

KAIRE UIBOLEHT

The relationship between teaching-learning
environments and undergraduate
students' learning in higher education:
A qualitative multi-case study



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TABLE OF CONTENTS

LIST OF ORIGINAL PUBLICATIONS	7
1. INTRODUCTION	8
2. THEORETICAL FRAMEWORK	11
2.1. The model of students' learning in higher education	11
2.2. The model of students' learning in higher education: the components	14
2.3. The model of students' learning in higher education: the relationships between components	21
2.4. Aim and research questions	25
3. RESEARCH METHODOLOGY	26
3.1. Methodological standpoint	26
3.2. Research design	27
3.2.1. Selection of the cases and participants	28
3.2.2. Data collection	31
3.2.2.1. Development of interview guides	31
3.2.2.2. Interviewing	33
3.2.3. Data analysis	33
3.3. Trustworthiness of the study	36
3.4. Ethical considerations	38
3.5. Researcher's role	39
4. RESULTS	42
4.1. Teaching-learning environment of the courses: teachers' course specific approaches to teaching (Article I)	42
4.2. The interplay between teaching-learning environment and its enhancing and hindering elements (Article II)	45
4.3. Relationship between teaching-learning environments and approaches to learning (Article III)	47
4.4. Relationship between teaching-learning environments and students' learning outcomes (Article III)	49
4.5. The relationship between teaching-learning environments, approaches to learning and learning outcomes	52
4.6. Summary of main findings	53
5. DISCUSSION	55
5.1. 4P-model of students' learning in higher education: general discussion	55
5.2. Teaching-learning environments and students' perceptions	59
5.3. Teaching-learning environments and approaches to learning	61
5.4. Teaching-learning environments and learning outcomes	62
5.5. Approaches to learning and learning outcomes	64
5.6. Methodological discussion	64
5.7. Limitations and further studies	66

6. CONCLUSIONS AND IMPLICATIONS OF THE STUDY	69
APPENDICES	71
Appendix 1. Interview guides to interview the teachers	71
Appendix 2. Interview guide used to interview students.....	72
Appendix 3. Example of a meaning unit for data analysis for Article II...	73
Appendix 4. Examples of meaning units, condensed meaning units and codes	74
Appendix 5. Example of codebook with codes, sub-categories and main categories	75
REFERENCES	76
ACKNOWLEDGEMENTS.....	88
SUMMARY IN ESTONIAN.....	90
ORIGINAL PUBLICATIONS	95
CURRICULUM VITAE	166
ELULOOKIRJELDUS	167

LIST OF ORIGINAL PUBLICATIONS

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- II. Uiboleht, K., Karm, M., & Postareff, L. (2018). Relations between students' perceptions of the teaching-learning environment and teachers' approaches to teaching: a qualitative study. *Journal of Further and Higher Education*. <https://doi.org/10.1080/0309877X.2018.1491958>
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Article II: developing research design, formulating the research questions, designing interview guide, participating in data collection, carrying out data analysis in cooperation with supervisors, writing the paper as main author.

Article III: developing research design, formulating the research questions, designing interview guide, participating in data collection, carrying out data analysis in cooperation with supervisors, writing the paper as main author.

1. INTRODUCTION

Higher education is challenged in educating students who have developed, in addition to the deep understanding of disciplinary knowledge, more broader generic or transferable skills in order to be prepared for unknown future and working life (Barradell, Barrie, & Peseta, 2017; Barrie, 2006; Grosemans, Coertjens, & Kundt, 2017; K rgharidusstandard, 2008; Vermunt, 2003). Furthermore, it is sometimes emphasised that the aim of higher education is also the development of other human qualities, such as carefulness, thoughtfulness, humility and criticality (Barnett, 2004). All these expectations aimed at graduates of higher education challenge university teaching. Teaching and learning in higher education is increasingly described as a partnership between teachers and learners. In the constructivist view of learning, the role of the teacher is to create and develop a challenging teaching-learning environment (henceforth TLE) where the students can actively engage and further develop knowledge and other qualities emphasised as important for higher education (Biggs & Tang, 2007; Mayer, 2004; Tynj l  & Gijbels, 2012). Parallel to the development of this view, research has sought evidence as to whether and how the TLE and students' learning are related.

The relationship between teaching and learning in higher education has been studied extensively for more than 40 years both at general (i.e. curriculum or degree) and course level. In general, researchers agree that the relationship between the TLE and the quality of students' learning exists but is highly complex. There are several strands of research on the relationship between the TLE and students' learning. For example, some researchers have sought to answer whether and how student-activating or student-centred TLEs enhance students' deep approaches to learning (i.e. learning strategies and intentions) and high-quality and broad learning outcomes (i.e. results of learning) (e.g. Lahdenper , Postareff & R m , 2019; Trigwell & Prosser, 1991; Tynj l , 1999; Wilson & Flower, 2005). Others have focused on how the change in one element of the TLE (e.g. assessment, feedback or constructive alignment) influences students' approaches to learning (Nijhuis, Segers, & Gijbels, 2005; Struyven, Dochy, Janssens, & Gielen, 2006). Another strand of research focuses on how students' perceptions of TLE and students' approaches to learning are related (e.g. Hailikari & Parpala, 2014; Hailikari, Tuononen, & Parpala, 2018; Parpala, 2010). Although previous studies have focused on several aspects in the process of students' learning (and researchers emphasise the process of learning is complex), few of the studies explore students' learning holistically, i.e. taking into account several factors that influence the quality of students' learning.

The starting point of this thesis was a corpus of studies, which investigated the *relationship between student-centred or student-activating teaching-learning environments and students' approaches to learning* (i.e. learning intentions and strategies). These studies have presented unexpected and even contradictory

results. Some studies found that TLEs designed according to the constructivist view of learning (i.e. labelled as student-centred or student-activating or constructivist TLEs) do not necessarily support adoption of the deep approach to learning or may even push students to employ the surface approach to learning (Baeten, Kyndt, Struyven, & Dochy, 2010; Gijbels, Segers, & Struyf, 2008; Struyven et al., 2006). By contrast, other studies found that in the action learning environment, students changed the learning strategies more towards the deep approach (Lahdenperä et al., 2019; Wilson & Fowler, 2005). Studies, where the relations between the teachers' approach to teaching (i.e. teaching intentions and strategies) and the students' approach to learning have been explored, are more consistent, concluding that the teacher-focused approach to teaching is related to the surface approach to learning and the student-focused approach to teaching is related to the deep approach to learning (Prosser & Trigwell, 2014; Trigwell, Prosser, & Waterhouse, 1999). Moreover, research has found that teachers often adopt elements from both approaches, resulting in a dissonant approach to teaching, where the teachers combine teacher- and student-focused approaches to teaching (Postareff, Katajavouri, Lindblom-Ylänne, & Trigwell, 2008; Stes & Van Petegem, 2014). One study indicates that dissonant approaches to teaching might be linked to students' surface approaches to learning (Prosser, Ramsden, Trigwell, & Martin, 2003).

Studies, where the *relationship between teaching-learning environments and students' learning outcomes* have been explored, are more consistent and have found that a student-activating a TLE compared with a traditional or lecture-based learning environment nurtured the development of both higher cognitive level of domain-specific knowledge, thinking and other generic skills (Mintz & Tal, 2013; Tynjälä, 1998; Tynjälä, Pirhonen, Vartainen, & Helle, 2009). Research on how approaches to teaching and students' learning outcomes are related is scarce.

The few studies on the relationship between *students' approaches to learning and learning outcomes* suggest that deep approaches to learning relate to high-quality learning outcomes (Marton & Säljö, 1976; Prosser & Trigwell, 1999; Tynjälä, 1998). Although a large-scale quantitative study found that academic achievement was related to the surface approach to learning, the same research found that only the deep approach to learning nurtured the development of generic metacompetencies (Lizzio, Wilson, & Simons, 2002). The study by Quinn & Stein (2013) suggests that the relationship between approaches to learning and learning outcomes is not so clear and the results of the studies may depend on the methodological approach.

Since previous studies, where the relationship between students activating the TLEs and students' approaches to learning are contradictory, researchers have focused on students' *perceptions of the learning environment* that enhance and hinder students' learning. Previous research in higher education has addressed students' perceptions of enhancing and hindering factors at the curriculum level (e.g. Hailikari et al., 2018; Parpala, 2010; Ruohoniemi & Lindblom-Ylänne, 2009) and how these factors are related to students' approaches to

learning (e.g. Baeten et al., 2010; Hailikari & Parpala, 2014; Hailikari et al., 2018; Postareff, Parpala, & Lindblom-Ylänne, 2015; Rytönen, Parpala, Lindblom-Ylänne, Virtanen, & Postareff, 2012). These studies describe the variation of both students' perceptions of contextual (i.e. related to the TLE) and students' personal factors that enhance and hinder their learning. Some studies indicate that students' perceptions of the TLE and adopted approaches to learning are related (Diseth, 2007; Parpala, 2010). Furthermore, some studies indicate that perceptions of the TLE do not always explain changes in deep approaches to learning (Postareff et al., 2015; Varunki, Katajavuori, & Postareff, 2017) initiating a debate whether contextual or student factors prevail. The overall conclusion is that the interaction between the TLE and student learning seems to be complex and challenging to investigate.

In short, (1) previous, mostly quantitative, studies present contradictory results about the relationship between the TLE and students' approaches to learning; (2) little research has been done on how students perceive different kinds of course environments; (3) previous research has not addressed how approaches to teaching and students' learning outcomes are related. Furthermore, the common suggestion in exploring the relationship between the TLE and students' learning is that research should go further to employ a broader perspective or a qualitative approach (e.g. Baeten et al. 2010; Parpala, 2010). Therefore, **the general aim of this doctoral thesis is to explore the relationship between the teaching-learning environment and several aspects of students' learning at the course level.** More precisely, this study compares and contrasts undergraduate students' self-reported approaches to learning and learning outcomes in three course contexts, in each of which the TLE varied. Furthermore, to understand the relationship between the TLE and students' learning more profoundly, this study aims to explore the students' perceptions of elements of TLE that enhance or hinder students' learning at the course level.

2.THEORETICAL FRAMEWORK

2.1. The model of students' learning in higher education

In general, it is acknowledged that learning in higher education is complex and several factors influence the quality of learning. Therefore, the need for theoretical underpinning in exploring complex phenomena, such as learning in higher education, is emphasised (Price, 2014). Several studies in higher education that focus on students' learning implicitly or explicitly, rely on Biggs' (1985; 1993) general 3P-model of student learning in higher education. This model of student learning and its successor, the 4P-model is considered valuable as it is 'heuristic in nature and it gathers together salient factors from a range of research findings' (Price, 2014 p. 58).

The theoretical framework of this thesis is informed by Biggs' (1985; 1993) 3P-model of student learning in higher education, which is further developed by several researchers (e.g. Baeten et al., 2010; Coertjens, Vanthournout, Lindblom-Ylänne, & Postareff, 2016; Lizzio et al., 2002; Price 2014; Ramsden, 2003) and is nowadays more known as the 4P-model. The original 3P-model explains students' learning referring to three components that try to reveal the learning phenomenon: 'presage', 'process' and 'product' components (Biggs, 1985) (see Figure 1). Later, the fourth factor 'perceptions' have been added in between process and presage components. The model is considered beneficial as it captures the complex phenomena of student learning in higher education and regards several factors that influence the quality of students' learning. Moreover, this model enables to explore the relationships between different components of the model. The 4P-model that informed the theoretical framework of this thesis is presented in Figure 1. In the following, the components of the model are described in more detail.

According to the Biggs (1985; 1993), the first component of the model, *presage*, comprises both student factors and factors in the teaching-learning environment (TLE) that both exist prior to the process of learning. Biggs describes one set of presage factors related to student characteristics, such as prior knowledge, abilities, values and motivation. The second set of presage factors are related to the TLE i.e. the teaching context of the course which is under the control of the teacher, such as teaching and assessment and atmosphere of classroom. Therefore, the teacher responsible for the course designs the TLE which influences students' learning. In higher education researchers have used various concepts to name the TLEs of the courses. In general, two groups of concepts can be determined. The roots of the first group of concepts in Figure 1 (student-activating/constructivist TLEs, learning-focused approaches to teaching) lie in constructivist view of learning. This view emphasises the active role of the learner in constructing the knowledge, and the role of the teacher is to design the TLE that supports the learner in the process of knowledge construction and development (Krahenbuhl, 2016; Tynjälä, 1999).

The roots of the second group of concepts (teacher-centred/traditional TLE or content-focused approaches to teaching) lie in the knowledge transmission model and views learning as rote memorisation of this transmitted knowledge (Krahenbuhl, 2016; Postareff, 2007). Moreover, research has found that teachers tend to combine approaches to teaching characteristic to both views of learning – constructivist and knowledge transmission, resulting in a dissonant approach to teaching (Postareff, 2007; Prosser et al., 2003).

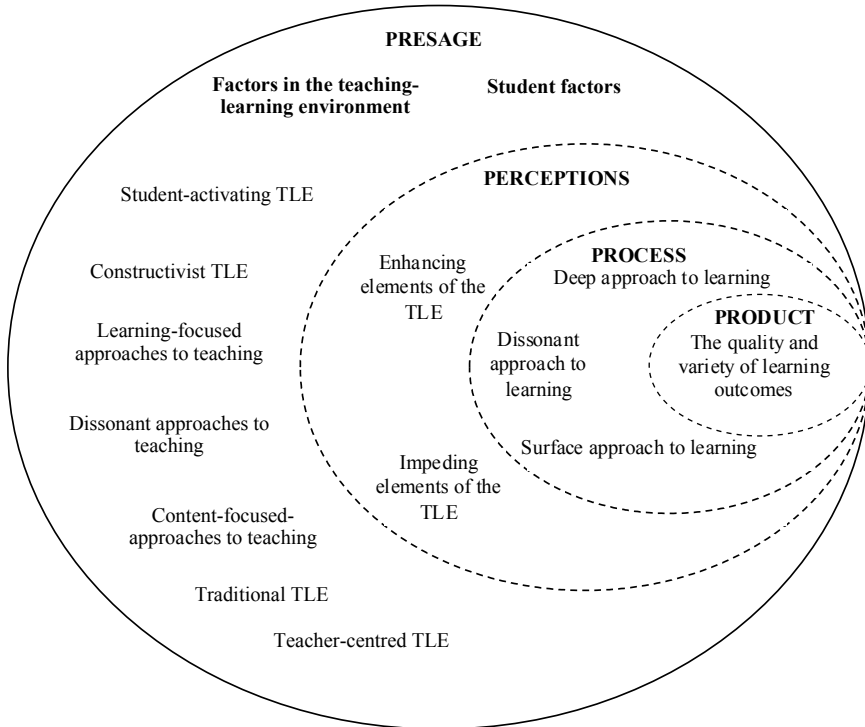


Figure 1. The general model of students' learning in higher education (modified from Biggs, 1985; Ramsden, 2003)

Informed by the research on student learning and teaching in higher education done after publication of Biggs' 3P-model, several researchers (e.g. Baeten et al., 2010; Coertjens et al., 2016; Price, 2014; Ramsden, 1997) suggest taking into account students' *perceptions* as the fourth and important component of the model. It is emphasised that from the perspective of the practical implication of the Biggs' model, students' perceptions of the TLE determine the adoption of approaches to learning (e.g. Baeten et al., 2010; Lizzio et al., 2002; Ramsden, 2003). Furthermore, several studies indicate that student factors inform how the students interpret and perceive the TLE of the course (e.g. Baeten et al., 2010; Biggs, 1989; Lizzio et al., 2002). In this thesis, students' perceptions of the TLE

at the course level are explored as ‘external factors’ which enhance or hinder students’ learning. Moreover, it is acknowledged that ‘perceptions’ act like a mediating tool between the TLE as a ‘presage’ component and the ‘process’ component of the model (i.e. students’ approaches to learning) (Baeten et al., 2010).

The *process* component of the model comprises the combination of learning processes or strategies and motives behind these while engaging with learning (Biggs 1985; 1993). A large corpus of research employs the concept of approaches to learning to characterise students’ learning strategies and intentions. Research has identified two main approaches to learning: deep and surface (Entwistle & McCune, 2004; Parpala, 2010; Prosser & Trigwell, 1999; Ramsden, 2003). The third approach, known as either ‘achieving’ or ‘strategic’, and later as ‘organised’, is more considered as an approach to studying, as opposed to learning, as it is more related with how students organise time and effort (Parpala, 2010). In this thesis, the process component of the model is explored through the concept of approaches to learning.

The last component of the Biggs’ model, the *product*, describes the results of learning process and can be described as learning outcomes: both in quantitative (how much), qualitative (how well) and affective (feelings about learning) terms (Biggs, 1989). The product component for this thesis is explored through the quality and variety of learning outcomes.

Biggs (1985; 1993) suggests that the model of learning is an integrated system and each component interacts with other components and ‘variations to any one component affect the whole system’ (Biggs 1993, p. 12). From the perspective of this thesis, this claim means that variation in the TLEs of the courses leads to the variation in the students’ perceptions of the TLE, approaches to learning and learning outcomes. Therefore, this doctoral thesis focuses on the relationships between the ‘presage’, ‘perceptions’, ‘process’ and ‘product’ components of the 4P-model of students’ learning. More precisely, this thesis tries to capture the relationship between the four components of the model of learning: (i) the TLE of the course i.e. the approaches to teaching the teacher adopts while teaching the course, (ii) students’ perceptions of the TLE, (iii) approaches to learning and (iv) learning outcomes.

2.2. The model of students' learning in higher education: the components

In this chapter the components of the general learning model 'presage', 'perception', 'process' and 'product' are described in a more detail manner.

'Presage' component: The course level teaching-learning environments in higher education.

The researchers in the field of higher education have used variety of concepts, levels and lenses to describe the environments, in which the learning occurs and which externally regulate learning. The two most often used concepts are learning environment (e.g. Tynjälä, 1999; Vermunt, 2003) and teaching-learning environment (Ashwin, 2012; Entwistle, 2009). These concepts describe the context of learning both at the curriculum level (e.g. Parpala, 2010) and at the course level (e.g. Tynjälä, 1999) and concepts 'learning environment' and 'teaching-learning environment' are often used as synonyms. According to Fraser (1998, p. 3) *learning environment* 'refers to the social, psychological and pedagogical contexts in which learning occurs and which affect student achievement and attitudes'. Entwistle, McCune, & Hounsell (2002, p. 7) employ the concept *teaching-learning environment*, which among other aspects includes 'course design and organisation, teaching and assessing course content, staff-student relationships, and of the student cohort on a particular course'. The researchers first describe the teaching-learning environment at a broader level, including social, cultural, political and institutional, departmental, disciplinary and professional contexts. They also offer a narrower perspective and suggest using 'inner' set of concepts to describe the elements, which have a proximate/immediate influence on students' learning. These elements are: course contexts (e.g. workload, learning outcomes), teaching and assessing content (e.g. teaching methods, assessment), staff-student relationships (e.g. guidance and support of learning), students and student cohort on a particular course (e.g. abilities, knowledge and learning skills) (Entwistle et al., 2002). All these components refer to the 'pedagogical lenses' to view the learning environment where the latter is closely 'interwoven with the teaching and learning process' (Abualrub, Karseth, & Stensaker, 2013, p. 96). For the same reason Ashwin (2012) suggests employing the concept 'teaching-learning environment' instead of 'learning environment' as teaching-learning are 'different aspects of the learning processes in which students and academics engage together' (p. 2). In this study, the concept 'teaching-learning environment' is used to refer to the pedagogical context of learning at the course level, which is designed by the teacher and influences students' learning proximately.

In general, two broad types of TLEs can be identified: student-centred or –activating and teacher-centred TLE although several concepts have been used to label TLEs explored in higher education (see Table 1). These concepts describe

TLEs in a more holistic way, as several elements of the TLE are changed more towards student-centred or -activating.

Table 1. Some selected comparative studies using various concept labels to describe the teaching-learning environment in higher education at the course level

	Student-centred or -activating TLE	Teacher-centred TLE
Tynjälä, 1999	Constructivist learning environment	Traditional learning environment
Wilson & Fowler, 2005	Action learning design	Conventional course
Struyven et al. 2006	Student-activating learning design	Traditional lecture-based learning environment
Kahl & Venette, (2010)	Student-centred classroom	Teacher-centred learning classroom
Baeten, Struyven & Dochy, 2013	Student-centred learning environment	Lecture-based learning environment
Nijhuis et al., 2005	Problem based learning environment	Assignment based learning environment

The first type of TLE comprises *student-centred or -activating TLEs*, where the learning environments share similar elements as the focus is on students' construction of knowledge and personal meaning, conceptual change and students' active participation. Therefore, several authentic assignments, projects, tasks or problems are designed to support knowledge transformation. Assessment and learning are often integrated: assessment is based on learning tasks and often the reproductive end of course exam is avoided. Therefore, the idea of constructive alignment (Biggs, 1996) where essential elements of the TLE, such as learning outcomes, teaching-learning activities and assessment tasks are aligned is also characteristic to student-centred TLEs. Furthermore, student-centred TLEs also emphasise students' self-regulated learning, responsibility and own initiative. In contrast, the second category can be described as *teacher-centred TLEs* where the transmission of knowledge or content is described and the focus is more on teacher's activity (e.g. lecturing) as the most important element of these teaching-learning environments. Traditional reproductive end of course exam is usually employed.

Many previous studies focus only on one element of the TLE. For example, there are studies focussing on the influence of assessment method (Scouller, 1998; Segers, Gijbels, & Thurlings, 2008; Segers, Martens, & Van den Bossche, 2008), the overall assessment design, e.g. assessment for learning (e.g. McDowell, Wakelin, Montgomery, & King, 2011) and formative assessment (e.g. Gijbels & Dochy, 2006) on student learning. To conclude, some studies explore

the TLE of the courses conceptualising the environment more broadly and describe several elements of the TLE (e.g. constructivist or student-activating or constructively aligned). On the other hand, some studies label the TLE by describing one or few elements of the TLE (e.g. portfolio assessment or lecture-based).

The higher education context, in which the relationship between teaching and learning is explored, employs the *approaches to teaching* concept (i.e. teaching and assessment intentions and strategies) to describe TLEs. This concept captures several aspects of the TLE, such as teaching and assessment methods, as well as students' and teachers' roles and responsibilities in the TLE, and thus determines the qualities of the TLE (Kember & Kwan, 2000; Postareff & Lindblom-Ylänne, 2008). Approaches to the teaching focus on teachers' teaching intentions and strategies and have been in researchers' focus for more than twenty years (Postareff, 2007; Trigwell, Prosser, & Taylor, 1994). The related concept *conceptions of teaching* describes more underlying beliefs about teachers' teaching, which form the background for and influence the teacher's approaches to teaching (Entwistle & Walker, 2000; Kember, 1997; Postareff, 2007). In the field of approaches to teaching research, a variety of concepts have been used to label the two approaches: teacher-centred and student-centred (Samuelowicz & Bain, 1992); teacher-focused and student-focused strategy (Trigwell et al., 1994); teacher-centred and student-centred orientation to teaching (Van Driel, Verloop, Van Werven, & Dekkers, 1997) and content-centred and learning-centred approach to teaching (Kember & Kwan, 2000).

Previous studies have identified two broad categories of approaches to teaching: content- and learning-focused approaches to teaching (Postareff & Lindblom-Ylänne, 2008). In general, the descriptions of the *content-focused approach to teaching* share similar elements with teacher-centred, lecture-based and traditional teaching-learning environments. More precisely, the intention of teaching for content-focused approach is to transmit the knowledge or course content; the knowledge or learning outcomes are seen as certain facts and concepts, which have to be memorised (Kember & Kwan, 2000; Postareff & Lindblom-Ylänne, 2008; Samuelowicz & Bain 1992; Trigwell et al., 1994; Van Driel et al., 1997). Thus, the owner or the source of knowledge and expertise is the teacher and the role of students is to listen and absorb the information, i.e. to remember the course content. It is also found that the teacher does not take into account students' previous knowledge when planning the teaching. During the teaching process, the teacher presents the course content, examples and experiences. Interaction occurs rarely or does not support students' learning. To ensure the learning of the material and to support external motivation, traditional assessment practices are often employed (e.g. frequent tests, quizzes, ease of grading). Similar to teaching practices, the variety of assessment methods is small.

On the other hand, the *learning-focused approach to teaching* shares similar elements with constructivist, student-activating, student-centred and problem

based teaching-learning environments. In contrast to content-focused teaching, the intention of teaching for learning-focused approach is to encourage the development of deep understanding and change in conceptual understanding. Moreover, the development of wider learning outcomes, i.e. as well as deep theoretical knowledge, application of knowledge and development of more generic skills (i.e. critical and original thinking) have been described as essential. Since the knowledge is seen as broader and deeper, the personal meaning is important to develop, and the students are viewed as active creators and constructors of knowledge and conceptions. Therefore, in the process of planning of teaching, students' prior knowledge and experiences, their needs and expectations are taken into account and, if possible, students are involved in the planning process. Researchers have described teaching as facilitating students' learning, and teaching practices encourage more students' engagement and interaction in the learning process, i.e. to ask questions and present views. Assessment practices are described as being more flexible; a variety of forms is employed and the intention is to encourage and value development of deep understanding of the subject matter.

Researchers have sought evidence of how coherent are the teachers' approaches to teaching. Some studies on approaches to teaching have found that teachers adopt either content- or learning-focused approaches to teaching, suggesting that the approaches are mutually exclusive (e.g. Kember & Kwan, 2000). Although Postareff (2007) suggests that the approaches to teaching can be intertwined. The content-focused approach lacks elements, which are inherent to learning-focused approach to teaching. In this sense, the learning-focused approach to teaching is more complete and the teacher who is typically learning-focused may adopt content-focused approaches to teaching when appropriate (Postareff, 2007). All this indicates that content- and learning-focused approaches to teaching co-exist, resulting in a *dissonant approach to teaching* (Postareff et al., 2008; Stes and Van Petegem, 2014). Dissonance may occur *between* aspects of teaching (e.g. both content- and learning-focused teaching intentions and strategies emerge) (Postareff et al., 2008) and *within* one aspect of teaching (e.g. teaching strategies are both content- and learning-focused) (Stes & Van Petegem, 2014).

To conclude, the roots of teacher-centred TLE and content-focused approaches to learning lie in objectivism, which suggests that knowledge exists independently and teaching-learning is seen as knowledge transmission (Postareff, 2007; Krahenbuhl, 2016). On the other hand, student-centred or student-activating TLE and learning-focused approaches to teaching view learning from the perspective of constructivism, which describes the knowledge as interpreted and constructed in learners' minds (Tynjälä, 1999; Krahenbuhl, 2016). The constructivist view of learning emphasizes the active role of a learner in constructing knowledge and the responsibility of a teacher is to design the TLE that would support the learner in the process of knowledge construction and development (Tynjälä, 1999; Luddeke, 2003; Postareff, 2007; Krahenbuhl, 2016). Although a variety of concept labels have been used to conceptualise the

TLEs of courses in higher education, two broad approaches can be detected when thinking about teaching-learning in higher education: the first approach lies in knowledge transmission model and the second in constructivism. Moreover, researchers have found that university teachers tend to combine different approaches. As approaches to teaching concept takes into account several aspects of TLE that is under the control of the teacher, in this thesis TLEs of the courses were explored using approaches to the teaching perspective.

Perception component: Students' perceptions.

It is widely acknowledged that the TLE does not necessarily influence students' learning, but the *perception* of the TLE determines how the student approaches learning (Baeten et al., 2010; Entwistle, 2007; Ramsden, 1997). Researchers also emphasise that the perceptions of the TLE depend as much on the student factors as on the TLE and therefore the same TLE can be perceived or interpreted in different ways (Elen & Lowyck, 2000; Entwistle, 2007). Researchers have found several personal factors of students that influence the perception of the TLE (Entwistle, 2009; Ramsden, 2003): previous knowledge and educational experiences; abilities and learning styles; personality and motivation; and thinking dispositions. Another aspect that may influence students' perceptions of the TLE are *instructional preferences* which refer to the persons' likes or dislikes of a particular context and may be influenced by previous educational experiences and their understanding of the nature of learning (Baeten, Dochy, Struyven, Parmentier & Vanderbruggen, 2016; Struyven, Dochy & Janssens, 2008). It must be noted that some of these personal factors (e.g. ability, motivation, personality) are not fixed characteristics of the learner but are probably more malleable by several educational experiences over a period of time (Entwistle, 2009).

Research has shown that the same educational context or TLE may be perceived as enhancing for some students and hindering for the others (Hailikari & Parpala, 2014; Hailikari et al., 2018; Struyven et al., 2008) indicating that personal factors influence the perception of the TLE. Furthermore, studies imply that the perception of the TLE affects some students' learning to a great extent, while some students seem to be rather immune to the TLE suggesting that personal factors prevail (Lindblom-Ylänne & Lonka, 1999; Postareff et al., 2015; Varunki et al., 2017). All this suggests that the interaction between teaching and learning is complex. In previous studies, students' perceptions of the TLE at the curriculum level are well explored (e.g. Hailikari et al., 2018; Parpala, 2010; Ruohoniemi & Lindblom-Ylänne, 2009). The focus in this thesis is the students' perceptions of the TLE at the course level.

Process component: Students' approaches to learning.

The 'process' component of the 4P-model involves learning strategies or processes and motives or intentions behind these i.e. approaches to learning (Biggs, 1993; Trigwell & Prosser, 1999). For more than four decades researchers have explored students' learning processes or strategies and motives or intentions applying different terminologies. Two well known research traditions are *approaches to learning* (Biggs, 1989; Entwistle, 2009; Marton & Säljö, 1976) and *learning patterns* (Vermunt & Donche 2017; Vermunt & Vermetten, 2004). In the former tradition, research focuses on different learning processes and intentions that students adopt to handle learning tasks and are considered to be more context dependent (Vanthournout, Donche, Gijbels, & Van Petegem, 2014; Vermunt & Donche, 2017). The learning patterns' research tradition distinguishes four components of students' learning: cognitive processing strategies, meta-cognitive regulation strategies, conceptions of learning and learning motivations and orientations. Initially these components of learning were considered to be more stable, although recent research indicates that some components may be more context dependent and others more stable (Vanthournout et al., 2014; Vermunt & Donche 2017). The concept of approaches to learning is adopted in the present study, as it focuses on more specific aspects of students' learning (i.e. strategies and intentions).

The concept of *approaches to learning* involves two aspects: the *intention and the strategy of learning* (Entwistle & McCune, 2004; Parpala, 2010; Prosser & Trigwell, 1999; Ramsden, 2003). Two broad categories of approaches to learning have been described: the deep and the surface approaches (e.g. Marton & Säljö, 1976; Parpala, 2010). The *deep approach to learning* is described as a way of learning where the students' intention is to understand the meaning of the learning material and therefore uses learning strategies, such as looking for meanings, relating ideas and knowledge etc. (Entwistle, et al., 2002; Prosser & Trigwell 1999). On the other hand, the *surface approach to learning* is described as a way of learning where the students' intention to cope with an assessment or task and therefore adopts learning strategies such as memorising without understanding or reproducing (Entwistle & McCune, 2004; Prosser & Trigwell, 1999). Researchers have also found that students might adopt either deep or surface approaches or they can combine these approaches, resulting in a *dissonant approach to learning* (e.g. Meyer, 2000; Quinn & Stein, 2013). Moreover, researchers have described a third approach to learning or studying, called *organised studying*, which is related to the ability to manage time, effort and concentration while studying (Entwistle & McCune, 2004; Parpala, 2010).

In general, there is consensus that whether or not the student adopts a deep or surface approach to learning is context dependent (e.g. Biggs & Tang, 2007; Entwistle, 2009; Marton & Säljö, 1976; Ramsden, 1997; Parpala, Lindblom-Ylänne, Komulainen, Litmanen, & Hirsto, 2010; Postareff, Mattsson & Parpala, 2018), suggesting that the popular terms "deep learner" or "surface learner" may not exist (Case & Marshall, 2009). Moreover, Asikainen & Gijbels (2017)

in their review article conclude that there is no empirical evidence that students would develop their approaches to learning more towards the deep approach during their time in higher education. Furthermore, a recent study by Postareff et al., (2018) found that organised studying is more stable across courses compared to the deep and surface approaches and therefore is less likely to be influenced by the TLE of a specific course. Therefore, in this thesis the process of learning was explored using the approaches to learning (i.e. deep or surface) perspective.

Product component: Learning outcomes.

The ‘product’ component as a result of learning have been studied from different perspectives in the higher education context: the study success or academic achievement i.e. grade point average or earned credits or course grade (e.g. Asikainen, 2014; Lizzio et al., 2002; Trigwell, Ellis & Han, 2012); self-evaluated or -reported learning outcomes (e.g. Asikainen, Parpala, Virtanen & Lindblom-Ylänne, 2013; Kumpas-Lenk, 2019; Lizzio et al., 2002; Tynjälä 1999; Täks 2015); responses to open-answer examinations (e.g. Quinn & Stein, 2013); or course satisfaction (e.g. Lizzio et al., 2002). There is evidence that, at the course level, exam grades and quality of students’ learning outcome are not necessarily related: students’ success and self-reported learning outcomes matched more than exam grades and probably because of to the nature or reliability of assessment (Asikainen, 2014). Therefore, in this thesis the results of learning were explored using the self-reported learning outcomes perspective.

Learning outcomes in higher education have gained considerable attention both in connection with changing education policy in higher education (Proitz, 2015) and teaching or assessment practices (Adam, 2004; Allan, 1996; Harden, 2002). Hussey and Smith (2008) describe the usage of learning outcomes at three different levels: (i) degree programme; (ii) module or course; (iii) teaching event. Learning outcomes at the course level can be explained as statements about the results of learning (Adam, 2004), i.e. ‘what is intended that learners will know, understand or do by the time they have completed a course or part of the course’ (James, 2005 p. 85). In higher education learning outcomes can refer to (1) theoretical knowledge, (2) practical knowledge and (3) generic skills. *Theoretical knowledge* encompasses subject-specific knowledge, which refers to ‘knowing about things’ (Biggs & Tang, 2007, p. 72) and is described by Anderson & Krathwohl (2001): (1) factual (i.e. knowledge of terminology) and (2) conceptual (i.e. knowledge of classifications, principles, theories and models) knowledge. *Practical knowledge* is described as the knowledge of methods or procedures or how to do something in the discipline (Biggs & Tang, 2007; Tynjälä & Gijbels, 2012). In the higher education context, the quality of knowledge is determined by whether the ‘understanding’ of something has been developed i.e. whether the personal meaning of the concept, theory or principles have been developed by the learner (Barnett, 2004; Entwistle & Nisbet 2013; Newton 2000). An important quality for higher education learning outcomes has

been the development of the way students see the subject-related phenomena (Bowden & Marton 1998; Walker & Finney, 1999).

Generic skills, which are applicable beyond the discipline, are specially valued in higher education in the last decade (Strijbos, Engels & Struyven, 2015). The most frequently described generic skills at Bachelor degree level are problem-solving, communication, teamwork, reasoning and thinking skills, critical reflection, self-management and learning skills, creativity and leadership skills (Young & Chapman, 2010). All this indicates that in higher education both the development of deep understanding of subject-specific knowledge and a variety of generic skills are important to consider.

The components of the 4P-model of students' learning represent various elements that influence the quality of students' learning in higher education. The next chapter is devoted on how the components are related.

2.3. The model of students' learning in higher education: the relationships between components

Relations between teaching-learning environment and students' perceptions of it.

Previous studies have referred to the student's perceptions of the TLE as 'external factors' and as being enhancing and hindering of learning. These studies have described a great variation of external factors that influence students' learning.

In general, research has found that positive perceptions of TLE are related to the deep approach to learning and negative perceptions are related to the surface approach to learning (e.g. Herrmann, Bager-Elsborg, & Parpala, 2017; Lawless & Richardson, 2002; Parpala et al., 2010; Prosser & Trigwell, 1997). Specifically, research has found that perceived elements of the TLE, such as: 1) high workload, 2) teacher-focused approaches to teaching, 3) low level of alignment, 4) little feedback, 5) lack of guidance or information, 6) lack of challenges or too much challenges, 7) summative assessments do either encourage students to employ the *surface approach to learning* or *hinder their learning* (Coertjens et al., 2016; Hailikari & Parpala 2014; Hailikari et al., 2018; Kreber, 2003; Kyndt, Dochy, Struyven, & Cascallar, 2011; Lindblom-Ylänne, Parpala, & Postareff, 2018; Mumm, Karm & Remmik, 2016; Parpala, et al., 2010; Postareff, et al., 2015; Prosser & Trigwell, 2014; Sambell, McDowell & Brown 1997). By contrast, the perceptions of: 1) challenging the TLE, 2) interest, 3) relevance, 4) constructive feedback, 5) good or interesting teaching, 6) constructive alignment, 7) appropriate and authentic assessment (tasks) do either encourage students to employ *deep approaches to learning* or *enhance their learning* (Baeten et al., 2010; Gulikers, Bastiaens, Kirschner, & Kester, 2006; Hailikari & Parpala, 2014; Lizzio et al., 2002; Parpala, 2010; Postareff et al., 2015; Postareff et al., 2018; Wang, Su, Cheund, Wong, & Kwong, 2013).

Most previous research has explored external factors that enhance or hinder students' learning at the curriculum level and from the students' perspective (e.g. Ruohoniemi & Lindblom-Ylänne, 2009; Hailikari & Parpala, 2014; Hailikari et al., 2018). Most are quantitative and few explore the perceived elements of TLE and their relationships with TLE at the course level. Therefore, this thesis focuses on and explores the perceptions of the TLE at the course level and how these vary in a variety of course contexts.

Relations between the teaching-learning environment and approaches to learning.

In general, it is considered that TLEs that adhere to the constructivist view to learning support deep approaches to learning and those TLEs adhering to the transmission view of learning leads students to adopt surface approaches to learning (Mayer, 2004). Researchers have sought evidence that the TLEs that adhere to the constructivist view of learning (i.e. student-centred or activating, constructivist or teachers adopting learning-focused approaches to learning) help students to adopt deep approaches to learning. Contrary to the expectations the research findings of this relationship are not univocal. Conditionally, two groups of studies have emerged.

The first group have found that constructivist, student-activating or problem-based TLEs do not encourage students to adopt deep approaches to learning (Baeten et al., 2010; Gijbels et al., 2008; Nijhuis et al., 2005; Struyven et al., 2006). The finding emerged despite the fact the whole TLE has been redesigned according to the constructivist view of learning: active use of knowledge, the alignment between teaching and assessment was considered and feedback was enabled. Some studies in this group found that changing one aspect or component of the TLE (e.g. assessment method, feedback) towards student-centred or -activating also does not alter the approach to learning towards the deep approach (Gijbels & Dochy, 2006; Gijbels, Coertjens, Vanthournout, Struyf, & Van Petegem, et al., 2009; Struyven et al. 2006). There is also evidence that dissonance in teaching i.e. combining teaching and assessment strategies inherent to both the transmission and constructivist views of learning also may encourage adoption of the surface approach to learning (Baeten et al., 2013; Postareff, 2007; Prosser et al., 2003). On the other hand, there is evidence that a gradual implementation of student-centred elements into lecture-based TLE decreases the adoption of surface approaches to learning (Baeten et al., 2013). Moreover, some studies in the group indicate that elements of the TLE, such as a low level of guidance i.e. unclear goals, ill-structured tasks and inappropriate workload, does not support adoption of the deep approaches to learning (Nijhuis et al., 2005).

The second group of studies indicate student-activating or -centred TLEs or TLEs where the teacher adopts the learning-focused approach to teaching may encourage students to use deep approaches to learning (Lahdenperä et al., 2019; Prosser & Trigwell, 2014; Trigwell et al., 1999; Wang et al., 2013; Wilson &

Flower, 2005). The positive relationship in those studies can be explained by the conclusion of Lahdenperä et al., (2019): the quality of learning i.e. deep approaches to learning can be promoted by the TLE where several aspects are changed more towards student-centred or -activating. Moreover, research has found that the idea of constructive alignment (Biggs, 1996) leads students to adopt deep approaches to learning (Wang et al., 2013). Furthermore, Wilson and Flower (2005) found not only student activating teaching and assessment methods influence these ‘typically surface’ learners to employ deep learning strategies, but also greater expectations and responsibility and interdependency with each other influence the learning process.

To sum up, as previous studies on the relationship between TLE and students’ approaches to learning reveal contradictory results, it appears that other elements of the TLE (e.g. the level of guidance or structure, expectations) than just student-activating or student-centred teaching and assessment practices may influence adoption of deep approaches to learning. Moreover, changing just a single element of the TLE (e.g. the assessment method) does not encourage students to employ deep approaches to learning indicating that several elements of the TLE of the course should be designed inherent to the constructivist view of learning or to enhancing students’ learning.

The relationship between the teaching-learning environment and students’ learning outcomes.

Studies which have explored the relationship between the TLEs that are inherent to the constructivist view of learning and the students’ learning outcomes have produced more univocal results and found evidence that students’ quality and variety of learning outcomes differ according to the TLE (Kahl & Venette, 2010; Loyens, Jones, Mikkers & Gog, 2015; Mintz & Tal, 2013; Trigwell & Prosser, 1991; Tynjälä 1998; Tynjälä 1999; Tynjälä et al., 2009). Tynjälä (1998; 1999) found that students in the constructivist TLE had developed more broader learning outcomes than did the students in the traditional TLE; meaning that, in the constructivist TLE students’ self-reported learning outcomes do not comprise only accumulation of knowledge but also the development of thinking and communication. These findings were confirmed by Tynjälä et al., (2009) and Mintz and Tal (2013), where the students also reported broader learning outcomes: for example domain-specific knowledge, generic skills (e.g. project management, communication and teamwork) and self-knowledge. Moreover, Loyens et al., (2015) found that the developed understanding (i.e. conceptual change in this study) turned out to be more stable over time in the problem based TLE.

To conclude, these studies show that students express development of a range of various kinds of learning outcomes in addition to theoretical content knowledge in TLEs where the constructivist view of learning is adopted. Although research has found that the TLE inherent to the constructivist view of learning encourages the development of broader students’ learning outcomes,

there is little research so far that addresses how approaches to teaching and students' learning outcomes are related.

Relationship between students' approaches to learning and learning outcomes.

Research focused on the relationship between approaches to learning and learning outcomes suggests that deep approaches to learning encourage the development of high quality and broader learning outcomes (Lizzio et al., 2002; Marton & Säljö, 1976; Prosser & Trigwell, 1999; Trigwell & Prosser, 1991) although some researchers (e.g. Quinn & Stein, 2013) found that the relationship between the approach to learning and learning outcome is not always so strong.

In general, studies in which learning outcomes are understood as knowledge of content indicate that the deep approach to learning and understanding of content are related (Marton & Säljö, 1976; Trigwell & Prosser, 1991). Reach, early in the millennium, (e.g. Lizzio, et al. 2002) suggest that the deep approach to learning was related to the development of generic metacompetencies indicating that the deep approach does not only nurture academic achievement (i.e. high grades), but also generic skills. This study also found that high course grades as learning outcomes were related to memorisation of declarative or procedural knowledge (i.e. surface approach to learning). This indicates that assessment and course grades may not reward deep understanding and development of generic skills (i.e. the quality and variety of learning outcomes) due to the nature of assessment (Asikainen et al., 2013; Gulikers et al., 2006). Quinn and Stein (2013) add that the relationship between the approach to learning and learning outcome is not always so strong and adopted methodological approaches may produce contradictory results. Quinn and Stein (2013) employed two types of measures to explore the relationship: quantitative data did not indicate that surface approaches to learning and low-quality outcomes would be related. However, qualitative data showed this relationship more clearly.

To conclude, studies that focus on the relationship between approaches to learning and learning outcomes do not show a clear relationship between deep approaches to learning and high quality and broad learning outcomes. Moreover, research indicates that the methodological approach and how learning outcomes are understood/conceptualised may produce contradictory results.

2.4. Aim and research questions

The previous sections detailed the complexity of student learning in higher education and regarded several factors that influence the quality of student learning in higher education. In this thesis, the complexity of student learning in higher education is conceptualised using the 4P-model of student learning, which explains students' learning employing four components: 'presage', 'perceptions', 'process' and 'product' enabling research to focus on the components and relationships between them.

In the context of previous research: (1) there are contradictory results about the relationship between the TLE and students' approaches to learning; (2) few studies focus on how students perceive the various kinds of course environments; (3) few studies focus on how the TLE and the quality of students' learning outcomes are related. More precisely, previous studies have explored the relationship between the TLE and approaches to learning or learning outcomes, and have conceptualised the TLE in a variety of ways. As a result, this study employs approaches to teaching theory to characterise the TLE of the courses. Furthermore, as previous research has indicated that the perception of the TLE is more important than the label researchers give for the TLEs they analyse, this study also focuses on students' perceptions of the elements of that TLE that enhance or hinder students' learning at the course level.

Therefore, **the overall aim of the study presented in this thesis was to acquire a thorough understanding of students' perceptions of the TLE, approaches to learning and learning outcomes while the TLE varies.** The following research questions are posed:

1. How are the teaching-learning environments of the courses designed according to approaches to teaching theory? (Article I)
2. What kind of enhancing or hindering elements of the teaching-learning environments do students describe in the various teaching-learning environments? (Article III)
3. How are the various types of teaching-learning environments of the courses and the students' perceptions of their approaches to learning related? (Article II)
4. How are the various types of teaching-learning environments of the courses and students' perceptions of their learning outcomes related? (Article II)
5. How are students' perceptions of their approaches to learning and learning outcomes of the courses related? (Article II)

To answer the research questions, an empirical study adopting qualitative approach was designed and conducted. The study employed multi-case study research design to explore students' learning and factors that influence the quality of students' learning at the course level.

3. RESEARCH METHODOLOGY

To capture the interplay between the teaching-learning environment (TLE) of the courses and the students' experiences of learning, this study employed a qualitative comparative multi-case research design, which was guided by the interpretivist paradigm (Merriam & Tisdell, 2016). Furthermore, students' experiences of learning were explored in authentic course settings, i.e. the naturalistic setting of teaching-learning was employed.

3.1. Methodological standpoint

The research paradigm or world view, which guides or underpins research practices, defines how the researcher seeks and uses knowledge (Thomas, 2016). This qualitative research study was guided by interpretivism (Mack, 2010; Merriam & Tisdell, 2016; Thomas, 2016), sometimes called constructivism (Crotty, 1998). Interpretivism is a paradigm or philosophical perspective, where the individuals' ability to construct meanings while engaging with the world or experiencing something is emphasised (Crotty, 1998; Mack, 2010). Researchers conducting studies based on interpretivism focus on peoples' interpretations of their experiences, and on how people either or both view the situation and construct their worlds, and what meanings they attribute to their experiences (Creswell, 2007; Merriam & Tisdell, 2016). Therefore the interpretivist paradigm is heavily influenced by phenomenology (Mack, 2010), which focuses on human "lived experience" and "how experiencing something is transformed into consciousness" (Merriam & Tisdell 2016, p. 26). Since this study focused on how students interpreted their experiences of learning while engaging with the specific course, it can be said that this study was also guided by phenomenology as a philosophy.

The interpretivist paradigm is characterised by two assumptions: ontological and epistemological (Mack, 2010). The *ontological assumption* (i.e. what is the nature of reality) of this study was relativism, where the reality is socially constructed and no single reality exists (Merriam & Tisdell, 2016). It is also assumed that truth or knowledge is context dependent and there are multiple interpretations of an event, a phenomenon or contexts (Guba & Lincoln, 2005; Merriam 2009). Mack (2010) explains that reality is subjective from the perspective of relativism as it is indirectly constructed, i.e. through individual interpretation. Based on *epistemological assumption*, i.e. how the knowledge is acquired, the study described in this thesis was guided by the belief that knowledge or truth is gained through personal experiences and is related with particular situations and by allowing individual differences and subjectivity (Crotty, 1998; Mack, 2010). Levering (2007) explains that while subjectivity is considered as a major methodological problem, and when people's accounts of their own perceptions are explored, it should be taken into account that the

descriptions of experiences are interpretations and therefore we can not claim anything about their faithfulness. Therefore, it should not be asked whether or not the account of the experience is true, but whether or not they are convincing.

Based on the described ontological and epistemological assumptions of interpretivism as a research paradigm, this study focused on understanding students' perceptions of the situation or the context of learning (i.e. the TLE of the course). Semi-structured individual interviews and inductive qualitative content analysis offered possibilities to explore the students' individual interpretations or views of their learning in a specific context.

3.2. Research design

To capture how the teaching (i.e. teaching-learning environment) and students' learning are related, this qualitative study uses a **case study design**, more precisely **comparative multi-case research** design. Several authors describe *case study* as a research design or frame, not as a methodological choice (Merriam, 2009; Stake, 2005; Thomas, 2016). Case study can be understood as 'an in-depth description and analysis of a bounded system' (Merriam (2009:40). The case is formed by the phenomenon within its real world context i.e. the contextual factors are taken account while exploring the phenomenon (Byrne, 2009; George & Bennet, 2005; Thomas 2016; Yin 2014). Thomas (2011; 2016) emphasizes that a case study does not study a case by itself, but comprises two elements: subject and object of the study. The *subject* of the case study is the case itself, a bounded system. The *object* is the analytical frame that the case illustrates and explains (Thomas, 2011; 2016). In this thesis, the object (i.e. the analytical frame) of the study was the students' (subjective) experiences of learning, i.e. perceptions of the TLE, approaches to learning and learning outcomes) related with a specific course. The subject, that explained or shaped the students' experiences of learning, was the TLE of the course designed by the course teacher. Therefore, it was presumed that the phenomenon, i.e. the object (the experience of learning) is influenced by the context and therefore cannot be separated from the specific course context. The case study employed in this thesis focused on both teaching and learning in a particular authentic context (i.e. the course), which formed a bounded system or entity where the teachers' teaching and assessment intentions and strategies created a unique TLE for the students of the courses.

In order to understand the relationship between the TLE and students' experiences of learning more profoundly, more than one case was employed in this study. Therefore, this study is a *comparative multiple case study*, which enables the researcher to investigate, illustrate and compare a phenomenon within different contexts (Creswell, 2007; Merriam, 2009; Stake, 2005). A comparison of multiple cases enables the researcher to add confidence, stability and validity to the findings and interpretation; allows the making of stronger arguments; moreover, and a deepening of the understanding of knowledge

(Bartlett & Vavrus, 2017; Bazeley, 2013; Miles, Huberman, and Saldaña 2014). Therefore, each compulsory undergraduate course (n=3) was considered as a case in this study and each case formed the unit of analysis (Miles, et al., 2014; Yin, 2009).

Within the case study tradition are several distinct approaches: variance-oriented, interpretivist or process-oriented case studies (Bartlett & Vavrus, 2017). In this study, the interpretivist case study approach was employed as the focus was on teachers' and students' perceptions of teaching and learning, which enabled an in-depth understanding of the relationship between the context of learning and the students' interpretations of their experiences of learning. Furthermore, the conceptual framework that informed the whole study was 4P-model of learning depicted in previous chapter.

3.2.1. Selection of the cases and participants

The aim of the qualitative case study is usually to gain a deep understanding of the phenomenon, i.e. how the TLE and students' experiences of learning are related, hence the selection of the cases was purposeful and the cases and participants were chosen for their informativeness (Mabry, 2008; Patton, 2002). Moreover, access was also an important factor when selecting the cases (Mabry, 2008; Yin 2009). Selection methods of both the cases and the participants in qualitative case studies, and for this study, include among other methods – maximum variation (Patton, 2002) and convenience sampling elements (Mabry, 2008). Maximum variation sampling in qualitative studies has been considered useful as offering possibilities to increase confidence in conclusions (Miles et al., 2014; Patton, 2002, 2015). Merriam and Tisdell (2016) argue that some level of convenience sampling is always present in case selection. The biggest problem with convenience sampling is related with credibility and information-richness. To avoid these problems several aspects were taken into account when selecting the cases. Merriam and Tisdell (2016) describe the selection procedure for a case study as a “two-tier” sampling (p. 99), in which the first set of criteria is related with the selection of cases and the second set is related with the within-case selection, i.e. what to observe, whom to interview. In the following the selection of cases, the two sets are explained.

Selection of cases

The first set of criteria for this study was involved with the selection of cases (i.e. the courses) to be explored and it contained the following stages:

1. *Selecting the field and preliminary analysis of curricula.* At this stage the starting point was the familiarity (Thomas, 2016) and therefore convenience in sampling emerged. This selection strategy includes cases acting as a local knowledge case, which Thomas (2016) considers a strength of the case study. The author's main teaching experience was related with teaching

undergraduate students in the field of business and administration. As a result, it was chosen to allow more in-depth understanding of the TLEs in the business and administration field as well as of the students' experiences of learning. Later, the public information of the curricula from the field was explored to get the first overview of what kind of teaching and assessment practices of the courses are mostly described. This preliminary analysis of curricula was made on the basis of descriptions of the curricula, which were made public in the Study Information Systems of the universities. Altogether the courses from five undergraduate curricula from five Estonian universities in the field of business and administration were analysed at this stage.

2. *Selecting the courses within curricula.* Research (e.g. Baeten et al., 2010; Lizzio et al., 2002; Parpala, 2010) suggests that the content and level of learning outcomes should be similar when comparing the courses from the perspective of the relationship between the TLE and students' learning. Therefore, at this stage the descriptions of the content, learning outcomes, teaching and assessment practices of the courses in selected undergraduate curricula of the field were compared. As a result, one course from four curricula from three universities were selected: the content and learning outcomes were similar but the descriptions of the teaching and assessment practices varied. The latter was employed in the interest of the maximum variation sampling (Miles et al., 2014; Patton, 2015). Invitations to participate in the study were sent by e-mail to the main teachers of the courses. Three teachers from two universities agreed to participate in the study and were interviewed.

Within-case selection: selection of participants

In the case studies, the second set of criteria in the selection process is related with selecting whom to interview (Merriam & Tisdell, 2016). The selection of undergraduate students to interview comprised three stages. *Firstly*, as the aim of the study was to explore students' experiences of learning related to a particular course, students who had gained the grade for the course were included into the whole sample (population). It was assumed that students who had not gained the grade were not engaged with the course entirely or did not fully participate in the learning activities. *Secondly*, whereas it was considered important to explore the students' experiences of learning with possibly varied experiences, maximum variation principles (see Cohen, Manion, & Morrison, 2007; Merriam & Tisdell, 2016; Patton, 2015) were followed. Research has indicated that students' approaches to learning are related with their learning outcomes and course grades (Alemeida et al., 2011). The present study assumed that students' experiences of learning vary according to the grade they received from the course, and therefore, to capture the variety of experiences of learning, students from five grade groups were invited to participate (A "excellent", B "very good", C "good", D "satisfactory", E "poor"). *Thirdly* stage, to address the validity of the study, systematic sampling (random sampling) was applied

within the grade groups (Cohen et al., 2007; Merriam & Tisdell, 2016). The sampling method used in the second and third stage, is also known as stratified sampling (Cohen et al. 2007) and has the aim of sampling the maximum variation of experiences of learning.

Email invitations to participate in the interviews were sent to students, (N=92), of three courses, of whom 26 in Courses I and II responded affirmatively (see Table 1). None of the Course III students replied to the invitation email. Therefore, a snowball sampling method was applied and the first student was asked in person by the researcher to participate in an interview. After that initial interview, the student was asked to either or both suggest and recruit the next participant. This request was repeated until seven Course III students agreed to participate in an interview. The main characteristics of the cases and participants are presented in Table 1. All interviewees participated in the study on a voluntary basis (any negative response to participation invite was accepted). The interviews with the students were held during 2012 and 2013.

Table 1. Characteristics of the cases and participants

	Course I	Course II	Course III
Characteristics common to the courses	The curricula of business and administration (the field); undergraduate level (1 st or 2 nd year students); compulsory introductory course; similar content, learning outcomes, textbook; duration 16 weeks (one semester); number of credits for the course: 4–6 ECTS		
University	University A	University B	University A
Number of students who completed the course	54	200	56
Number of students who were sent invitations to participate in the study	30	30	32
Sampling method	stratified	stratified	snowball
Number of student interviewees	12	14	7
Sample size according to gender			
Female	9	12	5
Male	3	2	2
Sample size according to grades			
A – excellent	2	3	3
B – very good	3	2	3
C – good	3	2	1
D – satisfactory	3	4	
E – poor	1	3	

3.2.2. Data collection

Individual semi-structured interviews were employed for collecting data from both groups of participants: (1) teachers who were responsible for the teaching and assessment practices of the compulsory undergraduate courses; and (2) undergraduate students who engaged in and participated in these courses and gained the grade. Interviewing was chosen as the main data collection method as it enables to elicit the interviewee's accounts of the experiences related with certain phenomenon (Brinkmann, 2014; Merriam & Tisdell, 2016). Interviewing is also one possible way to understand in depth the interviewee's interpretations of their behaviour, and the explanations and intentions behind that behaviour (Brinkmann, 2014; Merriam & Tisdell, 2016). Furthermore, in research interviews the knowledge is constructed through interaction between the interviewer and interviewee (Kvale & Brinkmann, 2009). There is a variety of forms for interviews in qualitative studies depending on the purpose of the research, theoretical assumptions, structure, number of participants, media and interviewer style and experience (Brinkmann, 2014; Roulston, 2010). For this study, semi-structured face-to-face individual interviews were employed because they offer possibilities to guide the conversation towards the issues, topics or themes that are most relevant in relation to the focus of the research (see Brinkmann, 2014; Kallio, Pietilä, Johnson, & Kangasniemi, 2016). The semi-structured format of interviews has a clear and structured focus, but open-ended questions offer the possibility to ask unstructured follow-up questions to further probe the responses (Brinkmann, 2014; McIntosh & Morse, 2015; Kallio et al., 2016). Individual or personal interviews offering more confidentiality, atmosphere of trust and discretion provide possibilities to focus on personal experiences and sensitive issues (Brinkmann, 2014; McIntosh & Morse, 2015).

3.2.2.1. Development of interview guides

A semi-structured interview guide enhances the objectivity and trustworthiness and makes results more plausible (Kallio et al., 2016). For both groups of participants (teachers and students) a semi-structured interview guide was developed following the four-step process (Kallio et al., 2016; McIntosh & Morse, 2015): (1) identifying previous knowledge and the topics of the interviews; (2) formulating the preliminary interview guide (i.e. questions); (3) testing and piloting the interview guide; (4) developing the complete interview guide.

Identifying previous knowledge and the topics of the interviews. The focus and purpose of interviews were guided by the review of previous studies, more precisely, the contradictory results of previous studies and limitations of those studies were specifically taken into account. As a result the focus, purpose and main areas of interest were identified and described. In the case of the *teachers' interviews* the main focus and purpose of the interviews was: (1) to obtain a thorough description of the teaching and assessment practices employed in the

courses; and (2) to understand the intentions behind these practices. The main areas of interest were: intended learning outcomes of the course; teaching practices and intentions; assessment practices and intentions; and the teachers' view of the students' role in the spectrum of teaching-learning episodes. In the case of the *students' interviews* the main focus and purpose of the interviews was to gain an account of the students' perceptions of the TLE of the courses and the experience of learning when participating in the course. The main areas of interest were: perceptions of the TLEs of the courses (i.e. teaching and assessment methods, tasks); students' perceptions of what the teacher expected; perceived learning outcomes; and students' learning processes and intentions in different learning episodes.

Formulating the preliminary interview guide. The aim of this phase was to develop an interview guide and formulate interview questions to ensure that all areas of interest would be discussed during the interviews. When formulating interview questions the use of theoretical concepts was avoided (e.g. teaching strategy and intentions; learning process, etc.) and interview questions were kept brief and simple to get an account of experiences or behaviours and the reasoning behind them (see Wengraf, 2001). For both interview guides, a warm-up question was formulated (e.g. "Please describe how you became a university teacher?" or "Please describe how you became a student of this faculty?") (see Kvale & Brinkmann, 2009). In order to clarify or gain deeper accounts, follow-up or probing questions, such as "Can you tell me more about that?" or "Could you explain that more?" were asked (Wengraf, 2001; Kvale & Brinkmann, 2009).

Testing and piloting the interview guide. To enhance the trustworthiness of the study an *internal testing* was carried out with the first supervisor to evaluate and discuss the preliminary interview guide. At this stage, the overall structure of the interview guide (the flow) and wording of questions were evaluated with the aim avoiding any leading questions. Therefore, *field-testing*, i.e. pilot interviews were carried out with one teacher and one student with the aim of evaluating the overall structure (the flow) of the interview guide, understandability and openness of questions to provide a variety of perceptions and experiences. The pilot interviews were not transcribed, but were listened to several times and brief summaries were compiled. The data from the pilot interviews was not included in the study.

Developing the complete interview guide. Following the piloting stage, some changes in the interview guides were made: the order of some questions was rearranged and minor changes in the wording of the interview questions were made. The interview guides for both groups of participants (the teachers and students) are presented in Appendix 1 and 2.

3.2.2.2. Interviewing

The *teachers* of the courses were all interviewed twice, except for one teacher. The aim of the first interview was to provide an account of intended learning outcomes, teaching and assessment practices and intentions, and it was conducted right after the teaching process. The aim of the second interview was to ask additional questions on the assessment process and practices and to reflect upon the assessment. The time between the first and second interview was one to two months. The total duration of two interviews with the teacher varied between 120 and 160 minutes. The interviews with teachers were conducted during 2012 by two researchers (the author of this thesis and the first supervisor).

The *students* were interviewed once within two months following the final assessment of the course and interviews were held in a room in the faculty library, which ensured a low probability of disturbance. The interviews lasted from 40 to 80 minutes. The interviews were carried out by two researchers (the author of this thesis and the first supervisor). The interviewees became acquainted with the interview guides before the interviews. Interviews with the students were conducted during the years 2012–2013.

3.2.3. Data analysis

Preparation of data analysis. All the interviews were audio recorded with the participants' permission and were transcribed verbatim following the recommendations of McLellan, MacQueen, & Neidig (2003) and Kvale & Brinkmann (2009). The aim of the transcription process was to prepare data for qualitative content analysis and therefore it was ensured that all content would be captured word-for-word (McIntosh & Morse, 2015). During the transcription process the rules were as follows: (1) transcribe the oral text word-for-word; (2) separate speakers' text, marking interviewer's questions in bold; (3) mark pauses or silence longer than three seconds with a symbol (.); (4) transcribe non-verbal sounds (e.g. laugh, sighs, background noises). The first versions of transcripts were read through and corrected while listening to the audio record at least twice to ensure the accuracy of the content. The aggregate length of a transcript of the teachers' interviews ranged from 19,100 to 22,500 words. In the case of the students' interviews the length of the transcript ranged from 4,700 to 12,600 words.

The process of data analysis. *Qualitative content analysis* (QCA) was used to analyse the data for this thesis. Qualitative content analysis is a data analysis method, which enables to describe the meaning of qualitative data (Schreier 2012) and is often characterised as systematic, rule guided and flexible at the same time (Mayring, 2014; Schreier, 2012) and offering open interpretations of qualitative data (Graneheim & Lundman, 2004). Flexibility emerges because it offers the possibility to develop a coding frame or categories close to the data

and therefore an inductive approach for QCA was used (Elo & Kyngäs, 2008; Schreier, 2014). According to Schreier (2014) an inductive approach for QCA means that codes, sub- and main categories are data-driven and the coding frame is a valid description of the material. For this study a combination of steps or phases of QCA was employed as described by Graneheim & Lundman (2004), Elo & Kyngäs (2008) and Schreier (2012).

The first phase: *Selecting meaning units and condensing the texts.*

All interviews were repeatedly read to select the parts, i.e. the meaning units, respective to the research focus and questions. Sentences or paragraphs were selected so that the meaning unit formed a united description of research focus (Graneheim & Lundman, 2004). For Article I where teachers were interviewed, the meaning units concerned the teaching and assessment practices. For Article II, which focused on the students' interviews, two aspects needed to be present in the same meaning unit: first, the students' perception of the TLE and second, a description of how this perception influenced their learning (see Appendix 3). This approach can be called a non-dualistic understanding of experience (Billet, 2009). For Article III, which also utilised the students' interviews, the meaning units addressed students' self-reported learning outcomes or learning activities and processes. For an example of a meaning unit for Article II see Appendix 3. At this stage, the software HyperResearch 3.7.3. was used. Subsequently, all selected meaning units were copied to the spreadsheet program (MS Excel), in which the remainder of the analysis process was conducted. In this phase, the process of condensing, to shorten the text while preserving the core idea and presenting the essence of a meaning unit took place because the phrasing was too long (see Graneheim & Lundman, 2004).

The second phase: *Coding and building a list of codes.*

In this phase, the condensed meaning units were coded to interpret their meaning from the perspective of the research focus and the aims of the article. In qualitative research, coding is a process where a code is 'word or short phrase that symbolically assigns a summative, salient, essence-capturing, and/or evocative attribute for a portion of language-based or visual data' (Saldaña, 2013 p. 3). All emerged codes were listed and described in separate file, which formed a list of codes and offered constant comparison between the extant and the emerging codes. More specifically, when the description of a meaning unit contained something that was not described or had not previously emerged, a new code was created; but when the description of meaning unit had already been described, the name of the emerged code was used (suggestion by Schreier, 2012, p. 88). The list of codes included the name of the code, description, examples and decision rules. The examples of meaning units, condensed meaning units and codes are provided in Appendix 4.

The third phase: *Grouping codes into categories and sub-categories.*

After the coding process, the codes were grouped under main and sub-categories. A principle for grouping codes into categories was commonality, i.e. the codes had to share some common feature (e.g. theoretical knowledge), whereas sub-categories represents a variety of the main category (e.g. the theoretical knowledge as a main category and understanding basic concepts as a sub-category) (suggestions by Schreier, 2012; Elo & Kyngäs, 2008). Moreover, it was important that the name of each main and sub-category would represent the their content (suggestion by Elo & Kyngäs, 2008). Moreover, constant comparison to create and describe sub-categories was carried out (Bazeley, 2013). At the end of this stage, the descriptions of categories and sub-categories with explanations and examples were created. This description can be called a coding frame (Schreier, 2012). In this phase moving back and forth between the present and previous phase was necessary. For an extract of codebook, i.e. the coding frame where the codes are grouped under sub-categories, see Appendix 5.

The fourth phase: *Applying coding frame.*

At this stage all the meaning units had been interpreted in the light of the coding frame, which had been developed at the end of the third phase. Frequency distributions by sub-categories were also created. The coding frame was not modified at this stage.

The fifth phase: *Presenting the results.*

In this phase, all the meaning units were categorised and collated and analytic summaries were produced. To illustrate the descriptions of the results, representative quotations were selected.

The novelty value of the methodology of this study lies in the general research design, in which the experience of learning was explored in a specific course context using a qualitative approach. Moreover, in this study, the TLE was described and analysed in detail in the light of approaches to teaching theory, which enabled the study to reveal the teachers' teaching intentions and strategies. In previous studies, the TLE is usually described in more general terms using the descriptions of methods (e.g. lecture-based learning environment, case-based assessment; problem based learning environment etc.). Furthermore, the selection of meaning units for Article II was novel compared to previous studies. The selected meaning units had to contain two aspects: first, the perception of the element of the TLE and second, how it influenced students' learning (see Appendix 3).

3.3. Trustworthiness of the study

To evaluate the trustworthiness of the qualitative study, the concepts of *credibility*, *transferability*, *dependability* and *conformability* have been introduced and proposed (Morrow, 2005). *Credibility* in qualitative studies deals with the questions of how well the data and the process of data analysis addresses the intended focus of the study and reality (Graneheim & Lundman, 2004; Merriam & Tisdell, 2016). *Transferability* is an aspect of trustworthiness of qualitative studies, which refers to how generalizable the findings are or how transferable the results are to other settings or groups (Graneheim & Lundman, 2004; Elo, Kääriäinen, Kanste, Utriainen, & Kyngäs, 2014; Merriam & Tisdell, 2016). *Dependability* refers to the ‘stability of data over time and different conditions’ (Elo et al., 2014, p. 2). In qualitative studies dependability does not mean that the same results could be found again, but is more related to the consistency in data collection and analysis process (Graneheim & Lundman, 2004; Merriam & Tisdell, 2016). *Conformability* is an aspect of trustworthiness, which is related to objectivity, meaning that the results are based on data, and the influence of the researcher on the results is as minimal as possible (Elo et al. 2014; Yilmaz, 2013). The different aspects of trustworthiness in qualitative studies should be ensured in the various phases of the study: preparation, organization and reporting phases (Elo, et al., 2014) and in the following sections, the methods or strategies to ensure the trustworthiness of the study are described by these phases.

Preparation phase. In this phase the *credibility* of the studies was enhanced by selecting an appropriate research design and data collection method; by discussing the interview guides with another researcher (i.e. the supervisor) and conducting pilot interviews; by using the interview guides, selecting students with a variety of experiences and the selection of suitable meaning units for analysis (see suggestions by Bazeley, 2013; Brinkmann, 2014; Elo, et al., 2014; Graneheim & Lundman, 2004; Kvale & Brinkmann, 2009). In this phase, it was decided to select multiple cases to enhance the *transferability* of the results, as Bazeley (2013) explains the benefit of multiple-case studies, which gives ‘some assurance that the results obtained are not completely idiosyncratic’ (p. 411) and are therefore more broadly applicable. The comparison of cases enables the study to explain and understand how the results, i.e. students’ experiences of learning are influenced by local conditions i.e. the TLE of the courses. Elo et al., (2014) emphasise the importance of selecting an appropriate data collection method, which offers possibilities to gather unstructured and descriptive data to apply the inductive content analysis. Therefore, in the preparation phase both interviewing methods, focus and individual interviews, were considered. Individual interviews were chosen as these allow to elicit personal experiences and discuss sensitive issues, which may not be possible in focus group interviews.

Discussing interview guides with another researcher and conducting pilot interviews is another method of increasing the *credibility* of qualitative study. The description of how credibility was enhanced in the interview guide development

phase is presented in the subchapter 3.2.2.1. To enhance the *dependability* in the data collection phase the interview guide was used to present the same areas and interview questions to all interviewees. In the case of the sampling strategy, the richness of data was the main purpose and therefore students with a variety of experiences of learning were selected to be interviewed. It was assumed that students with grades from the entire spectrum of the course experienced learning and the TLEs of the courses in different ways. Moreover, to increase *credibility*, at least two interviews in one grade group were carried out. According to Graneheim & Lundman (2004) the preparation phase also involves selection of meaning units for data analysis. In the process of selecting meaning units for data analysis it was ensured that meaning units are long enough to form a united description respective to the research focus (e.g. self-reported perception of the TLE and how it influenced students' learning; learning outcome; approaches to learning) and enable interpretation. Condensing the meaning units enabled the study to capture the essence of content respective to the research focus, especially in the case of long meaning units. Especially for the analysis of the Article II the condensation phase turned out to be crucial and to enhance interpretation of how TLE and students' learning were related.

Organization phase. In this phase, several steps were taken to enhance the trustworthiness of the study: more than one researcher was involved in the data analysis process; recoding the material while applying the coding frame; sufficient time was taken for data analysis, especially for coding and categorisation phases; memos were written while analysing the data (suggestions by Elo et al., 2014; Graneheim & Lundman, 2004; Schreier, 2012). Elo et al., (2014) claim that there are no clear recommendations to ensure trustworthiness of inductive content analysis, but suggest that while one researcher is responsible for the data analysis process, the other researchers can be involved in discussing any questions and opinions that emerge. This approach was employed for the data analysis that was used as a basis of this thesis. The thesis author was responsible for the data analysis process and both supervisors were engaged systematically, via face-to-face and Skype meetings, during different phases, especially while developing the categories and sub-categories, i.e. the coding frame with the aim to increase *conformability* and *dependability* of the data analysis. Article I used the method of face validity to increase *credibility*, which meant that an additional researcher who was familiar with the topic of assessment in higher education was involved in evaluating the interpretation of teaching and assessment strategies and intentions. To increase *dependability* in the phase of applying the coding frame, Schreier (2012) suggests to employ recoding after a time of interval. Therefore, recoding, i.e. applying a coding frame to interpret all meaning units and to create frequency distributions was employed at least 20 days after the first application a coding frame. Thus, to increase the **credibility** of results sufficient time was taken for all phases of the data analysis, especially for coding and grouping phases. The analysis of the data used in Article I took approximately 6 months, and that for Articles II and III each took 12 months, offering possibilities to go back and forth between the phases of data analysis,

to do additional reading to interpret the results, to discuss and re-evaluate findings. All this was done with the aim of increasing *conformability* and *credibility* of the findings, i.e. the findings represent the experiences of participants and interpretations are not invented by the researcher. To ease the discussions with other researchers and to make oral hesitations and questions visible during the data analysis process memos were written in the process of coding and grouping.

The reporting phase. To enhance the trustworthiness of the studies, several techniques were employed: the context of the courses' TLEs, i.e. the teachers' approaches to teaching, was described and analysed in detail (Article I); the descriptions of findings, i.e. sub-categories were supported by quotations from the interviews; the description of the research methods (sampling of both cases and participants, data gathering and analysis) were provided (according to suggestions by Elo et al., 2014; Graneheim & Lundman, 2004). To enhance the *transferability* of findings and to provide the basis for the comparison of students' experiences of learning (i.e. Articles II and III), the description and analysis of the TLE of the courses were provided (based on the analysis of the teachers approaches to teaching presented in Article I). To enhance *conformability* of the findings, i.e. to support the interpretations of the researchers, quotations were provided for each sub-category in the Articles. In the reporting phase, *dependability* of the studies is increased by describing the research methods, i.e. selection of the cases, participants, data gathering and analysis.

Throughout the process of the study, a researcher diary was kept to document thoughts and questions starting from developing the focus of the research and the rest of the research process; and to reflect on the bias experienced while reading previous studies and being a university teacher. The researcher's ethics and role is discussed in more detail in the following subchapters.

3.4. Ethical considerations

The credibility of a qualitative study is determined by the researcher whose previous experience, training, intellectual rigor, and practical wisdom start to play a vital role (Kvale & Brinkmann, 2009; Merriam & Tisdell, 2016; Patton, 2015). According to Traianou (2014) most of the debates concerning research ethics focus on how the researcher treats the people from whom they obtain the data. For this study, the principles of ethics were followed to protect the participants' autonomy and privacy (Kvale & Brinkmann, 2009; Traianou, 2014). To enhance the participants' autonomy, the focus of the research and the assurance of privacy was introduced in the invitation email for both the teachers and students. Moreover, the invitation emails were sent no more than twice (when the first one was not answered after three days); negative and non-answers to the invitation emails were accepted as final. Therefore, the participation in the study was completely voluntary. The steps to guarantee the privacy (i.e. anonymity) of participants were introduced once more just before the interview

(i.e. using pseudonyms in the case of teachers; not using the name of subject, topic, the exact titles of assignments and the names of students while reporting the results). Moreover, consent to record was asked before the interview.

3.5. Researcher's role

In qualitative research, the researcher plays a key role starting from choosing the research field and focus, formulating research questions, collecting and analysing data, and drawing conclusions (Berger, 2015; Merriam, 2016). The role of the researcher can be evaluated using the concept *reflexivity* which means 'self-appraisal in research' (Berger, 2015 p. 220) through recognizing the researcher's lenses and role within and effect on the research. Therefore, as follows, the role and lenses of the researcher are described in the first person perspective.

I have been engaged with teaching since 2001, initially in vocational school for five years and subsequently in higher education. During these years, I have been keen on finding out how to be a better teacher with the aim of further developing my students' knowledge and other qualities (e.g. application of knowledge, problem-solving skills etc.). Therefore, I have developed my qualities through participating in different programmes for vocational and university teachers. But still, while teaching at university, I had the feeling I did not fully understand how to encourage students' to deeply engage with learning and the development of deep understanding of knowledge through teaching an assessment practices. Parallel to my teaching at university, an important political movement in European Higher Education Area happened: learning outcomes and assessment were raised into focus. The acknowledged gap in my knowledge and changes in higher education encouraged me to start with doctoral studies in Educational Sciences at the University of Tartu in 2009.

My experiences with teaching in higher education greatly influenced selecting the research field and focus. I decided to choose teaching and learning in higher education as a research field with the intention of more profoundly developing my understanding of the perspectives and opportunities of the teacher (who is also responsible for the teaching and assessment practices of the course) to design the TLE of the course that enhances students' learning. At the beginning of my PhD journey, I familiarized myself with the studies in the field of teaching and learning in higher education and this developed my understanding that I should explore both sides of the coin: teaching and learning. Therefore, I focused on the relationships between teaching and learning at the course level. The course level focus was also encouraged by my belief in teaching and learning: the teacher of the course has an essential role in developing the TLE where the student could deeply engage and further develop knowledge and other qualities. As I had been struggling with developing a TLE that enhances students' learning, I wished to understand what elements of the TLE are crucial or important while the intention was to promote deep learning and understanding.

In acknowledging my own beliefs and teaching practices and my own knowledge on teaching and learning, I tried to minimize my impact on the process of data collection and analysis. First, in the process of data collection additional researcher was involved, who offered possibilities to reflect on the process of interviewing. The interview guides were developed so that open questions were asked. On the other side, my experiences with students and interviewing made me well equipped and prepared to ask follow-up and probing questions in order to get deeper accounts. Second, I planned time for the process of data analysis, firstly analysing data independently and therefore engaging supervisors to discuss my interpretations with the aim to increase trustworthiness of the study. On the other hand, I acknowledge that my previous practical teaching experiences could affect my data analysis and interpretation in a positive way, as I was more sensitive to certain aspects of the data. To make my beliefs and experiences more visible for myself I reflected on this in a research diary and in memos written during the process of data analysis.

To conclude, being a researcher in the field and a practitioner (i.e. teacher) can be viewed both as a limitation and an advantage. I feel that being in both roles made me well equipped to deeply understand the relationship between teaching and learning.

To summarise the Methodology chapter and introduce the Results chapter, an overview of the research aim, methods, focus of the articles is presented in Table 2.

Table 2. Overview of the research aim, methods, and the focus of the three Articles

	Article I	Article II	Article III
Overall aim of the study	To explore the relationship between teaching-learning environment and students' learning at the course level. To identify students' perceptions of teaching-learning environment (TLE) that enhances and hinders their learning.		
Methodology	Qualitative research, interpretivist paradigm		
Research design	Comparative multi-case		
Data collection	Individual semi-structured interviews from: (1) teachers and (2) undergraduate students of the courses.		
Data analysis	Qualitative content analysis, inductive approach		
Focus of the article	To explore teacher's approaches to teaching while teaching a specific course.	To explore the elements of the TLE that enhance and hinder students' learning in the course contexts	To identify the relationship between teachers' approach to teaching and students' learning outcomes
Title of published article	Uiboleht, K., Karm, M. & Postareff, L. (2016). How do university teachers combine different approaches to teaching in a specific course? A qualitative multi-case study. <i>Teaching in Higher Education</i> , 21(7), 854–869. https://doi.org/10.1080/13562517.2016.1183615	Uiboleht, K., Karm, M., & Postareff, L. (2018a). Relations between students' perceptions of the teaching-learning environment and teachers' approaches to teaching: a qualitative study. <i>Journal of Further and Higher Education</i> . https://doi.org/10.1080/0309877X.2018.1183615	Uiboleht, K., Karm, M., & Postareff, L. (2018b). The interplay between teachers' approaches to teaching, students' approaches to learning and learning outcomes: a qualitative multi-case study. <i>Learning Environments Research</i> , 21(3), 321–347. https://doi.org/10.1007/s10984-018-9257-1

4. RESULTS

In the following, an overview of the main findings addressed in the research questions is provided. The results are more thoroughly described in the journal articles.

4.1. Teaching-learning environment of the courses: teachers' course specific approaches to teaching (Article I)

The purpose of the analysis presented in Article I was to capture the teaching-learning environment (TLE) of the courses, exploring teachers' approaches to teaching, with a focus on the teachers' course specific teaching strategies and intentions behind them. Furthermore, the aim was to capture how theoretically consistent are the teachers' course specific approaches to teaching. In the following, the TLEs of the courses are described in more detail in a comparative way. The TLEs of the courses are described and analysed in more detail in the Article I and Article III (see Table 1).

For Course I, the descriptions of teaching reflected the learning-focused approach to teaching in all aspects and therefore the approach to teaching of the teacher for Course I was classified as *consonant learning-focused*. The teacher's descriptions of *intended learning outcomes* reflected the intention to further develop the students' understanding of content knowledge, as well as developing links between various concepts and themes of the content. Moreover, the development of the students' generic skills (i.e. writing, explanation and reasoning skills for this course) was considered essential.

Descriptions in the *teaching process* category reflected the students' expectation to take responsibility for their learning and constructing the knowledge through active dialogue with learning tasks and other students. The teacher's description of planning the teaching reflected focusing on the students' learning activities and on thinking when learning. In practice, the lectures were not held for this course but instead several two-hour long seminars occurred. Instead of attending lectures, the students had to read a textbook, answer some questions and submit them prior to attending the seminars i.e. prepare for seminars where the teacher provided tasks which enabled the application of knowledge, solving problems independently and in groups and sharing ideas with other students. The descriptions of the teaching practices reflected that the teaching activities were derived from the intention of achieving the learning outcomes and supporting the students' learning. Therefore, the descriptions of teaching revealed both will and action to align the learning outcomes and teaching. Descriptions of feedback revealed that students were asked to use feedback when improving their work and, if necessary, to remake and resubmit their work.

In the category of *assessment practice*, descriptions revealed the alignment between learning outcomes and assessment with the intention of ensuring the achievement of learning outcomes at the same time as supporting students' learning. Therefore, in practice, the teacher described the employment of a variety of assessment methods; the descriptions of assessment tasks reflected offering possibilities to use the knowledge and to analyse authentic objects and students' own experiences. Concerning summative assessment, the final exam was designed with an aim to evaluate the understanding of content knowledge (as an important learning outcome) and to prove the explanation and reasoning skills of the students. Therefore, various types of questions were used in the exam paper. The descriptions of assessment criteria reflected the use of criterion-referenced assessment when giving feedback and grading.

For Course II, the descriptions of teaching reflected both content- and learning-focused approaches to teaching and therefore the approach to the teaching of the teacher for Course II was classified as *dissonant*. For this course, the descriptions reflected that the teacher combined both intentions and strategies between and within various aspects of teaching (see Article I, Figure 1). The descriptions of *intended learning outcomes* (as an intention of teaching) reflected the learning-focused approach to teaching as the descriptions of the intended learning outcomes revealed the importance of understanding and using content knowledge and generic skills (i.e. thinking and presentation skills for this course).

The descriptions of the *teaching process* reflected the role of students as passive during the course; whereas in the descriptions concerning planning the teaching the intention was to design a course focusing on the content and making it easy for the students to pass the course. In practice, two hours of lectures every week focused on presenting new information, simultaneously trying to engage students to ask questions. In addition, two-hour long seminars occurred over the period of a week, during which the teacher provided tasks that required the students to use the knowledge by solving problems and discussing ideas. Therefore, the descriptions of the teaching practices reflected employing both content- and learning-focused approaches to teaching in a variety of teaching-learning events. The role of students according to the descriptions of teaching practices at the strategy level was different in the various teaching-learning events, being quite passive in lectures but active in seminars. Therefore, dissonance in teaching process was determined.

The descriptions of the *assessment practices* also revealed dissonant elements. The intention behind the assessment practices reflected the content-focused approach as the descriptions of the intentions behind the assessment practices revealed a testing of the knowledge of content and motivating the students and reducing the workload of the teacher. In practice, the descriptions of assessment methods and tasks reflected the use of various assessment methods. For example, traditional assessment forms (e.g. quizzes, mid-term test and final exam) and an alternative form (e.g. group work task) were employed. Moreover, according to

the descriptions the teacher employed both convergent and divergent types of tasks and questions (e.g. testing the knowledge as a convergent task and applying the knowledge as a divergent task). The descriptions of feedback reflected content-focused approach to teaching in this aspect, as the students had no opportunities or need to improve their work on the basis of feedback. The descriptions of assessment criteria revealed the use of norm-referenced assessment, which is more characteristic to the content-focused approach to teaching.

For Course III, the descriptions of teaching, as in Course II, reflected employing both content- and learning-focused approach to teaching and therefore, the approach to teaching was also classified as *dissonant* but to a lesser extent as the descriptions were more characteristic to the content-focused approach to teaching, although some learning-focused elements were also revealed. For this course, the teacher described both types of *intended learning outcomes*: (i) for content knowledge, the descriptions reflected more content-focused approach to teaching as the focus was more on acquiring the basic knowledge; (ii) for generic skills, the intention of the teacher was to offer opportunity to experience group work and further develop cooperation skills and therefore the descriptions reflected a more learning-focused approach to teaching.

The descriptions of the *teaching process* reflected also employing both content- and learning-focused approaches to teaching. The role of the students as the ‘intention’ part of the teaching process was described for this course as twofold in various teaching-learning activities reflecting both content- and learning-focused approach to teaching. The descriptions of planning the teaching also reflected both content- and learning-focused approaches to teaching (i.e. focusing on the content and the students’ workload). In practice, two-hour lectures for 10 weeks focused on presenting new information and the teacher’s descriptions reflected employing a content-focused approach since the students were described as passive listeners. Whereas in group work task, done between lectures and seminars (as the one assessment task) the teacher expected the students to take active roles (i.e. to construct the knowledge and take responsibility). The descriptions of the teaching practices were characteristic to the content-focused approach for both lectures and seminars as the teacher focused on introducing the theory, important aspects and giving personal examples without engaging students. In the seminars, the students also had passive role without opportunities for discussions.

The descriptions of *assessment practices* reflected the content-focused approach, although one element (the course work as an alternative assessment method) inherent to learning-focused approach emerged. The teacher described the aim of assessment for this course reflecting the content-focused approach as the focus was on the teacher’s convenience, saving time and energy when designing the assessment. In practice, two types of assessment methods and tasks were employed: course work done in groups (as an alternative and therefore learning-focused) and a final exam (as more traditional and therefore content-focused). The descriptions of the alternative assessment method reflected the

task as divergent and authentic and sequential (divided into smaller parts) revealing a more learning-focused approach. The descriptions of the traditional assessment method (final exam) revealed the use of convergent types of questions and more reproducing of answers. The descriptions of feedback reflected the content-focused approach as the students did not have to improve their work during the course like students of Course I had to do. The teacher described the assessment criteria reflecting a content-focused approach to teaching as the descriptions showed a norm-referenced approach.

The main result revealed that in the context of the TLE for Course I, the teacher's course specific approaches to teaching reflected the learning-focused approach in all aspects and therefore also reflected a consonant approach to teaching. The TLE for Courses II and III reflected a combination of learning-focused and content-focused approaches to teaching, i.e. dissonance in approaches to teaching was found. Although, the TLE for Course III can be defined as being more content-focused compared to the TLE for Course II as the teacher's descriptions included the least elements inherent to learning-focused approaches to teaching. To conclude, the TLE for: (1) Course I was labelled or characterised as consonant learning-focused, (2) Course II Course III were both labelled or characterised as dissonant.

4.2. The interplay between teaching-learning environment and its enhancing and hindering elements (Article II)

The aim of the analysis presented in Article II was to investigate what elements of the TLE students perceived as enhancing or hindering their learning in the contexts of the courses where the teachers' approach to teaching varied. The analysis revealed 12 sub-categories of students' perceptions of the TLE that were enhancements or hindrances, which were grouped under four main categories: (1) planning and organisation of the course; (2) teaching process; (3) course tasks; (4) assessment practices (see table 2 in Article II). The following paragraphs present the main results of the perceptions of the TLE by the main categories and a comparison by the courses.

The elements of the category *Planning and organisation of the course* reflected how constructive alignment, continuous learning and workload, expectations and a pre-set schedule were related to the students' learning. Students from the consonant learning-focused Course I and dissonant Course II described how opportunities to continuously engage with learning and assessment tasks enhanced their involvement throughout the course. Moreover, students from the consonant learning-focused Course I expressed how clear expectations enhanced their learning as they understood what was important to learn; and how a pre-set schedule enhanced their time management. While just a few of the student interviewees from Courses I and II expressed how alignment (between course tasks or between learning outcomes and course tasks) enhanced their learning,

most of the student interviewees from the dissonant Course III described how the perceived misalignment between teaching and course tasks made them struggle with the task and therefore adopted surface approaches to learning. Moreover, students' descriptions from the dissonant Course II reflected how the misalignment between the course and assessment tasks hindered their learning because of the perceived contradictory expectations of the tasks.

The descriptions of the elements of the category *Teaching process* revealed how teaching practices, methods, materials and interaction influenced students' learning. Most of the student interviewees from Courses I and II described how possibilities to interact with the teacher or peers enhanced their learning. More specifically, student interviewees from the consonant learning-focused Course I expressed how guidance to be prepared for interaction enhanced their learning as descriptions reflected the adoption of deep approaches to learning in the seminars. By contrast, student interviewees from the dissonant Course II described how unpreparedness for interaction hindered their learning in the lectures, but enthusiastic or interesting lectures, authentic examples and a pleasant atmosphere enhanced their learning. The opposite of uninteresting lectures and inappropriate interaction in the classroom were perceived as hindrances to learning and was described by most of student interviewees from the dissonant Course III.

The elements of the category *Course tasks* reflected how characteristics of the task, instructions of the task, group size and time management issues influenced the students' learning. Almost all student interviewees from both Course I and Course II expressed how an authentic and challenging task (i.e. enabling to relate theoretical knowledge to their own experiences or real-life examples) enhanced their learning. Furthermore, more than half of those from Course I added that flexible tasks offering possibilities to make some choices made learning not only challenging, but more interesting. By contrast, too many opportunities and too much freedom hindered learning (Courses II and III). While some students from the consonant learning-focused Course I expressed how a well-formulated instruction of the task (clear aims and guiding questions) enhanced their learning, then all the student interviewees from the dissonant Course II and most of those from an also dissonant Course III described how an ill-formulated task (unclear aims and expectations) hindered their learning. More than half of the student interviewees from the consonant learning-focused Course I described how guiding feedback and possibility to improve the course work enhanced their learning. Few students from the dissonant Courses II and III described the presence of feedback, being, however, more general, and as there was no need to improve the course work, it did not contribute to the learning. Some of the student interviewees from Course II and most of the student interviewees from Course III described big group sizes for tasks (five or more members) as being hindrances to learning due, it emerged, to the problems with the organisation of group work.

This study revealed descriptions of *Assessment practices*, but not at the same extent as previously described categories, and most of the described elements emerged from dissonant Course III students' interviews. All student inter-

viewees from this course described how the final exam, perceived as emphasizing factual knowledge and rote memorisation, made them adopt memorization as a learning strategy, which reflected surface approaches to learning. Moreover, all the student interviewees from Course III and a few students from Course II described how lack of assessment criteria hindered their learning.

In summary, the elements of the TLE that students described as enhancements or hindrances to their learning varied to a large extent by the courses. For the consonant learning-focused Course I most of the elements of TLE were described as enhancing and the ratio of enhancements to hindrances was 19:1. For the dissonant Course II both enhancements and hindrances of the TLE emerged across four categories. The ratio of enhancements to hindrances for this course was 16:13. As to the descriptions of the dissonant Course III most of the elements of the TLE were described as hindrances and the ratio of enhancements to hindrances was 3:14. Moreover, while analysing the relationship between approaches to teaching and perceptions of the TLE, it can be concluded that both the number of elements inherent to the learning-focused or the content-focused approaches to teaching and the level of guidance and teacher support varied by course, being both the highest for the consonant learning-focused Course I and lowest for the dissonant Course III.

4.3. Relationship between teaching-learning environments and approaches to learning (Article III)

The aim of this qualitative comparative analysis was to explore how students' approaches to learning differ when teachers' approaches to teaching vary. The teaching-learning environments (TLEs) of the courses were analysed and interpreted in the light of approaches to teaching theory and the main results are presented in the chapter 4.1. The analysis of the students' course specific and self-reported descriptions of learning strategies and intentions behind the strategies (i.e. approaches to learning) resulted in seven sub-categories, which were grouped under two main categories: deep and surface approaches to learning (see Table 3). In the following paragraphs, the qualitative similarities of, and the variations in, the descriptions of approaches to learning of the courses are presented. Frequency distributions of approaches to learning and learning outcomes for each sub-category of the courses were also created, but these are reported in Tables 5 and 6 of Article III.

Table 3. Main categories and sub-categories of the Deep and Surface approaches to learning

Main category	1. Deep approaches to learning	2. Surface approaches to learning
Sub-categories	1.1. Relating ideas and developing knowledge 1.2. Integration of knowledge 1.3. Seeking personal meaning of theoretical knowledge 1.4. Using the knowledge	2.1. Processing fragmented knowledge 2.2. Focusing on words, text 2.3. Rote memorisation

The descriptions of the *Deep approach to learning* reflected the intention to further develop comprehension by employing a variety of learning strategies (i.e. presented as sub-categories in Article III): relating ideas and developing knowledge, integration of knowledge, seeking personal meaning and using the knowledge. *Relating ideas and developing knowledge* (sub-category 1.1.) as the learning strategy embraced descriptions such as sharing ideas or understanding both teacher and peers, arguing and justifying opinions and integrating parts of the task when compiling the group work task. The descriptions were similar for all the courses, although for the dissonant Course III the teacher was not described as a partner in sharing ideas nor was the classroom a place where interaction (sharing ideas) occurred. The descriptions of the *Integration of knowledge* (sub-category 1.2.) revealed relating and integrating knowledge from a variety of sources. The list of sources was the longest for the consonant learning-focused Course I and shortest for the dissonant Course III where students did not describe either their personal experiences or the teacher's feedback as sources of knowledge. The descriptions for *Seeking personal meaning of theoretical knowledge* (sub-category 1.3.) emerged for Courses I and II, revealing that students developed personal understanding or focused on key ideas and relationships or studied the meaning of concepts. The descriptions were closely related to learning (e.g. the reading task for Course I) and assessment tasks (the final exams for Courses I and II). *Using the knowledge* (sub-category 1.4.) emerged only for the dissonant Course II although one student described how using the knowledge enhanced their understanding.

In summary, students' descriptions of the learning strategies of developing understanding were somewhat similar for Courses I and II being closely related to specific learning and assessment tasks or the teacher's suggestions and classroom activities. The lowest variation of the descriptions emerged for Course III as descriptions for seeking personal meaning did not emerge for this course. Moreover, the proportion of students who described deep approaches to learning was highest for the consonant learning-focused course and lowest for the dissonant Course III.

The descriptions of *Surface approach to learning* revealed the intention to cope somehow with the task by adopting learning strategies, which focused on

processing fragmented knowledge, focusing on words or text and rote memorisation. The descriptions of *Processing fragmented knowledge* (sub-category 2.1.) emerged from all courses and students described how they treated parts of the task as separate issues and did not develop an understanding and therefore did not learn about the various concepts. The descriptions of *Focusing on words and text* (sub-category 2.2) also emerged for all courses although being somewhat similar for Courses I and II were closely related to working with textbooks without developing any understanding. For Course III, the students described just reading the slides (the descriptions did not contain reading any textbook) without seeking any understanding. The descriptions of this sub-category were again closely related to learning or assessment tasks of the courses. *Rote memorisation* (sub-category 2.3.) as a learning strategy emerged from the descriptions from all courses and were related to final exams although the memorised object varied (concepts, relationships between concepts or answers to practice questions). In summary, the descriptions of students' approaches to learning were somewhat similar for all courses referring to the use of the surface approach to learning although what was read or memorised varied. Moreover, the proportion of students who described surface approaches to teaching varied, being the lowest for the consonant learning-focused course and highest for the dissonant Course III.

The analysis of the relationship between the teachers' approaches to teaching and the students' approaches to learning revealed that the more the teacher adopts learning-focused approaches to teaching, the more their students adopt deep approaches to learning.

4.4. Relationship between teaching-learning environments and students' learning outcomes (Article III)

The analysis of the students' course specific and self-reported learning outcomes resulted in 12 sub-categories, which were grouped under four main categories: (1) theoretical knowledge; (2) practical knowledge; (3) generic skills and (4) changes in thinking (see Table 4 below and Table 4 in Article III). The following section presents an overview of the relevant findings by the main categories regarding qualitative similarities and differences of the students' self-reported learning outcomes of the courses.

The descriptions of *Theoretical knowledge* reflected the quality of the theoretical knowledge in the following sequence: knowledge of basic concepts, understanding of basic concepts and understanding principles and generalizations. *Knowledge of basic concepts* (sub-category 1.1) comprised descriptions, in which the students expressed acquiring factual knowledge like the nature of the subject and its concepts without using the words, which would refer this to the cognitive level of knowledge.

Table 4. Main categories (n=4) and sub-categories (n=12) of learning outcomes

Main category	1. Theoretical knowledge	2. Practical knowledge
Sub-categories	1.1. Knowledge of basic concepts	2.1. Practical knowledge of subject-specific techniques and methods
	1.2. Understanding of basic concepts	2.2. Practical knowledge of group work
	1.3. Understanding principles and generalizations (conceptual knowledge)	2.3. Practical knowledge of communication 2.4. Practical knowledge of finding information
Main category	3. Generic skills	4. Changes in thinking
Sub-categories	3.1. Development of group work skills	4.1. Changes in understanding the subject
	3.2. Development of communication skills	4.2. Changes in awareness
		4.3. Changes in the interest of the subject/field

The descriptions of knowledge for this sub-category were somewhat similar for all the courses, except for the dissonant Course III where students did not express that they would develop the knowledge of which the subject is composed. The descriptions of *Understanding of basic concepts* (sub-category 1.2.) reflected the use of the word “understanding” to describe their factual knowledge. The students of the consonant learning-focused Course I expressed how they developed understanding of the meaning of concepts, and could explain the concepts and bring examples. The descriptions were somewhat similar for Course I and the dissonant Course II, but in the latter the students did not express that they could explain the concepts and the level of understanding varied. Moreover, students for Courses II and III (both dissonant) expressed their understanding was not the same for all concepts: they developed understanding only about those concepts, which were engaged in a group work task. The descriptions of *Understanding principles and generalisations* (sub-category 1.3.) reflected the development of an understanding about the relationships of concepts and principles of the subject. The descriptions were similar for Courses I and II and did not emerge for Course III. In summary, the quality of descriptions in the category of **Theoretical knowledge** was somewhat different for the courses, being the highest for the consonant learning-focused Course I and lowest for the dissonant Course III as understanding of relationships between concepts (sub-category 1.3) did not emerge for this course. The quality of **Theoretical knowledge** was somewhat similar for Courses I and II although, for the latter, students expressed understanding of concepts being at different level as descriptions revealed fragmented knowledge.

The descriptions of *Practical knowledge* were closely related with the specific learning and assessment tasks of the courses and the descriptions were therefore course specific, except for the practical knowledge of group work. Four types of practical knowledge emerged: (1) subject specific techniques and methods; (2) group work; (3) communication and (4) finding information. In general, the students' descriptions from all the courses revealed the *Practical knowledge of subject specific techniques and methods* (sub-category 2.1.) as knowledge of how to do something practical in the field. Most of the descriptions were closely related to the subject-specific techniques and methods, which the teachers designed as learning and assessment tasks and in which the students engaged during group work or tasks. However, some differences between the courses in *Practical knowledge of subject specific techniques and methods* also emerged. Firstly, for the consonant learning-focused Course I some students described the knowledge as how to use the theory. Secondly, for the dissonant Course II some students described the practical knowledge as not being the same for all techniques and methods. *Practical knowledge of group work* (sub-category 2.2.) emerged for all courses probably because the descriptions of group work as a teaching method was described by all three teachers. The descriptions of this knowledge were similar for all the courses and the students described how they developed their knowledge of group work: about benefits, problems, the size of the group and the organisation of group work. The descriptions of *Practical knowledge of communication* (sub-category 2.3.) emerged only for the dissonant Course II. The students described how they realised the importance of communication via different modes in the field. Moreover, students for Course II described how the teacher of the course represented for them a model of effective communication. *Practical knowledge of finding information* (sub-category 2.4) emerged only for dissonant Course III and students expressed how they developed the knowledge of finding information. In summary, the descriptions of *Practical knowledge* were somewhat different for all the courses and closely related to the specific task in which the students engaged. For the dissonant Course II, the descriptions revealed variety in the quality of understanding of techniques and methods emerged i.e. descriptions revealed fragmented knowledge.

The descriptions of *Generic skills* emerged only for dissonant Course II. The students expressed clearly how they developed group work skills or verbal communication skills.

Changes in thinking as a last category for learning outcomes emerged especially for consonant learning-focused Course I and dissonant Course II, being similar for both of these courses. The descriptions in this category for the dissonant Course III emerged only for the last sub-category. The descriptions of *Changes in thinking* reflected changes in understanding, changes in awareness and changes in the interest of the subject or field. Students described how the *Understanding of the subject* (sub-category 4.1.) changed on that they saw the subject as more broader than at the beginning of the course or understanding the importance of the subject in working life. Furthermore, some students described

Changes in awareness (sub-category 4.2.) as being more aware of (1) how practices in the subject's field influence their life and (2) other people. The descriptions of *Changes in interest of the subject/field* (sub-category 4.3.) emerged for all the courses. For the consonant learning-focused Course I and the dissonant Course II, the interest in the subject matter increased during the course whereas the interest for the dissonant Course III decreased. In summary, the results reveal that *Changes in thinking* were similar for Courses I and II. Students for Course III did not describe changes in understanding the subject nor in awareness, and was therefore the lowest in quality. Moreover, students for Course III expressed how the interest towards the subject matter decreased.

The analysis revealed that the more the teacher adopts a content-focused approach to learning, the more the quality and variety of learning outcomes decreases.

4.5. The relationship between teaching-learning environments, approaches to learning and learning outcomes

In order to evaluate the relationship between the TLE of the courses (i.e. adopted approaches to teaching) and the students' approaches to learning and learning outcomes, the number of students who described an approach to learning or a learning outcome at sub-category level by course was checked (see Table 5 and 6 in Article III). The key characteristics of the approaches to teaching, approaches to learning and learning outcomes of the three courses is presented in Table 5.

The comparison of the courses' key characteristics (see Table 5) reveals that when a teacher adopts learning-focused approaches to teaching, the proportion of students who employ a deep approach to learning is higher than for those courses where the teacher adopts both content- and learning-focused approaches to teaching (i.e. a dissonant approach to teaching). Although the teacher's approach to teaching was consonant learning-focused, some students described the use of the surface approach to learning, including dissonant elements. Furthermore, the descriptions showed that the quality of learning outcomes is also somewhat higher for the consonant learning-focused Course I than for the dissonant Course II. For the dissonant Course III, a high proportion of students described adopting surface approaches to learning, and the quality and variety of the learning outcomes was lowest.

Table 5. Comparison of key characteristics of the three courses

	Course I	Course II	Course III
Approaches to teaching	Consonant learning-focused	Dissonant	Dissonant, more towards content-focused
Students' perceptions of the TLE			
The ratio of enhancements to hindrances	19:1	16:13	3:14
Approaches to learning			
The proportion of students describing a deep approach to learning	High	Medium	Low
The proportion of students describing a surface approach to learning	Low	Medium	High
Learning outcomes			
The quality of learning outcomes	High	Somewhat lower than Course I	Low
The proportion of students describing understanding of theoretical knowledge	High	High	Low
The proportion of students describing practical knowledge	Medium	High	Medium
The proportion of students describing generic skills	Not described	High	Not described
The proportion of students describing changes in thinking	High	Somewhat lower than Course I	Not described interest decreased

4.6. Summary of main findings

The main research aim for this study was to explore the relationship at the course level between the TLE and the students' perceptions of it, approaches to learning and learning outcomes. The aim of the study was fulfilled by exploring: 1) the TLEs of the courses by analysing the teachers' approaches to teaching as a 'presage' component of 4P-model of learning; 2) students' perceptions of enhancing and hindering elements of the TLEs as a 'perception' component; 3) students' approaches to learning as a 'process' component and TLE of the

courses; 4) students' learning outcomes as a 'product' component of the 4P-model of learning and relating all these to the TLE of the courses as a 'presage' component of the 4P-model of learning

The main finding of the study is that TLE and students' perceptions of it, the approaches to learning and the learning outcomes are all interrelated. The study found that the more the teacher adopts a content-focused approach to teaching, the more students reported elements of the TLE that hindered their learning or encouraged them to adopt the surface approach to learning. The more the teachers' approach to teaching is learning-focused, the more likely the students are to adopt deep approaches to learning and gain high quality and broad learning outcomes (see Table 5). Vice versa, the more the teacher adopts the content-focused approach to teaching, the more likely the students adopt the surface-approach to learning and obtain low quality and narrow learning outcomes. This study also revealed that the dissonant approach to teaching does not necessarily mean low quality and narrow learning outcomes, but may encourage adoption of the surface approaches to learning. Furthermore, the students' perceptions of the TLE explained why students of dissonant courses adopted more surface approaches to learning and gained lower quality and narrow learning outcomes: when the level of structure, guidance and teacher support is low then students probably adopt surface approaches to learning and gain lower quality and narrow learning outcomes. Moreover, dissonance in teaching was revealed through students' perceptions' of misalignment between various elements of the TLE (e.g. learning outcomes and course tasks; different course or assessment tasks; teaching and course tasks).

5. DISCUSSION

The overarching aim of this thesis was to acquire a thorough understanding of the relationship between ‘presage’, ‘perceptions’, ‘process’ and ‘product’ components of the 4P-model of students’ learning. More precisely, the aim was to explore how the students’ course specific perceptions of the TLE, approaches to learning and learning outcomes vary in various course contexts where the teachers’ approaches to teaching also vary. In this chapter, the key findings are discussed in the light of 4P-model of students’ learning in higher education. First, general findings of the thesis are discussed and then the more detailed findings on the relationship between the components of the 4P-model of students’ learning are discussed further.

5.1. 4P-model of students’ learning in higher education: general discussion

The research presented in this thesis focused on the relationship between the components of the 4P-model of students’ learning and in general, the central findings were as follows:

1. At the general level, the components of the 4P-model of students’ learning are interrelated: *the teachers’ approaches to teaching* as a ‘presage’ factor, *students’ perceptions of the TLE* as ‘perception’ factor, *students’ approaches to learning* as ‘process’ factor and *learning outcomes* as ‘product’ factor are interrelated meaning that the quality of students’ learning is context dependent.
2. The students’ perceptions of the TLE varied to a large extent by the courses revealing that when most of the elements of the TLE are perceived as being an enhancement to learning, there is a greater probability of the students’ adopting deep approaches to learning and developing high quality and broad learning outcomes. Therefore, a more holistic approach is needed while developing the TLEs to enhance the students’ learning. This means that elements of the TLE that are both characteristic to the learning-focused approaches to teaching and those that guide, structure and support students’ learning are crucial to develop high-quality TLEs in higher education at undergraduate level.
3. Dissonance in teaching i.e. the combination of learning- and content-focused approaches to teaching is not always related to adoption of the surface approach to learning among students and lower quality learning outcomes. Adoption of surface approaches to learning and low quality and narrow learning outcomes are related with how students’ perceive elements of TLE, such as low level of guidance, structure and support. Therefore, this research reveals that a combination of dissonant approaches to teaching and a lack of guidance, structure and support is related to the students’ surface approaches to learning and lower quality of learning outcomes.

In the following paragraphs, the central findings are discussed in more detail.

First, the comparison of the three courses indicates that all four components of the 4P-model, are interrelated. In general, this study supports the claim that when the teachers' approach to teaching is learning-focused, the more do students' perceive the elements of the TLE as enhancements to learning and adopt a deep approach to learning and gain higher quality and broad learning outcomes. Vice versa, when the teacher adopts a content-focused approach to teaching the more do students' perceive elements of the TLE as hindrances to their learning and they adopt surface approaches to learning and gain lower quality and narrow learning outcomes. Moreover, this study also revealed that students' perceptions of the TLE that act like a mediating tool between a 'presage' and a 'process' component of the 4P-model (Baeten et al., 2010; Biggs, 1989) to some extent determine the adoption of approaches to learning and development of learning outcomes. 'To some extent' emphasises the role of personal factors, which were not explored in this study. Personal factors should be considered as this study revealed that despite the teacher's approach to teaching being consonant learning-focused for Course I, the students revealed that some still adopted both surface and deep approaches to learning depending on the task or assessment. This indicates that some students retain a surface approach to learning despite the TLE (see also Lahdenperä et al., 2019). All this indicates that at the course level the components of the 4P-model of students' learning are related, meaning that the quality of students' learning is to a large extent context dependent. Therefore, the teaching plays a crucial role while developing students' high quality and broad learning outcomes in higher education.

Secondly, students' perceptions of the TLE varied between courses, and the results showed that when several elements of the TLE are perceived by the students as enhancing their learning, they are likely to adopt deep approaches to learning and gain high-quality and broad learning outcomes. This study revealed that it is insufficient that some elements of the TLE are characteristic to learning-focused approaches to teaching. The analysis of students' perceptions of the TLE revealed that teaching practices that **guide, structure and support students' learning** are also important to consider while developing TLEs at undergraduate level. The findings presented in Article II showed that the enhancing and hindering elements of the TLE that students described varied to great extent by course. Students described *enhancing elements of the TLE that are characteristic to the learning-focused approaches* (e.g. enthusiastic and interesting lectures; authentic examples; variety in teaching methods; interaction that offers possibilities to construct the knowledge; pleasant atmosphere; authentic and challenging course tasks). Students also described *hindering elements of the TLE that are characteristic to the content-focused approaches to teaching* (e.g. uninteresting lectures; fictional or teachers' own examples; long lectures; little possibilities to interact in the classroom; summative assessment, i.e. the final exam). Moreover, students also described quite many enhancing and hindering elements of the TLE, which are not described so explicitly in the

context of approaches to teaching theory but have been described separately by various researchers as important elements of the TLE. These elements were: (1) the alignment or misalignment between different elements of teaching: learning outcomes and course tasks; aligned course or assessment tasks; (2) continuous learning activities and assessment tasks; (3) compulsory or optional learning activities; (4) expression of expectations and goals or lack of these; (5) pre-set study plan; (6) well- or ill-formulated instruction of the task; (7) guiding feedback and possibilities to improve the course work or insufficient feedback; (8) sufficient time for the task; (9) cumulative assessment. Overall, these elements are characteristic of the teaching practices that guide, structure and support students' learning. Most of these elements are described separately in various previous studies but as this study focused on the whole TLE of a course, then this enabled the emergence of a variety of elements of the TLE that enhance or hinder learning.

Moreover, the results of students' perceptions of the TLE in course contexts offered an explanation to the contradictory results of the previous studies on the relationship between the teaching and learning (Baeten et al., 2010; Gijbels et al., 2008; Nijhuis et al., 2005; Struyven et al., 2006). The results of this study showed the importance of taking into account several elements while conceptualising the TLE of the courses in higher education. Previous studies where one or a few elements of the TLE have been taken into consideration did not clearly indicate a clear relationship between learning-focused teaching or assessment methods and adoption of deep approaches to learning. However, the studies where several elements of the TLE are addressed have offered more consistent results of the relations between learning-focused teaching and deep approaches to learning. Therefore, it can be concluded that the results of the previous studies where the relationship between the teaching and learning is explored, depended on the focus of the elements of the TLE of those studies. At the same time other important elements of the TLE in contradictory studies were not so explicitly described (e.g. the alignment, the level of structure and guidance, possibilities to interact). All this reveals that a holistic approach is needed when exploring the relations between teaching and learning.

Thirdly, the research presented in this thesis found that a combination of dissonant approaches to teaching and a lack of guidance, structure and support may be related to low quality of students' learning. In this study, the TLE of the courses was conceptualised employing approaches to teaching theory i.e. teachers' intentions and strategies while teaching the course were analysed. In general, two broad categories of approaches to teaching have been detected: content- and learning-focused approaches to teaching where the former is inherent to a knowledge transmission view of learning and the latter to a constructivist view of learning (Kember & Kwan, 2000; Postareff & Lindblom-Ylänne, 2008). Moreover, earlier studies found that university teachers tend to combine content- and learning-focused approaches to learning resulting in a dissonant approach to learning (Postareff et al., 2008; Stes and Van Petegem, 2014). The analysis of teachers' approaches of teaching of the courses revealed

that the approach to teaching for two courses was determined as dissonant. Previous studies indicate that dissonance in teaching may not be a negative phenomenon, because content- and learning-focused approaches to teaching may even complement each other (Elen, Clarebout, Léonard, & Lowyck, 2007; Postareff et al., 2008). However, few studies that have explored how dissonant teaching and the quality of students learning are related, have indicated that combining the disparate approaches may encourage adoption of surface approaches to learning (Baeten, Struyven & Dochy, 2013; Prosser et al., 2003). Earlier studies have found that students may even prefer features of content-focused (e.g. teacher direction) as well as learning-focused (interaction with peers) TLEs (e.g. Baeten et al., 2016; Elen et al., 2007). The results of this study revealed that for Courses II and III, where the teachers approaches to teaching were characterised as dissonant, dissonance in teaching was not always related to lower quality learning. Although, in general this study found that the more content-focused approaches to teaching that the teacher adopted, the more did students describe both the use of surface-approaches to learning and lower quality and narrower learning outcomes. Moreover, this study found that dissonance in teaching might result in various approaches to learning and learning outcomes (Article III). Therefore, the results indicate that approaches to teaching per se do not enhance or impede students' learning (Article III), but students' perceptions of TLE mediate the influence of teaching on students' learning (Article II). The analysis of students' perceptions of the TLE (Article II) explains why dissonant teaching does not enhance students' learning.

Article II adds that the more the teacher adopted content-focused approaches to teaching, the more students described elements of the TLE that hindered their learning. Previous studies on approaches to learning (e.g. Asikainen, 2014; Parpala et al., 2010; Rytönen, et al., 2012) revealed that the adoption of deep approaches to learning is not necessarily sufficient for being successful in higher education, but organised studying combined with the deep approach to learning is necessary to succeed in higher education. Article II suggests the same for teaching in higher education. In general, the results suggest that it is insufficient to adopt learning-focused approaches to teaching to support students' learning, but the *teacher's guidance, structure and support for learning* are crucial. This claim is supported by Kirschner, Sweller & Clark (2006) who conclude that minimal guidance even in learning-focused learning environments does not support students' learning and might even have a negative effect on students' understanding. Baeten et al. (2016) also reveal the equal importance of teacher direction and guidance and possibilities to construct knowledge in higher education. Therefore, the research presented in this thesis reveals that a combination of dissonant approaches to teaching and lack of elements of the TLE that guide, support and structure students' learning is related to students' surface approaches to learning and lower quality and narrow learning outcomes.

To conclude, in the context of approaches to teaching theory, elements of the TLE that guide, structure or support students' learning have not been described so explicitly in previous research. This study supports the idea that TLE at the

course level should include elements characteristic to learning-focused approaches to teaching and elements that guide, structure and support students' learning. This indicates that the design of the TLE of the courses should take into account several elements of both approaches meaning that a holistic approach is needed to design TLEs that enhance students' learning.

In the above paragraphs, the general findings of the thesis were discussed. In the next ones, the relationships between components of the 4P-model of students' learning are discussed in more detail.

5.2. Teaching-learning environments and students' perceptions

The students described several elements of the TLE of the courses as both hindrances and enhancements to learning. In the following paragraphs, the most important findings on the relationship between the TLE and perceived elements are discussed referring to the main-categories of students' perceptions of the TLE.

In the context of approaches to teaching theory, *planning the teaching* is considered an important aspect (Postareff & Lindblom-Ylänne, 2008). The analysis presented in Article II indicated that it is crucial *to plan and organise* the course before teaching. Earlier studies have emphasised the role of clear expectations and goals, pre-set timetables and constructive alignment in enhancing learning (e.g. Biggs, 1996; Hailikari et al., 2018; Nijhuis et al., 2005; Postareff et al., 2015; Rytkönen et al. 2012; Wang et al., 2013). The findings also revealed that some students valued and expressed expectations and goals, continuous tasks and a pre-set timetabled study plan and alignment between the TLE's elements as enhancements to learning and a lack of these as hindrances to their learning. Earlier studies have indicated that insufficient planning, goal-setting or self-regulation skills may be the cause for students to struggle (Hailikari et al., 2018; Rytkönen et al., 2012). On the other hand, the findings revealed that elements of the TLE which support students' in planning and organising their studies are valued by the students as they help to organise and plan their own study time and focus on important things i.e. make learning time more efficient. The findings also indicated that misalignment between different elements of the TLE clearly causes confusion and is related with the adoption of surface approaches to learning. Therefore, the study suggests that surface approaches to learning and unorganised studying may not always be caused by the students' insufficient planning, goal-setting or self-regulation skills, but are to some extent caused by a lack of clear planning and organisation of the course that is the responsibility of the teachers. Overall, *planning the learning* of students and trying to see the course from the perspective of students' learning is crucial in the learning-focused approach to teaching.

Moreover, contrasting the teachers' approaches to teaching and the students' perceptions of the TLE enabled an understanding of how dissonance in teaching manifests in the students' descriptions. The results presented in Article II showed that the students do not perceive and describe alignment when it occurs. But, when it occurs, they perceive and describe misalignment more clearly. Only a few students from Course I (consonant learning-focused) perceived and described the alignment. Some students from Course II (dissonant) and almost all students of Course III (dissonant) described misalignment between teaching and course tasks or between assessment tasks. Therefore, it can be concluded that dissonance in teaching and assessment is perceived by the students as misalignment. The findings suggest that dissonance and misalignment can be similar phenomenon although dissimilar concepts are used.

Teaching practices as another important aspect of approaches to teaching theory are described in the learning-focused approach as enabling the construction of the knowledge and therefore the importance of the role of interaction and variety of teaching methods is emphasised (Kember & Kwan, 2000; Postareff & Lindblom-Ylänne, 2008). Previous studies also indicate that interesting teaching and interaction enhances learning, adoption of deep approaches to learning or development of generic skills (e.g. Hailikari et al., 2018; Rytönen et al., 2012; Virtanen & Tynjälä, 2018). The findings presented in Article II revealed that an opportunity to interact with peers or teacher enhances learning. The findings also add that *preparedness for interaction* (i.e. students were required or guided to be prepared for interaction) was related to deep approaches to learning making the interaction more beneficial and enhancing the development of understanding of knowledge (see also Erikson, Erikson & Punzi, 2016). The findings presented in Article II also emphasise the importance of variation in teaching practices which makes participation in classroom meetings more interesting and increases involvement (see also Oldfield, Rodwell, Curry & Marks, 2017). All this confirms the importance of development of teaching practices which take into account the learner's active and meaningful involvement and interaction.

In approaches to teaching theory, both *assessment practices* and *course tasks* have received scant attention although in general the importance of assessment is stressed a lot in higher education (Biggs & Tang, 2007; Rowantree, 1987). In general, earlier studies have indicated that a change in single elements of the TLE in assessment practices more towards authenticism does not improve students' learning (e.g. Gijbels et al., 2008; Struyven et al., 2006), but the formulation of the assessment task may be crucial (Nijhuis et al., 2005). Furthermore, feedback and the possibility to improve the task are important while developing understanding (Gijbels et al., 2009; Sadler, 1989; Täks, 2015). The findings presented in Article II showed that a high quality and broad learning outcomes are enhanced by developing several elements of the assessment more towards learning-focused. Overall, it can be claimed that authentic and well-formulated assessment or course tasks with the possibility to revise and improve during the course on the basis of constructive feedback and interaction enhance students'

learning and adoption of deep approaches to learning. Moreover, the final exam as a method for summative assessment does not play a crucial role in developing understanding, especially when the teacher adopts learning-focused approach to teaching, where developing understanding occurs throughout the course (see also Mumm et al., 2016; Sambell et al., 1997). This finding shows that assessment, which aims to judge the learning at the end of process may not necessarily enhance high quality learning (see e.g. Taras, 2005).

To conclude, the analysis of perceptions of the TLE presented in the Article II revealed many elements of the TLE affected students' learning, which is mostly similar to previous studies that have explored enhancing and hindering factors of learning at a more general level (e.g. Hailikari & Parpala, 2014; Hailikari et al., 2018; Parpala et al., 2010; Ruhoniemi & Lindblom-Ylänne, 2009). However, some elements of the TLE have not been described as explicitly as in Article II, which presented course specific hindrances and enhancements of the TLE. For example, continuous learning and assessment tasks, flexibility (compulsory and optional learning activities) or the quality of instructions of the tasks (well- and ill-formulated) have not been identified so clearly in previous studies in the field of higher education. The qualitative, comparative and course specific approach of this study enabled it to identify elements of the TLE that enhance students learning at the course level.

5.3. Teaching-learning environments and approaches to learning

In this thesis, the TLE of the courses was characterised using approaches to teaching theory. The analysis presented in Article III reveals that at the course level *teachers' approaches to teaching and students' approaches to learning* are related: the more teachers' approaches to teaching are learning-focused the more likely students' employ deep approaches to learning. This finding is in line with previous studies (Prosser & Trigwell 2014; Trigwell, et al., 1999; Wilson & Fowler 2005) and most recently (Lahdenperä et al., 2019), which also showed that learning-focused course design encourages students to adopt more deep approaches to learning. Although previous studies (Gijbels, et al., 2008; Struyven et al., 2006; Trigwell et al., 1999) indicated that encouraging students to adopt deep approaches to learning throughout the course is challenging, results of this study indicated that deep approaches to learning are to a large extent possible to encourage.

The results of this thesis also revealed that even though Course I's teacher's approach to teaching was consonant learning-focused, the descriptions of approaches to learning revealed that some students adopted surface approaches to learning for one learning or assessment task, but for another they adopted a deep approach. This indicates that some students retain surface approach to learning despite the TLE. This claim is supported by Lahdenperä et al. (2019),

who also found that some students still maintained a surface approach to learning although the TLE was changed to learning-focused. Previous studies (e.g. Gijbels et al., 2008; Gijbels et al., 2009; Lahdenperä et al., 2019) also indicate that improving the TLE by adding more learning-focused elements does not encourage students to adopt deep approaches to learning. Wilson and Flower (2005) indicate that it is possible to encourage ‘typically surface’ learners to change their approaches to towards deep learning when several elements of the TLE are learning-focused (e.g. teaching and assessment methods, greater expectations, responsibility and inter-dependency with each other). This thesis confirms that the TLE of the courses enhances the adoption of deep approaches to learning when several elements of the TLE are learning-focused and when the elements are coherently related. This increases the possibility that most of the students do adopt deep approaches to learning. Although, there is a chance that some students still adopt surface approaches to learning despite of the learning-focused TLE. Therefore, personal factors of the students may prevail over TLE.

Article III found, like Prosser et al. (2003) that dissonant approaches to teaching and students’ surface approaches to learning are related. This study indicated that the more content-focused approach to teaching the teacher employs, the more surface approaches to learning students report. However, Article III also showed that dissonance in teaching is not always related to the adoption of surface approaches to learning for all cases. The analysis in Article II of the students’ perceptions of TLE provided explanations for the adoption of surface approaches to learning: the low level of guidance, structure and support encouraged the adoption of surface approaches to learning. Constructive alignment is an important theoretical model that structures learning outcomes, teaching and assessment of the course to enhance students’ learning (Biggs, 1996; Blumberg, 2009). Wang et al. (2013) indicate that misalignment between the elements of the TLE encourages adoption of surface approaches to learning. This thesis specifies that the perceived misalignment between the elements of TLE causes confusion and this is related to the adoption of surface approaches to learning (Article II). This finding once more indicates that coherence or alignment between the elements of the TLE is important to consider.

5.4. Teaching-learning environments and learning outcomes

This thesis indicates how *teaching-learning environments* (i.e. *teachers’ approaches to teaching*) and *students’ learning outcomes* are related. In general, the results showed that the more content-focused approaches to teaching are employed the more the quality and variety of students’ self-reported learning outcomes decreases. This finding is in line with a few previous studies in this field (Mintz & Tal, 2013; Tynjälä, 1998). The thesis adds that dissonant

approaches to teaching may not automatically lead to lower quality of learning outcomes, but it could encourage an increase in the adoption of surface approaches to learning.

This thesis reveals important learning outcomes for higher education, such as *changes in thinking* (Barnett, 2004; Bowden & Marton, 1998). This outcome only develops when teachers encourage interaction by students with either or both the teacher and their peers; employ learning-focused teaching strategies (such as interaction and variety of teaching methods) and assessment strategies (such as authentic and challenging task) as it was for Courses I and II. This thesis showed that adopting only few learning-focused assessment methods is insufficient to encourage the development of high quality and broad learning outcomes, such as changes in thinking. For example, for Course III the descriptions of teaching and assessment practices reflected mainly the content-focused approach to teaching and only for one assessment method did the teachers' descriptions reflect the learning-focused approach to teaching. Moreover, the students' for the Course III perceived the instruction of the task as ill-formulated and the other assessment task (i.e. the final exam) as focusing on rote memorisation. In addition, possibilities to interact were low. As a result the students described low quality and narrow learning outcomes while higher quality learning outcomes, such as changes in thinking did not emerge for this course. These results emphasise that the assessment needs to be systematically learning-focused. Moreover, it emphasises the need to offer students' possibilities to interact with either or both the teacher and their peers while compiling the assessment tasks.

The descriptions of *generic skills* emerged only for the dissonant Course II. The development of generic skills has been the focus of higher education in recent decades. Previous studies (e.g. Kember & Leung, 2005; Kember, Leung, & Ma 2007) have found that the development of generic skills is supported by the TLE, where teaching for understanding, the variety of assessment methods, active learning and working together were apparent, i.e. where student- or learning-focused elements of teaching and assessment were employed. A recent study by Virtanen & Tynjälä (2018) suggests that teaching practices like collaboration and interaction both supported the development of generic skills (especially decision-making and problem-solving skills). Thus, previous studies indicate that elements of TLE do support the development of generic skills. As the elements of interaction and collaboration emerged in the descriptions of teaching for both Course I and Course II, the explanation why the descriptions of generic skills emerged only for Course II could be that they were probably made explicit for the Course in that the teacher emphasised activity enhances the development of presentations skills (see also Drew, 1998; Tynjälä & Gijbels, 2012; Täks, 2015). Therefore, this study also indicates that merely the approach to teaching (i.e. the adoption of the elements of interaction and collaboration in teaching) does not alone enhance the development of generic skills, but making the development of skills explicit may be more crucial.

5.5. Approaches to learning and learning outcomes

In general, earlier studies on the relationship between approaches to learning and learning outcomes have shown a relationship does exist between deep approaches to learning and high quality and a broad range of learning outcomes (Lizzio et al., 2002; Marton & Säljö, 1976; Prosser & Trigwell, 1999; Trigwell & Prosser, 1991; Quinn & Stein, 2013). However, some studies indicate that diverse methodological approaches may produce contradictory results (Quinn & Stein, 2013). This qualitative research shows relationships exist between surface approaches to learning and low quality and narrow learning outcomes at the course level. There is a distinct correlation between an increasing frequency of students describing surface approaches to learning or combining deep and surface strategies and an increasing reduction in the understanding of theoretical knowledge. This research also specified that dissonant approaches to learning are related to a fragmented understanding of knowledge. The understanding of concepts depended how deeply the learner engaged with different learning and assessment tasks.

This thesis also found that generic skills and changes in thinking were not described at all for the Course III where a high number of students described the adoption of surface approaches to learning. Although this study also revealed that the development of generic skills may not always be related with approaches to learning, other elements of the TLE may also be important (e.g. making the development of generic skills more explicit by the teacher). All this reveals that creating a TLE that enhances the adoption of deep approaches to learning and explaining the benefits of learning activities is highly crucial for the development of high quality and broad learning outcomes.

5.6. Methodological discussion

The qualitative comparative multi-case research was employed for this thesis as a research design. Previous studies, that have explored the relationship between teaching and learning, have applied comparative design but have been mostly quasi-experimental and quantitative in nature (e.g. Struyven et al., 2006). Some studies have employed quasi-experimental and both quantitative and qualitative data (e.g. Tynjälä, 1999). Several previous studies that have explored the relationship between the TLE and students' learning and had unexpected findings, suggested that a qualitative approach would be beneficial (e.g. Baeten et al., 2010; Parpala, 2010). As the results of previous studies have not been univocal, and several elements of the TLE may influence students' learning, this study used a qualitative approach because qualitative studies are open in nature enabling the researcher to explore phenomena in more detail (Merriam & Tisdell, 2016).

Furthermore, although earlier studies on the relationship between teaching and learning have focused on specific courses, the TLEs of those courses did

not explain the existence of contradictory results. Therefore, this study employed a case-oriented approach, which Miles et al. (2014) suggest using when the aim is to explore something more profoundly. Therefore, the TLE of the courses was explored in more detail using interviews with teachers and approaches to teaching theory. Moreover, the qualitative approach enabled the study to examine the students' learning and its interaction with the TLE in a holistic way. Moreover, the 4P-model of students' learning in higher education helped to explore the relationships between 'presage' component and students' 'perceptions', 'process' and 'product' component of the model.

As the purpose of this study was to understand how the students' perceptions of the enhancing and hindering elements of learning, self-reported approaches to learning, and learning outcomes are influenced by the local conditions designed by the teachers of the courses, the study explored multiple cases. Miles et al. (2014) argue the advantage of using multiple cases in research is to create possibilities to offer powerful explanations and to deepen understanding. Moreover, maximum variation sampling from the perspective of the teaching and assessment practices was employed while selecting the cases to increase the possibility of examining similarities and differences across the cases. Bazeley (2013) claims that comparing data sets enables the identification of conditions or processes that form each case and help to explain behaviour across wider population. For example, the use of a comparison of text and frequencies of the elements that enhance and hinder students' learning between cases as presented in the Article II. The suggested comparisons allow the understanding that dissonance in approaches to teaching may take various forms and have a range of impacts on students' learning. A comparison in Article II enabled the conclusion that the level of guidance, structure and support of teaching might be crucial elements of the TLE that enhance learning. Qualitative multiple case study research design has just recently been more frequently applied in studies exploring the relationship between teaching and learning in higher education (e.g. Hoidn, 2017; Pathways to quality...2018).

While comparing the methodological approach for the analysis presented in Article II and previous studies exploring the enhancements and hindrances of the TLE, one important originality should be emphasised. Namely, previous studies exploring students' perceptions of the TLE have used a more general approach, i.e. external factors that enhance or hinder students' learning at the curriculum level (e.g. Hailikari et al., 2018; Hailikari & Parpala, 2014; Ruohoniemi & Lindblom-Ylänne, 2009). The relationship between the perceptions of the TLE and students' learning has been explored mostly at the curriculum level and by using a quantitative approach. Due to the lack of knowledge as to what kinds of elements of the TLE do enhance or hinder students' learning at the course level, the analysis presented in Article II aimed to fill this gap. Moreover, the selection of meaning units was unique for the Article II's analysis: only those meaning units where both the students' perception of the TLE and how this influenced their learning were present, were selected. This approach was inspired by the non-dualistic approach that understands students' learning

experiences as ‘negotiations between the personal and social’ (Billet, 2009, p. 34), meaning that the external and personal factors determine the learning experience. This approach enabled the analysis of a united experience: the perception of elements of the TLE and how it influenced students’ learning.

5.7. Limitations and further studies

Considering the research design of the thesis, a few limitations can be observed. Directions for future studies are also offered.

Firstly, a possible limitation of the research presented was the small number of cases (n=3) despite attempts to increase the number (one invited teacher did not agree to participate), and the total number of possible cases was only five. It can be stated that from the perspective of generalizability the number of cases could be regarded as small. Although, Thomas (2016) suggests that the number of cases is not so important as the richness and depth of cases or how much the sample presents something (i.e. the TLE of the course and the relationship between the TLE and the students’ learning in this thesis). Therefore, the richness of the data could be regarded also as a limitation as the teachers’ descriptions of some approaches to teaching did not emerge, e.g. the consonant content-focused approach to teaching. Although, the analysis of curricula in the field of business and administration revealed that it is very common to combine both content- and learning-focused elements of the teaching-learning environments of courses.

Secondly, the small size of the sample populations of the cases can be regarded as another limitation. The numbers of student interviewees (n) were: Course I (n=12), Course II (n=14) and Course III (n=7). The aim was to include a variety of experiences of learning to be present in the sample. Moreover, as the number of students who finished the course was high, it was important that students would be selected on the basis of probability sampling and therefore systematic sampling was used. The influence of small sample size was reduced by representativeness of learning experiences, i.e. to ensure maximum variation of experiences. Moreover, the motivation to participate in the study can be considered quite high for Courses I and II as about half of the invited students agreed to participate. For Course III, a different sampling method was adopted as the students did not reply to the invitations probably due to the negative experience of the course. Therefore, though Course III students were invited through the snowball method and did participate in the interviews, there was the acknowledgement the variety of experiences related to the course would not emerge.

Thirdly, another limitation of this study was that only one type of data was employed (i.e. self-reports gathered by semi-structured interviews from both the teachers and students). Thomas (2016) suggests, that while employing case study research design, the researcher should employ different kinds of data to investigate the phenomenon. In this thesis, data was collected using semi-structured interviews from both the teachers and students who were engaged

with course. Self-reports can be unreliable as both teachers and students could give appropriate and desirable answers or explanations (Cohen et al., 2007). Moreover, it has been acknowledged that self-reports include only those explanations that people are aware of and can remember (Paulhus & Vazire 2007) or are socially approved (King & Bruner, 2000). To diminish the possibility of giving socially appropriate and desirable answers, personal interviews were held. Therefore, the interview guides were designed to be open and several follow-up probing questions were employed to elicit deeper accounts. Moreover, in the process of the data analysis, the validity of the results was assured, so that usually more than one meaning unit characterised a sub-category per interviewee. Several attempts were made to fully use the gathered data. Although, additional data would increase the trustworthiness of the study. For example, the descriptions of the courses in the public Study Information Systems or learning and assessment tasks could be used to interview teachers and students, i.e. a stimulated recall method (Vesterinen, Toom, & Patrikainen, 2010). Another option would be to explore how students conceptualise the subject at the end of the course or how they understand the nature of the subject (e.g. like Tynjälä, 1999). This kind of question could have been added to the interview guide. From the teaching perspective one option would have been to employ the observation method in classroom meetings (e.g. lectures, seminars).

Taking into account the previously described limitations, several directions for future research can be suggested. Although the qualitative multiple case study research design adopted in the thesis enabled the researcher to understand more deeply the relationship between teaching and learning, it would be necessary to employ multiple kinds of data to explore students' quality of learning. Some suggestions have been made in the previous paragraph. In this study, all the cases represented the same content i.e. the same discipline. Therefore, it would be necessary to explore the relationship between teaching and learning in other disciplines. Previous studies that explored the relationship between discipline and approaches to teaching indicated that the approach to teaching in the disciplines like pure hard sciences (e.g. chemistry) and applied hard sciences (e.g. medicine) are more likely to be content-focused (see e.g. Lindblom-Ylänne et al. 2006).

This study focused on undergraduate courses and experiences and revealed that the level of guidance, structure and support in teaching are crucial elements of the TLE. Future studies could explore how the TLE and students' learning are related to the Master's degree level. Moreover, it would be important to acknowledge the role of guidance, structure and support in Master's courses, although some researchers imply that self-regulation skills and the need for autonomy should increase during the studies in higher education to achieve academic success (see e.g. Zusho, 2017). Although Vermunt (2003) suggests, while examining the whole learning experience of the student during their studies, that a variety of TLEs of courses is important to consider, i.e. it is important to design different kinds of TLEs with the aim of offering a broad range of learning experiences during the studies.

This study implied that employing one learning-focused element of the TLE is insufficient for undergraduate students (as it appeared for Course III), but a more holistic approach when designing the TLE is needed. This study showed that several elements of the TLE do enhance students learning. In future studies, more specific analysis is needed to explore what kind of elements of the TLE are more important or crucial. These findings could help to develop course feedback questionnaires more in line with studies on teaching and learning in higher education. Moreover, it could be studied what kind of elements of the TLE are related to the deep and surface approaches to learning and organised studying, as the latter appears to be important for successful studying in higher education (see e.g. Asikainen, 2014).

6. CONCLUSIONS AND IMPLICATIONS OF THE STUDY

Although the relationship between teaching and learning in higher education has been explored for more than 40 years, previous studies have focused on some components of the 4P-model of students' learning and report somewhat contradictory results on the relationship between the TLE and students' approaches to learning. Therefore, this thesis focused on exploring the relationship between teaching and learning from the perspectives of both the teachers and the students in a holistic way by employing the 4P-model of students' learning and using a qualitative approach. The main theoretical and practical conclusions of this thesis were as follows:

1. Students' learning is context dependent, i.e. their approaches to learning and learning outcomes can be influenced through the TLE. Therefore, it is important to pay attention to the development of teaching-learning environments (TLEs) of courses. In this study, the TLE was conceptualised using approaches to teaching theory, which takes into account several aspects of teaching and assessment. The results showed the relationships between learning-focused approaches to teaching, the deep approaches to learning and the high quality and breadth of learning outcomes. It also found that the more content-focused approaches to teaching the teacher adopted, the more that surface approaches to learning and the lower quality and the narrowness of learning outcomes emerged from students' self-reports. Moreover, the results showed that one learning-focused element does not enhance students learning when other elements of the TLE are inherent to content-focused approaches to teaching. The results of this thesis stress the importance of systematic adoption of learning-focused approaches to teaching. Previous research has indicated that pedagogical development programmes can have a positive influence on the development of teaching moving more towards a learning-focused approach (see Postareff, Lindblom-Ylänne & Nevgi, 2007). This thesis suggests that these programmes should focus on how various teaching and assessment intentions and strategies may affect students' learning. Therefore, it is important to develop pedagogical development programmes that offer possibilities to reflect upon various elements of the TLE that are employed in teaching and assessment.
2. In this thesis, students' perceptions of TLE were explored at the course level. The results revealed that in addition to the learning-focused approaches to teaching, the level of guidance, structure and support provided by the teacher has an important role in students' learning. Previous studies on approaches to teaching have not emphasised that teacher guidance, structure and support for learning are also important to consider. Moreover, this research suggests that adopting systematically a learning-focused approach to teaching is needed to enhance students' learning. A mixture of content- and learning-focused elements might confuse the students and thus have negative con-

sequences on their learning. Therefore, the results of this thesis offer possibilities to specify and broaden the approaches to teaching theory by adding the descriptions of the elements that structure, guide and support students' learning. This could be referred to as 'organised approach to teaching'. In research on approaches to learning, a similar approach has been detected, labelled as 'organised studying', and it reinforces the traditional dichotomy of deep and surface approaches to learning.

3. This thesis offers explanations to the contradictory results of previous studies on the relationship between the teaching and learning. The results highlighted the importance of taking into account several elements while conceptualising the TLE of the course in higher education. Previous studies where one or a few elements of the TLE have been in focus have not been able to reveal a clear relationship between learning-focused teaching or assessment methods and quality of students' learning. The present study suggests several elements of the TLE should be taken into consideration when characterising TLEs in higher education (e.g. the alignment, the level of structure and guidance, possibilities to interact etc.).
4. In general, it has been shown that students' learning is related to assessment and what kind of learning is valued by the assessment (e.g. Biggs & Tang, 2007; Rowantree, 1987). The same could be applied to teaching: what kind of teaching is valued in a university or department may influence the design of TLEs at the course level. One option to value the implementation of the constructivist perspective of learning is to redesign course feedback questionnaires in a way that takes into account recent studies and theoretical frameworks in higher education. Researchers have found that one problem of course feedback questionnaires applied in universities as part of the quality system is related to a lack of theoretical frameworks and validity issues (Spooren, Brockx & Mortelmans, 2013). The results of this thesis offer evidence on the elements of the TLE at the course level that enhance students' learning and the results could be taken into account while redesigning course feedback questionnaires.

Societal expectations towards graduates of higher education are changing: high quality and broad learning outcomes or qualities are on the increase. The results of this thesis showed that the TLE, students' perceptions of it, and the quality of students' learning both in terms of approaches to learning and learning outcomes are interrelated at the undergraduate level. The more aspects of TLE that reflect learning-focused approaches to teaching and the more elements that guide, structure and support students learning the TLE entails, the more likely students are to develop high quality and broad learning outcomes. Therefore, teaching matters. Universities need to motivate university teachers to develop the TLEs of their courses in a way that students can develop high quality and broad learning outcomes or qualities needed for an unknown future and working life.

APPENDICES

Appendix 1. Interview guides to interview the teachers

The first interview. The interview guide, which was the basis for the interviews conducted after the teaching process.

1. Please describe how you became a university teacher.
2. In your view, what is the role of this course in the study programme? In your opinion, how important do the students regard this course?
3. What was the main thing the students were expected to learn in this course? What were the learning outcomes of this course?
4. Please describe your teaching methods or practices while teaching the course at this semester. Why did you use these particular methods or practices?
The teacher names the teaching practices, then I write these down and for each method or practice I ask the teacher to specify and explain more.
5. What was expected from the students in this course? How were the students expected to study in the course?
6. Which modifications have you made in your teaching in this course?
7. How do you assess students in this course? Why did you use these particular methods and tasks?
The teacher names the assessment methods and tasks, then I write these down. For each assessment task I ask the teacher to specify and explain more.
8. What was the aim of the assessment methods and tasks? Which activities were the students required to do in the assessment task, how were they expected to study?
9. How was the grade developed for this Course?
10. How did you notify the students regarding assessment and grading?
11. Which modifications have you made in your assessment practice in this course?
12. What would you like to find out from the student interviews?

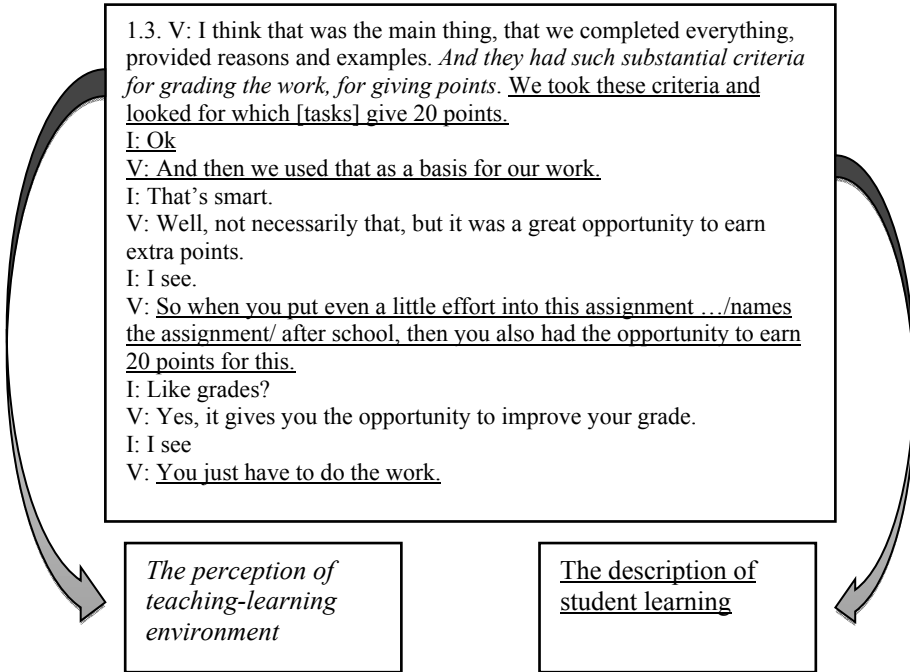
The second interview. Interview guide that was the basis for the interviews conducted after the assessment process

1. How satisfied are you with the students' grades? In your opinion, how objective and fair these grades are?
2. Please describe the final exam in more detail.
3. In the previous interview you described the assessment tasks. Please describe now once again the aim of these tasks and what was expected from students. In your opinion, how well the students met the expectations?
4. In the previous interview you described how the grade was developed for this course. What is the reason for this approach?
5. Which modifications in teaching and assessment do you plan to make next year in this course?

Appendix 2. Interview guide used to interview students

1. Please describe how you became a student of this faculty. Why did you choose this particular study programme?
2. How important was this course for you?
3. How did you do in general in this course?
4. What were your expectations regarding this course? To what extent these expectations were fulfilled?
5. Please describe what did you learn in this course. In your opinion, what do you think the teacher expected the students to learn?
6. Please describe how did you study in this course. Which activities did you do?
The student names the activities, then I write these down and for each activity I ask the student to specify and explain more.
7. Please describe what teaching activities the teacher used in teaching this course. How did s/he teach? What was his/her role?
8. If you could take this course again, what would you do differently?
9. How were you assessed in this course? What did you have to do to obtain a grade?
The student names the assessment methods and tasks, I write these down and for each task I ask the student to specify and explain more.
10. Which learning activities did you do for each task?
11. How did you come up with the idea of using these activities?
12. In your opinion, what was the aim of the assessment task, what was the teacher's expectation?
13. How difficult was the task for you? What made it difficult?
14. Please describe, how did you receive feedback. How was the feedback given? How did the feedback help you learn?
15. In your opinion, how different were the teaching and assessment done comparing with other courses in your study programme.
16. Let's imagine you are the teacher of this course: What would you do differently in this course in terms of teaching and assessment?

Appendix 3. Example of a meaning unit for data analysis for Article II



Appendix 4. Examples of meaning units, condensed meaning units and codes

Data analysis sample from the analysis for the Article III

Meaning unit/data extract	Condensed meaning unit	Code
<p>1.1.6. Was reading the textbook material enough? V: Well, for me, it mostly was, perhaps for some people it wasn't, but well, my entries to the learning diary were 1000–2000 words per topic, while some people only wrote 200 words. I: I see V: <u>So, for me it was enough, I understood the textbook material and the theory written there, I was able to connect it with the real world and to draw examples and conclusions from there.*</u> I: I see V: So for me it was enough. I: So it gave the opportunity to think for yourself how these things work in real life.</p>	<p>I understood the textbook material, was able to connect it with the real world, to give examples</p>	<p>1.2.1. understanding the meaning of all basic concepts</p>
<p>2.7.6. K. But are you satisfied with yourself as a student of this course, was it ok for you? S. (.) Yes, I think so, maybe if I had read the textbook more, maybe more so then, <u>in the exam I did not know the concepts so well, I knew what they were about, I even remembered on which page of the textbook and where exactly they were explained and written about, but I could not remember the exact wording.</u> I perhaps should have learned the concepts more. K: So as I understand, you were not able to remember how the concepts were named in the textbook? S. Yes, <u>I was able to remember the main idea about them and what the lecturer means by them, but the wording [posed a problem] yes.</u></p>	<p>Did not know the exact names of the concepts, knew what they were about, where they were explained in the textbook, but did not know how exactly they were worded</p>	<p>1.2.3. understanding the meaning of basic concepts, but did not remember the “term”</p>

*The underlined text was identified as important respective to the focus of the research

Appendix 5. Example of codebook with codes, sub-categories and main categories

The sample of codebook from the analysis for Article II

	The name/label	The description/meaning	Example
Main category	1. Theoretical knowledge	The description of sub-categories refers to the theoretical subject-specific knowledge	
Sub-category	1.2. Understanding of basic concepts	The description of codes of the meaning units refers to the understanding of basic concepts	
Code 1	1.2.1. understanding the meaning of all basic concepts	The student describes s/he understand all concepts expected for the course	I can define what is meant by ... (names the concept) (1.2.1)
Code 2	1.2.2. understanding the meaning of some (not all) basic concepts	The student describes that s/he understands some basic concepts, not all	"... I was able to give answers about the part that I had also written about myself ... the things I hadn't written about, I didn't know much about either..." (2.2.8)
Code 3	1.2.3. understanding the meaning of basic concepts, but did no remember the "term"	The student describes that s/he understands the meaning of the concept, but not the "term"	"Yes, I was able to remember the main idea as such, ... , but the wording." (2.1.7)
Category	2. Practical knowledge		
...			

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SUMMARY IN ESTONIAN

Õpikeskkonna ja bakalaureuseõppe üliõpilaste õppimise seosed kõrghariduses: kvalitatiivne mitme-juhtumi uuring

Kõrgkoolid seisavad juba viimased kümme aastat silmitsi järjest suuremate ootustega oma lõpetajatele: lisaks teoreetiliste teadmiste omandamisele peaks üliõpilased olema arendanud ka üldpädevusi, nagu probleemilahenduse oskus, kriitiline mõtlemine ja koostööoskused (Barradell *et al.*, 2017; Barrie, 2006; Grosemans *et al.*, 2017; Kõrgharidusstandard, 2008; Vermunt, 2003). Veel rõhutatakse, et ülikoolis õppimine peaks võimaldama arendada üldinimlikke omadusi, nagu hoolivus ja tagasihoidlikkus (Barnett, 2004). Samas püstitab nende teadmiste, oskuste ja omaduste arendamine ülikoolis õpetamisele uusi ülesandeid. Kõrgkoolis õppimist mõistetakse järjest enam kui koostööd üliõpilaste ja õppejõudude vahel: konstruktivistliku õpikäsituse kontekstis on õppejõu peamine ülesanne arendada intellektuaalselt proovile panevaid õpikeskkondi, kuhu üliõpilased on aktiivselt haaratud ning kus neil on võimalik arendada teadmisi, oskusi ning omadusi, mida on vaja toimetulemiseks muutuv-vas maailmas ja tulevases tööelus (Biggs & Tang, 2007; Mayer, 2004; Tynjälä & Gijbels 2012).

Üldiselt on teadvustatud, et kõrgkoolis õppimine on keeruline nähtus, mille kvaliteeti mõjutavad erinevad tegurid. Selle doktoritöö raamistamiseks kasutati Biggsi (1985; 1993) kõrgkoolis õppimise teoreetilist 3P mudelit, mille eri autorid on hiljem edasi arendanud kõrgkoolis õppimise 4P mudeliks (nt Baeten *et al.*, 2010; Price 2014; Ramsden, 2003). Õppimise 4P mudel selgitab kõrgkoolis õppimise fenomeni nelja omavahel seotud komponendi kaudu: (1) õppimise eeltingimused (*presage*), (2) õpikeskkonna tajumise (*perception*); (3) õppimise protsess (*process*) ja (4) õppimise tulemus (*product*). Mudeli esimene komponent, õppimise eeltingimused, koosneb üliõpilasest ja õpikeskkonnast tulenevad faktoritest, mille koostoimel üliõpilane tajub õpikeskkonda kas õppimist toetava või takistavana (mudeli teine komponent). Mudeli kolmas komponent, õppimise protsess, hõlmab endas õppimisviise, mida üliõpilased rakendavad. Mudeli neljas komponent kirjeldab õppimise tulemust, mida võib kirjeldada üliõpilase saavutatud õpiväljunditena. Biggsi (1985; 1993) järgi on kõrgkoolis õppimise mudeli komponendid omavahel seotud ning näiteks õpikeskkonna muutus toob kaasa muutuse mudeli teistes komponentides.

Varasemad uuringud on lähtunud kõrgkoolis toimuva õppimise uurimisel 4P õppimise mudelist, keskendudes nii üksikute komponentide kui nende vaheliste seoste uurimisele. Esiteks on uuritud, kuidas üliõpilased tajuvad õpikeskkonda (*perceptions of the teaching-learning environment*) ning millised õpikeskkonna elemendid toetavad ja millised takistavad üliõpilaste õppimist või millised tajutud õpikeskkonna elemendid on seotud sügava ja millised pindmise õppimisviisiga. Näiteks on varasemates uuringutes leitud, et pindmist õppimisviisi soodustavad suur töökoormus, õppejõukeskne õpetamine, vähene konstruktiivne

sidusus ja tagasiside, vähe juhendamist ja infot õppimise osas, liiga vähe või liiga palju proovile panekut, kokkuvõttev hindamine (Kyndt *et al.*, 2011; Hailikari *et al.*, 2018; Prosser & Trigwell, 2014; Hailikari & Parpala 2014; Coertjens *et al.*, 2016; Postareff *et al.*, 2015; Lindblom-Ylänne *et al.*, 2018; Sambell, McDowell & Brown 1997). Samas võimaldab sügavat õppimisviisi see, kui üliõpilased tajuvad õpikeskkonda kui proovile panevat, kui õpetamine on huvitav, konstruktiivselt sidus, hindamisülesanded asjakohased ja elulised (Postareff *et al.*, 2015; Hailikari & Parpala, 2014; Wang *et al.*, 2013; Baeten *et al.*, 2010). Lisaks on leitud, et õpikeskkonna ühte elementi võivad mõned üliõpilased tajuda toetavana, teised takistavana (Struyven *et al.*, 2006; Hailikari & Parpala, 2014; Hailikari *et al.*, 2018). Varem nimetatud uuringud on läbi viidud õppekava tasemel, kuid vähe on uuringuid, mis keskenduvad õppeaine tasemel õpikeskkonna taju uurimisele.

Teise osa moodustavad uuringud, mis uurivad seost õpikeskkonna ja õppimisviisi vahel. Näiteks uurimused, mis on keskendunud konstruktivistlikust õpikäsitusest lähtuva õpikeskkonna ja sügava õppimisviisi (*deep approach to learning*) vahelise seose uurimisele, on nimetatud seose osas mõneti ootamatud ja vastuolulised. Nendes uurimustes on leitud, et konstruktivistlikust õpikäsitusest lähtuvad õpikeskkonnad ja sügav õppimisviis ei ole omavahel seotud, vaid sellised õpikeskkonnad võivad isegi toetada pindmist õppimisviisi (*surface approach to learning*) (näiteks Struyven *et al.*, 2006; Gijbels *et al.*, 2008; Baeten *et al.*, 2010). Samas kui õpikeskkond on määratletud õppejõu õpetamisviisi (*approach to teaching*) kaudu, siis on leitud, et õppijakeskne õpetamine (*student-focused approach to teaching*) on seotud sügava õppimisviisiga ning õppejõukeskne õpetamine (*teacher-focused approach to teaching*) pindmise õppimisviisiga (Trigwell *et al.*, 1999; Prosser & Trigwell, 2014). Samuti on leitud, et ülikoolide õppejõud kombineerivad õppejõu- ja õppijakeskset õpetamist, see tähendab, et õpetamine on dissonantne. Uurimustest selgub, et sellises õpikeskkonnas on üliõpilaste õppimisviis pigem pindmine.

Kolmanda grupi moodustavad uuringud, milles soovitakse mõista, kuidas on seotud õpikeskkond ja üliõpilaste õpiväljundite kvaliteet. Õpiväljundeid käsitletakse selles doktoritöös kvaliteetsetena, kui nendes on kirjeldatud teoreetiliste teadmiste kognitiivset taset vähemalt mõistmise tasemel (*understanding*) ning välja on toodud võimalikult mitmekesiseid muid teadmisi ja oskusi (näiteks praktiline teadmine, muutus millegi mõistmises, üldpädevused). Varasemates uuringutes on leitud, et traditsioonilised ja loengutel põhinevad õpikeskkonnad ei toeta kõrgemal kognitiivsel tasemel teoreetiliste teadmiste ning erinevate teadmiste ja oskuste arengut (Tynjälä, 1998; Tynjälä *et al.*, 2009; Mintz & Tal, 2013).

Neljanda osa moodustavad uuringud, kus on küsitud, kuidas on üliõpilaste õppimisviis seotud õpiväljundite kvaliteediga. On leitud, et üldiselt on omavahel seotud sügav õppimisviis ja teoreetiliste teadmiste kõrgem kognitiivne tase, näiteks mõistetest arusaamine ning mõistete vahelised seosed (Marton & Säljö, 1976; Tynjälä, 1998; Prosser & Trigwell, 1999). Samuti on leitud, et head õpitulemused (*academic achievement*) on pigem seotud pindmise õppimis-

viisiga, seevastu üldpädevuste areng on seotud sügava õppimisviisiga (Lizzio *et al.*, 2002). Uurijad on järeldanud, et sügava ja pindmise õppimisviisi ning õpiväljundite seoste uurimisel võib olulist rolli omada ka uurimistöös rakendatud meetoodika (Quinn & Stein, 2013).

Kuna varasemate õpikeskkonna ja õppimise vahelistele seostele keskendunud uuringute tulemused on kohati vastuolulised ning õppimist toetavate ja takistavate õpikeskkonna elementide osas on uuringud olnud pigem õppeainete ülesed, siis oli selle doktoritöö eesmärk mõista õpikeskkonna ja õppimise vahelisi seoseid just õppeaine tasemel. Täpsemalt sooviti leida seoseid õppejõudude õpetamisviisi, üliõpilaste tajutud ning kirjeldatud õppimist toetavate ja takistavate elementide, õppimisviisi ning õpiväljundite kvaliteedi vahel. Õppeainete õpikeskkondi kirjeldati õppejõudude õpetamisviisi (*approaches to teaching*) kaudu. Doktoritöös uuriti nimetatud seoseid bakalaureuseõppe õppeainete kontekstis, mis võimaldas saada teadmisi õppejõudude õpetamispraktikate arendamiseks.

Selles doktoritöös kasutati kvalitatiivset lähenemisviisi ning mitme-juhtumi uuringudisaini (*multi-case research design*), mis võimaldas õpetamise ja õppimise vahelisi seoseid sügavamalt uurida ning juhtumeid omavahel võrrelda. Vaatluse all oli kolm juhtumit ning juhtumina käsitleti kohustuslikku bakalaureuseõppe õppeainet. Juhtumite valikul peeti silmas, et need oleks samast valdkonnast ning õppeaine sisu ja õpiväljundid oleks sarnased. Teisalt jälgiti, et õppeinfosüsteemis kirjeldatud õpetamis- ja hindamisviisid oleks erinevad, selles osas järgiti maksimaalse varieeruvuse printsiipi (*maximum variation sampling*). Juhtumi raames intervjueriti nii üliõpilasi kui ka vastutavat õppejõudu, kes oli samal ajal ka peamine õppetööd ja hindamist läbi viiv õppejõud. Eesmärgiks oli intervjuerida erineva õpikogemusega üliõpilasi, seetõttu kutsuti intervjuule erinevaid hindeid saanud üliõpilased. Lisaks peeti silmas vabatahtlikkuse printsiipi ning kokku intervjueriti 33 üliõpilast. Nii õppejõudude kui üliõpilastega viidi läbi poolstruktureeritud intervjuud ning andmeid analüüsiti kvalitatiivse sisuanalüüsi meetodit kasutades (Granheim & Lundman, 2004, Elo & Kyngäs, 2008; Schreier, 2012).

Doktoritöö kokkuvõtva tulemusena leiti, et üliõpilaste õpiväljundite kvaliteet, õppimisviis, õppimist toetavad ja takistavad elemendid on seotud õppejõu õpetamisviisiga mis tähendab, et üliõpilaste õppimise kvaliteet sõltub õpikeskkonnast. Alljärgnevalt on peamised tulemused kirjeldatud õppimise 4P mudeli kaudu.

Esiteks kirjeldati ja analüüsiti doktoritöös õppeainete ehk juhtumine õpikeskkonda õppejõudude õpetamisviisi (*approaches to teaching*) kaudu (Artikkel I). Analüüsiti, kuidõrd sisukeskne (*content-focused*, varasemates uuringutes on kasutatud mõistet “õppejõukeskne”) või õppimiskeskne (*learning-focused*, varem mõiste “õppijakeskne”) oli õppejõudude kirjeldatud õpetamine. Tulemusena leiti, et kuigi õppeainete sisu ja õpiväljundid olid sarnased, varieerus õppejõudude õpetamisviis oluliselt. Ühe õppejõu õpetamise ja hindamise kirjeldused peegeldasid kõikides aspektides õppimiskeskset õpetamisviisi. Kaks õppejõudu kombineerisid õppimis- ja sisukesksele õpetamisviisile omaseid elemente ning seetõttu võib väita, et õpetamine oli dissonantne.

Teiseks uuriti, kuidas üliõpilased tajusid õppimist toetavaid ja takistavaid õpikeskkonna elemente, kui õppejõudude õpetamisviis erines (Artikkel II). Tulemusena leiti, et mida enam õppejõud kirjeldasid sukeskeset õpetamist, seda enam tajusid ja kirjeldasid üliõpilased õpikeskkonna elemente õppimist takistavatena. Ka võib olulise tulemusena järeldada, et lisaks õppimiskeskse õpetamise elementidele (näiteks entusiastlik ja huvitav loeng, elulised näited, õppemeetodite variatiivsus, meeldiv atmosfäär, autentsed ja proovile panevad ülesanded) on oluline, et õpetamine sisaldaks elemente, mis struktureerivad, juhendavad ja toetavad üliõpilaste õppimist (näiteks sidusus õpetamise ja hindamise vahel, pidevad ülesanded, õppejõupoolne ootuste ja ajakava kirjeldus).

Kolmandaks analüüsiti üliõpilaste tajutud ja väljendatud õppimisviise ning võrreldi neid õppejõudude kirjeldatud õpetamisviisidega (Artikkel III). Üliõpilaste õppimisviisi (*approaches to learning*) sügavuse määramisel vaadeldi nii õppimise kavatsuse (*intention*) kui õpistrateegia (*strategy*) aspekti. Üliõpilaste õppimise kirjelduste analüüsi tulemustes eristati kaht õppimisviisi: sügav ja pindmine. Sügava õppimisviisi puhul kirjeldasid üliõpilased õppimise kavatsusena mõistmist (*development of understanding*), rakendades erinevaid õpistrateegiaid: mõistmise arendamine ideede või arusaamade võrdlemise kaudu (*relating ideas and developing knowledge*); teadmise loomine erinevate allikate põhjal (*integration of knowledge*); personaalse tähenduse loomine (*seeking personal meaning*) ning teadmise kasutamine (*using the knowledge*). Pindmise õppimisviisi puhul oli õppimise kavatsuseks kuidagi ülesandega toime tulla, rakendades järgmisi õpistrateegiaid: keskendumine ülesande üksikutele osadele (*processing fragmented knowledge*), sõnade või teksti meeldejätmine (*focusing on words and text*) ja pähetuupimine (*rote memorisation*), selmet jõuda teksti mõistmiseni. Võrreldes õppimisviisi kirjeldusi juhtumite lõikes, leiti, et mida enam kirjeldas õppejõud õpetamisviisi õppimiskesksena, seda enam kirjeldasid üliõpilased sügavat õppimisviisi. Samuti leiti, et kuigi ühe õppejõu õpetamisviis oli kõikide elementide osas kirjeldatud kui õppimiskeskne, rakendasid mõned üliõpilased kohati pindmist õppimisviisi.

Neljandaks analüüsiti, kuidas on üliõpilaste kirjeldatud õpiväljundid (*learning outcomes*) seotud õppejõu õpetamisviisiga. Õpiväljundite analüüsimise tulemusena toodi välja neli peamist õpiväljundite kategooriat: (1) teoreetiline teadmine (*theoretical knowledge*); (2) praktiline teadmine (*practical knowledge*); (3) üldpädevused (*generic skills*) ja (4) muutused millegi mõistmises (*changes in thinking*). Teoreetilise teadmise osas kirjeldati (1) faktiliste teadmiste omandamist peamiste mõistete osas kui madalamat kognitiivset taset (kirjeldustes kasutati sõna "teadmine"); (2) peamiste mõistete mõistmist (kirjeldustes kasutati sõna "mõistmine") või seoste mõistmist erinevate mõistete (*concepts*) vahel ning (3) põhimõtete (*principles and generalisations*) mõistmist. Kahel viimasel juhul mõisteti teadmise omandamist kõrgemal kognitiivsel tasemel. Praktilise teadmise kirjeldused olid tihedalt seotud õppimis- ja hindamisülesannetega ning erinesid juhtumite lõikes. Üldpädevuste puhul kirjeldasid üliõpilased, kuidas nad arendasid koostöö- või suulise kommunikatsiooni oskusi. Mõistmise muutust (*changes in thinking*) kirjeldavate õpiväljundite puhul selgitasid üliõpilased

muutusi aine olemuse mõistmises; muutusi teadlikkuses või muutusi huvis õppeaine vastu. Võrreldes teoreetiliste teadmiste kognitiivset taset ning teiste õpiväljundite mitmekesisust juhtumite lõikes, leiti, et mida enam õppejõud kirjeldas sisukeskset õpetamist, seda madalamal kognitiivsel tasemel ja vähem varieeruvad oli üliõpilaste õpiväljundite kirjeldused.

Doktoritöö peamise tulemusena leiti, et kõrgkoolis õppimise 4P mudeli komponendid: õppejõu loodud õpikeskkond, üliõpilaste tajutud õpikeskkond, õppimisviis ja õpiväljundid on omavahel seotud. Seega sõltub üliõpilaste õppimise kvaliteet õpikeskkonnast, mis tähendab, et õppimise sügavust ning õpiväljundite kvaliteeti mõjutavad õppeaine õpetamise viis, meetodid ja tegevused – õppejõu kujundatud õpikeskkond ning see, kuidas üliõpilased õppejõu loodud õpikeskkonda tajuvad. Doktoritöö olulise tulemusena leiti, et õppeaine õpikeskkond peaks sisaldama nii õppimiskeskele õpetamisviisile omaseid elemente (nt elulised näited, interaktsiooni võimalus) kui ka elemente, mis struktureeriks, juhendaks ja toetaks üliõpilaste õppimist (nt konstruktiivne sidusus, ootuste väljendamine, pidevad ja struktureeritud ülesanded). See uurimus tõi välja, et üliõpilaste õppimise sügavuse suurendamiseks ja õpiväljundite kvaliteedi tõstmiseks ei piisa ainult õppe- või hindamismeetodi muutmisest, oluline on ka sidusus erinevate õpetamiselementide vahel, ülesannete juhendid ning interaktsiooni kvaliteet. Seega tuleb õppeaine õpikeskkonna arendamisel võtta arvesse paljusid elemente. Selle uuringu andmeid saab kasutada õppejõudude õpetamisviiside ja õppeainete õpikeskkondade arendamiseks. Õppejõudude koolitustel peaks enam andma võimalusi mõtestada ja analüüsida, kuidas erinevad õpetamis- ja hindamistegevused võivad toetada üliõpilaste sügavat õppimisviisi ja õpiväljundite omandamise kvaliteeti. Ülikoolid peaks järjest rohkem tähelepanu pöörama õppejõudude toetamisele, et arendada õppeainete õpikeskkonnad selliseks, et need võimaldaksid üliõpilastel omandada teoreetilisi teadmisi kõrgemal kognitiivsel tasemel ning arendada mitmekesiseid üldpädevusi.

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- Uiboleht, K., Karm, M., & Postareff, L. (2018). Relations between students' perceptions of the teaching-learning environment and teachers' approaches to teaching: a qualitative study. *Journal of Further and Higher Education*. <https://doi.org/10.1080/0309877X.2018.1491958>
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