Lecturers' Beliefs regarding Research in Teaching compared in Hard and Soft Disciplines

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Abstract

This study aims at gaining insights in the differences and similarities between beliefs of lecturers in hard and soft disciplines. The integration of research in teaching is important to enhance students' learning opportunities. Lecturers play a key role in research-based teaching as they are the facilitators of it. The lecturers' behaviour in facilitating this combination is guided by their beliefs. The results of the present study suggest that lecturers in hard disciplines valued the role of knowledge accumulation and generalizability of research methods and used this as a starting point of their teaching pedagogy. In contrast, the findings indicate that lecturers of soft disciplines appear more focussed on letting students find their own path with the help of university education. These insights may help to gain understanding of lecturers' beliefs. As a result, this study may help to inform decisions about effective teaching approaches in the integration of research in teaching for the sake of lecturers, policy makers and educational advisors. Moreover, these results can inform decisions on how to support lecturers in integrating research in teaching, matching with the disciplinary similarities and varieties or aiming at the interdisciplinary policies of universities.

Key words: research-teaching nexus, hard disciplines, soft disciplines, beliefs

Beliefs of Lecturers regarding Research in Teaching in Hard and Soft Disciplines

Recently, there has been a growing interest in the relation between research and teaching (Bakx, Bakker, Koopman & Beijaard, 2016; Biesta, 2007; Nuthall, 2004). This interest in combining research and teaching can for example be seen in the United Kingdom (cf. Badley, 2002), Australia (cf. Brew, Mantai & Miles, 2019), New Zealand (cf. Nuthall, 2004) and the Netherlands (cf. Visser-Wijnveen, 2009). These international studies exemplified that we live in a world that is changing rapidly as knowledge is constantly changing and information is rapidly delivered in current and future society. Therefore, university education needs to prepare students more to solve unforeseen problems and complex issues which they will encounter in the insecure and unpredictable future (Brew, 2010; Brew et al., 2019). The integration of research in teaching is believed to help students during this preparation (Barnett, 2000; Brew et al., 2019; Schouteden, Verburgh & Elen, 2016). Therefore, as Visser-Wijnveen (2009) expressed, a closer relationship between research and teaching can provide the basis for improving the quality of a university education.

In the last decades, many attempts have been made to respond to this need for integrating research into teaching at universities (Brew, 2010). In fact, as illustrated by Schouteden et al. (2016), all types of higher education are expected to offer research-based teaching to their students in most European countries. Although the expectation and urgency are expressed, the actual implementation of this teaching approach is in hands of lecturers (Visser-Wijnveen, 2009). This study aims at gaining deeper insights into ways in which lecturers integrate research in teaching by comparing beliefs of lecturers in hard and soft disciplines. This may help to inform decisions about effective teaching approaches for supporting research skills in learning settings.

The lecturer as an integration-facilitator

A lecturer can be described as the most approachable actor in the educational institute for students (Lizzio, Wilson & Simons, 2002). As lecturers provide education, students will only experience research-based teaching when the lecturer offers this to them. Visser-Wijnveen (2009) has elaborated on this by describing that the lecturer is a facilitator who can bring research and teaching together in everyday work. Moreover, Prosser and Trigwell (2014) have stressed that students' perceptions of a lecturer play a key role in fostering deep learning as students believe what the lecturer regards important. Considering all findings, it can be concluded that lecturers should explicitly integrate research in their teaching in a way that is approachable for students.

However, lecturers are experiencing difficulties when trying to successfully facilitate the integration of research in teaching (cf. Bakx et al., 2016; Neumann, Parry & Becher, 2002; Visser-Wijnveen, 2009). Some studies explained this could be due to research and teaching being separated as they are funded from different sources (e.g. Gibbons et al., 1994; Visser-Wijnveen, van Driel, van der Rijst, Verloop & Visser, 2010). This may be connected to the higher status that research generally receives, since promotion and rewards are primarily based on research quality and less on teaching quality (Colbeck, 1998). Other studies have stressed that lecturers are performing both research and teaching, but at different times and in different situations (cf. Visser-Wijnveen, 2009). The studies of Hu (2014), Neumann et al. (2002) and Visser-Wijnveen et al. (2010) pointed out that lecturers may have experienced successful and less successful teaching methods for advancing research skills in learning settings. Visser-Wijnveen et al. (2010) elaborate on this by stating: "There is no one or best way of relating research and teaching. The richness is in the diversity of ways in which research and teaching might be linked" (p. 195-196). In the present study, in line with Visser-Wijnveen et al. (2010), the starting point is thus that there are multiple ways of integrating research into teaching successfully.

A key factor that influences the varying approaches of lecturers in integrating research in teaching is in many studies described as the discipline in which the lecturer is active (cf. Neumann, 2001; Visser-Wijnveen et al. 2010). Previous research (e.g. Neumann et al., 2002; Visser-Wijnveen, 2009) has shown that lecturers are shaping their teaching approaches in line with the epistemology, truth criteria, and culture of the discipline. Vereijken, van der Rijst, de Beaufort, van Driel and Dekker (2018) stress the importance of disciplinary-specific approaches to student participation in research, curriculum processes, and shared conceptions among colleagues of the teacher-role.

Beliefs of the lecturer

Neumann (2001) constituted a theoretical framework in which she probes the problem that disciplinary differences are usually not taken into account when analysing research-based teaching. However, it is crucial to take disciplinary differences into account while approaching the integration of research in teaching as lecturers identify most strongly with their own discipline (Neumann, 2001). The author has elaborated on this by explaining that lecturers form beliefs about how to overcome problems while integrating research into teaching in the light of their own discipline. Beliefs of lecturers concerning the role of research in teaching are of great importance, since those have a strong influence on the way in which lecturers merge the two. This is exemplified by Visser-Wijnveen et al. (2010) and Robertson (2007), as both studies stressed that beliefs shape the lecturers' understanding of the use of research in teaching. Beliefs can hence be seen as intuitive guides that lead lecturers in their particular manner of implementing this teaching approach. When these beliefs of lecturers as facilitators will be approached in the light of their discipline, policy makers and educational advisors will be able to give suitable support to lecturers in facilitating research-based teaching (Hu, 2014). This study will therefore adopt that approach as its framework.

In the field of education, beliefs can be defined as mental representations that influence the practice of a lecturer (Hutner & Markman, 2016). They colour how lecturers experience phenomena and how lecturers decide to interpret and recall situations (Pajares, 1992). Authors of previous studies considering beliefs of lecturers have mentioned that lecturers regard it important that students learn to critically reflect and that students gain experience in conducting research in higher education (cf. Hu, 2014). Gaining insights in lecturers' beliefs may be a first step in probing a stronger integration of research into teaching (Prosser & Triggwell, 2014).

Neumann et al. (2002) have stressed the influence of beliefs of lecturers on the integration of research in teaching. They have shown that some lecturers may believe that research is essential for them to stay competitive in the research market as an academic career depends on the success of the faculty. Moreover, lecturers in hard disciplines tend to believe that education needs to be adapted constantly as they want students to learn about the latest discoveries. It may be perceived difficult for lecturers to integrate the latest discoveries in their teaching as they also need to spend time on conducting research. However, as Neumann et al. (2002) illustrate, the discipline may ease this problem as collaboration between colleagues is deeply incorporated in the discipline's culture and lecturers work cooperatively on daily basis to enhance the education for students. This example illustrates how disciplines may influence the degree to which lecturers are able to integrate research in teaching in line with their beliefs.

The lecturer in hard and soft disciplines

The lecturers' beliefs regarding research-based teaching will be approached in this study by comparing lecturers from hard disciplines with lecturers from soft disciplines.

Hard disciplines can be defined as empirical, data-based disciplines in which the epistemology is present that there is the possibility of the absolute truth (Neumann et al., 2002). Previous studies have suggested that lecturers from hard disciplines generally consider the integration of research in teaching as vague and interfering with their own research plans, which hinders research-based teaching (e.g. Neumann et al., 2002; Visser-Wijnveen et al., 2010). Lecturers in hard disciplines generally prefer guiding master- or Doctor of Philosophy-students, who are better able to participate in their own research (e.g. Visser-Wijnveen et al., 2010). Moreover, they generally guide their students in collaborative groups, where students approach the learning content in a sociable way (Visser-Wijnveen et al., 2010). Visser-Wijveen et al. (2010) suggested that the teaching approach that is used in hard disciplines may regard information-transfer as the main goal of education.

In soft disciplines the epistemology is present that there exists no absolute truth but that education aims to learn students how to construct their own opinions in a scientific way (Neumann et al., 2002). The lecturers in soft disciplines tend to use a wide variety of research methodologies within the discipline and this offers lecturers opportunities to integrate research in teaching in various ways (Biglan, 1973). According to Brew (2010) this stimulates the implementation of their desired approach as lecturers are better able to integrate research and teaching in disciplines where knowledge is diffuse and curricula are idiosyncratic. Previous studies have indicated that lecturers in soft sciences could be more focused on students' conceptual and personal change than on knowledge transfer. Therefore, departmental policies of soft disciplines generally tend to focus more on teaching preparation than on research in teaching (Neumann et al., 2002; Visser-Wijnveen et al., 2010).

As previous studies have highlighted, lecturers are influenced in a different manner by hard or soft disciplines when integrating research in teaching (e.g. Hu, 2014; Neumann et al.,

2002; Visser-Wijnveen et al., 2010). However, beliefs of lecturers regarding this integration have not been studied before in a comparative study between hard and soft sciences.

Research question

This study aims at gaining insights in the differences and similarities between beliefs of lecturers of hard and soft disciplines since this can inform decisions on how to support lecturers in integrating research in teaching while matching with the disciplinary similarities and varieties. As aforementioned, the integration of research in teaching is important to enhance student learning opportunities. Lecturers are of great importance in facilitating the combination to let students profit of the benefits of this desired approach. The lecturers' behaviour in facilitating research-based teaching is guided by their own beliefs. This study will therefore address the research question "What are the differences and similarities in terms of lecturers' beliefs of research integrated in teaching between hard and soft sciences in a research-intensive university?".

Method

Design

The goal of this study is to gain deeper insights into differences and similarities between beliefs of lecturers of hard and soft disciplines regarding research in teaching. A comparative study using a qualitative research approach was therefore conducted. During semi-structured interviews the lecturers were asked to elaborate upon personal experiences regarding the integration of research into teaching. The richness of information that stems from these personal experiences can enhance the credibility of the study. Moreover, personal experiences can allow lecturers to thoroughly describe their beliefs concerning a concrete event (c.f. Krefting, 1991).

Participants

This study was conducted at Utrecht University which can be regarded research-intensive. In total, 18 lecturers working at this university were interviewed about their beliefs regarding research in teaching. All of these lecturers hold dual appointments, including teaching and research. An overview of background information of these participants is given in table 1.

Table 1

Overview of background information of participants

Discipline	Participants	Research experience in years		Teaching experience in years		Gender	
		Mean	Range	Mean	Range	Male	Female
Humanities	P1, P2, P4, P5, P8, P9, P11, P16, P18	32.3	20-41	27.3	4.5-43	7	2
Sciences	P3, P6, P7, P10, P12, P13, P14, P15, P17	20.9	1-35	23.8	1-36	8	1

The participants were selected upon the criterion of having at least four years of combined research and teaching experience, to ensure they would be able to explicate their beliefs using concrete, past experiences. P17 was less experienced in research as well as teaching. Nine lecturers were selected from the faculty Humanities, which belongs to the soft disciplines, and nine lecturers are employees at the faculty Sciences, which belongs to the hard disciplines. Comparing the two groups aims at promoting transferability in this study because comparison can unveil similarities and differences between the beliefs of lecturers of hard and soft disciplines (cf. Krefting, 1991).

Participants were informed on the present study by the directors of education of Humanities and Sciences, who were asked to forward the invitation letter to lecturers via a recruitment mail for potential participants (Appendix A). However, this resulted in a low response rate. Thereafter, the researcher addressed possible participants personally, with

permission of the faculty head, using e-mail addresses which were publicly available on the university's website. When the lecturers confirmed that they were willing to participate, they were contacted by e-mail to make an appointment for the date and time of the interview. Moreover, they were provided with the informed consent form, part I (Appendix B). During the interviews, this form was briefly discussed and lecturers were informed that they were allowed to stop the interview at any time and any moment. At the end of the interviews, the lecturers were asked to sign the informed consent form, part II (Appendix C).

Instrument

An interview guide (Appendix D) for the semi-structured interviews was developed to gain insights into the beliefs of lecturers about research in teaching. The interview guide was developed in Dutch as the interviews were conducted in Dutch. The interview guide consisted of multiple topics. Firstly, the introduction and questions for specific background data served the goal to get to know the lecturer. As beliefs of participants may be a delicate topic for participants to talk freely about, these questions also served the goal of making the participants feel at ease and get used to the interview style of the researcher (cf. Josephson & Peteet, 2007). This allowed the lecturers to feel comfortable talking to the researchers and triggered their willingness to reveal prior knowledge regarding their own experiences with research in teaching during e.g. lectures, tutorials, and thesis guidance. Moreover, as this study strives to gain insight into beliefs of lecturers regarding research in teaching, the lecturers were reassured that there were no 'wrong' or 'right' answers. Secondly, the central question "How do lecturers integrate research in their teaching?" was addressed through multiple questions to probe beliefs of lecturers. The beliefs of a lecturer were firstly addressed through a question in which beliefs were linked to a concrete course, e.g.: "What would you like to teach students about research in the course [name course]?". This method was chosen to attain a range of concrete examples and insights in how lecturers believe that integration of

research in teaching should take form. This was done in line with the study of Visser-Wijnveen et al. (2010) where these type of questions were proved to be successful to encourage lecturers to provide a detailed description of their belief using a past experience.. Therefore, the questions “Can you describe a situation in which you, in your opinion, successfully taught your student something about research?” and “Can you sketch a situation in which you, in your opinion, were less successful in teaching your student something about research?” were addressed to probe beliefs. In order to elicit lecturers’ ideas on how research can best be integrated and to promote their reflective thoughts, insights were consequently addressed through questions like “Why do you find it important to incorporate research in subject X in that way?” as directly asking the underlying belief was found to be successful by Josephson and Peteet (2007). The semi-structured interviews thus enabled participants to elaborate on their own views in an informal, though structured way. Moreover, the semi-structured interviews enabled the researchers to ask for further clarifications. Finally, the interview was closed by giving lecturers the chance to ask remaining questions and to elaborate on their visions.

The interview guide was piloted amongst three experienced lecturers of Humanities from the target university. These interviews were conducted in Dutch with Dutch lecturers. This pilot tested whether the interview lasted approximately forty-five minutes, whether the questions were understandable for lecturers and whether the questions were suitable for setting the tone for a dialogue between the researcher and lecturer that would effectively probe the beliefs of lecturers. During the pilot interviews, one researcher independently conducted the interview and another researcher was present as an observer. After conducting the pilot, a discussion arose amongst the researchers concerning the researchers’ interview skills and the transparency of the interview guide. Consequently, the interview guide was adjusted and the question “Why do you do this?*”* was added so that beliefs would be

thoroughly discussed. Moreover, the discussion amongst researchers led to more neutrality in the process, as it showed that the interviewer should focus solely on beliefs concerning the integration of research in teaching and not on other beliefs regarding teaching in general.

Procedure

Prior to the pilot and the actual data-collection, ethical approval was granted by the ethics research committee of the target university. Moreover, permission to conduct interviews was granted by the faculty directors of Humanities and Sciences. Just before the data-collection was supposed to start, the coronavirus influenced the world in spring 2020. Therefore, new appointments were scheduled and all interviews took place online, with or without video.

The interviews were audiotaped and lasted 50 minutes on average. The interviews were conducted in Dutch and useful excerpts were later translated to English for the purpose of this report. Within one or two weeks after the interview, the audio-fragments were transcribed according to the guidelines of the Verbatim-principle. The transcripts were pseudonymized and uploaded to a designated folder. Moreover, the transcripts were uploaded to the coding software NVivo. The participants received a pseudonymized summary of the interview, containing fragments which the researcher could possibly use during further analysis. The lecturer was asked “Are interpretations of the beliefs accurate?” and “Would you like anything to be removed during the analysis?”. This member check of whether the researcher’s interpretations of the participant’s beliefs were correct enhanced the accuracy of the presented data.

Analysis

The NVivo qualitative analysis software was used to iteratively analyse the data. This included several phases.

During the first phase of the analysis, starting with three of the transcripts, three researchers worked independently to identify interview fragments which referred to the beliefs that lecturers expressed. Those interview fragments had to be a meaningful whole to be selected, meaning that the interview fragment contained an element of integration of research in teaching and that the fragment was understandable when reading it on its own without context. A total of 144 fragments was selected. Then, descriptive codes were assigned to the selected fragment using an existing template based on the survey *Goals of including research and teaching* established by Hu (2014). The six scales of this survey are as follows: *reflection on research, students as participants, student research interests, critical disposition, research skills, creative disposition* and *current research in the domain*. Although this survey was applied in a quantitative survey analysis by Hu (2014), these scales remained the most suitable basis since they were quite recent and there were no other coding templates found in alternative studies. Moreover, the scales could be fairly easily transformed to a qualitative template for the current project. The coding of the individual researchers was compared and discussed to clarify disagreement about the descriptions of the codes. As a result of this discussion, descriptions of the codes *students as participants, student research interests, critical disposition, research skills* and *creative disposition* were added to clarify the lecturer's belief concerning why students need to participate (or not). For example, a fragment was coded as *research skills* when the lecturer believed 'participation in research aims to stimulate development of research skills' and coded as *students' research interests* when the lecturer believed 'participation in research aims to stimulate students' enthusiasm'. Furthermore, the new code *reflection of teaching in research* was added as the lecturers missed a code in which they could incorporate their beliefs concerning the value of teaching for research. The adjustments of demarcation criteria and the addition of a new code led to eight codes emerging from the data, namely: *reflection on research in teaching, reflection of*

teaching in research, students as participants, student research interests, critical disposition, research skills, creative disposition and *current research in the domain*. Thereafter, this new template was again coded individually by the three researchers with three more transcripts and no new codes emerged from the data. The now relatively stable coding schema was then discussed among the three researchers. After mutual agreement upon the final coding scheme, which is presented in table 2 in Appendix E, the coding process was completed for all the transcripts.

During the second phase of the data-analysis, the differences and similarities between lecturers' beliefs from hard and soft disciplines were compared per code. Fragments from Humanities concerning a specific code were compared with fragments from Sciences regarding the same code. The number of lecturers that addressed certain codes was then counted, as presented in table 2 in Appendix E. The first comparison of similarities and differences of specific codes was thereafter re-read and similarities and differences between the two disciplines were established and will be described hereafter.

Results

This study aimed at gaining insight into the differences and similarities between beliefs of lecturers of hard and soft disciplines. In general, the beliefs of lecturers of the two disciplines were rather similar concerning the codes *reflection on research in teaching* and *reflection on teaching in research* as these two codes occurred equally in both hard and soft disciplines. Firstly, all eighteen lecturers expressed their belief multiple times that the integration of research in teaching can enhance the quality of university education. In the discipline Humanities *reflection on research in teaching* was mentioned 21 times; the same code was mentioned 33 times in Sciences. *Reflection on research in teaching* was spontaneously thought of during different moments of some lecturers' interviews, whereas other lecturers expressed this as an answer to the second question of the interview guide:

"Why do you find that important?". The emphasis that lecturers have placed on the prominent role of research in teaching stems from the belief that teachers should be continuously based by research. This is for example illustrated by P12, who believed that lecturers must stay up to date with current research to deliver the education that students deserve:

> "I think that research within academic education is really essential. If we stop integrating research, if we are no longer active in both research and teaching, we won't be able to convey our students the latest ideas" (P12, Sciences)

Secondly, twelve lecturers, equally divided over the disciplines, valued the role of teaching in the quality of research as they believed that teaching enhances research. These lecturers mentioned *reflection on teaching in research* spontaneously as it was no part of the interview script. Generally, it can be stated that all participants believed that research enhances teaching and, vice versa, teaching enhances research.

From this point onwards, the two aforementioned findings will be discussed in-depth. Although lecturers may seem similar concerning the value they assign to research in teaching and teaching in research, nuances can be found in the underlying thoughts that shape the beliefs of lecturers in different disciplines. For example, four lecturers of Sciences and four lecturers of Humanities illustrated that they value *current research in the domain.* Whereas these numbers are similar, the argumentation behind these beliefs shows the differences between lecturers' research-based teaching approaches in the light of the discipline. Rather than the numerical differences and similarities, it is the content of the lecturers' beliefs that shows the greatest wealth of information. Therefore, it was chosen to report differences in a detailed manner, while just briefly mentioning the similarities. The similarities and differences between the lecturers from Humanities and Sciences are summarized in Table 2 in Appendix E. The number in parenthesis following each description in this table refers to the

number of lecturers who mentioned a clear belief concerning that particular description of the code during the interview. The differences and similarities between lecturers' beliefs will now be taken further into depth. Individual lectures will be referred to as participant 1 (P1) and so forth.

Reflection on research in teaching. Lecturers of both hard and soft disciplines emphasized the importance of stimulating students to learn about research findings, especially regarding findings of previous publications of the lecturers themselves. Lecturers of Humanities and Sciences elaborated on this by expressing the belief that stimulating students to learn about research makes the scientific research process an essential part of the curriculum. However, the beliefs of lecturers concerning the way in which this research process is presented in the curriculum and as a result, the way in which the students should approach the world differed between the two disciplines. Lecturers of hard sciences stressed the importance of planned research with the help of the empiric cycle:

> "Conducting research is a very specific way of looking at the world, in which we want to find out how the world works. Moreover, well, we investigate this in a very specific way: with the help of the empiric cycle" (P12, Sciences)

All nine lecturers of hard disciplines mentioned that they work with the empiric cycle in all of their courses and one lecturer (P12, Sciences) even mentioned that everything in life can be brought back to the empiric cycle. Whereas the empiric cycle helps lecturers from hard disciplines to plan research and teaching and structure knowledge, lecturers of soft sciences mentioned another view regarding epistemology, since they rather work with a variety of methods to teach students a certain worldview:

> "Students need to learn a variety of methods: interviews, observations, establishing a survey, organising a case study. Therefore, we are actually supportive of mixed methods. A combination of qualitative and quantitative, so students learn what the advantages are of one method and the advantages of the other one. A combination of both actually leads to the most interesting results" (P9, Humanities)

The lecturers' beliefs about *reflection on research in teaching* in soft disciplines indicated that conducting research is not a standard way of innovation: "Research can't be fully planned. There are surprises, things that get in your way accidentally. So also, you need a certain openness for surprises" (P11, Humanities).

Reflection on teaching in research. As illustrated before, the bulk of all lecturers in both disciplines believed that teaching enhances research. First of all, this importance is emphasized by lecturers who believe that teaching in research helps to themselves to broaden their perspectives. This is emphasized by P1 (Humanities) who mentions:

> "Teaching forces you to connect ideas. We often think very fragmentary: first concerning this topic, afterwards concerning that topic. However, when you try to step in you students' shoes, you realise: what are the connections between these topics? And then, you are forced to think about it yourself. For that reason, every researcher should be obliged to teach" (P1, Humanities)

Secondly, lecturers emphasize that students inspire them with questions which can enhance the lecturers' own research. This is for example exemplified by P3 (Sciences) who states:

> "Students, especially as they have less prior knowledge, sometimes ask questions which make you think about stuff you never thought about. And well, sometimes I can answer these

> questions with only two words since they are easy. However, sometimes the questions inspire me to look at my own research in a way I never looked at it before" (P3, Sciences)

Thirdly, lecturers mention the value they assign to teaching in research as students inspire researchers with starting points for future publications, like P5:

> "I was discussing a thesis with some students and I thought: wowie, this is such a nice theme for a new book! I am going to do what you do. Thank you for working together since you brought me to this book" (P5, Humanities)

Moreover, teaching in research stimulates lecturers to experience more joy in their job: "Yes, I really get enthusiasm in return. Because students really appreciate it" (P12, Sciences). However, the beliefs of lecturers of hard and soft disciplines concerning *reflection on teaching in research* also differed clearly in one aspect. Namely, to what extent lecturers rely on participants of students to get a bigger data-set. P4 (Humanities) mentions: "The students are my 180 helpers. I would never be able to conduct research without them". No lecturer of Sciences mentioned the value of students for the size of the data-set.

Students as participants. The involvement of students in hard disciplines seems to serve the function of "Trying to select the best master students so that they can continue their career in a research project in our university" (P13, Sciences) during their entire educational path as a student. Controversially, lecturers in soft disciplines seemed to allocate less value to students actually participating in research from the start of their studies onwards. Lecturers' beliefs of Humanities about the involvement of students in research indicated that students should be involved in research, but this can happen later, for instance in their masters: "There [in their masters] they learn what research is and what you come across then" (P9, Humanities). On the contrary, students in hard disciplines are used to participate in research

from the start of their studies due to the obligatory participation of students in different stages of the empiric cycle.

Research skills. All lecturers of Sciences mentioned the importance of students learning decent research skills through the integration of research in teaching. As stressed earlier, this may be related to the belief that lecturers of hard disciplines expressed that there is an absolute truth. P14 (Sciences) explicated upon the importance of research skills for living up to this epistemology:

> "It is of great importance that one knows how to conduct research with integrity in a way in which one finds the absolute truth. One can always conduct a single research and you can go any direction you wish to. However, this is not what science stands for. We try to teach them a reliable way of learning" (P14, Sciences)

In contrast to lecturers in hard disciplines, some lecturers of soft disciplines believed that every student should develop his or her research skills to form their own truth. Therefore, they stressed the importance of learning students how to form their own well-informed opinions during a debate: "What I want to teach students in how they can take their own well-informed stance with the help of primary sources" (P16, Humanities).

Students' research interests. Many lecturers mentioned the belief that students' research interests should be taken into account while integrating research in teaching. This is for example illustrated by P10 (Sciences): "We try to let students make their own choices. We hope that research then becomes something of their own, and not something we want them to do". Lecturers' beliefs of soft disciplines about integrating students' research interests in daily education suggested that students are able to discover their talents through executing research:

> "Some students are defeated by continuously gaining low marks on those cultural study theories papers and I don't know what more […] And then you notice as a lecturer that you can show your students: you are extremely talented. You definitely ask great questions. And you are capable of writing beautifully. So you train those students, and I find that extremely important, that you can show them that there exist multiple talents and you can use these different talents while conducting research" (P4, Humanities)

Lecturers' beliefs of hard disciplines about integrating students' research interests in daily education suggested that students are encouraged by others as they actually are able to participate in research more often than students in soft disciplines. P13 (Sciences) explained how participation in research stimulates students enthusiasm and encourages the students' interest for research:

> "I presume to notice that students become more enthusiastic when they get the feeling of freedom. That they can really play in a sandbox. That they don't get a recipe which they should strictly live up to. I don't think that that stimulates the enthusiasm of students. People like it when they really can participate, and then reflect on that they actually are more interested for research than they actually thought" (P13, Sciences)

Critical disposition. Concerning *critical disposition*, there were hardly any disciplinary differences to be found as all lecturers, from both disciplines, seemed to stress an attitude that students are ought to develop in university: "I actually want to create a kind of critical, well-calibrated civilians, in the scientific sense of the word. That is actually a basic value of my education. Do not let things intimidate you" (P1, Humanities). Moreover, consensus is found in lecturers from both disciplines as they agree on the impact of research on society: "One swallow doesn't make a summer. One publication proves nothing. There

need to be more studies pointing to the same direction" (P2, Humanities). All lecturers thus generally agreed on the limited impact that one single study has on the scientific world.

Creative disposition. No striking differences between disciplines were found regarding *creative disposition.* Lecturers from hard disciplines as well as lectures from soft disciplines used the metaphor of a recipe to describe the importance of creativity of students. "When you work with recipes or a cooking manual that does not lead to creativity or thinking on your own, though that is the most important" (P9, Humanities). The lecturers' beliefs concerning stimulating creativity indicated that students learn more if they think for themselves.

Current research in the domain. Lecturers in Sciences regularly mentioned the importance of keeping up with knowledge production as they are eager to slowly discover the absolute truth: "As a teacher you are constantly connected to research. With innovation, you know. Working on the so-called boundaries of knowing" (P7, Sciences). Lecturers in hard sciences expressed the importance of striving for new insights in scientific theories to keep up with the latest research findings 33 times during the interviews. Whereas lecturers beliefs' in hard disciplines about the construction of new knowledge suggested there exists an absolute truth, beliefs of lecturers from soft sciences indicated that research in the domain is not meant to prove theories or support an absolute truth. While lecturers in hard disciplines expressed their belief that research is essential for creating new theories to innovate, lecturers in soft disciplines explicated that innovation is related to a current issue in society. They stressed that research does not depend on one true situation in which the absolute truth is present, but that it depends on the situation that is currently present in society. This is for example illustrated by P4 (Humanities), who states:

> "The red line in my education is that the learning cycle always starts with questions. Communal questions, so the community places problems and we are tackling those problems

> and match the problem with a scientific theory. And sometimes the problem is so new, that there exists no theory for it" (P4, Humanities)

Conclusion and discussion

As outlined previously, this study aimed at gaining insights in the differences and similarities between lecturers' beliefs of hard and soft disciplines. The results found can help to gain understanding of the beliefs of lecturers and as a result of this inform decisions about multiple effective teaching approaches in the integration of research in teaching for the sake of teachers, policy makers and educational advisors. Moreover, these results help to advise how to support lecturers in integrating research in teaching, matching with the disciplinary similarities and varieties.

The value that lecturers assign to the integration of research in teaching illustrated in previous studies (e.g. Gibbons et al., 1994; Visser-Wijnveen et al., 2010) is echoed by the findings of the present study as all lecturers expressed the belief that research enhances teaching. Considering the value of research for teaching, the findings of Hu (2014) were confirmed in this study as all codes were named by participants. Vice versa, it is remarkable that twelve out of eighteen lecturers spontaneously expressed the belief that teaching enhances research while it was not explicitly examined. Although the significance of teaching for research was studied earlier (e.g. Visser-Wijnveen et al., 2010), the finding has not emerged spontaneously in previous studies. Considering the value of teaching for research, in both Visser-Wijnveen et al. (2010) and the present study three advantages were found. First, teaching in research allows lecturers to put research in a broader perspective. Second, teaching in research allows lecturers to get inspired by fresh perspectives of students in improving their own research. Third, students may trigger lecturers with new ideas that form the starting point of new studies. A fourth, additional advantage was found in the present study as lecturers expressed the enthusiasm that they experience when they are able to teach

about their own research. Generally, all lecturers' beliefs are thus based on the two principles that research enhances teaching and, vice versa, teaching enhances research. In previous studies, Griffiths (2004) and Visser-Wijnveen et al. (2010) described this double-sided view as a reciprocal relationship between research and teaching. All in all, it can be concluded that the lecturers' beliefs on the integration of research into teaching are shaped by the fundamental reciprocal relationship between research and teaching. Therefore, when considering support provided by policy makers and educational advisors that lecturers need while integrating research into teaching, this reciprocal relationship must be taken as a starting point.

As illustrated before, previous research showed that lecturers shape the integration of research into teaching in line with the epistemology of the discipline (e.g. Neumann et al., 2002; Visser-Wijnveen, 2009). Although other factors such as culture of the discipline and environmental issues may play a role in research-based teaching as well (Neumann et al., 2002), the results of the current study indicated that epistemological differences between disciplines are deeply rooted in the beliefs of lecturers. Three main findings concerning disciplinary differences in the beliefs of lecturers may be extracted from the data.

Firstly, lecturers of hard sciences seem to focus on innovation from the perspective that knowledge helps students to solve problems they may encounter in the future. Lecturers in hard sciences generally shared the belief that knowledge can be built up and the boundaries of knowing are ought to be expanded in education. This can be done through using *current research in the domain* in their teaching approach to contribute to building up knowledge and eventually finding the absolute truth. The belief that knowledge in hard disciplines can be found by accumulating, linear knowledge production is in line with earlier findings from Griffiths (2004) and Neumann et al. (2002). Whereas lecturers from hard sciences believed that innovation can be realised by producing new knowledge, the data showed that lecturers

from soft sciences believed that innovation starts when approaching problems that are currently present in society. Griffiths (2004) and Neumann et al. (2002) also detected in earlier studies that the epistemology of soft disciplines is based on an interpretative truth in which knowledge is subjective. Conclusively, the results of this study indicated that lecturers in hard disciplines are keen on innovating through finding the absolute truth, whereas lecturers in soft sciences focused on innovation through the lens of the interpretive, societal context. Therefore it can be stated that policy makers and educational advisors should take these differences into account while supporting teachers in integrating research in teaching.

Secondly, the data showed that lecturers from hard sciences believed that the empirical cycle can be generalized in every research study. All nine lecturers of Sciences expressed the belief that students should learn to approach the world in a reliable way which can be done with the help of the empiric cycle. The beliefs of lecturers of hard disciplines concerning the generalisability of knowledge matches with the so-called positivist paradigm of looking at the world (Austin, 1996). Whereas lecturers of hard sciences agreed upon the fact that knowledge is generalizable and always approachable with the help of the empiric cycle, lecturers of soft sciences expressed that the world should be looked upon from different viewpoints with the help of different research methods. This should serve the ultimate goal of education in soft disciplines to prepare students for the future as they learn to form their own, well-informed decisions in different situations. This stance of looking at the world may be described as a hermeneutic paradigm, as illustrated by Griffiths (2004) and quoted by P5: “I am an old-fashioned Hermeneut. […] I just want to know what the society has done with texts”. The differences found between lecturers’ beliefs in the hard and soft disciplines may thus stem from the different paradigms which seem to be deeply rooted in the beliefs of lecturers, namely the positivist paradigm of Sciences and the hermeneutic paradigm of Humanities.

Finally, this study demonstrated that disciplinary differences do not only contribute to the way in which lecturers believe research-based teaching should be approached, but also influence the way in which lecturers shape their teaching pedagogies. The present study echoes the finding of Shulman (2005) that pedagogies of teachers are shaped by beliefs of lecturers which are connected to the discipline. The data depicted that lecturers in hard sciences believed that letting students participate in research helps to discover which students are the most talented, which is essential for the continuation of the success of the department as it serves the goal to find future colleagues. In both a previous study of Neumann et al. (2002) as in the current study, lecturers pointed out that these talents are most effectively discovered when students are given the freedom to experiment and given the possibility to think logically on their own. On the contrary, some lecturers from soft sciences believed that students do not necessarily need to participate in research as early as possible. Instead, these lecturers emphasised that research gives students the chance to discover multiple talents in a later stage of their university education since multiple talents are essential for the personal development of the student. Neumann et al. (2002) elaborate on this by describing that lecturers in soft disciplines try to let students find their own path in life. The varying viewpoints regarding the participation of students in research was also found by Leach (2016) who states that participation in research is teacher-focused in hard disciplines and student-focused in soft disciplines.

It should be noted that the results provided in this study do not necessarily apply to all lecturers in hard and soft disciplines in research intensive universities in the Netherlands. This study involved only 18 lecturers and was conducted at one university. Furthermore, this study mainly discussed the influences of disciplines on the lecturers' beliefs regarding the integration of research in teaching in the light of epistemological influences and teaching pedagogy. However, there may be other potential disciplinary influences which affect the

beliefs of lecturers, such as the culture of the discipline, the disciplinary environment or shared conceptions among colleagues of the teacher-role (Neumann et al., 2002). These disciplinary influences were not explicitly exposed in this study but may also explain differences between beliefs of lecturers in hard and soft disciplines. However, the results suggested that beliefs were mostly shaped by epistemological differences and views concerning teaching pedagogy. Therefore, those beliefs were depicted thoroughly in the present study as they seemed crucial in shaping teaching behaviour in different disciplines. Moreover, in the present study the interview guide was based on a previous study in higher education (cf. Hu, 2014), but used generally for both disciplines. Future research may examine disciplinary support using different interviews or surveys based on the epistemology matching with the paradigm of the discipline.

Lecturers in hard and soft disciplines may benefit from insights provided in this study. The current results made clear that lecturers' beliefs are shaped by a reciprocal vision of research-based teaching. This vision is translated to teaching behaviour in multiple ways, influenced by epistemological disciplinary differences concerning perspectives on innovation and paradigms. Reflection upon the starting points of this teaching pedagogy may be beneficial for lecturers, as this would enable them to get inspired by possible ways to relate research to their teaching pedagogy. A possible way in which reflection regarding the research-based teaching pedagogy can be probed is through reflection amongst colleagues (Kreber & Castleden, 2009). In future research it could be depicted how lecturers can stimulate each other to actively reflect on their teaching pedagogy through sharing and evaluating effective teaching pedagogies which stimulates research-based teaching. On the one hand, this can be done within disciplines as the beliefs of lecturers exposed in the present study are influenced by epistemological differences and therefore may be approached in the light of the discipline as they shape the lecturers' teaching pedagogy. This may for example

be done through observing each other and learning from best practices in sharing their experiences of the integration suitable for the epistemology and teaching pedagogy of the discipline. However, on the other hand, future research should examine if this support should per definition be formed around the paradigm corresponding with hard and soft disciplines, or that it perhaps may be shaped interdisciplinary. Policies of universities are namely changing as universities express to believe that students are best prepared for the insecure future when education is shaped by lecturers from different disciplines who collaborate and provide students with more knowledge and innovative approaches to problem solving (Townsend, Pisapia & Razzaq, 2015). Therefore, interdisciplinarity can be seen as a rising trend in education as collaboration between lecturers from different disciplines is likely to improve the quality of education for students (Townsend et al., 2015). Future research has to point out how lecturers from different disciplines with different epistemological beliefs may successfully collaborate and reflect on research-based teaching. A condition for successful collaboration is namely that lecturers, educational advisors and policy makers do acknowledge the complexity of interdisciplinarity as there are different ways of knowing and lecturers must be open to potential general forms of research and teaching (Winberg, 2008). Policy makers and educational advisors in institutions may play a key role in stimulating reflection on research-based teaching as they may facilitate support through organising moments of collegial sharing. This may inspire lecturers, as is illustrated by P1:

> "Well, the nice part of it, at least in my experience, is that you often share the same goals as your fellow colleagues in what you want to teach students. However, some lecturers know different didactical tricks compared to other lecturers. So, when being together and specifically discussing the goals of a course and how to concretely shape your teaching

> pedagogy in the course; that is what then inspires you to reflect, when you share experiences with multiple colleagues" (P1, Humanities)

Future research should depict which other concrete forms of support may enhance the integration of research in teaching within and across different disciplines.

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Appendix A: Recruitment mail for potential participants

Beste academicus,

Momenteel zijn we op twee departementen van de Universiteit Utrecht een onderzoek uit aan het voeren naar de percepties en opvattingen van docenten over het gebruik van onderzoek in onderwijs. Dit onderzoek wordt uitgevoerd door Dr. Christel Lutz (https://www.uu.nl/staff/cilutz/Profile) en Dr. Mayke Vereijken (https://www.uu.nl/staff/MWCVereijken). Wij -Sander, Aniek en Truke- zijn de onderzoeksassistenten van dit project.

Middels deze brief willen we u vragen of u zou willen meewerken aan ons onderzoek. In dit onderzoek gaan we academici interviewen over het gebruik van onderzoek in onderwijs. We zijn geïnteresseerd in uw ervaringen wat betreft het integreren van onderzoek in het onderwijs dat u verzorgt. Ook zijn we geïnteresseerd in uw expertise, de cursussen waar u betrokken bij bent en de plaats die u toekent aan onderzoek in uw werk als academici. Het interview zal ongeveer een uur duren en er is vanuit uw kant geen voorbereidend werk vereist. Wel willen we u vragen om na het interview een vragenlijst in te vullen van ongeveer 10 minuten. Dit mag ook op een ander moment en hoeft niet aansluitend aan het interview plaats te vinden.

Dit afstudeeronderzoek wordt -evenals alle andere onderwijsactiviteiten van de Universiteit Utrecht- momenteel belemmerd door het coronavirus. Het is in uw volste recht om niet fysiek met één van de onderzoekers af te spreken. Daarom willen we u erop attenderen dat ook interviews via Skype en telefonische interviews mogelijk zijn en ons ontzettend zouden helpen. We willen er alles aan doen om op creatieve wijze dit onderzoek tot een succesvol einde te brengen.

We hopen ontzettend dat u mee wilt werken aan ons onderzoek. Wat betreft privacy en data-opslag werken we nauwkeurig volgens de ‘Richtlijn Wetenschappelijke Integriteit bij Student-onderzoek’ van de departement Educatie. Daarnaast is dit onderzoek geregistreerd bij de Ethische Toetsingscommissie van de faculteit Sociale Wetenschappen (FETC). Hier kunnen wij u nader over toelichten. Echter willen wij u reeds geruststellen met het feit dat het interview vertrouwelijk zal worden behandeld en dat geen enkele persoon naast Christel Lutz, Mayke Vereijken, en onszelf toegang zal hebben tot de data. We zullen het onderzoeksrapport daarnaast met u delen, wanneer u dit wenst.

Wilt u ons laten weten of u mee zou willen werken aan ons onderzoek? Dit horen wij graag op t.g.p.krijnen@students.uu.nl

Met vriendelijke groeten, ook namens Christel Lutz en Mayke Vereijken,
Aniek van den Ham, Sander van der Lee en Truke Krijnen

Appendix B: The informed consent form (Part I)

Informed consent, deel I: Beschrijving van de studie [voorafgaand aan het interview]

Middels het ondertekenen van dit formulier stemt u in met deelname aan de studie naar de docentbeleving van academische taken aan de Universiteit Utrecht (UU). De studie wordt uitgevoerd onder leiding van Christel Lutz, universitair hoofddocent van de afdeling Social 'Sciences' van het Utrecht University College en Mayke Vereijken, universitair docent binnen de afdeling Educatie, faculteit Sociale Wetenschappen UU. De onderzoekers binnen deze studie zijn geïnteresseerd in uw beleving van academisch werk en factoren die u in staat stellen onderzoeks- en onderwijstaken uit te voeren.

Drie masterstudenten Onderwijswetenschappen, Truke Krijnen, Sander van der Lee en Aniek van Ham maken deel uit van het onderzoeksteam. Een onderdeel van deze studie is een interview waarin u uw ervaringen kunt toelichten. Het interview zal ongeveer een uur duren (max. 90 minuten). Om de data te kunnen analyseren wordt een audio-opname gemaakt. Mocht u daar bezwaar tegen hebben, zal de interviewer aantekeningen maken tijdens het gesprek. Op elk moment tijdens het interview kunt u aangeven de opname te stoppen. Na afloop van het interview zullen we u vragen om een korte vragenlijst in te vullen van maximaal 10 minuten. Dit kan direct na afloop van het interview of op een ander moment wat u beter schikt. Na het interview en de vragenlijst zullen we u eenmalig benaderen om na te gaan of we uw informatie juist weergeven en om eventueel te vragen naar aanvullende informatie over uw functie. Er is geen vergoeding voor deelname. Deelname aan het onderzoek geeft u gelegenheid te reflecteren op uw werk.

De informatie die u deelt met het onderzoeksteam wordt vertrouwelijk behandeld. We gebruiken pseudoniemen in plaats van namen van deelnemers. U kunt de door u verstrekte

informatie aanmerken als ‘off the record’. In dat geval wordt informatie in generieke termen beschreven of weggelaten in mondelinge en schriftelijke rapportage over de studie. Inzichten uit de studie zullen uiteindelijk worden gedeeld met docenten en onderwijsonderzoekers, in de vorm van masterscripties, presentaties op onderzoeksbijeenkomsten en een wetenschappelijke publicatie in een internationaal, peer-reviewed tijdschrift. Indien gewenst informeren we u over de bevindingen uit de studie. Data wordt opgeslagen en gebruikt onder supervisie van Christel en Mayke.

De onderzoekers delen geen persoonlijke details van deelnemers in rapportage over de studie. Desondanks kan het gebeuren dat u te herkennen bent voor mensen die u of uw werk goed kennen. Bijvoorbeeld vanwege demografische kenmerken, de onderwerpen waar u onderzoek naar doet, les over geeft of u anderszins voor inzet. Het onderzoeksteam zal uw identiteit verhullen door zo’n 20 academici te interviewen verdeeld over meerdere afdelingen en door het aanpassen van bewoordingen in citaten uit het interview. Hiermee beperkt het onderzoeksteam de kans dat informatie terug te leiden is naar individuele deelnemers tot een minimum.

Na het interview zal de interviewer u vragen een keuze te maken op welke manier uw informatie weergegeven mag worden in rapportage. In het ene geval (optie A) zult u mogelijk herkenbaar zijn voor degenen die u of uw werk kennen. In het andere geval (optie B) zullen de onderzoekers geen persoonlijke kenmerken en uitingen rapporteren, door vaag te blijven of gegevens weg te laten, zodat u niet herkenbaar bent voor degenen die u of uw werk kennen.

Deelname aan deze studie is geheel vrijwillig en vrijblijvend. U kunt op elk moment afzien van deelname zonder opgaaf van redenen. U kunt ook aangeven bepaalde vragen niet te beantwoorden of informatie niet te verstrekken. Als de studie is afgerond, wordt de data mogelijk gedeeld met andere onderzoekers in een databank. Mocht dit het geval zijn, wordt

persoonlijke informatie verwijderd voordat de data gedeeld wordt zoals beschreven onder optie B.

Bedankt voor uw tijd.

Namens het onderzoeksteam,

Christel Lutz & Mayke Vereijken

Titel studie: ‘Research and teaching practices in a research-intensive university’

Versie datum formulier: November 2019

Hoofdonderzoeker (voor vragen): Dr. M. Vereijken, FSW/UU, m.w.c.vereijken@uu.nl, 06 4157 7641

Voor klachten: Klachtenbureau Utrecht University, klachtenfunctionaris-fetcsocwet@uu.nl.

Appendix C: The informed consent form (Part II)

Informed consent, deel II: Verklaring van voorkeur voor informatieweergave

De onderzoekers hebben aangegeven hoe uw privacy en anonimiteit geborgd worden en op welke manieren uw informatie beperkt of niet herleidbaar weergegeven kan worden in mondelinge en schriftelijke rapportage. Namelijk; A) de weergave in rapportage bevat persoonlijke kenmerken die tot u te herleiden zijn voor degenen die uw werk kennen (e.g., uw veld, vakken waarin u onderwijs over geeft, demografische achtergrondinformatie), of B) in rapportage wordt deze informatie vervaagd of weggelaten, zodat deze niet tot u te herleiden is.

Geef hieronder uw voorkeur aan:

____ (A) Ik geef Christel, Mayke en de masterstudenten toestemming data over mij te presenteren waarin kenmerken van mijn academische en persoonlijke identiteit weergegeven worden. Deze optie houdt in dat mijn identiteit gemaskeerd wordt door een pseudoniem en aanvullende manieren. Rapportages die toegankelijk zijn voor docenten en onderwijsonderzoekers geven de discipline(s), onderzoeksveld(en), vakken en demografische gegevens weer die voor de studie relevant zijn. De onderzoekers geven geen informatie weer waarvan ik aangegeven heb dat deze ‘off the record’ is.

____ (B) Ik geef Christel, Mayke en de masterstudenten geen toestemming data over mij te presenteren waarin kenmerken van mijn academische en persoonlijke identiteit weergegeven worden. Deze optie houdt in dat mijn identiteit gemaskeerd wordt door een pseudoniem en aanvullende manieren. Rapportages die toegankelijk zijn voor docenten en onderwijsonderzoekers geven de discipline(s), onderzoeksveld(en), vakken en demografische gegevens niet weer, al zijn ze voor de studie relevant. Deze informatie wordt dan weergegeven in generieke termen of wordt weggelaten uit de rapportage. De onderzoekers geven geen informatie weer waarvan ik aangegeven heb dat deze ‘off the record’ is.

_____	_____
(Handtekening deelnemer)	(Handtekening interviewer)
_____	_____
(Date)	(Date)

Appendix D: Interview Guide

Benodigdheden

- Recorder met oplader
- Voorafgaand aan interview informatiebrief versturen per e-mail
- Geprinte Informed consent formulieren
- Pen en papier voor de zekerheid
- Bedankje, chocola Merci

Introductie

- Goeiendag. Fijn dat u er bent. Mijn naam is… en ik ben een master-student(e) ‘Educational ‘Sciences’’.
- Zoals u waarschijnlijk al heeft gelezen in de *informed consent brief*, ben ik geïnteresseerd in uw beleving van academisch werk en factoren die u in staat stellen onderzoeks- en onderwijstaken uit te voeren. De universiteit heeft namelijk als een van hun doelen om studenten vertrouwd te maken met onderzoek om onderzoek in hun latere werk te leren gebruiken en om binnen hun studie onderzoek te doen. Dit gebeurt bijvoorbeeld in masterscripties, werkgroep-begeleiding of door literatuur te gebruiken in hoorcolleges. Ook zijn we benieuwd naar ervaringen van docenten en of zij nog dingen zouden op het gebied van het onderwijs dat zij geven.
- Wij zouden het interview graag willen opnemen. Heeft u daar bezwaar tegen? U kan na het interview kiezen op welke manier uw antwoorden gerapporteerd worden in ons onderzoek.
- We willen u meegeven dat er geen ‘goede’ of ‘foute’ antwoorden bestaan. U mag alles vertellen wat in u opkomt wanneer u een vraag hoort. Ook mag u ieder moment aangeven als u zou willen stoppen met het interview.

- Heeft u nog vragen voordat we beginnen?

Achtergrondgegevens

- Hoeveel jaar ervaring heeft u als onderzoeker?
- Hoeveel jaar ervaring heeft u als docent?
- In welke onderwijsprogramma's geeft u les?
- Zijn deze studenten bachelor- of masterstudenten?

Check: In welke vak of vak(ken) die u geeft aan studenten heeft u aandacht voor onderzoek?

- OPTIE BIJ MEERDERE VAKKEN --> Is er één vak waarin onderzoek een grote rol speelt?
- Ik ben geïnteresseerd in uw onderwijsaanpak en overwegingen binnen één van die vakken. De vragen die ik stel zijn daarop gericht.

Centrale Vraag: Hoe geven docenten onderzoek vorm binnen het onderwijs?

1. **Beliefs:** Wat wilt u studenten leren over onderzoek binnen [naam vak]?
2. Waarom is dat belangrijk voor studenten?
3. **LSD:** Zijn er daarnaast nog andere dingen die u studenten over onderzoek wil leren binnen [naam vak]?
4. Kunt u een situatie schetsen waarin het naar uw mening goed lukte om een student iets bij te brengen over onderzoek?
5. **LSD:** Als ik het goed begrijp, dan vindt u de integratie van onderzoek in onderwijs belangrijk omdat… (erop doorvragen wanneer van toepassing). Dan ben ik benieuwd hoe u dat vertaalt in de praktijk. Hoe pakt u het integreren van onderzoek dan bijvoorbeeld aan in colleges?
6. **LSD:** Waarom pakt u dit zo aan? (doorvragen tot alles duidelijk is)

7. Zijn er ook andere momenten dan in colleges in [naam vak] waarop u onderzoek integreert in het lesgeven? Hoe pakt u dat aan binnen [naam vak]?
8. Kortom, u geeft aan onderzoek te integreren in het onderwijs. Bereikt u wat u wil bereiken bij studenten met die aanpak?
9. Kunt u ook een situatie schetsen waar het minder goed lukte om onderzoek in uw onderwijs te integreren?
10. In hoeverre zijn uw eigen onderzoeksgebied en het onderwijs in [naam vak] gerelateerd?
11. Heeft u een voorkeur om les te geven in uw eigen onderzoeksgebied? Zo ja, waarom?

<u>Afsluiting</u>

- Oké, dit waren onze interviewvragen.
- Heeft u verder nog zaken die u nog kwijt wilt?
- Heeft u het gevoel dat u alles heeft kunnen zeggen wat u wilde of wilt u nog wat kwijt over onderzoek in onderwijs?
- Alvast ontzettend bedankt voor uw deelname. Wat er nu gaat gebeuren is het volgende:
    - We willen u vragen om het informed consent formulier te tekenen. Hierop staan twee opties beschreven die we kunnen inzetten om de data te analyseren. Leest u ze eens rustig door.
    - Binnen twee weken zal ik u een samenvatting van het interview voorleggen. U kunt dan nagaan of we uw informatie juist weergeven. Eventueel vragen we u dan naar aanvullende informatie over uw functie om tot diepere inzichten te komen in ons onderzoek. Aan het einde van het onderzoek wil ik daarnaast een

conceptversie van de resultatensectie met u delen. U kunt dan aangeven of de informatie juist is geïnterpreteerd.

- We gaan u een digitale vragenlijst toesturen over de mate waarin docenten ervaren het leren van hun studenten te beïnvloeden. We hopen dat u deze wilt invullen. Het zal maximaal 10 minuten duren.

- Hartstikke bedankt voor uw deelname en heeft u nog vragen, neem vooral contact met me op!

Appendix E: Final coding scheme and illustrating examples of beliefs of lecturers

Table 2

Beliefs identified by lecturers of Sciences and Humanities.

Code	Description	Sciences (n = 9)	Humanities (n = 9)	Example
Reflection on research in teaching	The lecturer indicates that he/she believes that research in teaching is valuable because:			Not everyone realises what the essence of academic education is: to learn that we educate students to actually conduct research. Especially when you are participating in a masters' studies (P4)
	-It stimulates students to learn about research findings	5	3	
	-It stimulates students to look at the world in a certain way	3	5	
	-It makes the scientific research process an essential part of the curriculum	4	4	
	-It pays attention to research methodology	3	4	
Reflection on teaching in research	The lecturer indicates that he/she believes that teaching in research is valuable because:			Without my students I would never have written about such beautiful subjects where I am absolutely happy about these days. Directly or indirectly these students triggered me to think in a direction, not directly, but things that made me feel like: you said something interesting which I want to hang on to! (P5)
	-it keeps lecturers up to date of new developments in the scientific world as they learn from discoveries of students	4	4	
	-it stimulates the lecturer to think critically about their own research	4	3	
	-participation in research helps teachers to get a bigger data-set	-	1	
Students as participants	The lecturer indicates that he/she believes that research in teaching is valuable because:			In the first course of the entire curriculum the students already need to execute a field research in an organisation, gather audiotapes, conduct interviews to gain practical experience and work in a team with different backgrounds. That's how you learn to execute research and what research actually means (P9)
	-he/she values the students' contribution to research	3	3	
	-participation in research forces students to participate	7	3	
Research skills	The lecturer indicates that he/she believes that research in teaching is valuable because:			Well, students should learn different methodological ways of researching. Then, they can learn how to plan research and

	-it increases students' ability to analyse complex situations	2	2	how to compare different situations with each other (P9)
	-participation in research aims to stimulate development of research skills	9	4	
Students research interests	The lecturer indicates that he/she believes that research in teaching is valuable because:			How can you possibly get out of your bed if you aren't motivated by what you are doing? (P7)
	-it increases students' enthusiasm about the scientific world	3	2	
	-it encourages students' interest for research	4	1	
	-participation in research aims to stimulate students' enthusiasm	4	2	
Critical disposition	The lecturer indicates that he/she believes that research in teaching is valuable because:			I want them to become a kind of critical, well-calibrated civilians in the world. Don't let anything impress you or scare you (P1).
	-it develops students' critical attitude	2	3	
	-it stimulates students to read scientific literature critically	2	2	
	-it stimulates students to critically reflect on the impact of research in society	1	2	
Creative disposition	The lecturer indicates that he/she believes that research in teaching is valuable because:			Sometimes you want students to think: how should I approach this? And then they should actually be able to answer that question. So we try to really mobilise the creativity of students a little. Hence, that is research: research partially equals creativity (P10)
	-it encourages students to have creative ideas of their own regarding innovation in society or in research	3	2	
Current research in the domain	The lecturer indicates that he/she believes that research in teaching is valuable because:			You need to know what is currently happening in biotechnology. So, the course is constantly stirred from research, so that students are really hands-on conducting current research (P7)
	-it increases students' awareness of the research issues currently being discussed	4	4	

Note. The number in parenthesis following each subcategory refers to the number of lecturers who talked about that subcategory in the interview.

Appendix F: FETC-form

Section 1: Basic Study Information

1. Name student:

Truke Krijnen

2. Name(s) of the supervisor(s):

Mayke Vereijken and Christel Lutz

3. Title of the thesis (plan):

Research and teaching practices of academics across disciplines in a research-intensive university

4. Does the study concern a multi-center project, e.g. a collaboration with other organizations, universities, a GGZ mental health care institution, or a university medical center?

Yes / **No** If yes: Explain.

5. Where will the study (data collection) be conducted? If this is abroad, please note that you have to be sure of the local ethical codes of conducts and permissions.

The data will be collected at different faculties at Utrecht University.

Section 2: Study Details I

6. Will you collect data?

Yes / No Yes Continue to question 11 No Continue to question 7

7. Where is the data stored?

8. Is the data publicly available?

9. Can participants be identified by the student? (e.g., does the data contain (indirectly retrievable) personal information, video, or audio data?)

10. If the data is pseudonymized, who has the key to permit re-identification?

Section 3: Participants

11. What age group is included in your study?

29 – 67.

12. Will be participants that are recruited be > 16 years? **Yes**/No

13. Will participants be mentally competent (wilsbekwam in Dutch)? **Yes**/No

14. Does the participant population contain vulnerable persons? (e.g., incapacitated, children, mentally challenged, traumatized, pregnant) Yes/**No**

15. If you answered 'Yes' to any of the three questions above: Please provide reasons to justify why this particular groups of participant is included in your study.

Participants are above the age of 16, as they are in the age cohort between 29 and 67 years. Also, participants are mentally competent as they sketch their beliefs regarding the research in teaching.

16. What possible risk could participating hold for your participants?

In recruiting participants through deans and vice-deans of faculties, the academics might feel pushed to participate by their staff. During the interviews academics might feel joy or

frustration when elaborating on their experiences. In reports about this study, academics might be identified by people who are familiar with their research interests, teaching and/or societal activities.

17. What measures are implemented to minimize risks (or burden) for the participants?

Participants can withdraw from the study without reason or consequences. Furthermore, during the interview they can chose not to answer questions, leave information out and to stop the audio-recording. In addition, they choose how personal information (e.g., discipline, field of study, teaching subjects, relevant demographics) will be reflected in oral and written reports on this study. In any case the research team minimizes the risk of revealing participants' identity by 1) providing pseudonyms, 2) interviewing 18 academics from several departments and 3) by carefully adjusting quotations before using them in public records. Additional measures will be taken when participants ask for that, which means that personal information will be blurred using generic terms or will be left out. Moreover, we appointed the complaints office of fsw which participants can approach for complaints about the way the research team treated them.

18. What time investment and effort will be requested from participants?

From participants in the interview study we ask 1h time investment to elaborate on their experiences in research and teaching. Furthermore, we ask them 10 minutes to fill in a questionnaire.

19. Will be participants be reimbursed for their efforts? If yes, how? (financial reimbursement, travelling expenses, otherwise). What is the amount? Will this compensation depend on certain conditions, such as the completion of the study?

There will be no (travel) expenses involved. Participants may receive a token of appreciation, such as a piece of chocolate or a small gift certificate.

20. How does the burden on the participants compare to the study's potential scientific or practical contribution?

This study has both a significant societal and scientific relevance. Recently, the question has been raised (inter)nationally on how to value academic work (DORA, 2012; VSNU, 2019). This is based on the idea that academic performance should be determined in three areas, namely research, teaching and societal impact and that there should be more differentiation in career paths. This study gains deeper insight into the practices of academics and how they intertwine. Implications of this study inform this discussion. Furthermore, previous studies mainly approach the problem of academics combining research and teaching on individual level. For example, studies into academics beliefs about research and teaching (Van der Rijst et al., 2013; Visser-Wijnveen et al., 2010). Findings from this study suggest that the link between research and teaching exists on the level of individual academics but also in their environment (Brew & Mantai, 2017; Visser-Wijnveen et al.,2010). The starting point from this perspective is that research and teaching are separate practices. Using a theoretical lens based on the notions of boundary crossing and (dis)continuity in this research program contributes to theorizing research and teaching as partly related practices (cf. Akkerman, Bronkhorst, & Zitter, 2013). More importantly, this research program aims to describe the nature of this relationship between research and teaching. Therefore, we think that the burden on participants is limited compared to the potential contribution of the research program.

21. What is the number of participants? Provide a power analysis and/or motivation for the number of participants. The current convention is a power of 0.80. If the study deviates from this convention, the FERB would like you to justify why this is necessary.

(Note, you want to include enough participants to be able to answer your research questions adequately, but you do not want to include too many participants and unnecessarily burden participants.)

In the first study within the research program we include 18 academics.

22. How will the participants be recruited? Explain and attach the information letter to this document.

We will approach deans, vice-deans, and/or directors of education with the request to provide us with a list of potential participants that we will then approach ourselves with a emailed request to participate.

23. How much time will prospective participants have to decide as to whether they will indeed participate in the study?

Two weeks.

24. Please explain the consent procedures. Note, active consent of participants (or their parents) is in principle mandatory. Enclose the consent letters as attachments. You can use the consent forms on Blackboard.

Participants will be asked consent actively.

25. Are the participants fully free to participate and terminate their participation whenever they want and without stating their grounds for doing so? Explain.

Yes, they are fully free to terminate their participation.

26. Will the participants be in a dependent relationship with the researcher?

Yes / **No** If yes: Explain.

27. Is there an independent contact person or a general email address of a complaint officer whom the participant can contact?

Yes, the independent complaint office of the faculty of social ‘Sciences’.

28. Is there an independent contact person or a general email address of a complaint officer whom the participant can contact in case of complaints?

Yes, the independent complaint office of the faculty of social ‘Sciences’.

Section 4: Data management

29. Who has access to the data and who will be responsible for managing (access to) the data?

The principle investigators (Lutz and Vereijken) are responsible for managing the data. The other researchers also have access to the data.

30. What type of data will you collect or create? Please provide a description of the instruments.

In the first study of the research program we will collect audio-recordings and transcripts of 18 interviews. The interviews cover the following topics: 1) background information such as gender, age, discipline and years of research and teaching experience; 2) academics' perceptions of research and teaching linkages; 3) academics' experiences with the integration of research and teaching in their work.

31. Will you be exchanging (personal) data with organizations/research partners outside the UU?

Yes / **No** If yes: Explain.

32. If so, will a data processing agreement be made up?

Yes / **No**

If yes: Please attach the agreement.

If no: Please explain.

33. Where will the data be stored and for how long?

Within 1-2 weeks, the data will be pseudonymized in a transcript. These transcripts will be stored on a USB-stick and in the coding program NVivo.

34. Will the data potentially be used for other purposes than the master's thesis? (e.g., publication, reporting back to participants, etc.)

The data is part of a bigger research of Mayke and Christel.

35. Will the data potentially be used for other purposes than the master's thesis? (e.g., publication, reporting back to participants, etc.)

Yes / No

If yes: Explain. It might be used for publication after the thesis's if Mayke and Christel are going to elaborate on the research.