Teaching Efficacy in Research-Intensive Universities and the Role of Research in Teaching

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Abstract

The aim of this study is to gain deeper insight in lecturers' beliefs about integrating research in teaching and how this relates to teaching efficacy. The integration of research in teaching is important to enhance students' learning opportunities. Underlying beliefs of lecturers determine what lecturers want to teach their students about research and how they give substance to their teaching approaches. In order to promote learning among students, it is important to gain deeper insight into how academics integrate research in teaching and to what extent this has an effect on teaching efficacy. Therefore, this study explores a possible relation between teaching efficacy and the way in which lecturers integrate research into their teaching. Interviews were conducted with teachers in research-intensive universities to gain insight into how teachers' beliefs about and perceptions of research in teaching relate to teaching efficacy. The most important finding of this study revealed that lecturers felt more confident teaching in their own field of research interest, which increased their sense of teaching efficacy. The results of this study suggest that teaching efficacy affects lecturers' teaching approaches. In addition, teaching in their area of expertise increases teaching efficacy and therefore students' and lecturers' motivation. Thus, teaching in lecturers' area of expertise enhances their teaching efficacy and this facilitates the process for lecturers to integrate research into teaching. Results of this study can contribute to support for lecturers, in order for lecturers to feel comfortable and capable enough to successfully integrate research in their teaching.

Keywords: research in teaching, teaching efficacy, teachers' beliefs, research-intensive universities, topic-specific teaching efficacy

Teaching Efficacy in Research-Intensive Universities and the Role of Research in Teaching

Introduction

The integration of teaching and research has been seen as fundamental to contemporary higher education (Hattie and Marsh, 1996). Moreover, Healey et al. (2010) found that the development of students' research skills and awareness of the research process are fostered when students are actively involved in research activities. This is explicated by Van der Rijst and colleagues (2013), who found that the way students experience the position of research in their courses determines their conceptions about research. Students experience courses as up-to-date and intellectually stimulating when lecturers bring elements of research into play (Van der Rijst et al., 2013). Rowland (1996) found that a closer relationship between research and teaching provides the basis for improving the quality of university teaching. "It is also possible that a teacher's productivity, experience and competence will be important for the extent of interaction between research and teaching. It has been said that teaching is good particularly for young researchers because it keeps them in touch with the wider subject and reinforces their ability to expound and clarify their thinking" (Smeby, 2006, p. 6). Another argument to increase integrating research into teaching more is that engaging in both research and teaching gives university teachers a critical attitude toward knowledge (Smeby, 2010).

In this study, the word 'lecturers' refers to teachers in a university or higher education context, while 'teachers' refers to teachers in primary and secondary education. Many studies emphasize a tension for lecturers between teaching and research within universities (Visser-Wijnveen, 2009). Findings from a previous study have suggested that lecturers in universities do both research and teaching, but at different times and in different situations (Visser-Wijnveen, 2009). Researchers and teachers work in different practices with different goals. The practices of

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research and teaching are not isolated, but are related to each other, because academics are constantly moving between these two practices. A frequently mentioned factor that influences the relationship between research and teaching is the intrinsic preference of academics for research instead of teaching (Visser-Wijnveen, 2009). Visser- Wijnveen, Van der Rijst and Van Driel (2012) found that lecturers' beliefs about teaching correlate most with their beliefs about the relationship between research and teaching. 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. Visser-Wijnveen et al. (2010) and Robertson (2007) stressed that beliefs shape the lecturers' understanding of the use of research in teaching. In order to understand this relationship, it is important to gain more insight in lecturers' beliefs about the relationship between research and teaching.

Beliefs about the role of research in teaching are important, as they shape lecturers' approaches towards teaching. A previous study among university teachers has shown a relationship between lecturers' beliefs of teaching and learning and their approaches to teaching (Trigwell, Prosser, & Waterhouse, 1999). For example: teachers who conceive of learning as developing and changing students' conceptions, conceive of teaching in terms of helping students to develop and change their conceptions and approach their teaching in a student-focused way (Prosser and Trigwell 1998). They also emphasized the correlation between students' deeper learning and higher quality learning outcomes. As a consequence of lecturers' beliefs of approaches in teaching, students experienced deeper learning.

Findings from a study by Brew (2012) indicate that lecturers' perceived beliefs regarding research, teaching and knowledge affect the manner in which teachers bring research and teaching together. Visser-Wijnveen (2009) also addressed the higher status that is usually given

to research over teaching. This higher status becomes visible in the rewards that are given to research: promotion and rewards are often still primarily based on research quality and less on teaching quality (Colbeck, 1998). Other factors that influence the relationship between research and teaching can be defined as academics' lack of time, an interference of interest and the imbalance in the appreciation of research over teaching (Brew & Mantai, 2017). Previous studies have indicated that university teachers feel that their teaching role is less valued than their research role. They therefore concentrate less on their instructional duties and professional development as a teacher (Olson & Einwohner, 2001; Serow, 2000).

Visser-Wijnveen (2009) described the higher demands that academics face, caused by the worldwide increase of scientific publications and the pressure for academics to contribute to that. For lecturers, the quality requirements of their teaching also increased. The Association of Universities (VSNU) is an organization of Dutch universities working together on a stronger university sector. In 2008, the VSNU drew up a qualification for teachers in a VSNU context. This University Teaching Qualification (UTQ) is a requirement for teachers in university education to prove their teaching competence and to improve teaching quality (VSNU, 2018*).* Despite these renewed quality requirements and national mandates for the pedagogical preparation of lecturers, institutions of higher education have been inconsistent in the way they train their lecturers, if they do so at all (Morris, 2011). In most cases, the amount of time allotted to preparing graduate students for their role as researchers is greater than the time spent preparing them to instruct college-level classes (Gaff & Pruitt- Logan, 1998). Given this, it is not ensured that lecturers feel confident and capable enough to teach in universities. According to a quantitative study conducted by Chang, Lin and Song (2011) among 513 academics in 17 different universities in Taiwan, most lecturers hardly received any training in teaching skills

because at universities, no special attention was paid to supporting them to teach better.

A literature review study conducted by Van Lankveld, Schoonenboom, Volman, Croiset and Beishuizen (2017) found that lecturers experienced their first years of teaching as a stressful period characterized by feelings of uncertainty, self-doubt, and inadequacy. This was even the case for teacher educators with significant experience in primary or secondary education. Researchers found that professional development programs strengthen lecturers' pedagogical skills and therefore enhance their teaching efficacy (Chacon, 2005; Henson, 2001). Many countries, such as Norway, the UK and Sri Lanka, have made decisions about the compulsory pedagogical training of university teachers (Gibbs & Coffey, 2004). The strategy of the University of Helsinki (Strategic plan for the years 2004–2006, University of Helsinki, 2003) highlights that every new lecturer should have the possibility to participate in an introductory seminar on university teaching in order to improve his pedagogical thinking and skills. Postareff, Lindblom-Ylänne and Nevgi (2007) found that pedagogical training had a positive effect on scales measuring conceptual change, a student-focused approach and self-efficacy beliefs. Increasing lecturers' teaching efficacy is beneficial not only for teachers, but for students as well, since teachers' sense of efficacy has been shown to be a factor that affects student outcomes such as achievement, engagement and motivation in a positive way (Tschannen-Moran et. Al, 1998). Teaching efficacy increases the effort lecturers invest in teaching, the goals they set and their level of aspiration (Milner & Hoy, 2003).

In order to promote learning among students, it is important to gain deeper insight into how academics integrate research in teaching and to what extent this has an effect on teaching efficacy. Therefore, this study explores a possible relation between teaching efficacy and the way in which lecturers integrate research into their teaching. A qualitative study was conducted,

because it is not always obvious how lecturers might implement research in their teaching and interviews can provide insight into teaching practices and help explore the relationship with teaching efficacy.

Teaching efficacy

Tschannen-Moran et al. (1998) found in their literature review that teachers' sense of efficacy has been shown to be a powerful factor related to student outcomes such as achievement. Many studies emphasize the importance of teaching efficacy and the benefits of a high level of teaching efficacy, but there is little insight in how teaching efficacy is cultivated among university teachers in research-intensive universities, because most studies were conducted in primary or secondary education. The meta-analysis of Tschannen-Moran et al. (1998) also mainly consisted of studies conducted in primary education. It is expected that lecturers' sense of teaching efficacy in higher education can have a positive influence on teaching performances and students' learning outcomes as well, since this effect was found in primary and secondary education.

Rooted in social cognition theory, the theory of self-efficacy espouses the belief that human beings have the ability to shape their own actions (Bandura, 2006). Teaching efficacy relates to teachers' beliefs that they can affect the learning and behavior of their students (Gibson & Dembo, 1984). Cook (1998) emphasized that "teaching efficacy is not an observable behavior, but rather an individual belief" (p. 14). Teaching efficacy refers to "a teacher's judgment about capabilities to influence student engagement and learning" (Woolfolk Hoy, 2004, p. 1).

According to a study of Ross (1994) with fifty students in four different school districts, teachers' perceptions of teaching efficacy have a positive influence on teaching performance and

students' learning achievements. Bandura (1997) explained that teachers with a high level of self-efficacy are more experimental and persistent in dealing with difficulties emerging from teaching. Woolfolk Hoy (2004) found that lecturers who had positive experiences as novices were more resilient when facing obstacles that occurred during their teaching. Teachers in primary education with a strong sense of teaching efficacy tend to have a greater level of enthusiasm, preparation and organization for teaching (Allinder, 1994). Teaching efficacy in primary education has proved to be powerfully related to many meaningful educational outcomes, such as teachers' persistence, enthusiasm, commitment and instructional behavior, as well as student outcomes such as achievement, motivation, and self-efficacy beliefs (Tschannen-Moran et al., 2001). However, very few studies have investigated teacher efficacy in the population of university teachers (e.g., Heppner, 1992; Preito & Meyers, 1999; Young & Kline, 1996). Some aspects of teaching at universities might differ compared to primary or high school teachers, as university teachers have to combine the teaching role with other roles, such as researcher or practitioner. More qualitative research is needed to understand the impact of teaching efficacy on university teaching and explore a possible relation with their individual beliefs about their teaching.

Chang, Lin and Song (2011) found a few differences among university teachers regarding the perception of teaching efficacy in universities. They claim that lecturers who were teaching a course that matched their own field of interest and research felt more confident in their teaching than lecturers who were teaching partially matched courses (Chang et al., 2011). Lecturers in the Faculty of Education reported a higher level of efficacy than faculty members of other disciplines (Chang et al., 2011). In addition, for the Faculty of Social Sciences, teaching efficacy was positively related to motivation for learning (Young & Kline, 1996). Tschannen-Moran et al.

(1998) defined teaching efficacy as both context- and subject-matter-specific. The level of teaching efficacy is dependent on the topic. For example, a lecturer can feel very competent in one area of study, but feel less competent regarding other subjects. Lecturers can also feel less comfortable under certain circumstances in which they teach, such as teaching a specific group of students, teaching a lecture to a tutorial group or using different forms of instruction. Therefore, it can be stated that teaching efficacy is context-specific as well (Tschannen-Moren et al., 1998).

A study conducted by Morris and Usher (2010) among award-winning lecturers found that lecturers generally stabilized their teaching efficacy within the first few years of their tenure-track position. Lecturers most commonly identified examples of mastery experiences and social persuasions as the most powerful sources of their teaching efficacy (Morris, 2010). Content mastery was also a central source to lecturers' teaching efficacy (Morris, 2010). Content knowledge is so central to individuals' teaching self-efficacy that lecturers may believe themselves capable of teaching one subject well, but not another (Tschannen-Moran et al., 1998). It is therefore important to take lecturers content mastery into account in order to understand teaching efficacy, in line with previous findings of Tschannen-Moran et al. (1998).

Beliefs about research in teaching

As stated before, the integration of research in teaching is important to enhance students' learning opportunities. Hu et al. (2014) examined lecturers' beliefs about research in teaching and found that teachers were positive about the role of research in their ideal teaching situation. However, they found that lecturers were neutral or slightly negative about the current role of research in their teaching. They also suggest a significant gap in lecturers' ideal teaching and

their actual teaching. This gap can be explained by a lack of institutional focus and investment in teaching, combined with demands of required academic training and research (Chang et al., 2011). This could mean that lecturers do not consider themselves capable enough to adequately integrate research into their educational practice (Hu et al., 2014). Teaching efficacy relates to teachers' beliefs that they can affect the learning and behavior of their students (Gibson & Dembo, 1984). If a lecturer has a specific belief and has the conviction that he can influence the learning of his students, this will have an effect on the way he integrates research into teaching. It is to be expected that a particular belief about the integration of research in teaching, such as the relevance of using research elements in a course, relates to teaching efficacy.

The aim of this research is to gain insight in the sense of teaching efficacy among lecturers who are employed at a research-intensive university and to explore a relationship between teaching efficacy and lecturers' beliefs about the role of research in teaching. In order to explore the relation between teaching efficacy and lecturers' beliefs about the role of research in teaching, the experiences of teachers have been examined in-depth by conducting semi-structured interviews. The following research question was formulated: 'To what extent do lecturers ' beliefs about research in teaching relate to teaching efficacy?'

Method

Design

The goal of this study was to gain deeper insight into the relation between teaching efficacy and teachers' beliefs about research integrated into teaching. Semi-structured interviews were used and analyzed to gain deeper insight in beliefs about the relevance of integrating research into teaching and to explore the level of teaching efficacy. In addition, an extra data source was added in the form of a questionnaire. This source was used to gain a general overview of lecturers' sense of teaching efficacy in the university context. This source was addes for the purpose of data triangulation, which is a powerful strategy to enhance the quality of the research, particularly credibility. It is based on the idea of the convergence of multiple perspectives for mutual confirmation of data to ensure that all aspects of a phenomenon have been investigated (Knafl & Breitmaye, 1989).

Participants

This study was conducted among university teachers at Utrecht University. Utrecht University is a research-intensive university. The participants were all faculty members of Utrecht University in the Netherlands. In total, eighteen academics participated in semi-structured interviews about teaching efficacy and their beliefs about the role of research in teaching. All participants combined research and teaching in a research-intensive university. Participants had an average of 25.55 years of teaching and could therefore be seen as experienced lecturers.

Before the interviews, participants were informed about the confidentiality of this study in an information letter. Permission was sought from all respondents and they were all given

consent forms before the interviews. All interviews were audio-taped with the consent of the

interviewees. Background information and the mean of the overall TSES score can be found in

Table 1.

Table 1

Overview of background information of participants

Research experience in years		Teaching experience in years		Gender		TSES score *N= 14*	
Mean	Range	Mean	Range	Male	Female	Mean	SD
26,6	1-41	27,3	1-43	15	3	5.09	1.38

Instrument

An interview guide (Appendix D) for the semi-structured interviews was designed for

interviewing all eighteen academics and to gain deeper insight in their personal experiences of

research and teaching. Interviews allowed the respondents to elaborate on situations from their

own views and in their own words. Semi-structured interviews were conducted in order to

generate rich qualitative data and the questions were open-ended, thus not limiting the

respondents' answers (Gubrium & Holstein, 2002; McCracken, 1988).

Participants were reminded that their names were identified by pseudonyms throughout

this study and that other identifying information would not be revealed, for confidential

purposes. The interview started with a brief introduction of the topic of research and some

background questions, such as teachers' years of experiences in teaching and conducting

research. Different topics were questioned in the interview guide. In total, seventeen questions

were asked, varying from 'What do you want to teach students about research?' to 'Do you prefer teaching a course that aligns with the topic of your research field?' to understand the underlying beliefs of each teacher.

The first topic was lecturers' beliefs about research and teaching. The central question of this topic was 'How do teachers integrate research in their teaching?' Specific courses were discussed and participants were asked to outline situations in where they integrate research in teaching and why. This was in line with a previous study of Visser-Wijnveen et al. (2010), in which similar questions were asked to encourage lecturers to describe their beliefs by outlining past experiences. This gave teachers the opportunity to think about how they integrate research in teaching and what they want to teach students to probe their beliefs about the role of research in teaching.

The second topic was related to teaching efficacy, with questions such as 'To what extent do you think you can affect students' motivation?' This topic was inspired by a previous study about teaching efficacy by De Jong, Van Tartwijk and Verloop (2013). In addition, lecturers were asked if they had a preference for teaching about a specific topic, to probe their feelings of competence, their level of confidence and their ability to teach in different contexts and topics in order to get an impression of their sense of teaching efficacy. Furthermore, the studies of Chang et al. (2011) and Morris (2010) pointed out that content mastery was also a central source to lecturers' teaching efficacy.

The interviews were conducted in Dutch, the native language of the participants. The semi-structured interviews left enough space for the researchers to ask about the practical situations in which the teachers integrated research in teaching, but also to ask more in-depth questions about teachers' underlying beliefs.

Three pilot interviews were conducted to optimize the interview guide and the validity of the present study. After the pilot interviews, the results and findings were discussed jointly with colleague researchers from a similar project to ensure that the collected data are suitable to explore teachers' beliefs about integrating research in teaching. The pilot interviews were conducted to increase the quality of the interview guide, to improve the formulation of the questions and to improve interview skills, to make sure beliefs were questioned. During the pilot interviews, one researcher conducted the interview and one researcher observed to see how the questions were interpreted, to monitor the time and to later provide feedback on the interviewer's skills.

In addition, a questionnaire about teaching efficacy was used. After the interviews, the participants received a digital questionnaire about teaching efficacy in Dutch. In the first part of the questionnaire, additional information about the questionnaire was provided, including instructions. The questionnaire is a translated version of a short, 12-item version of the Teachers' Sense of Efficacy Scale (Tschannen-Moran & Woolfolk Hoy, 2001). The original questionnaire can be found in Appendix 2. The translation was taken from a study about teaching efficacy among Dutch teachers (De Jong, van Tartwijk & Verloop, 2013). In that study, the reliability score of the overall test was .82 among beginning, selected from the group of teachers following the university teacher training (De Jong, van Tartwijk & Verloop, 2013). This instrument is designed to assess efficacy on three scales of teaching: student engagement, instructional practice and classroom management (Tschannen- Moran & Woolfolk-Hoy, 2001). Items vary from 'To what extent can you end disruptive behavior of students?' to 'To what extent can you differ in forms of assessments?' Participants in this study responded on a 7-point Likert scale, ranging from 1 (not good at all) to 7 (very good).

Procedure

Data for this study were collected between February and April 2020. Teachers were invited to participate in this study and contacted by email. The questionnaires were administered through Qualtrics. The questionnaires were conducted in Dutch, to ensure that participants interpreted the questions correctly. The questionnaire was conducted digitally, so teachers had the opportunity to fill in the questionnaire at a suitable moment for them and on a device of their preference. In total, 14 teachers filled in the questionnaire after the interviews. Participants also filled in a number ranging from 1 to 18 to match the questionnaires with the data of the interviews. The participants also filled in the date of the interview on the questionnaire, as an extra assurance. The interviews were numbered from 1 to 18. In the questionnaire, teachers' perceptions of their overall level of self-efficacy were measured.

Interviews took place partly in Utrecht Science Park and partly online. The interviews were audio-recorded to ensure a thorough future analysis. The audio recordings were transcribed. The interviews were typed according to the guidelines of the Verbatim Principle. Each of the respondents was given a pseudonym from P1 to P18. The transcripts were pseudonymized and summaries of the interviews were sent to the participants to ensure that the given answers are interpreted correctly.

Analysis

The data from the interviews were transcribed and analyzed in Nvivo. The analysis process included several phases.

During the first phase of the analysis, the researchers independently identified interview fragments that referred to teachers' beliefs. In total, 288 fragments regarding teachers' beliefs were coded and 139 fragments regarding teaching efficacy were coded. The fragments were

selected in which participants spoke about the role of research in teaching. After this process, the results were analyzed using a template analysis based on subscales of a questionnaire of Hu (2014) about lecturers' beliefs. The following beliefs of lecturers were addressed: reflection on research, students as participants, student research interests, critical disposition, research skills, creative disposition, teaching in research and current research in the domain. These beliefs were the base of the new template analysis and included beliefs, descriptions and examples. An overview can be found in Appendix A.

Teaching efficacy was coded as four codes, namely 'effect on students', 'effect on teachers', 'topic-specific teaching efficacy' and 'situation-specific teaching efficacy'. The teaching efficacy codes were based on literature by Chang et al. (2011) and Tschannen-Moran et al. (1998). The coding scheme can be found in Appendix A.

The researchers coded six interviews separately and compared and discussed the results of the coding process afterwards to ensure the quality and descriptions of the codes. The descriptions of the excising codes were adjusted and a new code was added, 'Reflection on teaching in research', because this code emerged from the data and did not fit within Hu's (2014) seven beliefs. Next, codes that appeared in the interviews were counted per teacher and listed accordingly (Appendix E).

Finally, fragments were read to understand lecturers' beliefs about the role of research in teaching. First, the codes about beliefs and teaching efficacy per teacher were counted in a frequency table in order to see which topics were often mentioned by a lecturer. The researcher has decided not to highlight one belief per lecturer, but to focus on the most frequently mentioned beliefs per lecturer. Therefore, per lecturer, the two or three most mentioned comments about beliefs appeared. The analysis was conducted for each lecturer separately.

After this process, the researcher explored the relation between the most mentioned beliefs per teacher and their teaching efficacy. This was done by reading the fragments of each code and each lecturer very carefully and looking for corresponding fragments among lecturers. The last step in this process was to explore a relation and look for similarities and differences between specific beliefs and fragments about teaching efficacy.

After this process, two predominant types of lecturers appeared. These two groups of lecturers mentioned the beliefs with the same codes the most. Within the first group of lecturers (P5, P7, P8, P12, P13, P14, P15, P16 and P17), the codes 'reflection on research' and 'critical disposition' often emerged together. An overview of this type of lecturers and their most mentioned codes can be found in Appendix F. In the second group (P3, P4, P6, P9, P10 and P18), the codes 'students' research interest', 'students as participants' and 'creative disposition' mostly emerged together. An overview of this type of lecturers and their most mentioned codes can be found in Appendix G. For example, the most mentioned codes by respondents P3 and P4 were 'creative disposition' and 'students' research interest'. This finding matches the corresponding interview fragments about teaching efficacy. This is discussed in more detail in the results section. To clarify the results, fragments from the interviews were used to illustrate teachers' beliefs about the role of research in teaching and teaching efficacy.

The questionnaire was used as an extra data source in order to increase the comprehensive understanding of teaching efficacy and teaching beliefs and improve the quality of this study. The results of the questionnaires were analyzed and turned into descriptive statistics per lecturer, which were then used to help interpret fragments about teaching efficacy to provide concrete insights into the research question.

Results

The role of research in teaching

All eighteen lecturers were positive about the role of research in teaching and emphasized the importance of basing their teaching on scientific research. An example from the data is the following quote: "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 to our students the latest ideas" (P12).

The data suggest that lecturers have multiple beliefs about the role of research in teaching. Per lecturer, two or three codes for most mentioned beliefs appeared. The four most mentioned codes found in the data, in the sequence of most coding references, were 'reflection on research in teaching', 'students' research interests', 'research skills' and 'reflection on teaching in research'. Descriptions of these codes can be found in Appendix A.

A difference was found between what lecturers want to teach students about research and what lecturers find important about the role of research in teaching. The underlying beliefs of lecturers have caused different approaches towards integrating research in their teaching. The results presume that there are two predominant types of lecturers, who differ in their approaches towards integrating research in teaching. In order to present the findings of this study clearer, the two predominant types of lecturers are defined as 'knowledge finders' and 'personal inspirers'. This dichotomy in approaches of teachers regarding research in teaching is discussed in more detail below.

As mentioned above, most lecturers had one or two predominant codes that shaped their approach of the role of research in teaching. Those predominant codes showed similarities. For example, the codes 'reflection on research' and 'critical disposition' often emerged together and

teachers generally had the same thoughts about the importance of research. For nine lecturers (P5, P7, P8, P12, P13, P14, P15, P16 and P17), these codes emerged (partly) together. These codes all have a strong emphasis on research findings and knowledge for both lecturers and students. Therefore, this predominant type of lecturers was defined as 'knowledge finders'. Knowledge finders want to teach students about current research and research findings to ensure the quality of education. This type of lecturer aims to teach students how to interpret research findings and to stimulate students to read scientific literature critically and to develop a critical attitude among students.

> […] I think the most important goal for students is that they are very critical on what they are doing and learning to be critical towards research findings. If students start an internship or a master thesis, they have to be extremely critical and accurate. If they are not, the experiment will fail. (P8)

Moreover, this type of lecturers emphasizes the importance of the role of research in teaching. Multiple participants stated that it is crucial for teachers to stay up to date with current research to ensure quality of education. These thoughts stem from the belief that lecturers should be continuously stimulated by (recent) research. This was mentioned multiple times by lecturers, as shown by the code 'current research in the domain'. The knowledge finders explained that it is lecturers' responsibility to be involved in research, so that they know what is going on in the field and can involve students in this.

> You can create a course without research, but that would be a completely different course and you will have the problem that teachers are not keeping up with the newest knowledge. It is so important for teachers to be continuously stimulated by research. (P7)

Furthermore, the codes 'research interest', 'students as participants' and 'creative disposition' mostly emerged together. For six lecturers (P3, P4, P6, P9, P10 and P18), these codes emerged

together and they had similar beliefs about the role of research in teaching. These lecturers had a strong focus on stimulating creativity and arousing students' interest in research. Therefore, this predominant type of lecturers was defined as 'personal inspirers'. This type wants to integrate research into teaching to increase students' enthusiasm about the scientific world and to stimulate students' creativity to conduct research of their own. Personal inspirers find it important to let students choose a subject of their own interests in order to activate and motivate these students to conduct their own research. They want to do so by creating a learning environment where students have a lot of autonomy regarding how and what they want to study.

> One of the basic principles is self-discovery learning, which is not only suitable for primary education, but especially in universities. If students have the ability to discover knowledge by themselves, they learn a lot more. (P6)

Respondent P9 stated: "If students only conduct research by a 'recipe', that won't lead to any creativity and only that creativity can give the ability to learn and to think by yourself" (P9).

Five out of six personal inspirers stated that research is only worth it if students are really interested in their research question. "…We try to let the students decide for themselves what to study. We therefore hope that it will become more part of themselves and they want to do so and not something that we tell them to do" (P6). This contrasts the knowledge finders, whose emphasis is less on creatively challenging students and more on teaching students to be critical towards knowledge and to be able to conduct and replicate research.

Teaching efficacy

A code that emerged very clearly in the interviews was 'topic-specific teaching efficacy'. Seventeen out of eighteen lecturers mentioned beliefs matching this code during the interviews. Lecturers in general said they do not feel comfortable teaching a subject that is not related to

their own field of research.

"The further away the subject is from me, the more difficult and less fun I find it to teach" (P13). Lecturers mentioned different reasons for feeling more comfortable teaching their own research topic. These varied, from being able to give good research examples to students and give inside information about their research process and findings to being able to answer critical questions from students, add more depth to a course and to make a good impression on students. P7 stresses: "That a teacher can convey it with finesse, that you feel: hey, this guy knows it, he understands it and can teach it. That is so special." In fact, some lecturers took it a step further and stated that one cannot be a good lecturer if one is not a specialist in one's own research discipline: "How can you provide education at top academic level if you are not a specialist in that field?" (P7)

In contrast, one lecturer mentioned that he sometimes experienced teaching in his own field of research as difficult, since he is unable to include all details of a specific topic in his lecture: "And therefore you are often most dissatisfied with the lecture about your own field. You know that there are so many more important details that you have to skip, because it is only a bachelor course" (P1).

Lecturers were asked different questions to gain insight in their sense of teaching efficacy. The first question was to what extent lecturers feel like they have the ability to motivate students and affect their learning outcomes. Fifteen lecturers felt like they could motivate students, but only up to a certain level. "…I think there should be some kind of basic motivation, or you won't get anywhere. But I do think that as a teacher you have the possibility to challenge and stimulate students' motivation" (P3).

What is notable about these results is that most lecturers feel like they can motivate students, but what differs is for *what* lecturers want to motivate students. Lecturers try to motivate students for different purposes. Four lecturers of the type knowledge finders mentioned they want to motivate students to choose their discipline, for example a specific master or an internship, or to make a contribution to research in that discipline. "We give lectures about our field of expertise in the bachelor and show students what we contribute to research, so that they can elaborate on that in their masters and perhaps choose our discipline" (P14).

In contrast, 'personal inspirers' want to motivate students to get the most out of themselves: "I like to challenge students, to push them to see how far they can go" (P3). These lecturers are less focused on motivating students to choose the lecturers' discipline and more focused on helping students to find a discipline or topic the student himself is passionate about. Multiple lecturers encourage students to pick a topic of their own interest and therefore increase their motivation to conduct research and finish their studies. "I want them to find their own path, for themselves the outcome will matter. If they can choose the topic of their interest, they will put much more effort into it" (P4).

A number of lecturers emphasized the interaction between lecturers and students and how that can affect motivation for both students and lecturers.

> You can influence the motivation of students by creating conditions. We say upon entering the master that we can only make this master work with the help of our students. Their experiences and different backgrounds are the capital on which we build our education. They therefore know that their input is considered important and is taken seriously. That works, and people are motivated to do more. (P9)

In the literature, teaching-efficacy is mostly defined as the influence the teacher has on students' motivation, but the data suggest that students have the ability to increase lecturers' motivation as

well. Since students have an effect on lecturers' motivation, it can be stated that students can also increase lecturers' sense of teaching efficacy. After all, teachers feel more enthusiastic and enjoy teaching more when students are more motivated. Lecturers attribute this interaction to investing in personal contact with students. The following quotes from interviews illustrate this reciprocity.

I think it is rewarding if students are motivated, if I can motivate a student that stimulates me as a teacher. It is a reciprocity. I expect my students to work hard. If students don't try their best, I am not motivated to help them out. (P3)

Relationship beliefs and teaching efficacy

There seems to be a relation between particular beliefs and the level of teaching efficacy. The lecturers of the type 'knowledge finders' made similar statements about the code 'topic-specific teaching efficacy' and stated that lecturers should be experts in a field to ensure the quality of their education. Moreover, lecturers of the type 'personal inspirers' made similar statements about teaching efficacy and they aim to help students find their catalyst.

The code 'topic-specific teaching efficacy' was most mentioned among the participants. Sixteen out of eighteen lecturers preferred to teach a topic within their own discipline, because they felt more comfortable doing so. Lecturers indicated that the level of teaching efficacy is dependent on the topic, as they state that they feel more confident when they are enthusiastic about a topic they are teaching. "It is the most fun to teach in your own discipline. That's the subject you are most into and feel the most enthusiastic about and I can give an overview of the current research and situation in the field" (P14).

Lecturers stated that their sense of teaching efficacy can be influenced by the topic they are teaching, by whether or not the topic matches the lecturers' field of interest and by whether or not the content knowledge matches the lecturers' mastery of the content.

> If you can tell students a lot about your discipline, you have gained a lot of experience and relevant knowledge over the years, thus you can answer all questions students ask and you can cite fun and interesting results and examples from research findings. If you just transfer knowledge from books, it feels further away from you and you can't really talk passionately about it, seems to me. (P14)

Knowledge finders expressed strong opinions on teaching in their own discipline. They believe that education should be provided by experts in certain disciplines only in order to motivate students to become enthusiastic about and participate in that field of research. These lecturers also stated that a lecturer cannot teach in a specific discipline if it is not his field of research. The goal of their teaching was to motivate students to choose their discipline and they indicated that this works best if the lecturer is an expert in that discipline and is aware of the latest technologies and research findings.

> I think a teacher is a very determining factor. This semester, I had 50 students and 25 students did not show up to lectures. You just lose them. And then you keep 25 students in your lecture and about 15 of them will conduct research in our discipline. As a result of our level of teaching, I am 100% sure of that. (P15)

Respondent P15 said: "When I first came to Utrecht in 2001, I wanted to make everyone enthusiastic for microbiology. I then adjusted my percentages down very quickly. I went down to 20%" (P15).

As an answer to the question 'Do you prefer to teach in your own discipline, which matches your own results?', P16 stresses:

That seems desirable for two reasons: first, it is desirable for students, because they will be

educated by experts in that field and second, it is also interesting for the teacher, because you are

able to speak with more knowledge and there is less preparation time for a lecture. (P16)

Conclusion and discussion

This study aims to gain deeper insight into the relation between teaching efficacy and

teachers' beliefs about the role of research in teaching. A closer relationship between research

and teaching can provide the basis for improving the quality of university teaching. Previous

studies showed a significant gap in lecturers' ideal way of teaching and their actual way of

teaching (Hu et al., 2014). This could indicate that lecturers do not consider themselves capable

enough to adequately integrate research into their educational practice. Multiple lecturers' beliefs

were studied to examine in what way integrating research into teaching relates to teaching

efficacy. The following research question was asked: 'To what extent do lecturers' beliefs about

research in teaching relate to teaching efficacy?' The findings of this study contribute to

understanding lecturers and illustrating the extent to which their teaching efficacy is related to

the integration of research into teaching. Moreover, results of this study can contribute to support

for lecturers, so they can feel comfortable and capable enough to successfully integrate research

in their teaching.

The most important finding of this study revealed that lecturers feel more confident

teaching in their own field of interest. This increases their sense of teaching efficacy. This

finding corresponds with the findings of Chang et al. (2011), namely that when a lecturer

perceives that the parameters of a course fall within his specialized area, his level of self-

confidence in teaching increases and vice versa. Multiple lecturers mentioned the advantages of

teaching in their specialized area, such as less preparation time and the ability to provide students with the most recent research findings, examples and knowledge. Lecturers said they find it easier to integrate research into their teaching when it concerned their own field, since this makes them feel more specialized and more experienced. This finding should serve as an important reminder of the reciprocal interaction between teaching self-efficacy and context conditions (Bandura, 1993).

This study provided insight into the fact that teaching efficacy does not exist in a vacuum; changes in environmental demands often require a reevaluation of one's efficacy to handle them. When lecturers are asked to teach courses outside of their primary area of expertise, to take on large lectures or small seminars with which they have less experience or to teach a group of students with whom they have never worked, they are required to renegotiate their teaching efficacy (Morris, 2011). University support at such times is needed to ensure a smoother adjustment for lecturers. Thus, teaching in lecturers' area of expertise enhances their teaching efficacy and this facilitates the process for lecturers to integrate research into teaching.

Visser-Wijnveen et al. (2010) state in their study that lecturers have multiple ways to integrate research into teaching successfully. This study has confirmed that lecturers acknowledge the importance of integrating research in their teaching, since all lecturers stated that they integrate research into their teaching. However, this study presumed that there are two predominant types of lecturers, who differ in their approaches of integrating research in teaching successfully. Lecturers in the present study who were defined as knowledge finders, placed a strong focus on knowledge transmission regarding (current) research findings. The knowledge finders advocated that only experts in the field are suited to teach in order to enhance the quality of education. These lecturers aim for students to become experienced researchers and to motivate

students to choose the lecturers' discipline.

In comparison, the personal inspirers focus more on students' understanding of the topic and enhancing their research interests. These lecturers integrate research in their teaching to introduce students to research and eventually stimulate them to be creative and conduct research in students' own field of interest. These findings are in line with Prosser and Trigwell's (1999) study about teaching approaches ranging from 'teacher-focused teaching', in which the instructional style is largely characterized by an information transfer from teacher to student; to 'student-focused teaching', which is characterized by the teacher's focus on conceptual change in their students' understanding of a topic. Students experiencing the student-focused approach are more likely to develop deep learning (Prosser and Trigwell, 1999). Benefits for learners who experience a student-focused approach include more opportunities for active learning, enhanced autonomy and greater ownership in learning (Lea, Stephenson, & Troy, 2003).

Lecturers defined as personal inspirers in this study echoed these findings and emphasized the importance of students' autonomy to design their own research project, to enhance their motivation and ownership in learning. This suggests that creating practices which encourage student-focused approaches can provide greater benefit for the student learning experience compared to more traditional, teacher-focused approaches. Prosser and Trigwell (1999) also found that teachers' enhanced sense of teaching efficacy may be related to teaching approaches characterized by greater innovation and a focus on students' conceptual and learning processes.

To conclude, this study provided new insights regarding a relationship between teaching efficacy and lecturers' motivation to teach. Broadly speaking, the lecturers felt like they could affect students' motivation up to a certain level. Lecturers mentioned the interaction between

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lecturers and students and how that can affect the motivation of both students and lecturers. At the same time, a lecturer who feels enthusiastic is more confident, meaning his teaching efficacy increases. In addition, lecturers stated that they found teaching more fun when they were teaching their own topic. This is in line with earlier findings by Allinder (1994) and Hall, Burley, Villeme, & Brockmeier (1992). It is therefore important that lecturers teach a topic that matches their own research field, which increases their sense of teaching efficacy via motivation. Therefore, teaching in your own discipline makes it easier for lecturers to integrate research into teaching,

Conclusively, it can be stated that teaching efficacy affects lecturers' teaching approaches. Underlying beliefs determine what lecturers want to teach their students about research and how they give substance to their teaching approaches. Teaching in their area of expertise increases teaching efficacy and therefore enhances students' and lecturers' motivation. Accordingly, teaching efficacy has shown positive effects on lecturers' ability to integrate research in teaching.

As with most studies, this one has shortcomings that limit the generalizability of the findings. These include the fact that the participants were volunteer professors from two faculties, whereof the participants had an average of 25.55 years of experience as lecturers. It is generally assumed that teachers' sense of teaching efficacy develops with increasing teaching experience, so these results may not be generalizable. Finally, the questions asked regarding teaching efficacy were mainly focused on the teaching practice. This has led to new insights regarding teaching efficacy at universities and the importance of and preference for lecturers to teach in their own field of expertise. A follow-up study is required to further understand the manner in which teaching efficacy impacts both the teaching and the research practice.

All in all, this study represents an encouraging step in the examination of teaching efficacy, particularly in the rarely explored context of research-intensive universities. Lecturers' teaching efficacy, and in particular topic-specific efficacy, is closely aligned with lecturers' success of integrating research in teaching. Future qualitative studies can be used to refine the understanding of how teaching efficacy is related to both teaching and research practices. In conclusion, more qualitative studies may be needed to sharpen and broaden knowledge about teaching efficacy in universities and should be focused on different contexts and a proper balance of novel and experienced lecturers.

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Appendix A Table 1

Table 1

Final Coding Scheme and Illustrating Examples of Teachers' Beliefs and Teaching Efficacy.

Beliefs	Definition	Example
Reflection on research in teaching	The lecturer indicates that he/she believes that research in teaching is valuable because: • it stimulates students to learn about research findings • it teaches students to pay attention to the way research is carried out • it makes the scientific research process an essential part of the curriculum • it pays attention to research methodology	*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)*
Reflection on teaching in research	The lecturer indicates that he/she believes that teaching in research is valuable because: • it stimulates the lecturer to think critically about their own research • participation in research helps teachers to get a bigger data-set	*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)*
Students as participants	The lecturer indicates that he/she believes that research in teaching is valuable because: • he/she values the students' contribution to research • he/she considers students' participation in research important • he/she asks students to make contribution to research	*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 involves students in scientific studies
- participation in research forces students to participate

Research skills	The lecturer indicates that he/she believes that research in teaching is valuable because: • it increases students' ability to analyse complex situations • it develops students' research skills • it increases students' ability to conduct research • participation in research aims to stimulate development of research skills	*Well, students should learn different methodological ways of researching. Then, they can learn how to plan research, and how to compare different situations with each other (P9)*
Students research interests	The lecturer indicates that he/she believes that research in teaching is valuable because: • it motivates students to learn more about the discipline • it increases students' enthusiasm about the scientific world • it encourages students' interest for research • participation in research aims to stimulate students' enthusiasm	*How can you possibly get out of your bed if you aren't motivated by what you are doing? (P7)*
Critical disposition	The lecturer indicates that he/she believes that research in teaching is valuable because: • it develops students' critical attitude • it stimulates students not to be easily satisfied with an explanation	*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 stimulates students to read scientific literature critically
- it stimulates students to ask critical questions about their work
- it stimulates students to critically reflect on the impact of research in society

Creative disposition	The lecturer indicates that he/she believes that research in teaching is valuable because: - it fosters students' sense of innovation for renewments in society or in research - it encourages students to have creative ideas of their own regarding innovation in society or in research	*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)*
Current research in the domain	The lecturer indicates that he/she believes that research in teaching is valuable because: - it increases students' awareness of the research issues currently being discussed - it shows students the kind of studies carried out in areas related to hot topics in the research field - it makes links to current research practices	*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)*

Teaching Efficacy	Description	Example
Effect on students	The lecturer indicates that he/she believes that he/she can('t) affect students because: - he/she thinks he/she has(n't got) the ability to affect students' achievements and/or learning performances	*Yes, I surely think that you can influence motivation. By shaping conditions and making demands. And also to listen to what people have to say. I mean, we tell students at the beginning of their masters that we can only make the study work on the behalf of students. What*

	• he/she thinks he/she has(n't got) the ability to affect students' engagement • he/she thinks he/she has(n't got) the ability to affect students' motivation • he/she thinks he/she has(n't got) the ability to affect students' behaviour	*they bring to experience and different backgrounds is the capital on which we build our education. (P9)*
Effect on teachers	The lecturer indicates that he/she believes that he/she can('t) : • cope with unexpected events or difficulties that occur in the classroom • become more experimental with instructional strategies (such as working in pairs, using small groups, case studies) • feel more confident as he/she has a feeling of enthusiasm while teaching • feel more confident as he/she prepares and organizes classes properly (such as making appropriate presentations, selecting motivating and relevant literature) • feel more confident in designing instructional courses (such as designing curriculum)	*What I like, I have a lecture about diversity and inclusion, which is not at all my specialty, but I do think it is very interesting and I read a lot about that topic (P6).*
Topic specific Teaching efficacy	The lecturer indicates that he/she believes that the level of teaching efficacy is dependent on the topic, for example: • The topic (doesn't) match(es) with the teachers' field of interest • The content knowledge (doesn't) match(es) with the lecturers' mastery of that content	*The closer it gets to my field of research, the more fun I have to teach. The better my examples are and the more it matches with my previous experiences. This had advantages of course.*
Situation specific Teaching efficacy	The lecturer indicates that he/she believes that the level of teaching efficacy is dependent on the situation, for example: • The lecturer feels more comfortable in lectures than in small practica or tutorials or the other way around	*I prefer teaching in small tutorials. 25 is the maximun of students, I can work with that. I don't want to do lecturers for 200 people (P6)*

- The lecturer feels (un)comfortable when being observed by a colleague
- The lecturer feels (un)comfortable with a specific class of students
- The lecturer feels (un)comfortable with new forms and contexts of teaching

Teachers' Sense of Efficacy Scale[1]

Teacher Beliefs

Directions: This questionnaire is designed to help us gain a better understanding of the kinds of things that create difficulties for teachers in their school activities. Please indicate your opinion about each of the statements below. Your answers are confidential.

1. How much can you do to control disruptive behavior in the classroom?
2. How much can you do to motivate students who show low interest in school work?
3. How much can you do to get students to believe they can do well in school work?
4. How much can you do to help your students value learning?
5. To what extent can you craft good questions for your students?
6. How much can you do to get students to follow classroom rules?
7. How much can you do to calm a student who is disruptive or noisy?
8. How well can you establish a classroom management system with each group of students?
9. How much can you use a variety of assessment strategies?
10. To what extent can you provide an alternative explanation or example when students are confused?
11. How much can you assist families in helping their students do well in school?
12. How well can you implement alternative strategies in your classroom?

Appendix C Translated TSES

Teachers' Sense of Efficacy Scale[1]

Teacher Beliefs

Aanwijzingen: Deze vragenlijst is bedoeld om ons te helpen om een beter beeld te krijgen van zaken die problemen op kunnen leveren bij docenten tijdens studieactiviteiten. Geef hieronder uw mening over elk van de verklaringen. Uw antwoorden zijn vertrouwelijk.

1. Hoe goed kunt u vragen voor studenten formuleren?
2. Hoe goed kunt u bij studenten een positieve houding ten opzichte van leren ontwikkelen?
3. Hoe goed kunt u variëren in vormen van toetsing?
4. Hoe goed kunt u een einde maken aan storend gedrag van studenten?
5. Hoe goed kunt u studenten de regels na laten leven?
6. Hoe goed kunt u aan verschillende groepen studenten effectief onderwijs geven?
7. Hoe goed kunt u alternatieve uitleg of voorbeelden geven wanneer studenten iets niet snappen?
8. Hoe goed kunt u studenten ervan overtuigen dat zij goed kunnen presteren op de universiteit?
9. Hoe goed kunt u een student kalmeren die een college verstoort of onrustig is?
10. Hoe goed kunt u studenten motiveren die weinig interesse in studeren hebben?
11. Hoe goed kunt u verschillende werkvormen in uw onderwijs toepassen?

Appendix D Interview Guide

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 is masterscripties, werkgroep-begeleiding of door literatuur te gebruiken in hoorcolleges. Ook zijn we benieuwd naar mogelijkheden voor docenten qua dingen die u nog zou willen leren.
- Wij zouden het interview graag willen opnemen. Heeft u daar bezwaar tegen?
- We willen u nog even 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?

Algemene vragen
- 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 jij geeft aan studenten heb je 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 1: Hoe geven docenten onderzoek vorm binnen het onderwijs?
1. Wat wilt u studenten leren over onderzoek binnen [naam vak]?
2. Waarom is dat belangrijk voor studenten?
3. Hoe pakt u dat aan in colleges?
4. Zijn er nog andere manieren waarop u dat aanpakt?
5. Bereikt u wat u wilt bereiken bij studenten met die aanpak?

Centrale vraag 2: Teaching Efficacy
1. Heeft u voorkeur om les te geven in wat overeenkomt met uw onderzoeksgebied?
2. Kunt u een situatie schetsen waarin u het naar uw mening goed lukte om een student goed iets bij te brengen over onderzoek?
3. Kunt een situatie schetsen waarin dit minder goed lukte?
4. Op welke manier kunt u het gedrag en leerresultaten van studenten beïnvloeden?
5. Zijn er dingen die u nog beter onder knie wilt krijgen in het geven van onderwijs?

6. Heeft u het idee invloed te hebben op motivatie van studenten? En zo ja, op welke manier?

<u>Centrale vraag 3: In hoeverre geeft de onderwijsomgeving ruimte onderzoek in onderwijs te integreren?</u>
1. Vindt u het leuk om studenten vertrouwd te maken in onderzoek? Wat maakt het leuk?
2. Wat zou het makkelijker maken voor u om studenten te leren over of van onderzoek binnen [naam vak]?
3. Waarom?
4. Hoe integreren uw collega's onderzoek in onderwijs? Doen ze dat?
5. Welke zaken hinderen u bij het vertrouwd maken van studenten met onderzoek?
6. En welke stimuleren dit juist?

<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 uw integratie van onderzoek in uw lespraktijk?
- Alvast ontzettend bedankt voor uw deelname. Wat er nu gaat gebeuren is het volgende:
  - o Binnen twee weken zal ik het interview transcriberen en anonimiseren en dan ga ik het naar u sturen als een member-check.
  - o We gaan u een digitale vragenlijst toesturen over self-efficacy. We hopen dat u deze wilt invullen. Het zal ongeveer X minuten duren.
  - o Dan willen we u nu nog vragen om het informed consent formulier te tekenen. Deze heeft u thuis al kunnen tekenen.
- Hartstikke bedankt voor uw deelname en heeft u nog vragen, neem vooral contact met me op!

Appendix E Frequency tables concerning Teachers' Beliefs and Teaching Efficacy

Table 2
Frequency tables concering Teachers' Beliefs and Teaching Efficacy

Participants	Creative disposition	Critical disposition	Current research in the domain	Reflection on research in teaching	Reflection on teaching in research	Research skills	Students as participants	Students research interest
P1		8		4	4	2		1
P2	1	3	5	2		5		
P3	6	3	2	2	6	2	3	1
P4			2	7	8		8	9
P5	3			5	1	1	5	
P6	5	2	3	1	3	2	1	3
P7	2		6	3	1	2	1	1
P8	0	2	2					
P9	5	3	1		1	2	6	
P10	3			7		1	2	
P11	1			4	4			
P12	2	3	2	6	2	3	1	4
P13				2	1	3	4	3
P14			3	4		4	3	5
P15				3	1	5	2	
P16				1		3		
P17			5	5		2		2
P18		3		2	1			4

Table 3

Frequency Table concerning Teaching Efficacy codes

Participants	Effect on students	Effect on teachers	Situation Specific TE	Topic Specific TE
P1	6			
P2	3	5		
P3	11	2	3	1
P4	5	3		1
P5	7	2		2
P6	3	3	1	3
P7	1	1		4
P8	2			2
P9	4	7	2	2
P10	6			
P11	4	3		1
P12	1	2		1
P13	2		4	
P14	3			1
P15	2	1		
P16		1		1
P17	3	1		1
P18	3		1	2

Appendix F Table 4

Table 4

Most Frequent mentioned Beliefs Codes among Personal Inspirers

Participants	Creative disposition	Critical disposition	Current research in the domain	Reflection on research in teaching	Reflection on teaching in research	Research skills	Students as participants	Students research interest
P3	6	3	2	2	6	2	3	1
P4			2	7	8		8	9
P6	5	2	3	1	3	2	1	3
P9	5	3	1		1	2	6	
P10	3			7		1	2	
P18		3		2	1			4

Appendix G Table 5

Table 5

Most Frequent mentioned Beliefs Codes among Knowledge Finders

Participants	Creative disposition	Critical disposition	Current research in the domain	Reflection on research in teaching	Reflection on teaching in research	Research skills	Students as participants	Students research interest
P5	3			5	1	1	5	
P7	2		6	3	1	2	1	1
P8		2	2					
P12	2	3	2	6	2	3	1	4
P13				2	1	5	4	3
P14			3	4		4	3	2
P15				3	1	5	2	
P16				1		3		
P17			5	5		2		2

Appendix H

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. Naast het interview 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
Onafhankelijke onderzoeker (voor klachten): Prof. dr. J. van Tartwijk, FSW/UU, j.vantartwijk@uu.nl

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)

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
Onafhankelijke onderzoeker (voor klachten): Prof. dr. J. van Tartwijk, FSW/UU, j.vantartwijk@uu.nl

Appendix I Information Letter for potential participants

RECRUITMENT MAIL FOR POTENTIAL PARTICIPANT

Dear Dr. X,

At Utrecht University we are conducting research into lecturers' perceptions of research and teaching. This research is carried out by Dr. Christel Lutz (https://www.uu.nl/staff/cilutz/Profile) and Dr. Mayke Vereijken (https://www.uu.nl/staff/MWCVereijken), here in cc. We are their research assistants on this project. We are approaching you with permission of your dean.

With this email we would like to ask you whether we may interview you. We are interested in your experiences in research and teaching at Utrecht University, the content of your expertise and of your course(s), and the place that research and teaching hold for you in your work as an academic. The interview will take approximately one hour, and no preparatory work on your part is required.

We very much hope that you will allow us to interview you. Please know that we are of course working in accordance with all rules regarding privacy, data protection, and informed consent. If you are willing to participate we will explain this in more detail, but it is of course important to say at this time that your interview will be treated confidentially and filed anonymously, and that no one besides Christel Lutz, Mayke Vereijken and ourselves will have access to the data. We will share our research report with you, if you would like.

Please let us know whether you would allow us to interview you?

Warm regards, on behalf of Christel Lutz and Mayke Vereijken,

Truke Krijnen, Sander van der Lee and Aniek van den Ham

Appendix J FETC Form

Section 1: Basic Study Information

1. Name student:

Aniek Pauline van den Ham

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

Mayke Vereijken and Christel Lutz

3. Title of the thesis (plan):

Teaching Efficacy and the role of research in teaching

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?

No

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 ☐ 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?)

Yes
If yes:

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?

Teachers at University Utrecht. Age group 29-67

12. Will be participants that are recruited be > 16 years?   Yes
13. Will participants be mentally competent (wilsbekwam in Dutch)?   Yes
14. Does the participant population contain vulnerable persons?
    (e.g., incapacitated, children, mentally challenged, traumatized,   No
    pregnant)
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. Participants are mentally competent as they sketch their beliefs and feelings of competence regarding 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 an independent research who participants can approach for complaints about the way the research team treated them.

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

One hour for the interviews, max 90 minutes

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?

here 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.)

18.

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

Via email

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, the informed consent letters in the Appendix.

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. Being participant in this study is voluntary and participants are free to quit whenever they want.

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

No

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

Jan van Tartwijk.

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?

Jan van Tartwijk.

Section 4: Data management

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

Truke Krijnen, Sander van der Lee and me, Aniek van den Ham. The principle investigators (Lutz and Verwijken) are responsible for managing 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. In addition, we will ask academics for documents related to their personal and work context. These documents are 1) a description of the educational program in which they teach; 2) a description of the research program and 3) a teaching statement reflecting their beliefs about good teaching.

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

No

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

No

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 conducted by Mayke Vereijken and Christel Lutz.

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

Yes. It can be used for publication after the thesis's if Mayke and Christel are going to elaborate on the research.