



Universiteit  
Leiden  
The Netherlands

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

Visser-Wijnveen, G.J.

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**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<sup>1</sup>**

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.

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## 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, Saulea, & 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]; 'enlightenment', 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.