Teaching in Higher Education
Critical Perspectives

ISSN: 1356-2517 (Print) 1470-1294 (Online) Journal homepage: www.tandfonline.com/journals/cthe20

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To cite this article: Mayke W. C. Vereijken & Roeland M. van der Rijst (2023) Subject matter pedagogy in university teaching: how lecturers use relations between theory and practice, Teaching in Higher Education, 28:4, 880-893, DOI: 10.1080/13562517.2020.1863352

To link to this article: https://doi.org/10.1080/13562517.2020.1863352

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Published online: 11 Jan 2021.

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TEACHING IN HIGHER EDUCATION
2023, VOL. 28, NO. 4, 880–893
https://doi.org/10.1080/13562517.2020.1863352

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Subject matter pedagogy in university teaching: how lecturers use relations between theory and practice

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ABSTRACT
A central aim of university teaching is to transform students' conceptual understanding of disciplinary knowledge. In order to achieve this, lecturers make decisions on subject matter and teaching approaches. However, there seems to be little attention for the role of subject matter pedagogy in university teaching. This study aims to explore a knowledge base of teaching through lecturers' accounts of a relation between subject matter, theory and practice in Child and Education Studies (CES). Four narratives of the lecturers suggest that subject matter is central to how a relation between theory and practice is taught. At the same time, orientation towards teaching was relevant to teaching subject matter. Furthermore, the analysis revealed that every lecture runs into their own limits when teaching theory and practice. The findings suggest that university pedagogy is informed by specific subjects rather than the discipline. Implications for teaching and academic development are discussed.

ARTICLE HISTORY
Received 7 July 2020
Accepted 6 December 2020

KEYWORDS
University teaching; disciplines; research-teaching nexus; threshold concepts; pedagogical content knowledge

Introduction

A central aim of university teaching is to stimulate students' ways of thinking about ideas and concepts in order to transform their understanding of a knowledge domain (e.g. Ashwin, Abbas, and McLean 2014). To that end, lecturers stimulate student reflection on relations between theory and professional practice in a field. Stimulating this reflection inevitably demands from lecturers to engage in a process of (re)consideration on what is taught, how and why. Until now, the question of how and why lecturers teach to university students has been answered in generic terms (e.g. Norton et al. 2005). However, lecturers can make decisions on teaching theory and practice informed by subject matter (Barradell 2013). The present study aims to explore relations between subject matter, theory and practice in the teaching of university lecturers. Findings from this study can inform initiatives to stimulate lecturers'

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reflections on what is taught, how and why to promote student understanding of disciplinary knowledge.

University teaching

An important aim of university teaching is to transform ways in which students see the world and the disciplinary knowledge that they are studying (cf. Meyer and Land 2005). Previous studies show that lecturers' conceptions of teaching as facilitating learning as opposed to transmitting knowledge have a strong potential to foster such conceptual change in students (Kember and Kwan 2000; Norton et al. 2005; Trigwell and Prosser 1996). Generic conceptions of teaching (i.e. student-centered or teacher-centered conceptions) are quite commonly used in higher education aiming to explain lecturers approaches to teaching (Kane, Sandretto, and Heath 2002; Kember and Kwan 2000; Trigwell and Prosser 1996). As opposed to generic conceptions, there has been an emphasis on the relevance of discipline and subject matter for university teaching (e.g. Ashwin et al. 2020, 108). Shulman (2005, 52) argued that the ways in which students are educated for their new professions is closely linked to the discipline taught (i.e. signature pedagogies). The notion of signature pedagogies implies that a discipline as a whole is to be understood by students through an unique teaching approach (e.g. bedside teaching in medical education, case-based teaching in law). However, recent studies into teaching and learning indicate that lecturers make decisions based on their knowledge of subject matter and appropriate teaching approaches to create transformative learning experiences for that particular subject matter (Barradell 2013; Oleson and Hora 2014). These findings suggest that closer investigations on subject level are needed to gain deeper understanding of university teaching approaches. Meyer and Land (2005) suggest that particular subject matter, namely threshold concepts enable students to understand, interpret or view things in new ways. Threshold concepts are conceptual gateways that expose formerly hidden interrelations of something and as such they are transformative, unlikely to be forgotten or unlearned and once students understand these usually hard concepts a whole new world opens up (Meyer and Land 2005). In this study, the notion of threshold concepts was used to enable lecturers to focus on subject matter that is crucial to change student understanding of a knowledge domain. This study aims to explore a subject-specific knowledge base of university teaching. Findings from this study can inform initiatives to promote the quality of university teaching.

Studies into teaching and teacher education suggest that teacher knowledge is closely related to teachers' experiences and contexts and includes teachers' knowledge about the content and beliefs about their own teaching practice (Barendsen and Henze 2019; Verloop, van Driel, and Meijer 2001). To understand the knowledge that is needed for science teaching, the concept of pedagogical content knowledge (PCK) has been introduced as an unique form of knowledge for teaching that makes a content domain understandable for learners (Shulman 1986). Recent studies in science and physics suggest that lecturers, like teachers, use an integrated set of conceptions and knowledge based on subject matter and pedagogical knowledge in university teaching (Fraser 2016; Jang, Tsai, and Chen 2013; Winberg et al. 2019). In this study, we focus on the individual lecturer as this is the person who makes a content domain understandable for students. Magnusson, Krajcik, and Borko (1999) described PCK as a unique type of knowledge

for teaching which is based on orientation to teaching science and knowledge of curricula, assessment, instructional strategies and students' understanding. In this study we use PCK as a sensitising concept to capture academics' knowledge base of university teaching about theory and practice. Shulman (1986, 8) defines PCK as 'that special amalgam of content and pedagogy that is uniquely the province of teachers, their own special form of professional understanding.' So, a complex relationship between subject matter and generic pedagogy informs how teachers make subject matter accessible to students. In line with the notion of PCK, we define subject matter in this study as a specific topic that is taught within a module and subject matter pedagogy as the way in which lecturers teach specific subject matter.

This study has been conducted in Child and Education Studies (CES) as an example of a soft-applied discipline (Biglan 1973). CES was selected for this study as it can be expected that teaching in applied disciplines requires careful consideration of the relation between theory and practice. Furthermore, findings from this study could inform teaching theory and practice in other applied disciplines such as medicine, law and clinical psychology.

Teaching theory and practice

The integration of research into university teaching has strong potential for fostering a deeper understanding of disciplinary knowledge (Hua and Shore 2014; Vereijken et al. 2018). There are multiple ways in which research is articulated in teaching in order to foster student understanding of disciplinary knowledge. Some examples are assignments in which students apply research findings or theoretical models to hypothetical or real professional situations that are new to students (e.g. case-based teaching), stimulating student reflection on practical implications of research findings (e.g. group discussions) and solving practical problems using research processes (e.g. problem based learning, authentic practices) (cf. Healey and Jenkins 2009; Visser-Wijnveen 2013). On a different level, these examples illustrate that a relation between theory (i.e. research findings, models) and practice (i.e. professional situations, problems) is encapsulated in teaching disciplinary knowledge. In this study we use the term '*teaching theory and practice*' referring to teaching about a relation between theory and professional practice in order to foster student understanding of disciplinary knowledge. We choose this term, as lecturers also integrate research into teaching to foster student learning about current research, research methods and doing research in which 'practice' refers to research practice (Griffiths 2004; Van der Rijst et al. 2013).

Previous studies into university teaching have resulted in multiple frameworks and typologies to describe ways in which lecturers incorporate research in teaching (Griffiths 2004; Healey and Jenkins 2009; Visser-Wijnveen 2013; Zamorski 2002; Zimbardi and Myatt 2014). These typologies are helpful to portray the great variety of ways in which research is or could be integrated in university teaching. At the same time, typologies can imply that the role of research in teaching, including teaching theory and practice, has the same meaning for every lecturer. In fact, a relation between research and teaching can be constructed individually and thus differ between lecturers. A reason for this is that a knowledge base of teaching, as we aim to explore

in this study, is closely related to lecturers' individual experiences with teaching subject matter (cf. Barendsen and Henze 2019). Therefore, this study focuses on the accounts of teaching from individual lecturers.

Aim of study

Our analysis targets four lecturers representing four different domains relevant to CES (i.e. learning disabilities, student learning, behavioural problems and clinical work). These domains were chosen to cover the breadth of the CES programme. Specifically these lecturers indicated to explicitly focus their teaching on a relation between theory and practice. For our analysis, we use rich descriptions of teaching CES in a research intensive university. We aim to explore how relations between subject matter, theory and practice are constructed in the accounts of lecturers.

Method

Data collection and instruments

In order to explore the meaning of theory and practice in teaching we started with a survey conducted in November 2018. In this so-called content representations survey (CoRes; Hume and Berry 2011), the lecturers explicated how they teach concepts that support students in their transition to beginning scientist practitioners. In a preliminary study, these concepts were clustered by twelve lecturers into *learning and developmental disabilities*, *scholarly research* and *theory and practice*. The CoRes is designed to elicit PCK involved in teaching specific concepts and consists of nine open items (Hume and Berry 2011). Examples of items are 'What I intend the students to learn about this concept is … ', 'Knowledge about students thinking which influences your idea of teaching' and 'Specific ways of ascertaining students understanding or confusion about this concept are … '. The CoRes were used to gain understanding of pedagogical subject matter in CES and provided the authors with an insight into the way specific concepts are taught in CES.

The lecturers were asked if we could observe their lecture (i.e. four lectures in total). During the lecture, we made field notes using an open ended observation scheme based on ways in which lecturers link research and teaching (cf. Visser-Wijnveen et al. 2012). In line with Visser-Wijnveen et al. (2012) we expected lecturers to use research in lectures (1) to illustrate phenomena occurring to practitioners, (2) to foster an academic disposition and take position in practices of practitioners, (3) to introduce literature, after which students conduct practical assignments, (4) to follow in the practitioner's footsteps and (5) to participate in the lecturer's research or practice. Immediately after the lecture individual semi-structured interviews were held with the lecturers. The aim of the interviews was to elicit lecturers' knowledge and experiences of teaching theory and practice as used in the classroom. The central question in this interview was: 'At what moments in the lecture have you focused on theory and practice?'. Prompts such as 'What did you intend students to learn about theory and practice?' and 'Did it go according to your plan?' were used to make sure lecturers elaborated on their intentions, evaluations and considerations made. The interviews took place between December 2018 and March

2019 and lasted between 35 and 45 min each. Furthermore, we asked lecturers to formulate teaching statements as one-page written texts describing their orientation to teaching in CES. Ethical approval was granted by the research ethics committee of the graduate school of teaching.

Participants

We drew on our network in the CES department of a research intensive university in the Netherlands. Twelve lecturers volunteered to work with us in the preliminary study. Out of these twelve we purposefully selected the lecturers based on the following criteria: (1) the subject matter they taught, so that the cases should reflect the breadth of the educational programme; (2) we chose the lecturers who experienced to focus their teaching on explicating a connection between theory and practice through subject matter and (3) the lecturers taught in the current semester. As a result, four lecturers were included in the in-depth case study. Table 1 provides the background information of the lecturers. Please note that pseudonyms are used. All lecturers have a minimum of six years teaching experience in a range of subjects and the amount of teaching can be considered to be substantial.

Analysis

Transcribed interviews were analysed to identify aspects of knowledge and experiences that lecturers used and gained in teaching theory and practice using a constant comparison analysis based on all five elements of PCK as sensitising concepts (Magnusson, Krajcik, and Borko 1999). These elements included lecturers' orientation towards teaching CES, knowledge of the curriculum, student understanding, instruction and assessment. Fragments referring to PCK from two interviews were inductively coded based on descriptions of PCK-elements from Magnusson, Krajcik, and Borko (1999). Next, the two authors discussed the codes until consensus was reached. Then the first author coded the other transcripts accordingly. After that, attention was paid to relations that lecturers described between these aspects in the interview, the CoRes, field notes and the teaching statement. We developed PCK-maps (cf. Park and Chen 2012), one per lecturer which displayed the intensity of the relations between aspects of their knowledge and experience in order to identify differences and similarities between lecturers. A

Table 1. Lecturers' background information.

Lecturer	Age (years)	Highest degree	Teaching experience (years)	Teaching subject	Undergraduate year (class size)	Position	Teaching appointment (fte)
Margaret	30	Master's	6	Clinical diagnostics	3 (24 students)	Teaching-only	1.00
Kate	39	PhD	7	Social emotional functioning	3 (60 students)	Research & teaching	0.52
Susan	34	PhD	9	Learning disabilities	2 (120 students)	Teaching-only	0.80
Arthur	41	PhD	12	Reading disabilities	4 (20 students)	Research & teaching	0.52

final step was to develop the narratives by reading and re-reading the raw and processed data (cf. McAlpine 2016). Guiding questions in developing the narratives were 'How does theory and practice look like in the teaching of this lecturer?', 'What does teaching theory and practice mean to the lecturer?' and 'What moments or events are crucial to the lecturer when teaching?'. Using multiple instruments and combining the data during data-analysis allowed us to gain in-depth insights into four lecturers teaching theory and practice and to promote trustworthiness of the study (cf. triangulation, Cohen, Manion, and Morrison 2007).

Margaret

Margaret, a 30-year-old lecturer has been teaching CES to undergraduates for the past six years. After Margaret's graduation in CES, she started off her teaching career besides being a professional practitioner. At the time of data collection she is finishing her PhD. In teaching theory and practice she focuses on explicating the relevance of theory for the profession. Her goal is to teach students that a practitioner always works with and according to models which provide deeper insight and guidelines for action. Besides that, models are important for making professional practice traceable. To that end, the concept of an explanatory hypothesis is crucial.

> [In the last lecture I mainly focused on] a connection to theory. That connection is particularly present in developing an explanatory hypothesis, students really need to apply theory to a client. In this case, the client represents practice. The aim of this is to explain problem behaviour. That is the core of the profession, I think. We all can follow protocols, we all can conduct interviews in the end when you're a practitioner, but that explanatory element that characterises an academic pedagogue. Those who are able to connect theory to practice and to decide 'Ok, how does this generic theory relate to this specific client?'.

She purposefully does not tell students that using diagnostic models in practice mainly happens implicitly, because explicitly practicing these steps is needed for students to understand the problem analysis. She aims to deepen student understanding of the problem analysis. Using her knowledge of different ways in which student learn to approach the problem analysis and difficulties that students experience is of great importance to her.

> In the problem analysis that students do I have to dwell longer on the preliminary phase the client has gone through, because students lose themselves in details. […] The good students then take the lead, while others do not yet fully understand […]. The problem analysis seems to be a simple step for students, but presenting the model as a checklist [of information that needs to be collected] will result in students taking for granted everything the client says. Clustering the information from the client's story is quite difficult. Students should experience how to reduce that information to a selection of problem behaviours, to distinguish main issues from side issues. That is a skill they must acquire. Using a professional lens instead of relying on what the mother said. It's about taking a stance as an pedagogue.

Her teaching approach is aimed at making students aware of the requests for help that they will encounter in practice. Fostering this kind of student awareness was reflected in the assignments. She adapts her own instruction to the curriculum. Students live through the diagnostic model including the legal aspect involved in actions of a pedagogue.

> I think the legal aspect is also important, especially at the beginning [of the course]. When clients enter, you actually have to deal with a lot of guidelines and rules that students need to be aware of. They follow a course, a whole course in legal and ethical aspects, but that is often perceived as uninteresting, but they have to realise - again - that it has to do with what you will ultimately do in practice. And that you have to know something about those rules and the professional code. That is what it boils down to. So there I also made the link between theory and practice.

At its core, Margaret's narrative is aimed at demonstrating the relationship between theory and practice in order for students to gain a deeper understanding of subject matter, although she is aware of difficulties for students in understanding and learning the material. This is evident from both her approach to problem analysis (see above) and her teaching statement.

> In my opinion, the lecturer has various responsibilities in the learning process of students, both knowledge transfer as coaching. The lecturer is responsible for the quality of the education provided and must ensure that the learning objectives and relevance are clear to students. It is important to teach students to reflect on their personal and professional actions […] so that their actions can are traceable. To stimulate this reflection it is important that lecturers are involved and accessible, so that students acknowledged. This promotes student motivation and involvement in the subjects and creates a safe atmosphere to work on personal reflection.

Arthur

Arthur is a university teacher aged 41 and has been teaching in the CES programme for twelve years. His research interests are in the field of children's reading difficulties, particularly eye tracking. For him, the link between theory and practice lies in the practical implications of studies into reading tools that help children with reading comprehension. His orientation and teaching approach can be described as didactic, focusing on transfer of research findings to students. He hardly seems to realise that promoting learning requires more than sharing information with students. He essentially aims to teach students that research results can be interpreted in several ways, although he has doubts whether students are open to this. His lecture covered interventions that focus on the concepts of spacing, visual crowding (i.e. distance between letters) and word preview, translated into a tool called 'Reader' (see excerpt below).

> There is a whole jungle of digital applications out there that are simply thrown into the market, which is something practical. I think you should learn to look at that carefully. I picked this specific example about Reader because I know more about it […]. [I discuss] possible pros and cons all the time. If you want to talk about practical reading tools, the first thing to know is what they can do, both positive and negative, which is the easiest dimension to think about [for students]. […]. In this lecture I was lucky, because a student asked me about transfer. Her question was whether we can help children to read better later in life with Reader or whether this only works shortly after the training. I responded by saying that you have to think about the ultimate goal. That was a little too abstract, but in a way her question was about the practical usefulness of Reader.

In his teaching on theory and practice, his instructional strategy is to some extent tied with his experience and assessment of student learning, but even more closely tied to his own expertise and interest.

> I think reading tools are a very interesting topic. That is one reason why the link between theory and practice is easy to explicate. It is all the easier to keep talking about this. The only danger -every time I give this lecture- is that the subject is really too narrow for some. Then I do not reach my goal, because I take very specific examples such as reading apps to achieve the more general goal of how practice and research are linked. I sometimes notice students who are interested in much larger or other questions. Such as 'How do I encourage children to read in the classroom? Because they are not motivated to do schoolwork.' Those children require an integrated approach. This is a simple app, so to speak, with very nice underlying mechanisms. I notice that some students think 'Yeah, a reading app. Who cares?'. And that is dangerous, of course, because I am trying to make something clear, but whether they make the transfer to the connection between research and practice is unknown to me.

The examples from the data above show that Arthur has a clear picture of the relationship between theory and practice which is heavily inspired by subject matter. In the assignment during the lecture, he focuses on his instruction of the link between theory and practice.

> If you think of practical implications of studies from a research perspective, you leave the translation to practice the person who needs this translation. That person plays a very important role, this is the teacher or those who design teaching materials in education. In the next lecture we will see whether digital resources can facilitate this translation. […]. In the assignment, practice is very simple in this case: As a remedial teacher you observe certain reading behaviour with different children. Students have to do something with that observation based on the material we have discussed before. So I think it is pre-eminently the case that you just try using meaningful literature to look at what eye movements are, based on literature or scientific knowledge. Eye movements have no meaning in themselves, but if you think carefully about the movements and how they come about, you can do something with them. That's the assignment.

Kate

Kate is a university teacher of 39 years old and she has been teaching for seven years. Her research focuses on student motivation. For her, the link between theory and practice lies in her conception of research that motivation depends on educational context and is not a stable phenomenon. In her lecture she, therefore, focuses on differences and similarities between formal definitions of motivation and the conceptions that teachers have of motivation. She has students clustering items from a questionnaire about motivation and identify possibilities to promote autonomy support and cognitive choice of pupils. Her orientation towards teaching can be seen as didactic, it is important to her that education is aligned with research in the department, because lecturers then have an expert role. From the fieldnotes it seems that she has little attention for what happens with students during class. She gives many examples of what concepts such as autonomous motivation, autonomy support, cognitive choice and controlled motivation look like. She remains close to her role as a researcher.

> Using examples you can give students a feeling of 'okay, you can do this at school with [autonomy support]". I hope that students think 'Hey, I didn't expect this or this gives me new insights'. But somehow I hope not, because it is not my goal to give practical solutions that work everywhere. You cannot do that as a researcher. Well, that is possible, but

> that is not my intention, because I also think that students themselves and the teachers with whom they work or where they end up after graduation think for themselves in that context. […] I am not completely enthusiastic about this way [of linking theory to practice], but that has to do with the large scale lectures.

In her teaching, her instruction strategy is very loosely linked to her knowledge and experience of teaching students about the scope and implications of research into motivation for practice.

> For the most part, the studies I cited were practice oriented studies into motivation. Those studies are still very theoretical, but relatively practical in motivational research. I find that the most interesting studies myself, that is not a goal but an underlying reason. I think it is good for students when they see, a kind of learning themselves, what is there about motivation theory and what you can and cannot do with it and what may be missing. Because everyone is talking about a gap between theory and practice, and I think it is important for students to see that gap.

Kate feels limited in the extent to which she can link theory to practice, because of the way in which lectures take place. She says that it makes it difficult for her to focus on understanding of students, she hardly adjusts her instruction to that.

> I find it difficult to determine whether I achieve my goal in large scale lectures or not. Every now and then students spend a few minutes discussing. They do so in small groups, talk enthusiastically and sometimes have real discussions with each other, so that works very well. […] Today, I heard that they were talking about cognitive choice in the front of class, but they soon moved on to another topic. […] I think it is good if they start thinking for themselves and although some people may not participate enthusiastically, some find it instructive. The questions students ask provide me feedback [on their participation], so that's okay. That is really nice, then you have a better feeling for what people think and what happens and what does not happen.

Susan

Susan is a teacher, aged 34 years and she has nine years of teaching experience. In her lecture on attention deficit hyperactivity disorder (ADHD) and autism spectrum disorders, the link between theory and practice was made by guests lecturers. After an introduction to ADHD, where Susan emphasised that there is more to it than difficulty with executive functions, she shares insights from research into ADHD with students. After that a fellow student with ADHD and an educational consultant are invited to share their experiences. The student's experiences put the theory to the test and students ask questions. Susan then takes over and starts her lecture on autism spectrum disorders. Her teaching statement shows a strong intention to adjust to what students already know about ADHD, although the interview shows that students should mainly make the link with practice themselves.

> Normally I would dwell longer on executive functions in the beginning and link it [to practice] with a video. This part was now theoretical […]. [Determining] whether the goal of linking to practice has been fully achieved with a guest speaker is difficult. You don't fully know what to expect, even though we discussed it beforehand. And a part depends on which questions arise from the students. That is why I also very explicitly emphasised the goals of the lecture, why they are important and hopefully they realised because of the stories of the guest speakers, but of course you cannot be 100% sure that students have made the connection themselves.

Susan's narrative of the link between theory and practice of executive functions and ADHD strongly focuses on the subject matter, although she does have an eye for the experiences that students bring to the classroom and what students can do with it later.

> If we had more time, I would cover all components [of executive functions], at least an explanation of that, now it was quickly about what executive functions are […]. You also want students to be able to visualise it and link it to previous experiences they have. The teacher education students in the group also have students in their class. You hope that a bell will ring; they have already seen this in their own environment. A similar case, perhaps slightly different. […] You also provide all kinds of information, so that in their internship and later work they will see such a situation and that bell will ring like 'I'll look it up again, what are the theories about that?

Gaining or hearing experiences of professionals and fellow student with ADHD is essential for Susan in gaining understanding of ADHD and autism spectrum disorders. Because as a lecturer you cannot fully convey the link between theory and practice.

> I have invited a total of three guest speakers for the entire course and I want to highlight ADHD and autism spectrum disorders from different perspectives. […] Since we train professionals who work with these people, now students can also see what it is like to live with it. […] If you experience that for yourself, it is very different from being a professional looking at it from the other side.

Discussion and conclusions

Our central aim was to explore how relations between subject matter, theory and practice are constructed in the accounts of lecturers. Although all lecturers in this study emphasise a relationship between subject matter, theory and practice in teaching their students every lecturer seems to construct this relationship in his or her own way, from a research or a practice perspective. The teaching practices even show a greater variety between lecturers.

Our findings indicate that subject matter plays a role in how a relation between theory and practice is taught. Subject matter seems to be crucial in decisions lecturers make in teaching theory and practice. For example, Margaret decided to provide her students with a lived experience of clinical decision making while Kate decided to bring a theoretical example of student motivation to the fore familiarising students with studies into motivation. Decisions made by Arthur and Susan can be understood in a similar way as Margaret's and Kate's, as all lecturers made decisions based on their experience with subject matter. Arthur decided to link specific theoretical concepts such as word preview to a tool that he is passionate about to raise his students' enthusiasm. Student motivation, the central concept in Kate's lectures, can be explained to students through explication of the theories about this concept, whereas clinical diagnostics can be understood by using a clinical case in which students take steps that a practitioner should take. Explication of theories through examples for the concepts of executive functions and autism spectrum disorders in a class, the central concepts in Susan's lectures, could be harder to explain through examples from practice, as executive functions and autism spectrum disorders cover a broad range of sub concepts which cannot be understood isolated from each other in professional practice (i.e. might require very specific, targeted interventions). In the narratives of the lecturers the subject matter informs

the way in which a relation between theory and practice is taught (cf. Shulman 2005). In addition, all lecturers refer to their previous experiences with the subject matter. These experiences seem to inform the way in which theory and practice are taught as well. This is illustrated in the narratives of Arthur and Kate, who explicate that their research experience contributed to their teaching method. As opposed to Margaret and Susan, who demonstrate that their practical experience shape their teaching method (i.e. working with a case and guest speakers). This finding indicates that lecturers' knowledge of teaching specific subject matter is related to their experiences (cf. Barendsen and Henze 2019).

Every lecturer meets barriers when it comes to explicating a relation between subject matter, theory and practice for students. Nevertheless, all lecturers aim for and teach about this relation. Being only partly able to connect theory and practice as an academic lecturer yourself, Kate and Susan demonstrate that collaboration with professional practice can be considered to be crucial, whereas Margaret and Arthur use their knowledge of professional practices in which they engage in teaching. Interestingly, Margaret seems to experience lesser barriers than the other lecturers and also her orientation to teaching differs from the other three lecturers. Namely, the findings suggest that Margaret is more focused on student understanding than the other three lecturers. This could mean that a teaching orientation on transmission of knowledge can promote lecturers' experience of being bounded when explicating a relation between subject matter, theory and practice. For example, lecturers have expressed in the interviews feelings of being bounded making reference to their knowledge of professional practice, class size, specific subject matter or the degree of control they have over learning objectives in class. Our findings suggest that barriers experienced by lecturers when teaching about theory and practice are informed by their conception of subject matter, but can be overcome by their orientation to teaching.

Results from previous studies into teaching in higher education support our findings, suggesting that subject matter informs lecturer's ways of teaching (Barradell 2013; Fraser 2016; Oleson and Hora 2014). Shulman (2005, 52) argued that discipline shapes teaching approaches, introducing signature pedagogies as 'the types of teaching that organise the fundamental ways in which future practitioners are educated for their new professions suggesting that instruction is closely linked to the discipline taught'. Examples are bedside teaching in medical education or case-based teaching in law. In contrast to Shulman (2005), our findings indicate that subject matter and orientations to teaching shape lecturers' approach to teaching. This finding implies that future studies into teaching in higher education should aim to gain a fine-grained insight into how subject matter informs teaching. This is important, as subject matter pedagogy can transform students' understanding which is a central goal of higher education (cf. Ashwin, Abbas, and McLean 2014; Meyer and Land 2005). In our study, the teaching of the lecturers evolved around concepts of model-based working, motivation, reading tools and ADHD. These might qualify as threshold concepts (Meyer and Land 2005), although we did not collect data on ways in which students understood these concepts after the course as this was not the aim of study. At the same time, the findings of our study suggest that other more generic aspects such as orientations towards teaching, lecturers' experiences and expertise are of importance as well.

The current study was deliberately conducted among four lecturers from CES to allow for an in-depth understanding of a relation between subject matter, theory and practice which can be considered a strength of this study. Our findings follow from coding and mapping data from teaching statements, class observations, interviews and an open-ended survey. Lecturers developed the teaching statements for the purpose of gaining their university teaching qualification.

The findings of this study have implications for teaching and academic development in higher education in general. Findings of this study show that there is no definite answer to how a relation between theory, practice and subject matter should be taught. Therefore, lecturers should engage in continuous reflection on how they shape a relation between subject matter, theory and practice. Besides lecturers, academic developers should foster lecturers' reflections on teaching through subject matter and teaching orientation. To achieve this, academic developers should have conversations with lecturers starting from the subject matter and then enable lecturers to translate educational principles to the subject matter taught. Thus far, methods supporting reflections on teaching through subject matter mainly have been developed in secondary education (e.g. Hume and Berry 2011; Korthagen and Vasalos 2005; Wieringa, Janssen, and van Driel 2013). For example, the CoRes in this study enabled lecturers to reflect on relations between their intentions for teaching subject matter, modes of instruction, the curriculum and assessment. Still, the teaching statements in this study indicated lecturers' reflexivity in teaching in general rather than in teaching specific subject matter. Future research is needed in higher education to further develop methods that enable academic developers and lecturers to have access to and to provide insight into subject matter pedagogies.

Disclosure statement

No potential conflict of interest was reported by the author(s).

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