning in their Disciplinary Contexts: A conceptual analysis. *Studies in higher Education, 27*(4), 405-417.

Nicholls, G. (2005). *The challenge to scholarship. Rethinking learning, teaching, and research*. London: Routledge.

North, S. (2005). Different values, different skills? A comparison of essay writing by students from arts and science backgrounds. *Studies in Higher Education, 30*(5), 517-533.

Norton, L., Richardson, J.T.E., Hartley, J., Newstead, S., & Mayes, J. (2005). Teachers' beliefs and intentions concerning teaching in higher education. *Higher Education, 50*(4), 537-571.

Oolbekkink-Marchand, H.W., Van Driel, J.H., & Verloop, N. (2006a). A breed apart? A comparison of secondary and university teachers' perspectives on self-regulated learning. *Teachers and Teaching: Theory and Practice, 12*(5), 593-614.

Oolbekkink-Marchand, H.W., Van Driel, J.H., & Verloop, N. (2006b). Secondary and university teachers' perspectives on self-regulated learning. In F. Oser, F. Achtenhagen & U. Renolds (Eds.), *Competence oriented teacher training: old research demands and new pathways* (pp. 219-236). Rotterdam: Sense Publishers.

Ortony, A. (1975). Why metaphors are necessary and not just nice. *Educational Theory, 25*(1), 45-53.

Out, T.J., & Groot, C.G. (n.d.). *Een studieonderdeel ontwikkelen (Developing a course)*. Leiden: Leiden University, ICLON.

Pajares, M.F. (1992). Teachers' beliefs and educational research: Cleaning up a messy construct. *Review of Educational Research, 62*(3), 307-332.

Pease, D., Boger, R., Melby, J., Pfaff, J., & Wolins, L. (1989). Reliability of the Q-sort inventory of parenting behaviours. *Educational and Psychological Measurement, 49*(1), 11-17.

Pedhazur, E.J., & Pedhazur Schmelkin, L. (1991). *Measurement, design, and analysis: An integrated approach*. Hillsdale, New Jersey: Lawrence Erlbaum Associates.

Pinch, T. (1990). The culture of scientists and disciplinary rhetoric. *European Journal of Education, 25*(3), 295-304.

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.

Prosser, M., Martin, E., Trigwell, K., Ramsden, P., & Middleton, H. (2008). University academics' experience of research and its relationship to their experience of teaching. *Instructional Science, 36*(1), 3-16.

Prosser, M., & Trigwell, K. (1999). *Understanding learning and teaching. The experience in higher education*. Buckingham: The Society for Research into Higher Education & Open University Press.

Putnam, R.T., & Borko, H. (1997). Teacher learning: Implications of new views of cognition. In B.J. Biddle, T.L. Good, I.F. Goodson (Eds.), *International Handbook of Teachers and Teaching* (Vol. 2, pp. 1223-1296). Dordrecht: Kluwer Academic Publishers.

Quinlan, K.M. (1999). Commonalities and controversy in context: A study of academic historians' educational beliefs. *Teaching and Teacher Education, 15*(4), 447-463.

Richardson, V., & Placier, P. (2001). Teacher change. In V. Richardson (Ed.), *Handbook of Research on Teaching* (Vol. 4, pp. 905-947). Washington, DC: American Educational Resaerch Association.

Robertson, J. (2007). Beyond the 'research/teaching nexus': Exploring the complexity of academic experience. *Studies in Higher Education, 32*(5), 541-556.

Robertson, J., & Blackler, G. (2006). Students' experiences of learning in a research environment. *Higher Education Research and Development, 25*(3), 215-229.

Robertson, J., & Bond, C. (2001). Experiences of the Relation between Teaching and Research: what do academics value? *Higher Education Research and Development, 20*(1), 5-19.

Robertson, J., & Bond, C. (2003). *The research/teaching relation: Variation in communities of inquiry*. Paper presented at the annual conference of the Society for Research into Higher Education, London, United Kingdom.

Robertson, J., & Bond, C. (2005). The research/teaching relation: A view from the 'edge'. *Higher Education, 50*(3), 509-535.

Rowland, S. (1996). Relationships between teaching and research. *Teaching in Higher Education, 1*(1), 7-20.

Rozendaal, J.S., De Brabander, C.J., & Minnaert, A. (2001). *Boundaries and dimensionality of epistemological beliefs*. Paper presented at biennial conference of the European Association for Research on Learning and Instruction, Fribourg, Switzerland.

Samuelowicz, K., & Bain, J. (1992). Conceptions of teaching held by academic teachers. *Higher Education, 24*(1), 93-111.

Schimank, U., & Winnes, M. (2000). Beyond Humboldt? The relationship between teaching and research in European university systems. *Science and Public Policy, 27*(6), 397-408.

Serow, R. (2000). Research and teaching at a research university. *Higher Education, 40*(4), 449-463.

Seymour, E., Hunter, A.B., Laursen, S.L., & Deantoni, T. (2004). Establishing the benefits of research experiences for undergraduates in the sciences: First findings from a three-year study. *Science Education, 88*(4), 493-534.

Shore, B.M., Pinker, S., & Bates, M. (1990). Research as a model for university teaching. *Higher Education, 19*(1), 21-35.

Simons, M. (2006). 'Education through research' at European universities: Notes on the orientation of academic research. *Journal of Philosophy of Education, 40*(1), 31-50.

Simons, M., & Elen, J. (2007). The 'research-teaching nexus' and 'education through research': an exploration of ambivalences. *Studies in Higher Education, 32*(5), 617-631.

Smeby, J.-C. (1998). Knowledge production and knowledge transmission. The interaction between research and teaching at universities. *Teaching in Higher Education, 3*(1), 5-20.

Smeby, J.-C. (2003). The impact of massification on university research. *Tertiary Education and Management, 9*, 131-144.

Spillane, J.P., Reiser, B.J., & Reimer, T. (2002). Policy implementation and cognition: Reframing and refocusing implementation research. *Review of Educational Research, 72*(3), 387-431.

Stainton Rogers, R. (1995). Q methodology. In J.A. Smit, R. Harré & L. Van Langenhove (Eds.), *Rethinking methods in psychology*. Thousand Oaks, CA: Sage Publications.

Stes, A., Gijbels, D., & Van Petegem, P. (2008). Student-focused approaches to teaching in relation to context and teacher characteristics. *Higher Education, 55*(3), 255-267.

Stes, A., Min-Leliveld, M.J., Gijbels, D., & Van Petegem, P. (in press). The impact of instructional development in higher education: A state-of-the-art of the research. *Educational Research Review*.

Stoecker, J.L. (1993). The Biglan classification revisited. *Research in Higher Education, 34*(4), 451-464.

Stofflett, R.T. (1996). Metaphor development by secondary teachers enrolled in graduate teacher education. *Teaching and Teacher Education, 12*(6), 577-589.

Strauss, A.L., & Corbin, J. (1990). *Basics of qualitative research: Grounded theory procedures and techniques*. Newbury Park, CA: Sage.

Tillema, H.H. (1998). Stability and change in student teachers' beliefs about teaching. *Teacher and Teaching: theory and practice, 4*(2), 217-228.

Tillema, H.H., & Knol, W.E. (1997). Collaborative planning by teacher educators to promote belief change in their students. *Teacher and Teaching: theory and practice, 3*(1), 29-45.

Turner, N., Wuetherick, B., & Healey, M. (2008). International perspectives on student awareness, experiences and perceptions of research: Implications for academic developers in implementing research-based teaching and learning. *International Journal for Academic Development, 13*(3), 199-211

Van den Akker, J.J.H. (2003). Curriculum perspectives: An introduction. In J.J.H. Van den Akker, W. Kuiper & U. Hameyer (Eds.), *Curriculum landscapes and trends*. Dordrecht: Kluwer Academic Publishers.

Van den Berg, R. (2002). Teachers' meanings regarding educational practice. *Review of Educational Research, 72*(4), 577-625.

Van der Rijst, R.M., Van Driel, J.H., Kijne, J.W., & Verloop, N. (2007). *Scientific research dispositions in research, teaching, and learning.* Paper presented at biennial conference of the European Association for Research on Learning and Instruction, Budapest, Hungary.

Van der Rijst, R.M., Visser-Wijnveen, G.J., Verstelle, T., & Van Driel, J.H. (2009). Studentbeleving van de onderzoeksintensiviteit van universitaire onderwijsomgevingen [Student experience of the research intensiveness of learning environments at university]. *Pedagogische Studiën, 86*(3), 214-229.

Van Driel, J.H., Verloop, N., Van Werven, H.I., & Dekkers, H. (1997). Teachers' craft knowledge and curriculum innovation in higher engineering education. *Higher Education, 34*(1), 105-122.

VSNU (2008). *Overeenkomst inzake wederzijdse erkenning basiskwalificatie onderwijs*. *(Agreement concerning mutual acknowledgement basic teaching qualification).*

Ylijoki, O.H. (2000). Disciplinary cultures and the moral order of studying - A case-study of four Finnish university departments. *Higher Education, 39*(3), 339-362.

Zamorski, B. (2002). Research-led teaching and learning: A case. *Teaching in Higher Education, 7*(4), 411-427.

Zubrick, A., Reid, I., & Rossiter, P. (2001). *Strengthening the nexus between teaching and research*. Canberra: Department of Education, Training and Youth Affairs.

Zwart, R.C., Wubbels, T., Bergen, T.C.M., & Bolhuis, S. (2007). Experienced teacher learning within the context of reciprocal peer coaching. *Teacher and Teaching: theory and practice, 13*, 165-187.

Summary

Summary

Background
Research and teaching are the two main tasks of a university, and are essential to its identity. Therefore, the relation between both has been the focus of attention for several decades. Until the 1990s attention was primarily paid to the correlation between being a good researcher and being a good teacher, measured by either citation indices or student satisfaction. A meta-analysis (Hattie & Marsh, 1996) showed only a marginal correlation. However, many academics were convinced of the importance of the relation. In the last decades there has been a lot of attention for questions of academics' views on this relation and the importance of the research-teaching nexus. This research project is to be placed in this tradition. Unlike earlier comparative studies, this project concentrated on academics within one faculty, the Faculty of Humanities at Leiden University.

Research questions
In this research project the focus was on how academics (including assistant professors, associate professors, and full professors) view the research-teaching nexus. We were interested in their conceptions on this connection, how these conceptions are related to their conceptions of knowledge, research, and teaching, and whether strengthening the link between research and teaching in their own courses changed their conceptions. Furthermore, we studied students' perceived learning gains in these learning environments. The following five research questions were central in this thesis:

- What are the relations between the conceptions of knowledge, research, and teaching held by academics in the humanities? (Chapter 2)
- What variations in ideal images of the research-teaching nexus can be found among academics in the humanities? (Chapter 3)
- How is the preferred research-teaching nexus related to conceptions of knowledge, research, and teaching, and to (disciplinary) background? (Chapter 4)
- In what ways do academics in the Faculty of Humanities integrate research in their teaching when encouraged to, and what learning outcomes do their students report? (Chapter 5)
- What change patterns occur in academics' conceptions of the research-teaching nexus when they intentionally integrate research in their teaching? (Chapter 6)

Research design

To answer the questions posed above two studies were conducted. The first concerned an interview study in which thirty academics from the Faculty of Humanities were interviewed about their backgrounds, conceptions of knowledge, research, and teaching, and their ideal images concerning the research-teaching nexus. The conceptions of knowledge, research, and teaching were studied on the basis of metaphors, whereas the ideals were studied using a mental visualisation assignment. The second study focused on twelve academics of the same faculty during one semester, in which they intentionally strengthened the research-teaching nexus in one of their courses. This was done on the basis of their personal views of the best way to connect research and teaching. Before the semester there was an introductory session, and during the semester they attended three peer meetings to reflect on their teaching and share experiences and ideas. Data were gathered from the academics as well as their students.

Results

First study

The second chapter addresses the research question: *what are the relations between the conceptions of knowledge, research, and teaching held by academics in the humanities?* In answering this question it needs to be noticed that concepts such as 'research' and 'teaching' can be interpreted differently among academics. These different interpretations, including views on the relation between them, might have their grounds in academics' conceptions of knowledge (Robertson & Bond, 2005). Studying conceptions is complex as they are partly unconscious, context-dependent, and people are not always willing to reveal them. Therefore, in this study metaphors were used to elicit academics' conceptions. Metaphors contain several layers of meaning and therefore provide opportunities to uncover respondents' conceptions. Furthermore, each respondent interprets the metaphors in a different way and thus is not limited to the researcher's predefined categories. Thirty academics were each presented with six metaphors about knowledge, research, and teaching, for example: knowledge is (like) a pyramid: stone by stone it is built up to a great height; research is (like) an excavation: underlying patterns are uncovered and teaching is (like) a demonstration: a matter of showing and imitating. Finally they were invited to create their own metaphor for each concept. On the basis of an interpretive analysis of key statements, academics' conceptions of knowledge, research, and teaching could each be characterised as five different conceptions on a dimension. For knowledge this dimension ranged from *knowledge as isolated*

facts in an external world to *knowledge as a personal construction*. For research the conceptions varied from *research as an activity in which patterns are disclosed* to *research as an activity in which patterns are created by the researcher*. The teaching conceptions could be placed on a dimension running from *teaching as an activity in which knowledge is transmitted to the students* to *teaching as an activity in which the main goal is to teach students to think critically and possibly to change students' conceptions*. A substantial and significant correlation was found between conceptions of knowledge and of research. Teaching conceptions were weaker correlated with conceptions of knowledge and of research.

The third chapter focuses on the research question: *what variations in ideal images of the research-teaching nexus can be found among academics in the humanities?* After the discussion of knowledge, research, and teaching conceptions in Chapter 2, the focus in this chapter was on academics' conceptions of the research-teaching nexus itself. In the literature various models are found to characterise the relation between research and teaching. Neumann (1992), Griffiths (2004), Healey (2005) en Robertson (2007) present different ways to identify the variations in linking research and teaching. These characterisations could be placed on various positions on the following five dimensions: tangible – intangible, specific – diffuse, one directional – reciprocal, result – process, and audience – participants. In this part of the study a mental visualisation assignment was used to identify academics ideal images of the research-teaching nexus. The respondents were encouraged to imagine and describe these in detail. A code book was developed and the combination of quantitative (hierarchical cluster analysis) and qualitative (based on case-variable matrices) analyses resulted in the identification of five different profiles. The first profile is *teach research results*: knowledge that is derived from research is transmitted to the students. The teacher is an expert, discussing the literature and telling the students about research results in the discipline. The second profile is *make research known*: students need to get acquainted with and preferably enthusiastic about research. The teacher uses examples of his/her own research to explain what research really entails. The third profile is *show what it means to be a researcher*: the teacher is a role model for the students by showing them what it means to be a researcher; the first thing one needs is an academic disposition. Furthermore, the teacher speaks about own research experiences, while focusing on the research process. The fourth profile is *help to conduct research*: students are given research assignments and the teacher acts as a tutor, supporting the students in these projects and focusing on stimulating an academic disposition. If possible,

the teacher will also introduce the students to the academic world. The fifth profile is *provide research experience*: students participate in the teachers' own current research projects and thus contribute to generating academic knowledge. The teacher is a guide for the students. Finally, these five profiles were placed on the dimensions derived from the literature.

In the fourth chapter, the results of Chapters 2 and 3 are related to each other and to respondents' backgrounds on the basis of the question: *how is the preferred research-teaching nexus related to conceptions of knowledge, research, and teaching, and to (disciplinary) background?* Because of the ongoing debate in the literature about the role of the discipline we paid explicit attention to this theme in this chapter. A substantial distinction is whether a discipline contains one dominant paradigm (hard) or several equivalent paradigms (soft). A second distinction is whether the discipline concerns fundamental or applied sciences. The research literature (Brew, 2006; Robertson, 2007) does not show a consistent picture concerning the meaning of academics' disciplinary backgrounds for their conceptions of the research-teaching nexus. In this chapter four questions are at the centre: 1) Is the preferred research-teaching nexus related to discipline? 2) Is discipline related to conceptions of knowledge, research, and teaching? 3) Is the preferred research-teaching nexus related to conceptions of knowledge, research, and teaching? 4) Is the preferred research-teaching nexus related to age, sex, and position? The thirty academics were equally represented from the three disciplines within the faculty, namely culture and literature, (art) history, and linguistics. No correlation was found between academics' ideal images and the discipline. An association was found between conceptions of knowledge and research, and their disciplines. The linguists viewed knowledge mainly as facts and research as the disclosure of patterns, while historians and literary scholars viewed knowledge mostly as a personal construction and research as the creation of patterns. Conceptions of teaching were not related to discipline. Yet, the ideal image of the research-teaching nexus was related to teaching conception rather than to knowledge and research conceptions. *Show what it means to be a researcher* was associated with a teaching conception *focused on critical thinking and conceptual change*, while *help to conduct research* was associated with teaching as *knowledge transmission*. Furthermore, the only background variable correlated with the ideal image was the position of an academic at university: assistant professors were predominantly found in *teach research results* and *help to conduct research*, while associate and full professors were mostly found in *make research known* and *show what it means to be a researcher.*

Second study

In the fifth chapter the focus is on the relation between a research-intensive learning environment and students' learning, on the basis of the question: *in what ways do academics in the Faculty of Humanities integrate research in their teaching when encouraged to, and what learning outcomes do their students report?* Previous research has shown that academics see the development of an academic disposition among students as an important goal of linking research and teaching (Elen et al., 2007). Several kinds of learning environments are considered research-intensive, such as inquiry learning, which can take place either individually or in teams. Other variants are discussing the teacher's own research and methodology courses. Students report mainly positive, but also some negative experiences of research-intensive learning environments (Turner et al., 2008). A negative aspect is the reduced availability of their teachers for educational purposes. Positive aspects are the intellectual stimulating learning environments that are created by researchers. In the literature, so far, the learning environments and students' perceptions of the research-teaching nexus had been studied separately. In this study we combined the learning environments and students' experiences. During one semester twelve academics were studied, focusing on one of their courses, in which they strengthened the research-teaching nexus. At the end of the semester the students were asked to report their experiences and perceived learning gains of these courses. Five different learning environments were identified: using teacher's own research to illustrate the subject matter; focusing on the researcher's disposition and position; introducing students to literature, after which students conduct research projects; follow in the teacher's footsteps; and participation in the teacher's research. Two teachers taught first- and second-year courses and mainly focused on basic knowledge and research skills. Their students reported learning in these areas. Two other teachers focused on encouraging an academic disposition; their students primarily reported learning outcomes related to academic disposition. The three teachers in the third group dived their courses into a part that concentrated on theory, and a part in which students conducted research projects. They mainly focused on research skills; their students reported learning research skills, but also acquiring an academic disposition. Another group of three teachers focused on skills and knowledge in the context of students becoming independent researchers. This group was characterized by the close attention that was paid to the teacher's own research. Their students reported knowledge gains and learning outcomes on research awareness. The last two teachers were also focused on knowledge and research skills, but their students participated in the

teacher's own research. These students primarily reported learning gains on research skills. Overall, we can state that the students reported more learning on the level of academic disposition (by doing and reflecting on research) and research awareness (by a close look into their teacher's research), while their teachers primarily focused on academic knowledge and research skills.

In the sixth chapter, the focus is on the changes in academics' conceptions resulting from their attempts to strengthen the research-teaching nexus, on the basis of the question: *what change patterns occur in academics' conceptions of the research-teaching nexus when they intentionally integrate research in their teaching?* In educational innovation teachers have proved to be a crucial factor for success. Teachers' conceptions are important in this respect, and are seen as not likely to change easily. This especially applies to core beliefs about concepts such as *learning* and *teaching*; the assumption is that peripheral beliefs change more easily (Pajares, 1992). In this study the focus was on any changes that occur if academics are invited to strengthen the research-teaching nexus in their own way during one semester. The twelve teachers (see Chapter 5) were given Q-sorts with statements on the research-teaching nexus, before and after the semester. They were asked to order these statements according to importance, based on the principles of Q-methodology, and were also interviewed about their ordering. Five factors were identified on the basis of factor analysis: stimulating academic disposition in general; utilising teacher's own ongoing research in teaching; training students to become independent researchers; discussing disciplinary research problems; and students participating in research as co-workers. Next, three change patterns were identified. No change was found for the first group of teachers; their scores after the semester hardly differed from those before. The second group of teachers showed a change on a non-dominant factor. Their scores on the main view were almost equal before and after, but on one of the factors changed considerably. The final group of teachers even changed their dominant factor. At the start of the semester they showed a different view than afterwards. In this last group the dominant factor had relatively low scores at the start compared to the dominant factors of the other teachers, i.e., they started with a less distinct view than their colleagues in the other two groups. However, a distinct view did not mean that no changes were found, as was shown by group two. This is even more striking considered the fact that all academics were supported to strengthen the research-teaching nexus in ways closely related to their views. So, even when academics are innovating their teaching while staying close to their own beliefs, these beliefs are not static, but might change.

Conclusion and discussion

Regarding the first study it can be noticed that conceptions of knowledge and research are closely related, while teaching conceptions are only weakly related. Furthermore, knowledge and research conceptions are related to discipline, while teaching conception is related to the conception of the research-teaching nexus. Teaching conception is also related to academics' positions within the university. The conceptions of knowledge, research, and teaching can be placed on dimensions stretching from the disclosure and transmission of facts to creating meaning for what is discerned. In the second study attention was paid to the learning environments created by the participants and their conceptions. The students reported more learning gains on academic disposition and research awareness than their teachers actually aimed for. One third of the participants did not change their conceptions about the research-teaching nexus during the research project, while the views of the other two thirds did change. In Chapters 5 and 6 five categories of ways to link research and teaching were identified. However, no association was found between academics' conceptions and the learning environments, or with academics' change patterns. If discrepancies between conceptions and learning environments were identified the context seemed to be most influential. Regarding the coherence between the different categorisations of the research-teaching nexus described in the Chapters 3, 5 and 6, three forms were found in Chapter 3 (ideals) and Chapter 6 (Q-sort) with only small differences: 1) students learn about research on the basis of their teacher's research examples, 2) research assignments are used to provide students the opportunity to become independent researchers, 3) students participate in their teacher's research. In different ways the other forms combine aspects such as achieving an academic disposition, a focus on disciplinary research, a focus on either the research process or the research content, and the reciprocal character of the nexus. Relating these characterisations to the learning environments leads to the conclusion that the profiles in Chapter 3 are most useful in this case. Therefore, it is this categorisation that is recommended as a tool to identify the various ways the research-teaching nexus can take, while the views in Chapter 6 provide more punctual, coherent, and less prototypical images of academics' conceptions.

One of the strengths of this research is the open approach that was used. The basic assumption, i.e., that conceptions of the research-teaching nexus vary, meant that no specific forms of the research-teaching nexus were given prevalence over the others. The main idea was to give space to the wide variety of

academics' ideas and forms. One of the other strengths is the variety in methods used to study academics' conceptions. The main limitation was the sample in this study, i.e., the only participants were academics working at the Faculty of Humanities in a research university. Additional variations of the research-teaching nexus might have been found if academics from other disciplines or other higher education institutes had been involved. Furthermore, the sample was fairly limited in number, especially in the second study, resulting in categories with only a few representatives. A final limitation concerns the use of self reports, which is almost inevitable in studying conceptions. To limit the restrictions of self reports several different types of instruments were used and participants' students were involved as well.

Further research might include case studies as well as large-scale studies in different faculties. Case studies are a suitable means to study the interaction between conceptions, context, and the learning environments academics create. In large-scale studies in a great number of faculties the six dimensions identified in Chapter 3 might be used. Furthermore, the relation between research intensive learning environments and students learning might be studied further. This research project provides the university with tools to continue the discussion about the research-teaching nexus. On the basis of the profiles and dimensions in Chapter 3 academics and administrators might discuss what they actually talking about when they mention a strong research-teaching nexus. Finally, this research has again demonstrated the importance of teaching conceptions, and shown that participation in innovation projects in which academics are putting effort in strengthening the research-teaching nexus leads to better-considered views on this relation.

Samenvatting

Samenvatting

Achtergrond
De universiteit heeft twee kerntaken: onderzoek en onderwijs. Beide taken zijn van grote waarde voor de identiteit van de universiteit. Het is daarom niet verbazingwekkend dat de relatie tussen beide al enige decennia in de belangstelling staat. Tot halverwege de jaren negentig ging veel aandacht uit naar het verband tussen het zijn van een goede onderzoeker en van een goede docent, gemeten via citatie-indexen en tevredenheid bij studenten. Een meta-analyse (Hattie & Marsh, 1996) liet zien dat dit verband marginaal is. Desondanks werd de relatie door veel wetenschappers van cruciaal belang geacht. Sindsdien is er veel aandacht voor de vraag hoe wetenschappers deze relatie zien en wat het belang van de verwevenheid van onderzoek en onderwijs is. Dit onderzoek staat ook in die traditie. In tegenstelling tot eerder onderzoek is ervoor gekozen geen vergelijkende studie te verrichten tussen disciplines uit verschillende onderzoeksgebieden, maar na te gaan hoe wetenschappers binnen één faculteit, in dit geval de Faculteit der Geesteswetenschappen, vorm (willen) geven aan deze relatie.

Onderzoeksvragen
In dit onderzoek beoogden we meer te weten te komen over hoe wetenschappers (universitaire docenten, universitaire hoofddocenten en hoogleraren) aankijken tegen de verwevenheid van onderzoek en onderwijs. Hierbij ging onze aandacht uit naar de opvattingen die zij hierover hebben, hoe deze zich verhouden tot hun opvattingen over kennis, onderzoek en onderwijs en of het bewust in praktijk brengen van een sterkere verwevenheid van onderzoek en onderwijs in hun eigen onderwijs leidde tot veranderingen in hun opvattingen daarover. Tevens is ook onderzocht wat studenten leerden van dergelijke onderwijsomgevingen. In het onderzoek stonden daarom de volgende vijf onderzoeksvragen centraal:

- Op welke manier zijn de opvattingen over kennis, onderzoek en onderwijs van wetenschappers in de Geesteswetenschappen aan elkaar gerelateerd? (Hoofdstuk 2)
- Welke variaties in ideaalbeelden van de verwevenheid van onderzoek en onderwijs kunnen worden aangetroffen onder wetenschappers in de Geesteswetenschappen? (Hoofdstuk 3)
- Op welke manier zijn de ideaalbeelden van de verwevenheid van onderzoek en onderwijs gerelateerd aan de (disciplinaire) achtergrond van wetenschappers in de Geesteswetenschappen? (Hoofdstuk 4)

- Op welke manieren integreren wetenschappers in de Geesteswetenschappen onderzoek in hun onderwijs wanneer zij gericht proberen deze relatie te versterken en welke leeropbrengsten ervaren hun studenten? (Hoofdstuk 5)
- Welke veranderingspatronen in opvattingen komen voor bij wetenschappers die de verwevenheid van onderzoek en onderwijs versterken? (Hoofdstuk 6)

Opzet van het onderzoek

Om bovenstaande vragen te beantwoorden zijn twee deelstudies uitgevoerd. De eerste deelstudie betrof een interviewstudie waarbij dertig wetenschappers uit de Faculteit der Geesteswetenschappen (tijdens de dataverzameling nog de Faculteit der Letteren) werden bevraagd over hun achtergrond, opvattingen over kennis, onderzoek en onderwijs en hun ideaalbeelden ten aanzien van de verwevenheid van onderzoek en onderwijs. De opvattingen over kennis, onderzoek en onderwijs werden bevraagd aan de hand van metaforen, terwijl voor de ideaalbeelden gebruik werd gemaakt van een visualisatieopdracht. De tweede deelstudie betrof een traject waarbij gedurende een semester twaalf wetenschappers werden gevolgd. Zij werkten daarbij gericht aan de versterking van de verwevenheid van onderzoek en onderwijs in een van hun cursussen op basis van hun persoonlijke visie op de manier waarop een sterke relatie tussen onderzoek en onderwijs het best vormgegeven kan worden. Voorafgaand aan de cursus vond een startdag plaats en tijdens het semester een drietal bijeenkomsten met enkele collega's om te reflecteren op hun onderwijs en wederzijds ervaringen en ideeën uit te wisselen. Data werden vooral verzameld bij de participerende docenten, maar ook bij hun studenten.

Resultaten

Deelstudie 1

In hoofdstuk 2 wordt de eerste onderzoeksvraag beantwoord: *op welke manier zijn de opvattingen over kennis, onderzoek en onderwijs van wetenschappers in de Geesteswetenschappen aan elkaar gerelateerd?* Wanneer het gaat om de vraag op welke manier onderzoek en onderwijs met elkaar verweven zijn, is het van belang om zich te realiseren dat de begrippen 'onderzoek' en 'onderwijs' door wetenschappers verschillend opgevat (kunnen) worden. Een belangrijke opvatting die hieraan ten grondslag zou kunnen liggen, is de opvatting over kennis. De opvatting over kennis zou bepalend zijn voor de opvatting over onderzoek, onderwijs en de relatie daartussen (Robertson & Bond, 2005). Het onderzoeken

van opvattingen is complex, omdat deze deels onbewust zijn en, voorzover ze bewust zijn, mensen niet altijd geneigd zullen zijn ze prijs te geven. Ook blijken opvattingen context-gevoelig te zijn. In ons onderzoek hebben we er daarom voor gekozen gebruik te maken van metaforen. Metaforen kennen verschillende betekenislagen en zijn daarom geschikt om uitspraken waarin de opvatting van een respondent schuil gaat te ontlokken. Iedere respondent interpreteert de metafoor op zijn eigen manier en is daardoor niet beperkt door vooraf gedefinieerde categorieën van de onderzoeker. De dertig wetenschappers die hierover geïnterviewd werden, kregen zowel over kennis, onderzoek als onderwijs zes metaforen voorgelegd, waarbij hun gevraagd werd hierop te reageren. Voorbeelden van metaforen zijn: kennis is (als) een piramide, steen voor steen opgebouwd tot grote hoogte, onderzoek is (als) een opgraving, onderliggende patronen worden blootgelegd, en onderwijs is (als) een demonstratie, een kwestie van voor- en nadoen. Tot slot werd hun per concept gevraagd om zelf een metafoor te formuleren die hun visie op het betreffende concept het beste weergaf. De opvattingen van de wetenschappers konden, na een interpretatieve analyse aan de hand van sleuteluitspraken, gekarakteriseerd worden in steeds vijf verschillende opvattingen op een dimensie. We benoemen hier de uitersten. Wat kennisopvattingen betreft strekte de dimensie zicht uit van *kennis als geïsoleerde feiten in de externe wereld* tot *kennis als persoonlijke constructie*. De onderzoeksopvattingen varieerden van *onderzoek als activiteit waarin reeds bestaande patronen worden ontsluierd* tot *onderzoek als activiteit waarbij patronen worden gecreëerd door de onderzoeker*. De opvattingen over onderwijs, tot slot, waren te plaatsen op een dimensie van *onderwijs als activiteit waarbij kennis wordt overgedragen aan studenten* tot *onderwijs als activiteit waarbij het belangrijkste doel is om studenten kritisch te laten denken, mogelijk leidend tot een verandering in opvattingen*. Een substantieel en significant verband bleek te bestaan tussen opvattingen over kennis en onderzoek. De onderwijsopvattingen bleken zwakker samen te hangen met de opvattingen over kennis en onderzoek.

In hoofdstuk 3 stond de volgende onderzoeksvraag centraal: *welke variaties in ideaalbeelden van de verwevenheid van onderzoek en onderwijs kunnen worden gevonden onder wetenschappers in de Geesteswetenschappen?* Na de aandacht voor de onderliggende concepten kennis, onderzoek en onderwijs in hoofdstuk 2, werd hier expliciet gekeken naar de opvattingen die wetenschappers hebben over de verwevenheid van onderzoek en onderwijs. In de literatuur werden verschillende modellen gevonden waarmee de relatie tussen onderzoek en onderwijs gekarakteriseerd konden worden. De onderzoekers Neumann (1992),

Griffiths (2004), Healey (2005) en Robertson (2007) hanteren verschillende indelingen om de variaties van de verwevenheid van onderzoek en onderwijs aan te duiden. Al deze indelingen waren terug te brengen tot verschillende posities op de volgende vijf dimensies: tastbaar - niet tastbaar, specifiek - diffuus, eenrichtingsverkeer - wederkerig, resultaat - proces, toeschouwers - participanten. Voor de beantwoording van de vraag naar de variaties in ideaalbeelden maakten we gebruik van een visualisatieopdracht. Aan de 30 respondenten werd gevraagd om zich voor te stellen hoe de verwevenheid van onderzoek en onderwijs er idealiter uit zou zien en dit vervolgens zo gedetailleerd mogelijk te beschrijven. Door de ontwikkeling van een codeboek en een combinatie van kwantitatieve (hiërarchische clusteranalyse) en kwalitatieve (aan de hand van casus-variabele matrices) analyses werden vijf profielen geïdentificeerd. Het eerste profiel betreft *overdragen van onderzoeksresultaten*: kennis, opgedaan door onderzoek, wordt overgedragen aan studenten. De docent is expert en discussieert met de studenten over de literatuur en vertelt over uitkomsten van ander onderzoek binnen de discipline. Het tweede profiel betreft *bekend maken met onderzoek*: de studenten moeten vertrouwd raken met en het liefst ook enthousiast worden over het verschijnsel onderzoek. De docent verheldert aan de hand van voorbeelden uit eigen onderzoek wat het doen van onderzoek werkelijk inhoudt. Het derde profiel betreft *laten zien wat het betekent om onderzoeker te zijn*: de docent is hier het rolmodel voor de studenten en laat zien wat het betekent om onderzoeker te zijn. Dit vraagt namelijk een wetenschappelijke houding. De docent vertelt daarbij over zijn of haar eigen ervaringen en focust op het onderzoeksproces. Het vierde profiel betreft *helpen bij het doen van onderzoek*: studenten krijgen onderzoeksopdrachten waarbij de docent als tutor optreedt. De docent begeleidt de onderzoeksprojecten en is daarbij zowel gericht op het aanleren van een wetenschappelijke houding als onderzoeksvaardigheden. Waar mogelijk introduceert de docent de studenten ook in de wetenschappelijke wereld. Het vijfde profiel betreft *onderzoekservaring bieden*: studenten participeren in het onderzoek van hun eigen docenten en dragen zo bij aan het genereren van wetenschappelijke kennis. Het lopende onderzoek van de docent speelt een centrale rol en de docent treedt op als gids. Deze vijf profielen werden op de uit de literatuur afgeleide dimensies geplaatst.

In hoofdstuk 4 worden de resultaten van de eerder besproken hoofdstukken met elkaar in verband gebracht en gerelateerd aan achtergrondkenmerken van de respondenten op basis van de vraag *op welke manier zijn de ideaalbeelden van de verwevenheid van onderzoek en onderwijs gerelateerd aan de (disciplinaire)*

achtergrond van wetenschappers in de Geesteswetenschappen? Hierbij is vooral aandacht geschonken aan de rol van de discipline, aangezien in de literatuur een debat woedt over de vraag hoe belangrijk de discipline is ten aanzien van de verwevenheid van onderzoek en onderwijs. Een belangrijk onderscheid in disciplines is de vraag of er één dominant paradigma is (hard) of dat verschillende paradigma's naast elkaar bestaan (zacht). Een tweede belangrijk onderscheid is de vraag of het om een fundamentele wetenschap gaat (puur) of om een toegepaste wetenschap (toegepast). Uit tot nu toe verricht onderzoek (Brew, 2006; Robertson, 2007) komen tegenstrijdige gegevens naar voren omtrent het belang van de disciplinaire achtergrond van wetenschappers voor hun opvattingen omtrent de verwevenheid van onderwijs en onderzoek. In dit hoofdstuk ging het daarom om een viertal deelvragen: 1) Is het ideaalbeeld van de verwevenheid van onderzoek en onderwijs gerelateerd aan de discipline? 2) Is de discipline gerelateerd aan opvattingen over kennis, onderzoek en onderwijs? 3) Is het ideaalbeeld van de verwevenheid van onderzoek en onderwijs gerelateerd aan opvattingen over kennis, onderzoek en onderwijs? En 4) Is het ideaalbeeld van de verwevenheid van onderzoek en onderwijs gerelateerd aan leeftijd, sekse en positie? In het onderzoek participeerden dertig wetenschappers uit één faculteit, evenredig verdeeld over de drie disciplines binnen de faculteit, namelijk cultuur en letterkunde, (kunst)geschiedenis en taalkunde. Er bleek geen verband gevonden te kunnen worden tussen het ideaalbeeld van de verwevenheid van onderzoek en onderwijs en de discipline. Wel bleek er een verband te zijn tussen de opvattingen over kennis en onderzoek en de discipline. De taalkundigen zagen kennis veelal als *feiten* en onderzoek als het *ontsluieren van patronen*, terwijl de historici en cultuur- en letterkundigen meer neigden naar opvattingen over kennis als *persoonlijke constructie* en over onderzoek als *creëren van patronen*. De opvattingen over onderwijs bleken geen verband te houden met de disciplinaire achtergrond. Het ideaalbeeld van de verwevenheid bleek echter gerelateerd aan de opvatting over onderwijs en niet aan die over kennis en onderzoek. Het ideaalbeeld *laten zien wat het betekent om onderzoeker te zijn* hing samen met een opvatting over onderwijs als *gericht op kritische houding en conceptuele verandering*, terwijl het ideaalbeeld *helpen bij het doen van onderzoek* samenhing met onderwijs als *kennisoverdracht*. Tot slot bleek van de overige achtergrondvariabelen alleen de positie relevant. Universitaire docenten waren vaker terug te vinden bij de ideaalbeelden *overdragen van onderzoeksresultaten* en *helpen bij het doen van onderzoek*, terwijl universitaire hoofddocenten en hoogleraren oververtegenwoordigd waren bij de ideaalbeelden *bekend maken met onderzoek* en *laten zien wat het betekent om onderzoeker te zijn*.

Deelstudie 2

In hoofdstuk 5 staat de relatie tussen het creëren van een onderzoeksintensieve onderwijsomgeving en de leeropbrengsten van de studenten centraal aan de hand van de vraag *op welke manieren integreren wetenschappers in de Geesteswetenschappen onderzoek in hun onderwijs en welke leeropbrengsten ervaren hun studenten?* Eerdere onderzoeken tonen aan dat universitaire docenten het verwerven van een academische houding door hun studenten als belangrijkste doel zien van de verwevenheid van onderzoek en onderwijs (Elen et al., 2007). Verschillende soorten leeromgevingen worden gerapporteerd waarbij 'onderzoekend leren' veel genoemd wordt. Dit kan zowel individueel als in teamverband plaatsvinden. Andere varianten die genoemd worden zijn het bespreken van het eigen onderzoek in het onderwijs en het geven van methodologiecursussen. Studenten rapporteerden zowel positieve als negatieve ervaringen met een sterke verwevenheid van onderzoek en onderwijs (Turner et al., 2008). Negatief vonden ze bijvoorbeeld het gebrek aan tijd en aandacht van hun docenten voor het onderwijs. Positief waardeerden ze de uitdagende en stimulerende leeromgevingen, die door deze docenten werden gecreëerd. In het verleden werden deze verwevenheid van onderzoek en onderwijs en deze ervaringen van de studenten veelal los van elkaar onderzocht. In dit onderzoek keken we specifiek naar genoemde relatie. Daartoe werden 12 wetenschappers gedurende een semester gevolgd bij een specifieke cursus, waarin ze op gerichte wijze de relatie tussen onderzoek en onderwijs probeerden te verstevigen. Aan het eind van het semester werd hun studenten gevraagd naar hun ervaringen met dit onderwijs en hun leeropbrengsten. Vijf verschillende leeromgevingen konden geïdentificeerd worden. Allereerst waren er twee docenten die lesgaven aan eerste en tweedejaars studenten en daarom sterk gefocust waren op basiskennis en onderzoeksvaardigheden. Hun studenten gaven aan op dit gebied veel geleerd te hebben. Een tweede groep bestond uit twee docenten die vooral gericht waren op het aanleren van een academische houding. Ook hier gold dat de studenten vooral leeropbrengsten op dit gebied rapporteerden. Een derde groep docenten had hun cursus opgesplitst in een deel waarin vooral aandacht uitging naar de achterliggende theorie en een gedeelte waarin studenten zelf een onderzoeksproject opzetten. Het belangrijkste doel van de deze drie docenten was het aanleren van onderzoeksvaardigheden. Hun studenten gaven aan inderdaad veel op het gebied van onderzoeksvaardigheden geleerd te hebben, maar ook veel met betrekking tot een academische houding. De vierde groep bestond uit drie docenten die zowel op vaardigheden als op kennis gericht waren. Zij wilden dat hun studenten onafhankelijke onderzoekers werden. Kenmerkend

voor hen was dat zij de studenten mee lieten kijken met het onderzoek dat zij zelf deden. Hun studenten lieten weten niet alleen op het gebied van kennis veel geleerd te hebben, maar ook veel meer inzicht te hebben gekregen in wat onderzoek doen inhield. De vijfde groep bestond uit twee docenten die, evenals die in de vierde groep, gericht waren op kennis en vaardigheden. Alleen participeerden hun studenten ditmaal volledig in het onderzoek van de docent. Deze studenten gaven aan vooral veel onderzoeksvaardigheden te hebben opgedaan. Alles overziend valt vooral op dat de studenten meer geleerd hebben op het gebied van academische houding dan beoogd, vooral door het in praktijk brengen en hierop reflecteren, en dat de studenten die mee mochten kijken met het onderzoek van hun docenten ook inzicht hadden gekregen in wat onderzoek eigenlijk inhoudt.

In hoofdstuk 6, tenslotte, wordt gerapporteerd in hoeverre het bewust tot stand brengen van een sterkere relatie tussen onderzoek en onderwijs invloed heeft gehad op de opvattingen van de docenten. De vraag was hier: *welke veranderingspatronen in opvattingen komen voor bij wetenschappers die de verwevenheid van onderzoek en onderwijs versterken?* Docenten blijken veelal de bepalende factor wanneer het gaat om het wel of niet slagen van een onderwijsvernieuwing. De opvattingen van docenten spelen daarin een belangrijke rol. In het algemeen wordt aangenomen dat deze niet gemakkelijk te veranderen zijn. Dit geldt vooral voor de kernopvattingen, die betrekking hebben op zaken als *leren* en *onderwijzen*. Men neemt aan dat meer perifere opvattingen eenvoudiger wijzigen (Pajares, 1992). In dit onderzoek werd nagegaan in hoeverre opvattingen veranderden wanneer wetenschappers deelnamen aan een traject waarbij ze zelf vorm mochten geven aan het versterken van de relatie tussen onderzoek en onderwijs. Bij de 12 docenten over wie we al rapporteerden in hoofdstuk 5 werd vooraf en achteraf een Q-sort afgenomen. Daarbij werd de docenten gevraagd een aantal uitspraken over de verwevenheid van onderzoek en onderwijs te sorteren op belangrijkheid, volgens een bepaalde methodologie. Op basis hiervan werden ze vervolgens geïnterviewd. Een vijftal factoren werd na het uitvoeren van een factoranalyse geïdentificeerd: het stimuleren van een academische houding in het algemeen, het benutten van het eigen lopende onderzoek van een wetenschapper, het trainen van studenten om onafhankelijke onderzoekers te worden, het vertellen over disciplinaire onderzoeksproblemen en studenten laten participeren in onderzoek. Daarnaast werden drie veranderingspatronen onderscheiden. Allereerst was er een groep docenten die niet veranderden: hun scores op de 5 factoren verschilden na afloop nauwelijks

van die bij de eerste afname. De tweede groep docenten veranderden alleen op een niet-dominante factor. De scores op de hoogste factor bleef vrijwel gelijk, maar op een van de andere factoren verschilden ze na afloop aanmerkelijk ten opzichte van de eerste afname. De laatste groep docenten veranderden ook op de dominante factor. Vooraf was er sprake van een andere dominante opvatting dan achteraf. Opvallend hierbij was dat de dominante factoren vooraf relatief lage scores hadden ten opzichte van de dominante factoren van de andere deelnemers. Voorafgaand aan hun deelname aan het onderzoek hadden zij dus een minder uitgesproken opvatting dan de docenten in de eerste en tweede groep. Desondanks was het niet zo dat degenen met een uitgesproken opvatting niet meer veranderden, zoals blijkt uit groep twee. Dit is deste opvallender wanneer we ons realiseren dat de docenten werden aangemoedigd om hun eigen visie op de relatie tussen onderzoek en onderwijs zoveel mogelijk in praktijk te brengen. Ook wanneer docenten bewust aan de slag gaan met een vernieuwing en daarbij aansluiten bij hun opvattingen, blijken deze niet statisch, maar aan verandering onderhevig.

Conclusie en discussie

Ten aanzien van de eerste deelstudie blijkt dat de opvattingen over kennis en onderzoek sterk met elkaar samenhangen, terwijl de opvattingen over onderwijs daar zwak mee samenhangen. De kennis- en onderzoeksopvattingen blijken eveneens verwant met de discipline, terwijl de onderwijsopvatting verwant is met de opvatting over de verwevenheid van onderzoek en onderwijs. De opvattingen over de verwevenheid hangen ook samen met de posities die de wetenschappers bekleden binnen de universiteit. De gevonden opvattingen over kennis, onderzoek en onderwijs blijken op dimensies te plaatsen die zich grofweg uitstrekken van het ontsluiten en overdragen van feiten naar het persoonlijk betekenis geven aan zaken die worden waargenomen. In de tweede deelstudie gaat de aandacht uit naar zowel de leeromgeving die door de participanten werd gecreëerd als naar hun opvattingen. De studenten rapporteren meer leeropbrengsten op het gebied van academische houding en bekendheid met onderzoek dan de docenten beoogden met het creëren van hun leeromgeving. De opvattingen over de verwevenheid van onderzoek en onderwijs van eenderde van de docenten verandert niet door deelname aan het traject, terwijl bij tweederde wel verandering wordt waargenomen. In beide hoofdstukken wordt een vijfdeling in varianten van de relatie tussen onderzoek en onderwijs geïdentificeerd. Er blijkt geen verband te zijn tussen beide. Ook een verband met de veranderingen in opvattingen kon niet worden getraceerd. Bij discrepantie tussen opvatting en

leeromgeving lijkt de context veelal bepalend te zijn geweest. Wat betreft de samenhang tussen de verschillende indelingen van de verwevenheid van onderzoek en onderwijs wordt geconstateerd dat drie varianten in zowel hoofdstuk 3 (ideaalbeelden) als in hoofdstuk 6 (Q-sort) terug te vinden zijn met slechts kleine verschillen: 1) studenten nemen kennis van onderzoek via voorbeelden uit het eigen onderzoek van de docent, 2) via onderzoeksopdrachten worden studenten tot onderzoekers opgeleid en 3) studenten participeren in het onderzoek van hun docent. De andere twee varianten combineren aspecten zoals het aanleren van een academische houding, het gericht zijn op disciplinair onderzoek of op het eigen onderzoek, gericht zijn op het onderzoeksproces of op de onderzoeksresultaten en de wederkerigheid van de verwevenheid op verschillende manieren. Bij de koppeling van beide indelingen aan de leeromgevingen blijkt dat de profielen hiervoor de meest bruikbare indeling opleveren. Deze indeling wordt daarom aangeraden voor identificatiedoeleinden, terwijl de factoren een nauwgezetter, meer coherent en minder prototypisch, beeld schetsen van de opvattingen van wetenschappers.

Een sterk punt van het onderzoek betreft de open aanpak die is gehanteerd. Vanuit het vertrekpunt dat er een variatie in opvattingen is over de relatie tussen onderzoek en onderwijs, waren we zeer terughoudend in het voorschrijven van een specifieke vorm die deze relatie zou moeten hebben. Gedurende het gehele onderzoek was het uitgangspunt juist om aan deze variatie zoveel mogelijk recht te doen. Een ander sterk punt betreft de grote verscheidenheid aan, deels ongebruikelijke, methoden, waarmee de opvattingen van de wetenschappers in kaart werden gebracht. De beperkingen van dit onderzoek hebben vooral betrekking op de steekproef. Aan dit onderzoek namen alleen wetenschappers uit de geesteswetenschappen werkzaam op een onderzoeksuniversiteit deel. Het is goed mogelijk dat wanneer er ook wetenschappers uit andere disciplines en andere hoger onderwijs-instellingen betrokken waren bij dit onderzoek nog additionele varianten van de verwevenheid van onderzoek en onderwijs gevonden waren. Een andere beperking is de relatief kleine steekproef van in het bijzonder de tweede deelstudie. Hierdoor ontstonden categorieën met een zeer beperkt aantal representanten. Een laatste beperking van dit onderzoek betreft het steunen op zelfrapportages. Voor het achterhalen van opvattingen is dit vrijwel onvermijdelijk. We hebben getracht de daaraan inherente beperkingen enigszins te corrigeren door verschillende typen instrumenten in te zetten en door ook gegevens te verzamelen bij de studenten van de betrokken wetenschappers.

Suggesties ten aanzien van vervolgonderzoek betreffen zowel het uitvoeren van gevalsonderzoeken als het uitvoeren van grootschaliger onderzoek in verschillende faculteiten. Gevalsonderzoeken zijn geschikt voor het inzichtelijk maken van de interactie tussen opvattingen, de context en de gecreëerde leeromgeving. Voor grootschaliger onderzoek in verschillende faculteiten kan gebruik gemaakt worden van de dimensies uit hoofdstuk 3 waarmee de relatie tussen onderzoek en onderwijs kan worden afgebeeld. Tevens wordt aangeraden om verder onderzoek te doen naar de relatie tussen onderzoeksintensieve leeromgevingen en leeropbrengsten bij studenten. De universitaire praktijk heeft met dit onderzoek handvatten gekregen om het gesprek over de verwevenheid van onderzoek en onderwijs een stap verder te helpen. Aan de hand van de profielen (en dimensies) uit hoofdstuk 3 kunnen wetenschappers en bestuurders discussiëren over wat zij voor ogen hebben wanneer zij het hebben over een sterke verwevenheid van onderzoek en onderwijs. Daarnaast heeft dit onderzoek opnieuw het belang van onderwijsopvattingen benadrukt en laten zien dat participatie in trajecten waarin wetenschappers bewust de relatie tussen onderzoek en onderwijs versterken, leidt tot een sterker ontwikkelde visie op deze relatie.

Publications

Scientific publications

Elsen, G.M.F., Visser-Wijnveen, G.J., Van der Rijst, R.M., & Van Driel, J.H. (2009). How to strengthen the connection between research and teaching in undergraduate university education. *Higher Education Quarterly, 63*(1), 64-85.

Van der Rijst, R.M., Visser-Wijnveen, G.J., Verstelle, T., & Van Driel, J.H. (2009). Studentbeleving van de onderzoeksintensiviteit van universitaire onderwijsomgevingen [Student experience of the research intensiveness of learning environments at university]. *Pedagogische Studiën, 86*(3), 214-229.

Visser-Wijnveen, G.J., Van Driel, J.H., Van der Rijst, R.M., Verloop, N., & Visser, A. (in press). The relationship between academics' conceptions of knowledge, research and teaching – a metaphor study. *Teaching in Higher Education*.

Visser-Wijnveen, G.J., Van Driel, J.H. , Van der Rijst, R.M., Verloop, N., & Visser A. (in press). The ideal research-teaching nexus in the eyes of academics – building different profiles. *Higher Education Research and Development*.

Manuscripts submitted for publication

Visser-Wijnveen, G.J., Van Driel, J.H., Van der Rijst, R.M., Verloop, N., & Visser, A. (submitted). The role of the discipline in the debate about the research-teaching nexus.

Visser-Wijnveen, G.J., Van Driel, J.H., Van der Rijst, R.M., Visser, A., & Verloop, N. (submitted). Change patterns in university teachers' beliefs in the context of linking research and teaching.

Visser-Wijnveen, G.J., Van Driel, J.H., Van der Rijst, R.M., Visser, A., & Verloop, N. (submitted). Relating academics' various ways of integrating research and teaching to their students' perceptions.

Other publications

Visser-Wijnveen, G.J., Van Driel, J.H., Verloop, N., & Visser, A. (2009). Profiles of the research-teaching nexus. In J. Fanghanel, N. Rege Colet, & D. Bernstein (eds) *London Scholarship of Teaching and Learning 7th International Conference (2008) Proceedings, Vol. 4.* London: City University London.

Elsen, G.M.F., Van Driel, J.H., Groot, C.G., Vaatstra, H.F., Van der Rijst, R.M., Visser-Wijnveen, G.J., Nedermeijer, J., & Verloop, N. (2006). Researchintensief onderwijs: hoe kan de universiteit Leiden zich hierbinnen profileren? [Research intensive education: what distinct profile can be created by Leiden University within this spectrum]. Leiden University Rapport nr. 166. Leiden: Universiteit Leiden, ICLON.

Papers

Visser-Wijnveen, G.J., Van Driel, J.H., Verloop, N., & Visser, A. (2005, December). *The disciplinary character of the research-teaching nexus*. Paper presented at the annual Postgraduate and Newer Researchers Conference of the Society for Research into Higher Education, Edinburgh, UK.

Visser-Wijnveen, G.J. (2006, November). *Verwevenheid van onderzoek en onderwijs: metaforenstudie naar kennis, onderzoek en onderwijs [The research-teaching nexus: metaphor study into knowledge, research and teaching].* Paper presented at ICO-Toogdag, annual meeting of the Dutch Interuniversity Centre for Educational Research, Amsterdam, The Netherlands.

Visser-Wijnveen, G.J., Van Driel, J.H., Verloop, N., & Visser, A. (2006, December). The role of knowledge in the research-teaching nexus*.* Paper presented in J.H. Van Driel (chair), *Strengthening the link between research, teaching and learning.* Symposium conducted at the annual conference of the Society for Research into Higher Education, Brighton, UK.

Visser-Wijnveen, G.J., Van Driel, J.H., Verloop, N., & Visser, A. (2007, June). Onderliggende concepties van de relatie tussen onderzoek en onderwijs [Underlying conceptions of the relationship between research and teaching]. Paper presented in J. Elen (chair), *Perspectieven op de relatie onderwijs en onderzoek [Perspectives on the relationship between teaching and research].* Symposium conducted at the Onderwijs Research Dagen, Groningen, the Netherlands.

Visser-Wijnveen, G.J., Van Driel, J.H., Verloop, N., & Visser, A. (2007, August). Conceptions of knowledge, research, and teaching, and their influence on the research-teaching nexus. Paper presented in J.H. Van Driel (chair), *University teachers' conceptions of relations between teaching and disciplinary research.* Symposium at biennial conference of European Association for Research on Learning and Instruction, Budapest, Hungary.

Visser-Wijnveen, G.J. (2008, January). *The research-teaching nexus in the arts: variation in ideals.* Paper presented at the Winterschool of the Dutch Interuniversity Centre for Educational Research, Jyväskylä, Finland.

Visser-Wijnveen, G.J., Van Driel, J.H., Verloop, N., & Visser, A. (2008, July). *Images of the research-teaching nexus.* Paper presented at annual international conference of Higher Education Research and Development Society for Australasia, Rotorua, New Zealand.

Visser-Wijnveen, G.J., Van Driel, J.H., Van der Rijst, R.M., Verloop, N., & Visser, A. (2008, July). *Student learning in a research community.* Paper presented at annual international conference of Higher Education Research and Development Society for Australasia, Rotorua, New Zealand.

Van der Rijst, R.M., Visser-Wijnveen, G.J., Verstelle, T., & Van Driel (2008, June). *Studentbeleving van research intensieve onderwijsomgevingen bij 'harde' en 'zachte' disciplines [Student experience of research intensive learning environments in hard and soft disciplines].* Paper presented at the Onderwijs Research Dagen, Eindhoven, the Netherlands.

Van der Rijst, R.M., Visser-Wijnveen, G.J., Verstelle, T., & Van Driel (2008, June). Studentbeleving van onderzoeksintensieve onderwijsomgevingen [Student experience of research intensive learning environments]. Paper presented in G.J. Visser-Wijnveen (chair), *Onderzoek in het Hoger Onderwijs: curriculum, student en docent in perspectief [Research in Higher Education: curriculum, student and teacher in perspective]*. Symposium at VFO-Studiedag, Hasselt, Belgium.

Visser-Wijnveen, G.J., Van Driel, J.H., Van der Rijst, R.M., & Verloop, N. (2009, April). *The benefits of integrating disciplinary research in teaching.* Paper presented at annual conference of American Educational Research Association, San Diego, CA, USA.

Visser-Wijnveen, G.J., Van Driel, J.H., Verloop, N., & Visser, A. (2009, May). Veranderingen in opvattingen van universitaire docenten over de verwevenheid van onderzoek en onderwijs [Changes in beliefs of academics about the research-teaching nexus]. Paper presented in M.J. Min-Leliveld (chair), *Leren van docenten op de werkplek. [Learning of teachers at the workplace].* Symposium at Onderwijs Research Dagen, Leuven, Belgium.

Visser-Wijnveen, G.J. (2009, August). *The importance of the discipline in linking research and teaching.* Paper presented at Junior Research Pre-Conference of the European Association for Research on Learning and Instruction. Amsterdam, The Netherlands.

Visser-Wijnveen, G.J., Van Driel, J.H., & Verloop, N. (2009, August). Student learning through an integration of research and teaching. Paper presented in A. Verburgh (chair), *The student experience of the research-teaching nexus.* Symposium at biennial conference of the European Association for Research on Learning and Instruction. Amsterdam, The Netherlands.

Posters/Round tables

Visser-Wijnveen, G.J., Van Driel, J.H., Verloop, N., & Visser, A. (2006, May). *Opvattingen van universitaire alfadocenten over de verwevenheid van onderzoek en onderwijs [Academics in the humanities' conceptions of the research-teaching nexus]*. Poster presented at Onderwijs Research Dagen, Amsterdam, the Netherlands.

Visser-Wijnveen, G.J. (2007, August). *The ideal research-teaching nexus according to academics in the Arts.* Round table at Junior Researchers Pre-Conference of European Association for Research on Learning and Instruction, Budapest, Hungary.

Curriculum Vitae

Gerda Visser-Wijnveen was born in Amersfoort, the Netherlands, on March 14th 1981. She attended secondary education at CSG Liudger in Drachten, where she graduated in 1999. From 1999 to 2003 she studied Pedagogy and Educational Sciences at the University of Groningen. Her master's thesis addressed the moral aspects of teaching in a teacher education programme. After her graduation she worked as a policy advisor at a school governing body for Secondary Education (CVO) in Rotterdam.

In 2005 Gerda started her PhD project at ICLON, Leiden University Graduate School of Teaching,. Her research focused on the research-teaching nexus in the humanities, and was linked to a project in the sciences. Her PhD project aimed at improving our understanding of, and strengthening the link between research and teaching. She attended master classes on teacher education and curriculum innovation, and relevant methodology courses. Furthermore, she presented on several national and international conferences. Additionally, she was the secretary of the Higher Education division of the Netherlands Educational Research Association (VOR), a member of the educational committee of the national research school ICO, and the student member of the programme committee of the ICO Winterschool 2008 in Jyväskylä, Finland.

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Leiden University Graduate School of Teaching

ICLON PhD dissertation series

Hoeflaak, A. (1994). *Decoderen en interpreteren: een onderzoek naar het gebruik van strategieën bij het beluisteren van Franse nieuwsteksten.*

Verhoeven, P. (1997). *Tekstbegrip in het onderwijs klassieke talen.*

Meijer, P.C. (1999). *Teachers' practical knowledge: Teaching reading comprehension in secondary education.*

Zanting, A. (2001). *Mining the mentor's mind: The elicitation of mentor teachers' practical knowledge by prospective teachers.*

Uhlenbeck, A.M. (2002). *The development of an assessment procedure for beginning teachers of English as a foreign language.*

Oolbekkink-Marchand, H.W. (2006). *Teachers' perspectives on self-regulated learning: An exploratory study in secondary and university education.*

Henze-Rietveld, F.A. (2006). *Science teachers' knowledge development in the context of educational innovation.*

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Meirink, J.A. (2007). *Individual teacher learning in a context of collaboration in teams.*

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Bakker, M.E.J. (2008). *Design and evaluation of video portfolios: Reliability, generalizability, and validity of an authentic performance assessment for teachers.*

Oonk, W. (2009). *Theory-enriched practical knowledge in mathematics teacher education.*

Visser-Wijnveen, G.J. (2009). *The research-teaching nexus in the humanities: Variations among academics.*

Van der Rijst, R.M. (2009). *The research-teaching nexus in the sciences: Scientific research dispositions and teaching practice.*