# Universiteit Leiden
## The Netherlands

## The research-teaching nexus in the humanities : variations among academics
Visser-Wijnveen, G.J.

**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.
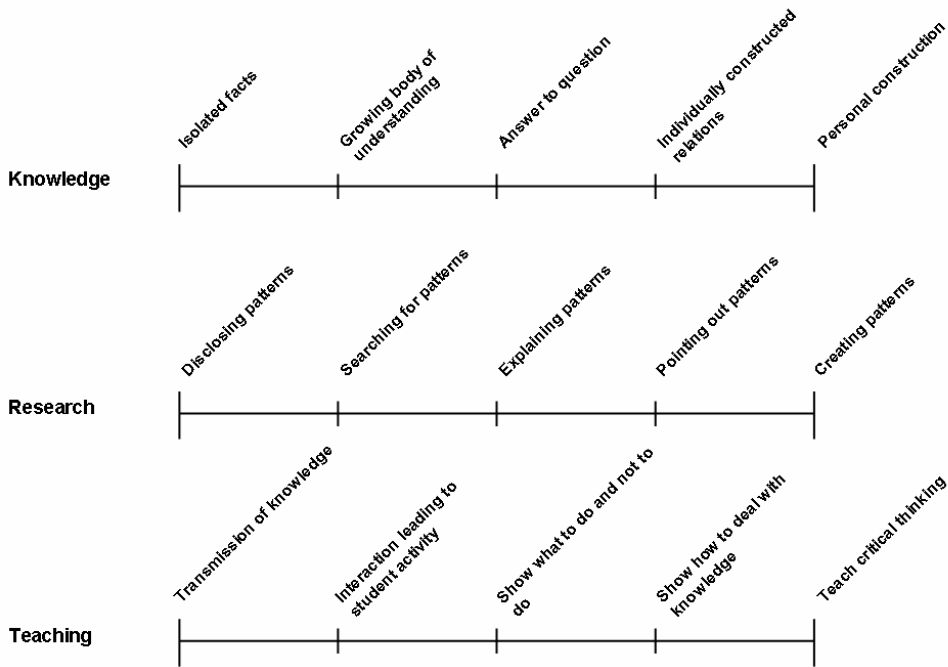
*Figure 7.1.* Conceptions of knowledge, research and teaching

*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.
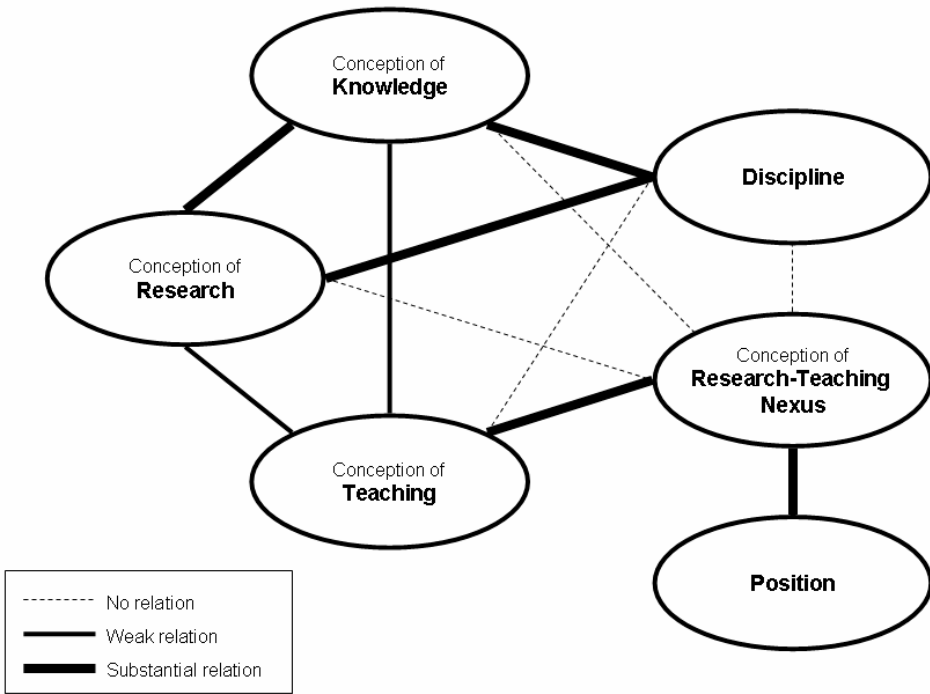


*Figure 7.2.* Relationships between academics' conceptions and background

### 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.