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LIINA LEPP

The objectives of doctoral studies and factors influencing doctoral study process from the perspectives of different parties

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Dedication

This work is dedicated to my parents and children. It would not have been possible without your support, patience and understanding.

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LIST OF ORIGINAL PUBLICATIONS

This dissertation is based on the following original publications, which are referenced in the text by their Roman numerals (Articles I–V):

I. Leijen, Ä., **Lepp, L.,** & Remmik, M. (2015). Why did I dropout? Former students' recollections about their study process and factors related to leaving the doctoral studies. *Studies in Continuing Education,* (ahead-of-print), 1–16.
II. **Lepp, L.,** Remmik, M., Karm, M., & Leijen, Ä. (2013). Supervisors' conceptions of doctoral studies. T*rames: Journal of the Humanities and Social Sciences, 17*(4), 401–415.
III. **Lepp, L.,** Karm, M., & Remmik, M. (2013). Supervisors' activities in supporting PhD students in the supervisory process. In *Higher Education at the Crossroads: The Case of Estonia*, edited by E. Saar and R. Mõttus, 247–265. Frankfurt am Main: Peter Lang.
IV. **Lepp, L.,** Remmik, M., Leijen, Ä., & Karm, M. *(submitted).* Doctoral students' research stall: Supervisors' perceptions and intervention strategies.
V. **Lepp, L.,** Remmik, M., Leijen, Ä., & Karm, M. (2014). Läbi raskuste tähtede poole: doktoritööde juhendajate kraadiõpingute kogemused ja nende seosed juhendamispraktikaga. *Eesti Haridusteaduste Ajakiri, 2*(2), 79–115.

The author contributed to the publications as follows:

For Article I: participating in data analysis, writing the paper in cooperation with Äli Leijen and Marvi Remmik.

For Article II: designing the study, formulating the research questions, participating in data collection and analysis, writing the paper as the main author.

For Article III: designing the study, formulating the research questions, participating in data collection and analysis, writing the paper in cooperation with Mari Karm and Marvi Remmik.

For Article IV: designing the study, formulating the research questions, participating in data collection and analysis, writing the paper as the main author.

For Article V: designing the study, formulating the research questions, participating in data collection and analysis, writing the paper as the main author.

Related conference papers:

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Karm, M., Lepp, L., & Remmik, M. (2014). *Discourse analysis as a possibility for making sense of supervisors' views of PhD students.* Symposium presentation. EARLI Special Interst Groups SIG 4 Higher Education & SIG 17. Qualitative and Quantitative Approaches to Learning and Instruction Conference. Leuven, Belgium.

Remmik, M., Leijen, Ä., & Lepp, L. (2015). *"Kuidas metsa hõikad, nii ta sulle vastu kajab": Doktoriõppe katkestanud endised doktorandid õpingute katkestamisega seotud teguritest*. Plenary presentation. Tradition and Innovation in Education Conference. Tallinn, Estonia.

Lepp, L., Remmik, M., & Leijen, Ä. (2015). *Non-completers' recollections of the process of their doctoral studies.* Paper presentation. 16th Biennial EARLI Conference for Research on Learning and Instruction. Limassol, Cyprus.

1. INTRODUCTION

Over the past few decades, issues surrounding doctoral education have increasingly become the focus both in Europe as well as globally (e.g., Bogle, Dron, Eggermont, & van Henten, 2011; European University Association, 2010; Kehm, 2004; Kärner, 2009; Nyquist, Woodford, & Rogers, 2004). Demographic changes, fast technological developments, and the economic crises have forced educational policy makers and universities to reassess what is happening in higher education. It is now understood that there is an increased need for the development of knowledge societies (Jørgensen, 2012), in which the training of researchers has been recognized as an issue of central importance (Byrne, Jørgensen, & Loukkola, 2013). Therefore, doctoral studies as the highest level of higher education need to be *reframed* (McAlpine & Norton, 2006), *rethought* (Walker, Golde, Jones, Bueschel, & Hutchigs, 2008) and *re-envisioned* (Nyquist et al., 2004) by means of research-based decisions in order to produce doctoral (PhD) degree holders who correspond to societal needs and requirements when it comes to contributing to societal development in this changing environment.

In this new environment, universities are expected to educate researchers with a wide range of qualities (Byrne et al., 2013; Jørgensen, 2012) – doctorate holders who think innovatively and creatively and hence could act as mediators in the exchange of ideas between universities and the business community. According to Nyquist et al. (2004), doctoral education is a major contributor to commercial success in both business and industry, and key to resolving social challenges in government and not-for-profit sectors. Furthermore, a need for internationally competitive PhD students and doctorate holders is stressed (Byrne et al., 2013). In addition to the traditional training of the next generation of researchers and faculty members, doctoral education is increasingly focusing on the teaching and acquiring of transferable competencies and communication skills. These skills allow PhD holders to make a much more significant contribution to societal development outside of the university – in the private or public sector (Byrne et al., 2013).

In addition to the above, over the past decade, a need for an increased number of researchers and research-related careers has been indicated by studies and policy documents pertaining to doctoral studies. These increased numbers are necessary to reach the ambiguous goals that doctoral education is intended to fulfill in society (Bogle et al., 2011; Kehm, 2004; Nyquist et al., 2004). Even as the number of doctorate holders (and doctoral students) has increased drastically in the world over the past few decades, the biggest problems concerning doctoral studies are still dropout rates and the amount of time it takes to complete the candidature. For instance, studies indicate that only one half of all admitted PhD students manage to complete their studies within the nominal study period (Bair & Haworth, 2004; Gardner, 2009; Smith, Maroney, Nelson, Abel, & Abel, 2006). This issue has been highlighted in European (Kehm, 2004), Australian (McCormack, 2005) as well as North American studies

(Clarke & Lunt, 2014; Ostriker, Kuh, & Voytuk, 2010). The efficiency of doctoral studies is also a point of concern in Estonia. A study by Vassil and Solvak (2012) reveals that on the average, the rate of doctoral students prolonging or discontinuing their studies is 60%. The rate of on-time graduations in the field of Educational Sciences is even lower: 25–30% depending on the university (Eesti Kõrghariduse Kvaliteediagentuur, 2011).

Aside from the issue of low graduation rates in doctoral studies preventing the fulfillment of societal expectations by doctorate holders, high attrition rates are also problematic in the narrower sense of indicating an inefficient use of funds within universities. Allowances, funding, and scholarships provided to doctoral students, as well as the cost of human resources (the time and energy spent by doctoral supervisors in order to advise the student), and other expenditures related to the organizational side of doctoral studies put universities in a position where high attrition rates are translated into high costs for institutions that support students as well as for people who work with PhD students. Malone, Nelson, and Nelson (2004) conclude: "Since universities invest considerable resources in doctoral preparation, attrition has significant implications for efficient use of those resources as well" (p. 34).

Consequently, given that on the one hand, there exists an increasing societal need for PhD degree holders and yet on the other hand, the number of doctoral students reaching graduation is insufficient or the entire process is perceived as lacking economic efficiency by the universities, a number of questions arise. Namely, what is causing these low on-time graduation rates and high attrition rates, and what could be done in order to ensure a sufficient output of PhD degree holders, who should also effectively adapt to rapidly changing societal requirements? These questions served as the starting point for the planning process of this dissertation.

1.1. Focus of the Research

The topic of doctoral attrition has been addressed quite thoroughly in previous studies (see, e.g., the meta-analysis of 118 research studies by Bair & Haworth, 2004). The main focus of these studies has been on the correlation of various doctoral student-related factors (e.g., motivation, self-image, self-confidence; demographic variables) and graduation efficiency in doctoral studies (see Bair & Haworth, 2004). Fewer studies have been conducted to inquire in depth understanding of the PhD students' study experiences and reasons related to discontinuing their postgraduate studies (see, e.g., Golde, 2005; Tinto, 1993). An understanding of these experiences would, however, help to further explain and comprehend the reasons behind dropping out, thus allowing universities to improve the planning of their support systems, as also noted in several other studies (e.g., D'Andrea, 2002; Willis & Carmichael, 2011). Hence, one of the aims of this dissertation is to further investigate the issue of dropout doctoral

students in order to utilize their experience to gain a better understanding of the factors related to the discontinuation of doctoral studies, and, by doing so, to expand the research studies carried out to analyze the perspectives of dropout PhD students, as well as to gain valuable information for further development of doctoral education in Estonia.

Beyond a given doctoral student's personal characteristics, the success of their candidature is also affected by the learning environment and interaction between the doctoral student and their learning environment (Stubb, 2012). This affects the student's future career opportunities at the university as well as in other sectors (Jones, 2013). A PhD student's actual learning experience and opportunities for dynamic interaction in the learning environment are, in turn, greatly influenced by the people who interact with the student during their studies, including their doctoral supervisors. Earlier studies have indeed established that supervision is a critical issue when it comes to students' satisfaction with their doctoral experience and successful completion of their doctoral studies (Halse & Malfroy, 2010; Lee, 2008; Lovitts, 2001; McAlpine & Amundsen, 2012; Pearson & Kayrooz, 2004).

As stated above, issues related to doctoral studies, including doctoral supervision, have been the subject of many papers over the past decades (see, e.g., the meta-analysis of 995 articles by Jones, 2013). The main supervision-related topics discussed in such articles have dealt with different approaches to supervision, supervisor activities, and supervisory styles (see, e.g., Barnes & Austin, 2009; Brew, 2001; Emilsson & Johnson, 2007; Lee, 2008, 2010; Sinclair, 2004), the relationship between a doctoral student and their supervisor (Grant & Graham, 1999; Martinsuo & Turkulainen, 2011; Sambrook, Stewart, & Roberts, 2008; Stubb, Pyhältö, & Lonka, 2011), and the role of community during the doctoral student's studies, including the subject of disciplinary differences (e.g., Gardner, 2010; Lovitts, 2001; Pyhälto, Stubb, & Lonka, 2009; Stubb et al., 2011; Vehviläinen & Löfström, 2014). Fewer studies have been carried out to explore the possible ways in which supervisors' own previous postgraduate study experience could be affecting their current supervisory practices (e.g., Delamont, Parry, & Atkinson, 1998; Lee, 2008), and ways in which current supervisors have adapted their supervisory conceptions and practices to the changes undergone by doctoral education. Therefore, as the conceptions underlying supervisory practices in Estonia remain unclear, these issues were explored in the Estonian context as part of the current dissertation.

To conclude, knowing that the efficiency of doctoral studies is a problem to be solved, and understanding that the supervisor plays a key role in the formation of a PhD student's study experience, while also acknowledging that the supervisor's supervisory conceptions are influenced by their own postgraduate study experience on the one hand and the environment in which the supervisory takes place (i.e., an evolved higher education landscape and different disciplinary conventions) on the other hand, it is important to uncover current PhD students' supervisors' perspectives on the aims of doctoral education, their own

descriptions of their roles and tasks when supervising a student, and the extent to which these descriptions warrant the planning of changes in order to increase the efficiency of doctoral studies. These are the reasons for focusing doctoral supervisors' descriptions of their supervisory practices (next to the descriptions of the dropout doctoral students) in this dissertation.

1.2. Aim and Research Questions

The aim of this study was to identify factors leading to study stall and discontinuation of doctoral studies (based on the perspectives of dropout doctoral students[1]); to describe the study process of doctoral students and supervisory processes of doctoral supervisors (based on the reports of dropout doctoral students and doctoral supervisors); to provide empirical basis for discussions concerning PhD supervision between the various parties involved in doctoral studies; and to make recommendations for policy development in the context of doctoral studies in Estonia.

This aim was approached with the following research questions:

1) How do dropout doctoral students retrospectively describe the process of doctoral studies and which factors do they associate with dropping out?
2) What are doctoral supervisors' perspectives on the aims of doctoral education and the quality of doctoral dissertations?
3) How do doctoral supervisors describe and interpret their own tasks and responsibilities in the course of doctoral studies?
4) What kind of connections do doctoral supervisors describe between their own postgraduate study experience, their supervisory conceptions, and current supervisory practices?

To achieve the general aims and answer the above specified research questions, two empirical studies based on qualitative interviews were devised and conducted. For both studies, specific aims and research questions were formulated. More detailed sub-questions of the dissertation (and the explanations for posing sub-questions) are presented in the following Literature review chapter (Chapter 2), in Figure 7 (p. 68), and in each of the articles used as the basis of this dissertation.

In the following chapter, the relevant literature is reviewed (Chapter 2) and sub-questions of the above listed main research questions are presented. The context of the study – doctoral education in Estonia – is described in more detail in Chapter 3. Chapter 4 introduces the methodology of the studies used as the basis of this dissertation. The most significant findings are presented in Chapter 5, and a discussion of the theoretical and practical implications, as well as the limitations of the study together with suggestions for further research can be found in Chapter 6.

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[1] 'Dropout doctoral student' is a doctoral student who has discontinued their doctoral studies without attaining a PhD degree. This dissertation does not differentiate between 'dropout student' and 'non-completer'; words are used interchangeably throughout this dissertation.

2. LITERATURE REVIEW

2.1. The Purpose of a Doctorate and Doctorateness as the Main Aim

Evolution of our social, economic, and cultural realities creates new circumstances, and thereby also new challenges for the educational process (Nyquist et al., 2004). The orientation of the academia towards the knowledge economy also gives cause to re-evaluate the content of doctoral studies, as these changes are reshaping or have already reshaped our understanding of what a doctorate currently is, and stimulating the debate over what a doctorate should be. Both framework documents dealing with educational policy as well as articles concerned with doctoral education have, for years and decades, actively addressed topics related to the purposes and desirable outcomes of doctoral studies, posing questions such as "What is a PhD?" (Burnard, 2001; Gannon, 2006) and "What is its purpose?" (Wellington, 2013), but also more direct questions targeted directly at the end result of the studies – the doctoral dissertation: "What does it involve?" (Trafford & Leshem, 2009) and "What is a PhD thesis and when should it 'pass'?" (Burnard, 2001; see also, e.g., Johnston & Murray, 2004; Poole, 2014).

As one of the topics of this dissertation concerns supervisors' conceptions of the aims of doctoral studies (see more in Article II used as the basis of this dissertation), it is here relevant to provide a short overview of the aims of doctoral studies, the nature of the dissertation, and the competences and skills of PhD graduates as presented in previous studies and various documents governing the organization of doctoral education, while at the same time also addressing the most significant (i.e., most discussed in the relevant literature) bottlenecks within this circle of topics. In addition to the contents of this subchapter, an overview of literature concerning the aim of doctoral studies can be found in Article II used as the basis of this dissertation, as well as a brief outline of the topic in Chapter 3 of this dissertation ("Doctoral Education in Estonia").

When determining what exactly a PhD is, it becomes immediately evident from the literature that there is no single uniform answer to this question. There exist, however, international (e.g., European Union-wide) and national documents establishing overall aims for the competences and skills of PhD degree holders (e.g., A Framework for, 2005; Bogle et al., 2011). Additionally, each university has its own specific university regulations, which provide formal statements outlining the nature of the award (Trafford & Leshem, 2009; see, e.g., Procedure for awarding doctorates, 2014; Tallinn University Regulations for Doctoral Studies and Defence of Doctoral Theses, 2014). Because of this, it is still relevant today to quote Gannon's (2006) conclusion of some ten years ago: "PhD has as many meanings as there are educational systems. It is not – and has never been – a single, well-defined qualification" (p. 1061).

Descriptions of the aims for doctoral education fall largely into two categories according to various European Union (EU) documents governing the

organization of doctoral studies (Bogle et al., 2011; European University Association, 2010) and in studies concerning doctoral education (e.g., Lee, 2008; Park, 2005). Namely, the aims are described either: (1) by means of outlining the process, e.g., doctoral studies should entail doctoral student's personal development; doctoral studies are intended to prepare a person for a career; the doctoral student should develop as a researcher; or (2) by detailing the outcome, e.g., adding new knowledge to existing work (extending knowledge), doctoral dissertation as a substantial piece of original research, originality and contribution to knowledge (see more detailed descriptions of approaches to *PhD as a process* and *PhD as a product* in Park, 2005).

The criteria listed above are also present in the European University Association's (2010) document Salzburg II Recommendations, which uses the following phrasing to formulate the goals and outcomes of doctoral education to be adhered to and used in the development of doctoral studies in EU member states:

> *The goal of doctoral education is to cultivate the research mindset, to nurture flexibility of thought, creativity and intellectual autonomy through an original, concrete research project (p. 4)./.../The main outcome of doctoral education are the early stage researchers and their contribution to society through knowledge, competences and skills learnt by undertaking research, as well as awareness and openness towards other disciplines. The outcome of their research must testify to the originality of the research and be suitable for dissemination within the scientific community (p. 5).*

Considering the various societal expectations held for PhD graduates in Estonia, it can be summarized that on a national level and based on the Estonian Qualifications Framework (see more in Aarna et al., 2012; Estonian Qualifications Framework, 2008), in order to be awarded a PhD degree, a student in Estonia needs to achieve the following learning outcomes in their competences, skills, and scope of responsibility and autonomy (see Table 1; for more details see Appendix 1):

Table 1. Learning outcomes of doctoral degree qualifications (based on the Estonian Qualifications Framework, 2008, p. 2).

Learning outcomes of doctoral degree qualifications	
Knowledge (theoretical and/or factual)	Knowledge is at the most advanced frontier in the field of work or study and the interface between fields.
Skills (cognitive skills)	Skills are the most advanced and specialized skills and techniques – including synthesis and evaluation – required to solve critical problems in research and/or innovation, and to extend and redefine existing knowledge or professional practice.
Scope of responsibility and autonomy	Demonstrate substantial authority, innovation, autonomy, scholarly and professional integrity, and sustained commitment to the development of new ideas or processes at the forefront of work or study contexts, including research.

The explanations above describe aspects that are emphasized in the context of the aims and learning outcomes of doctoral education in pan-European and Estonian documents. Turning to the narrower topic of requirements set for doctoral dissertations (a doctoral dissertation being a research paper written as the end result of doctoral studies), Park (2005) indicated, based on several studies, that regardless of the country in question, "typically a PhD thesis is expected to embody independent research carried out by the author, and through that to demonstrate that the student has located the research within a discipline or an interdisciplinary context, has shown an ability to carry out independent research as an autonomous practitioner, and has made a substantial contribution to knowledge and advance understanding" (p. 198). This is also reflected in the requirements for dissertations laid down in the University of Tartu's document *Procedure for awarding doctorates* (2014), and the explanations listed in *Tallinn University Regulations for Doctoral Studies and Defence of Doctoral Theses* (2014). Both also emphasizing, among other aspects, the independence of the research paper and originality of the solutions suggested:

> *A dissertation is an independent research paper that presents a well-argued, original solution to a specific scientific problem and whose results are published in international professional literature (Procedure for awarding, 2014, p. 2).*

In addition to explaining the nature of doctoral dissertations, these documents (see more in Procedure for awarding, 2014; Tallinn University Regulations, 2014) also contain requirements set for doctoral dissertations. These requirements describe the parts making up a doctoral thesis, the possible types of theses (monograph or collection of articles), the number of pre-reviewed publications and their required classifications according to the classification scheme for research and development publications used within the Estonian Research Information System (ETIS), and, in the case of article-based dissertations, the volume of the review article (the latter clause is only present in the case of Tallinn University). Additionally, the defense procedure is described in these documents (see also the description of the procedure for defending dissertations in Chapter 3 of this dissertation).

When trying to form an understanding of what constitutes a high-quality dissertation, one comes across the notion of *doctorateness*, a term used widely in research papers of the past few years addressing the quality of doctoral studies and doctoral dissertations (see, e.g., Poole, 2014; Trafford & Leshem, 2009; Wellington, 2013). As this dissertation is, among other issues, concerned with doctoral supervisors' views on the quality requirements set for doctoral dissertations (see more in Article II), it is relevant to provide a brief overview of a model of doctorateness that has been suggested as a basis for assessing the quality of doctoral dissertations, as well as a helpful guideline to be used in the process of writing and supervising the writing of doctoral dissertations corresponding to these same quality requirements.

Expanding on the possible quality criteria that should be applied to a doctoral dissertation's content, authors list several essential elements of research activity that must be accounted for and explained in a PhD thesis, and note that doctorateness is achieved when there is synergy between the components of the dissertation. Hence, according to Trafford and Leshem (2008, pp. 51–52), "doctorateness results from specific critical research features being present in a doctoral thesis".

The model that clarifies the concept of doctorateness (for more details, see Trafford & Leshem, 2008, pp. 38–52; Trafford & Leshem, 2009) consists of 12 aspects and could be described as "a jigsaw puzzle that can be fully appreciated when all the components are present and fitted together" (Trafford & Leshem, 2009, p. 308). The model is initially used to determine a gap in knowledge, proceeding then to other stages in the order presented in Figure 1, arriving finally at the stage of evaluating the contribution made to knowledge.

While the model of doctorateness presented above details some of the aspects that should be considered when writing or evaluating a doctoral dissertation and assessing the scholarly merit of a thesis (Trafford & Leshem, 2009), other aspects (of various levels of detail) are also pointed out by other authors (e.g., Bourke & Holbrook, 2013; Clarke & Lunt, 2014; Mullins & Kiley, 2002) that could be used as a basis for assessing doctoral dissertations.

Mullins and Kiley (2002), for example, recommend paying special attention to the extent to which the dissertation is characterized by the elegance of design, synthesis and execution, and coherence and creativity. They deem a thesis that corresponds to these qualities worthy of an outstanding dissertation. On the other end of the spectrum, the same authors suggest that a lack of coherence, lack of, or confused understanding of the theory, lack of or confused understanding of methodology, lack of confidence, and lack of originality should be considered as indicators of a poor dissertation.

In previous studies, several problems have been indicated in connection with the subjectivity of such criteria. For instance, Poole (2014) draws attention to the use of the term *originality* (i.e., creation/contribution of new knowledge) in this context (this term is used in the list of characteristics by Clarke and Lunt (2014), the model suggested by Trafford and Leshem (2009), as well as both pan-European documents (Bogle et al., 2011) and documents governing the organization of doctoral studies at the University of Tartu and Tallinn University (Procedures for awarding, 2014; Tallinn University Regulations, 2014). Poole (2014) argues that this term can be interpreted differently by different people (mentioning also the possibility of understanding "original" to mean "not copied" or "groundbreaking", or (presumably) to denote any point on the scale between those two meanings). In the same vein, Poole takes issue with the adjectives *new*, *different*, and *novel*, all of which are polysemous – "newness" differs from person to person.

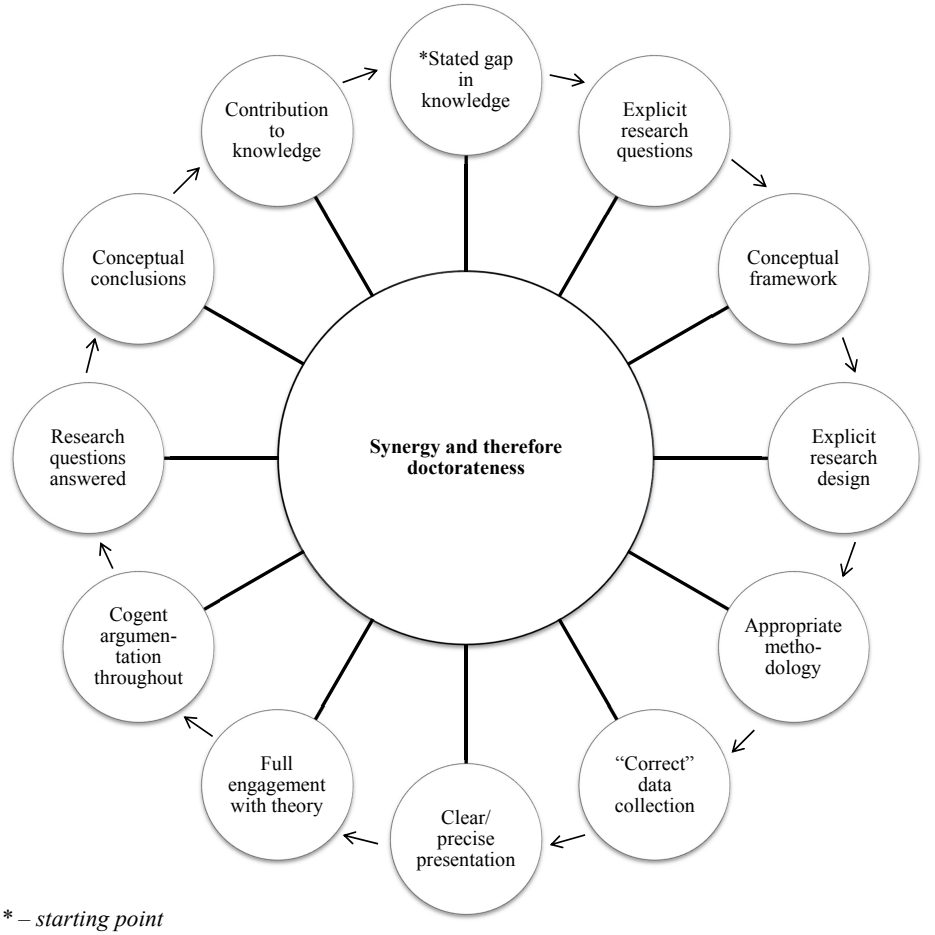

Figure 1. The Trafford and Leshem model of doctorateness (after Trafford & Leshem, 2009, p. 309).

Another characteristic widely expected from dissertations is the concept that a student must carry out an individual piece of research. According to Gannon (2006), this concept seemed "outdated" (p. 1061) even a decade ago. His reasoning is that most publications list many authors, each of whom have contributed to the overall content of the paper. At the same time, he argues that a PhD student is really expected to gain experience in cooperation, as scientific research increasingly demands teamwork, and the PhD system must adapt accordingly. Gannon notes "if the thesis is a cooperative effort, then it becomes even more difficult to judge the input of each individual – yet a PhD is awarded to an individual" (p. 1061).

Consequently, it could be concluded that "we should know more and ask more about what a PhD really means" (Gannon, 2006, p. 1061) knowing that on the one hand, both the process and product are (somewhat controversially)

emphasized as the goals of doctoral studies in the official regulative documents (see e.g. Park, 2005) and that at the completion of doctoral studies the person with a PhD is expected to have obtained certain skills, knowledge, scope of responsibility, and level of autonomy (see Aarna et al., 2012; Estonian Qualifications Framework, 2008), and that on the other hand, there is a continuous debate over the goals of doctoral studies as well as over the quality of PhD dissertations and the competences of PhD graduates in literature.

Therefore, taking into consideration the abovementioned, it is relevant to clarify through empirical research what exactly in the regulations and guidelines describing the goals and quality of doctoral education is emphasized by supervisors in the Estonian context in order to study to which extent the abovementioned goals of doctoral education described in the literature overview are in accordance with supervisors' descriptions of their own supervisory practices (or what exactly is in accordance or controversial). Knowing that the conceptions of supervisors influence their supervisory focuses (see Lee, 2008), thus, their actions during doctoral supervision and thereby, PhD students' development and overall advancement in doctoral studies (the richness of the content and efficiency of studies), it was considered to be important in the particular dissertation to formulate the following questions (sub-questions of research question 2): *(1) What are the conceptions of doctoral supervisors regarding the aim of doctoral studies?; (2) What do PhD supervisors presume a doctoral student should learn, and in what way should students change during their doctoral studies?; and (3) What conceptions do PhD supervisors hold with regard to the aim of doctoral dissertations?* These questions are addressed in Article II.

2.2. Main Factors Involved in Doctoral Students' Doctoral Study Period

Several factors determine the eventual nature of a PhD student's doctoral studies; the extent to which the student is able to, by the end of their candidature, attain the outcomes and "doctorateness" set as the aims of doctoral studies; and whether and in what way they are able to produce a high-quality doctoral dissertation within the required time frame. As such, a successful candidature is thus complex and intertwined (Bair & Haworth, 2004; Lovitts, 2001; Manathunga, 2002; Pole, Sprokkereef, Burgess, & Lakin, 1997). Even though there appears to be no "single recipe" leading to a successful completion of studies for all doctoral students, previous studies (see, e.g., meta-analysis by Bair & Haworth, 2004; Smith et al., 2006) have distinguished two mutually influencing factors that have an impact on doctoral students' course of studies: (1) student-related factors, i.e., personal and interpersonal factors; and (2) environmental or organizational factors (institutional and structural context, including that related to supervision). The following subchapter provides a concise overview of these factors, along with references to the articles used as the basis of this dissertation, in which these issues are introduced in more detail.

2.2.1. Issues around doctoral students in the doctoral study process – student-related factors: personal and interpersonal factors

Doctoral students' objectives and dedication, and thus their integration into the doctoral study program, are influenced by students' attributes and prior experiences (Tinto, 1993). Even though PhD students are, generally speaking, the most carefully selected students in higher education, and should therefore be the most capable and academically successful group (Golde, 2000), dropout rates for PhD students remain high. Stalling[2] and discontinuation of studies have often been directly associated with student-related personal and interpersonal factors or a combinations of both (Bair & Haworth, 2004; Lovitts, 2001).

According to Bair and Haworth's (2004) meta-analysis of 118 research studies regarding doctoral students' attrition[3], there are four important student-related personal factors that seem to correlate with PhD students' persistence[4] in their studies: (1) motivation (both intrinsic as well as extrinsic), for more on motivation as one of the more significant factors consequent on a PhD student influencing advancement in doctoral studies, see e.g. Kember, Ho, and Hong, (2010), Wellington and Sikes (2006), and Wellington (2013); (2) goal directedness (related to the value ascribed by the student to the eventual attainment of the PhD degree [often described as self-motivation (Lovitts, 2008)]); (3) positive self-concept and an internal locus control; and (4) well-being during the candidature. Additionally, it has been indicated by, e.g., Lovitts (2005) that personal characteristics such as intelligence, knowledge (both formal and informal), and thinking style are also key factors influencing degree completion. Additionally, Lovitts (2008) also indicates self-dicipline and the ability to work independently as influencing factors.

In addition to the above, several research studies have identified correlations between study stall and discontinuation of studies, and age, gender, race, and other personal factors. These correlations have, however, been refuted in numerous other research studies (see more in Bair & Haworth, 2004). Neither is there a consensus among researchers as to the extent to which (if any) the level of academic preparation (studies mostly compare the students' undergraduate grade point average) can predict the degree of completion and retention (see Bair & Haworth, 2004; Lovitts, 2001). According to a study carried out by Lovitts (2001), for example, completers and non-completers of doctoral studies had comparable undergraduate grade point averages.

In addition to the aforementioned student-related personal factors, several research studies (e.g., Ampaw, 2010; Lovitts, 2001; Nelson, Dell'Oliver, Koch,

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[2] 'Stalling' (study stall) is a situation where the doctoral student is not progressing in their studies at a pace considered sufficient by their supervisor (Ahern & Manathunga, 2004).

[3] 'Attrition' is that proportion of the entering cohort into a doctoral degree program that does not complete the graduate program undertaken (Rapoport, 1998, p. 1).

[4] 'Persistence' is the continuance of a student's progress toward the completion of a doctoral degree (Bair, 1999, p. 8, as cited in Spaulding & Rockinson-Szapkiw, 2012, p. 199).

& Buckler, 2001; Smith et al., 2006) have also described student-related interpersonal factors, which are in turn relevant when it comes to contributing to attrition. Listed among such factors impacting the doctoral students' progress and discontinuation of studies are: (1) family responsibilities and relationships with significant others (e.g., ability to balance study and family time, as well as to balance study time and time for friends); (2) support systems (presence of loved ones who provide important environments of acceptance and understanding during the study period, i.e., are prepared to listen to concerns and buffer them); (3) employment responsibilities and financial strain, which have also been associated with time constraints and overload. According to Tinto (1993), financial aid will shape a PhD student's participation in the program to a great degree, as time spent by the student on supporting themselves financially equals less time spent on the demands of their candidature. In general, however, authors tend to agree (see e.g. Bair & Haworth, 2004; Lovitts, 2001; Sinclair, 2004) that the advancement of PhD students and the success and discontinuation of doctoral studies are influenced by the concurrence of several factors. A more in-depth overview of doctoral student-related factors as an influence on doctoral studies can be found in Articles I (in the subchapter "Personal characteristics and life-situation") and in Article IV (in the subchapter "Student-related factors") used as the basis of this dissertation.

To summarize, since the results about the relations between PhD students' study stall and discontinuation of studies and PhD students'characteristics (the interplay between different factors) are still controversial despite numerous studies in this area, it is important to further research the topic of advancement in studies from the viewpoint of the doctoral students, as also stated by e.g. Bair and Haworth (2004); Lovitts (2001), and Willis and Carmichael (2011). At the same time, in the Estonian context, it is reasonable to focus on the experience of doctoral students, more specifically on students having discontinued their studies (non-completers/dropout doctoral students), in a field with low graduation rates since it would provide an opportunity to better grasp the process of doctoral studies from the viewpoint of doctoral students and to examine the most important factors related to the discontinuation of studies for students themselves. Accordingly, the following questions were formulated (sub-questions of research question 1): *(1) How is the process of doctoral studies described by former doctoral students (non-completers) in the field of Educational Sciences?; (2) What factors do they associate with dropping out of their studies?; (3) How do they describe their non-academic commitments during the doctoral studies?* These questions are addressed in Article I.

2.2.2. Environmental factors in the doctoral study process and doctoral student socialization

Earlier studies have indicated that next to student-related factors the largest group of factors associated with doctoral students' progress and discontinuation

of studies is environmental or organizational influences (see, e.g., Bair & Haworth, 2004; Golde, 1998, 2005; Lovitts, 2001; Smith et al., 2006). Within this group, it is possible to distinguish between factors related to other community members (communication with academics/other researchers and student peers) and those related to supervision. This subchapter offers a brief overview of the ways in which a PhD student's study environment affects their development and study results, and factors that have been found in previous studies to play an important role in helping PhD students to integrate into their community. The subchapter also deals with the role of fellow doctoral students during a student's study period and focuses more closely on issues related to doctoral supervision and doctoral supervisors.

Learning is, according to Parker (2009), a social activity in which "knowledge and meaning are constructed through shared and joint practices between members of a community that share a common culture or language, codes and ways of seeing the world" (p. 45), and it is also possible to extend this social approach to doctoral studies. This means that the learning process occurs when doctoral students communicate with different people. PhD students' learning process in their environment is thus influenced both by people working or studying in their field who communicate with the student during their candidature, as well as disciplinary conventions and requirements making up a certain contextual or communication framework that surrounds a person's activities.

Doctoral studies constitute a period of time during which a doctoral student should, in addition to the knowledge and skills directly related to their specific area of research (i.e., their dissertation), assimilate the norms, values, ethics, and work habits unique to their discipline (Austin, 2009; Gardner, 2010). At the same time, students should also develop an understanding of the institutional expectations for the development and exploration of their field of study. The level to which such knowledge, skills, and perspectives are obtained (and thus also indirectly the nature of the student's entire period of PhD studies) is largely determined by the individual's relationships and opportunities for communicating with other academics and researchers, student peers, and their supervisor. In other words, the course of a doctoral student's candidature and the assimilation of disciplinary conventions are also influenced by the student's perception of their socialization process (Austin, 2002; Delamont, Atkinson, & Parry, 2000; Golde, 1998; Stubb, 2012). Golde (1998) believes that the socialization of doctoral students could be viewed as a process through which PhD students are "made members of a community: the community of an academic department in a particular discipline" (p. 56). PhD students are integrating themselves (or are integrated) into their department.

Different disciplines, however, have different practices for cooperation, therefore also providing different socialization opportunities (Gardner, 2009, 2010; Golde, 2005; Löfström & Pyhältö, 2014). For instance, in the "hard" sciences, doctoral students have more opportunities for interacting with both

their student peers and their supervisor, whereas in the "soft" sciences, it is more prevalent to work individually and without belonging to a research team. Yet, it is the duty of the organization (i.e., the institution coordinating the doctoral study program) to create socialization opportunities for students of all disciplines and specialties (see more in, e.g., Delamont et al., 2000; Smeby, 2000).

Access to academic communities, their procedures, values, and norms is not an easy objective to attain (Pilbear & Denyer, 2009). Features of organizational processes or practices (e.g., low flexibility, lack of creative methods in course offerings, course scheduling [see more in Smith et al., 2006, pp.18–22], departmental requirements, as well as interpersonal relationships between community members, and doctoral supervision) can either facilitate or inhibit the socialization process (Lovitts, 2001; Stubb, 2012). As indicated by Lee and Danby (2011), in order to achieve this aim of assimilating the practices of a community by means of student socialization, a doctoral student's study opportunities should be analyzed at an institutional level already during the planning stage of their study period. This should be done in such a way as to provide the student with both formal and informal interaction opportunities with community members, while maintaining a positive attitude towards the inclusion of doctoral students on the part of community members in question. In brief, PhD students should be provided with subsequent everyday interaction or engagement with different members of the academic community (Stubb, 2012; Weidman, Twale, & Stein, 2001).

Prior studies (e.g., Gardner, 2010; Golde, 2005; Lovitts, 2001; Stubb, 2012; Terrell, Snyder, & Dringus, 2009) suggest that the presence of active communication with community members, on the condition that this communication is also perceived as positive by doctoral students themselves, has a positive effect on the students' level of satisfaction with their studies, leading to a reduced likelihood of study stall or discontinuation.

In addition to students' relationships with academics, activities of these academics, and the student having a sense of belonging to a community, another important factor impacting PhD students' level of satisfaction with their study period is their relationships with student peers, referred to by Floresh-Scott and Nerad (2012) as "learning partners". Austin (2002) has pointed out that the importance of other doctoral students during the candidature lies chiefly in three aspects: students provide one another with emotional support (as an example of this, Austin notes that peers help to celebrate milestones in the doctoral process), general counsel (e.g., tips and advice in matters pertaining to the organizational side of studies), and specific content knowledge (e.g., tutoring in shared or adjacent research topics or research methods; providing feedback).

The extent to which doctoral students are provided with interaction opportunities with their student peers in order to learn from them or to receive support, is, in turn, largely determined by the perspectives and conventions governing their institutions and academic programs. Floresh-Scott and Nerad (2012) claim that cooperation between PhD students can be shaped through

planning and organizing formal cooperation meetings (e.g., cohort-based programs – shared courses), as well as creating opportunities for informal peer pedagogies (e.g., by providing workplace facilities in areas shared by doctoral students, allowing for frequent contacts and thus also for learning from each other). Both approaches contribute towards PhD students helping each other during their period of studies in a mutually beneficial process, providing both emotional and academic support.

In addition to the community support-related activities listed above, doctoral student's progress is also influenced by a potential lack of financial support (see more in Ampaw, 2010; Ampaw & Jaeger, 2011; Lovitts, 2001). Consequently, providing doctoral students with funding opportunities is, from the perspective of universities, contributes towards them making better progress in their studies, as this reduces the time constraints and overload that may be caused by students working outside of the university due to a lack of financial means. When students are provided with sufficient funding, they generally tend to graduate sooner and are less likely to drop out (Lovitts, 2001).

Interaction with environmental factors is, thus, one of the key aspects in this process of attaining doctoral students' satisfaction with their studies and successful completion thereof (Gardner, 2010; Golde, 2005; Lovitts, 2001; Smith et al., 2006; Stubb, 2012). The role of the organization, in this case, is to provide a beneficial study environment and to foster the students' socialization with their community to allow them to familiarize themselves with the academic culture. It is also important to provide funding opportunities in order to circumvent any obstacles posed by possible time constraints during the study period.

Environmental factors affecting the progress of a student's candidature are also discussed in the articles used as the basis of this dissertation (Article I subchapter "Interactions within the wider learning community"; Article IV subchapter "Environmental factors impacting the progress in doctoral studies"; and Article V subchapter "Community as the supporter of a doctoral student").

Consequently, since prior studies argue for the significant role of interaction with the community and the perception of self as a PhD student belonging to a community in the advancement in and continuation of doctoral studies, it is relevant to find out, firstly, to which extent the drop-out PhD students, who have not been studied from that angle, value community (to which extent the need for support is emphasized and what exactly in it is emphasized), and secondly, in which way the current organization of doctoral education (e.g. course-based format, limited involvement in the work of research groups in the educational domain) enables the PhD students to receive the support of fellow students and members of the community. Therefore, it was considered relevant to formulate the following question in the particular dissertation (a sub-question of research question 1): *How do former students who have dropped out of doctoral studies describe the role of fellow students, and the role of departments in the process of doctoral studies?* These questions are addressed in Article II.

2.2.3. Supervisor in the doctoral process

Prior studies have also highlighted the role of doctoral supervisors in the progress of studies, as the supervisor is a part of the environment shaping the student's study period. As this has been considered one of the most influential factors, the next subchapter is dedicated to examining this issue further.

Doctoral supervision is a crucial factor when it comes to shaping a doctoral student's progress and success during their studies, and is therefore highly relevant to any discussions concerning the development of doctoral education. The importance of good cooperation between the various parties of the doctoral study process (including members of the community surrounding the student [i.e., academic institutions], the doctoral student, and the doctoral supervisor) has been emphasized in a number of research studies and documents governing the organization of doctoral studies (e.g., Byrne et al., 2013; Ives & Rowley, 2005). The topic continues to be relevant, and a clear emphasis on focusing on the perspectives and actions of doctoral supervisors as "it is not an exaggeration to state that any institutional initiative to enhance the quality of doctoral education will have to recognize the supervisor as the main transmission belt between institutional strategies and their implementation" (Byrne et al., 2013, p. 28).

Ways in which supervisors approach, handle, and resolve the supervisory process and various situations that they come across over the course of a student's candidature, i.e., the supervisor's experience and expertise as a supervisor (as well as a former PhD student), has, according to Lee (2008) and Trafford and Leshem (2009) a direct effect on the supervision, and thereby also the student's learning journey as a whole, along with the quality of the PhD dissertation. Prior studies offer many colorful and descriptive examples of "lazy or unmotivated supervisors [having] a demoralizing effect on their students (Rudd, 1975, as cited in Delany, 2008, p. 3) and notes on how "the student-supervisor relationship has the potential to be wonderfully enriching and productive, but it can also be extremely difficult and personally devastating" (Dinham & Scott, 1999, p. 10). In a broader sense, "the supervisor can make or break a PhD student" (Lee, 2008, p. 267).

The issue of doctoral student supervision is explored in more detail and with varying emphases in all five articles used as the basis of this dissertation. The following subchapter provides an overview of what has been the traditional approach to doctoral supervision and its organization, as well as some of the changes that have taken place in this field.

2.2.3.1. Common approaches to doctoral supervision

Traditionally, in social sciences, doctoral supervision is discussed in terms of the apprenticeship model (also called the master-apprentice model): a dyadic model that places the student-supervisor relationship at the core of the learning process (Byrne et al., 2013; Kärner, 2009; Parker, 2009). According to Golde

and Dore (2001), this model describes a situation in which "students work under the tutelage of their advisors, learning the intricacies of research and becoming increasingly independent scholars" (p. 5). Based on this approach, the doctoral supervisor is intended to provide criticism and commentary on the PhD student's work over the study period. Accordingly, within the apprenticeship model a supervisory relationship is based on a hierarchical and vertical relationship between the PhD student and the supervisor, in which the student learns to do research in the course of close one-on-one interaction. This model of doctoral supervision has been considered particularly effective as PhD studies have traditionally been considered largely an individual effort, and doctoral students have been expected to follow "a hypothesis or an idea leading them to uncharted territory, which they must then learn to navigate" (Byrne et al., 2013, p. 8) during their studies, whereas the curricula of Bachelor and Master programs are clearly structured into distinct subjects/courses and modules. For this reason, the master-apprentice model of individual research under supervision has been viewed as an effective approach considerate of the individual needs of a PhD student (Byrne et al., 2013). As stated by Kärner (2009), the apprenticeship model has been the most widely applied model used for doctoral supervision in Estonia.

Over the past decade, a system has been introduced in doctoral studies (in Europe as well as for example in the United States and in Australia) in which optional training modules (coursework) in PhD supervision have gradually been replaced with comprehensive and compulsory programs (Manathunga, 2005; see also guidelines governing the organization of PhD studies in Europe, e.g., European University Association, 2010, 2013). The purpose of this has been to harmonize academic degrees. Within this new structure, when it comes to advancing the growth and learning of a PhD student by means of coursework, the responsibility for the student's progress is, to a certain degree, divided between the lecturers in charge of the courses and the doctoral supervisor; i.e., the responsibility does not lie solely on the supervisor and their one-on-one cooperation with the student.

Moreover, another approach is strongly emerging next to the one-on-one supervision model described above: joint supervision (also called co-supervision). In the case of joint supervision, one PhD student is jointly supervised by several supervisors who share the responsibility (see more in Pole, 1998). The main value of this approach lies in doctoral students being granted several perspectives. Involving different supervisors allows for the inclusion of different yet complementary specialist perspectives during the supervisory process and is primarily relevant in cases where a student's dissertation topic or research methods call for additional expertise (Thompson, Kirkman, Watson, & Stewart, 2005). It has also been suggested that joint supervision is helpful in that PhD students feel more secure and better protected when this model is used. It is, however, deemed necessary that when this approach is used, one of the supervisors should act as a main supervisor (i.e., take the overall

responsibility for supporting the student in their studies) and that supervisory meetings between the team of supervisors and the student be held on a regular basis (see more in Thompson et al., 2005). However, joint supervision also has several drawbacks. Bourner and Hughes (1991), for instance, have indicated possible scenarios of supervisory responsibilities becoming fragmented, the student receiving conflicting advice from different supervisors, the supervisors lacking a complete overall perspective on the dissertation, and conflicts emerging in communication between supervisors.

In addition to the above, McCallin and Nayar (2012) distinguish between three types of supervision: (1) traditional supervision (similar in essence to the aforementioned model of apprenticeship and joint supervision) characterized by a dyadic relationship between a PhD student and their supervisor; (2) group supervision, in which together with student-supervisor communication, relationships between students constitute an important part of doctoral studies (e.g., students receiving feedback in scholarly writing groups); and (3) mixed model supervision: a combination of traditional and group supervision that also incorporates the use of new technologies, including online communication opportunities (for a more detailed description of the supervisory models, see McCallin & Nayar, 2012, pp. 67–68).

Given that supervisory models used in PhD studies have changed or are in the process of changing (both because of the increased proportion of courses and the rising popularity of joint supervision), it is relevant in this dissertation to study and analyze the supervisory practices of supervisors working with PhD students. Below, a brief overview is presented of supervisory activities and supervisory styles (functions of the supervisor and approaches to supervision).

2.2.3.2. Supervisory activities and supervisory styles

Functions of the supervisor

In descriptions of the supervisory process, regardless of whether they concern individual supervision or any other model of supervision described above, earlier studies have pointed to various activities that PhD students expect of their supervisor and ascribe importance to.

In addition to the differences in PhD students' personal and interpersonal factors, as discussed above (see subchapter 2.2.1; in the Estonian context see, e.g., Eamets et al., 2014; Ots, Leijen, & Pedaste, 2012), they also naturally differ in their expectations and needs when it comes to supervisory support during their candidature. As an example, Kam (1997) distinguishes between four types of supervisees, the two extreme categories being the *dependent supervisee* and the *non-dependent supervisee*. A student's expectations towards their supervisor (the intensity, content and extent of the supervision) are determined by their level of need for support (see more in Kam, 1997).

Based on several other authors (e.g., Hockey, 1995; Thompson et al., 2005; Wright, 1991), Gill and Burnard (2008) have itemized some activities that students should, in spite of their varying needs and expectations, expect their supervisors to perform during the supervisory process. The overall expectation is for the supervisor to support the doctoral student in both practical research tasks as well as by providing the necessary material means, while creating an emotionally encouraging learning environment that makes it easier for the student to progress in their studies. According to Gill and Burnard (2008), successful supervisors will help students with any academic and personal problems that could interfere with the smooth course of their research.

More precisely, successful supervisors, as defined by Easterby-Smith, Thorpe, and Lowe (2002, p. 15), manifest the following characteristics:

- *Technical expertise*: as stated by Cullen, Pearson, Saha and Spear (1994), a supervisor generally needs to be "scientifically competent", aware of the relevant academic literature in their field, and owns real expertise in the doctoral student's area of research. It is noteworthy that according to Easterby-Smith et al. (2002), a deep knowledge of the subject area and narrow specialism in particular methods are actually considered less important for doctoral supervision than a general knowledge of both the research method and topic at hand.
- *Being an active researcher*: the supervisor themselves should also be an active researcher and part of international networks to act as a gateway between the PhD student and academic careers. Van Ours and Ridder (2003) study showed that supervisors who were active researchers had lower doctoral students dropout and higher graduation rates.
- *A responsive style and availability*: the supervisor is enthusiastic and committed, and available at appropriate times (e.g., provides feedback for the student's work within an acceptable period of time and holds regular meetings with their supervisee). Brew and Peseta (2004) consider it essential for the supervisor themselves to have a clear interest in the supervisee's dissertation as well as specific goals with regard to the development of the dissertation.
- *Providing facilities and resources*: the supervisor, where appropriate, ensures adequate facilities and resources for their students' research and makes sure that they receive appropriate research and other relevant training (Gill & Burnard, 2008, pp. 669–670).

In addition to the above, doctoral supervisors' personal qualities are also deemed important.

- *Personal characteristics, attitudes, and behaviors*: Cullen et al. (1994) note that another set of traits that PhD students value highly in their supervisors involves the supervisors' personal characteristics, attitudes, and behaviors. A "good" supervisor has the personal characteristics of being friendly and approachable, supportive, open-minded, organized and thorough; they have a positive attitude, are stimulating, and convey enthusiasm for research.

According to Gill and Burnard (2008), it is essential for the supervisor to be supportive throughout the student's PhD study period, even as they deliver constructive criticism. A supervisor is also expected to exhibit openness, honesty, mutual respect, and good collegial relationships (Thompson et al., 2005). The issue of student-supervisor relationship is discussed in more detail (in the Theoretical framework section) in Article V (in the subchapter "Doktorandi ja juhendaja suhted").

To sum up, doctoral supervisors have a dual role of providing both research-related as well as personal help. The extent and manner of the supervisor's communication with the student depend on the expectations and characteristics of both parties.

Approaches to supervision

In addition to the above-mentioned expectations toward a supervisor's functions, a different paradigm is presented in literature: a conceptual approach towards supervision. As described by Lee (2010), the significance of such models (this dissertation uses the term *model of supervision* interchangeably with the terms *approach/conceptual approach, as well as supervisory pedagogy*) lies in the notion that they "might make it easier for supervisors to look at the underlying themes of how they could approach different situations" (p. 18).

There are several alternative approaches to supervision (see more in Article II used as the basis of this dissertation [in the Theoretical framework section]). Kam (1997) has stated that the quality of doctoral supervision (and hence the quality of a doctoral dissertation) is largely contingent on the supervisor's ability to recognize the needs and expectations of their supervisee, and to use this information in order to adapt their supervisory style. A brief overview is presented below of Sinclair's (2004) *hands on* and *hands off* pedagogies and Lee's (2008, 2010) framework of approaches to research supervision (holistic approach to supervision), as these are two of the most widespread approaches that are also key to interpreting the results of the studies used as the basis of this dissertation.

***Hands on* versus *hands off* intervention continuum** (Sinclair, 2004). One approach used to observe the phenomenon of supervision in doctoral education-related literature is to describe supervision (as a supervisor's pedagogy) by means of an *intervention continuum* ranging from *hands on* to *hands off* supervision (Sinclair, 2004). Speaking of supervisory pedagogies in these terms, it is, however, important to note that the continuum refers to extremes, which may not really manifest themselves as extremes in all aspects of supervision. Table 2 below provides an overview of the *hands on* end of the intervention continuum, assuming that the *hands off* approach entails the opposite of these traits. The descriptions used here are based on Sinclair's (2004) source "The Pedagogy of 'Good' PhD Supervision: A National Cross- Disciplinary Investigation of PhD Supervision" carried out among more than 1000 doctoral supervisors in Australia.

Table 2. Supervisory pedagogy intervention continuum – *hands on* supervision (a synthesis of Sinclair, 2004).

Supervisory activities (interventions)	**Description of characteristics and supervisory activities**
Purposefully building a relationship based on trust	The supervisor relies on discussing mutual expectations with the student and making agreements for cooperation. The supervisor values trust and contributes to building trust, since it allows the student to approach them with confidence and helps to identify problems further on, allowing for timely and appropriate interventions. Over the critical first year of supervision, supervisors organize a mix of formal and informal interactions between the student and the supervisor as well as colleagues and student peers.
Setting attainable milestones	The supervisor provides guidance by means of setting specific tasks (e.g., at the initial phase of studies, finding relevant research literature). At meetings, detailed and clear agreements are made for the following work period. Towards the beginning of the supervision relationship, the supervisor often negotiates little attainable milestones and tasks. As the candidature progresses, more significant milestones are set to help the student become a more independent researcher. While independence is important, it does not mean that a student should work alone.
Holding regular supervisory meetings in combination with an "open door" policy	Regular supervisory meetings are held to keep up to date on the student's progress in their studies and dissertation writing. The supervisor is, however, also available outside of the agreed-upon meeting times, i.e., has an "open door" consultation policy. The supervisor acknowledges that even exceptional students still require some intervention, as overconfidence can become as counterproductive as a lack of confidence.
Encouraging the student to undertake multiple tasks and aspects simultaneously	The supervisor encourages their students to target more than one task at once, as this prevents them from becoming bogged down in case of problems in one or another area of research. The student can work on, e.g., literature review and developing their methodology at the same time. The student is advised to set the problematic task aside and return to it later.
Organizing teamwork and consultations	The supervisor seeks out opportunities for PhD students to work in teams (e.g., small face-to-face teams, larger research teams or cooperation with students in other universities/countries by means of IT solutions). If the supervisor does not have sufficient competence in order to solve a problem at hand, they seek out opportunities to consult with either colleagues or other experts in the field.

Supervisory activities (interventions)	Description of characteristics and supervisory activities
Joint preparation for conferences and co-authoring	The supervisor co-authors articles with their supervisees, and contributes preparing conference papers.
Providing feedback for written work quickly	The supervisor believes in offering a rapid turnaround of edited manuscripts for their students (ideally within the same day or 48 hours).
Intervention when recognizing warning signs	Instead of waiting for a student to approach them, the supervisor actively seeks out students in case they notice any warning signs, thus preventing problems from escalating (see more in Sinclair, 2004, p. 33).

As mentioned previously, in the case of *hands off* supervision, supervisory activities are the opposite of those described in Table 2. The supervisor, in such a case, expects that a doctoral student should be able to handle both their studies and research on their own unless they ask for support, and therefore support is only provided when explicitly requested. This approach means that supervisors intervene minimally, holding it true that this helps their students to develop into independent researchers. Proponents of the *hands off* approach assume that students themselves are responsible for keeping on track. Such supervisors thus leave their PhD students largely to their own devices, assuming that the students ought to be self-reliant. According to Sinclair (2004), the *hands on* approach brings about more and faster completions, while doctoral students under *hands off* supervision complete their studies later and largely as a result of their own efforts. Figure 2 below summarizes the *hands on* and *hands off* approach, bringing out the characteristics of supervisor activities and perceptions.

Both Sinclair (2004) and Cullen et al. (1994) assert that supervisors should also consider the stage that their doctoral students are in, and alter the intensity of their supervision and degree of intervention accordingly, as the extent to which PhD students should be supported is individual to each supervisor-student relationship. For instance, Sinclair (2004) has noted that PhD students should be allowed increasingly more independence and freedom in decision-making towards the end of their doctoral studies. Thompson et al. (2005) warn, however, against the "danger of spoon-feeding" (p. 286) which may be brought on by a supervisor's excessive initiative and intervention, thus decreasing the student's future ability to operate independently in the field of science.

All in all, it is therefore important to seek a balance between different levels of intervention (*hands on* and *hands off* approaches) and to find a combination of approaches that would both take into account the specific student's needs as well as contribute to their progress, i.e., a balance that is acceptable for both the PhD student and the supervisor, and has been agreed upon based on their mutual understanding.

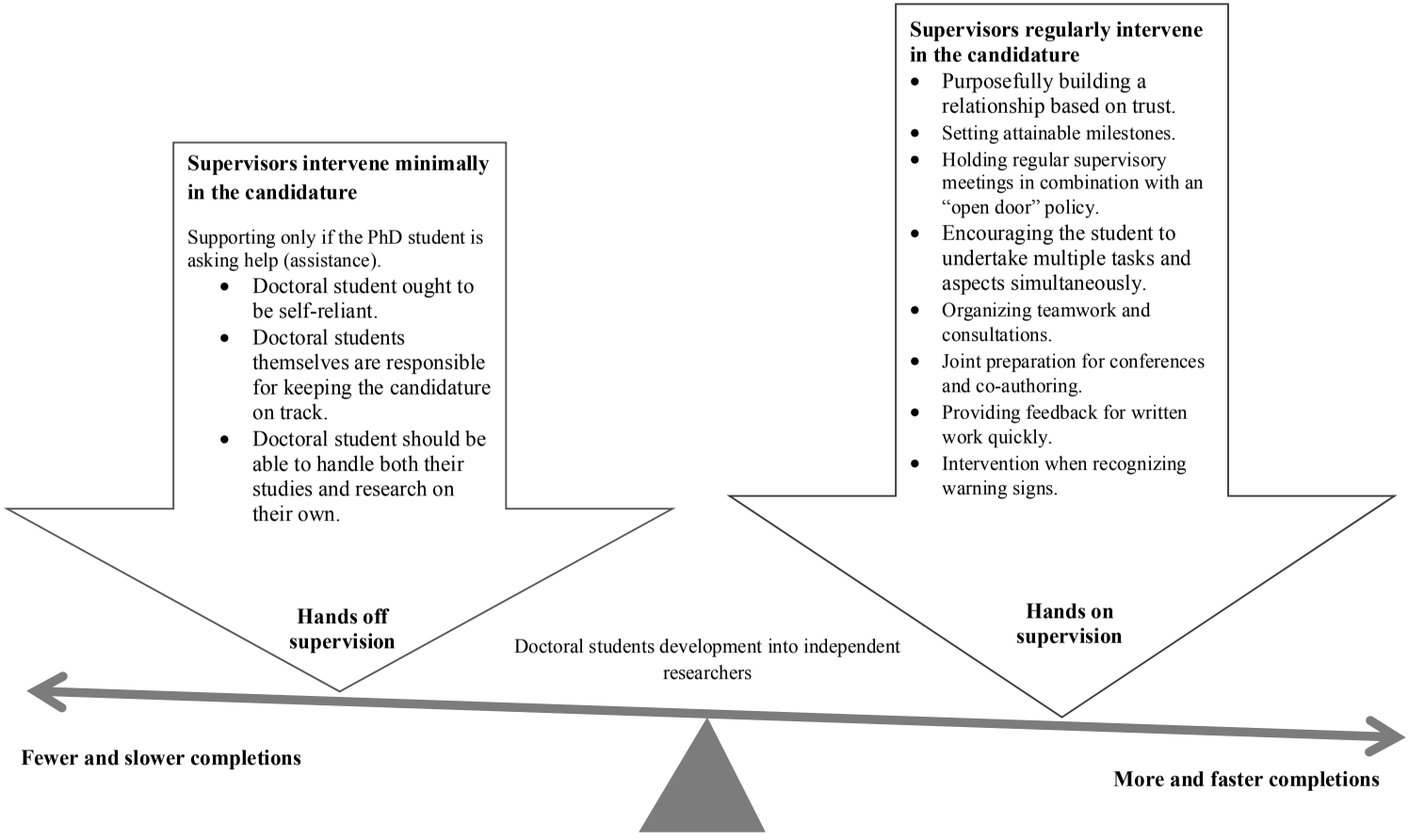


Figure 2. *Hands on* and *Hands off* approach to supervision (based on Sinclair, 2004).

Holistic approach to supervision (Lee, 2008, 2010). Another widespread approach to supervision is the *holistic approach* (as defined in Lee, 2010, p. 20) briefly described below. This approach integrates the organizational, sociological, psychological, philosophical, and emotional dimensions of supervision and consists of five areas (see Table 3), all of which overlap and can be blended in various ways, depending on the situation and the specific parties of the supervisory relationship.

Table 3. A framework of approaches to supervision (based on Lee, 2008, 2010).

Approach to supervision	**Description of characteristics and supervisory activities**
Functional	The supervisor's task is to progress through interim targets in a rational manner. They help the doctoral student through the work required by their doctoral studies. The supervisor is focused on tasks that expedite the completion and defense of the doctoral dissertation as the final objective. Effective process and time management is essential throughout the student's study period. Functional supervision is the background to all doctoral supervision.
Enculturation	The supervisor's task is gatekeeping. They can choose which gates to open (e.g., gates to learning resources, networks, and specialist opinions). Supervision is centered on acquiring the behavioral standards of the disciplinary community and the student is encouraged to become a member of this community. The supervisor's function as a role model is also significant.
Critical thinking	The supervisor's task is to evaluate and to challenge. Supervisory focus is on developing the supervisee's analytical thinking skills; the supervisor's own argumentation and analytical skills are used in order to support, e.g., the student's ability to synthesize literature and make coherent arguments. According to Lee (2008, p. 273), "conventionally, this is the heart of the PhD supervision".
Emancipation	The supervisor's task is to offer mentoring and support in a constructive manner. Supervision is focused on the doctoral student's personal growth and development supported by offering the student opportunities to reflect.
Relationship development	The supervisor's task is to supervise by experience and to develop a relationship. The supervisor is focused on nurturing good relationships. Important aspects are team building, care, and management of possible conflicts that may arise.

As stated earlier, the approaches described above are all interrelated. The functional approach is the backdrop to all supervision, and other approaches can blend and overlap in various ways, depending on the specific supervisory situation or relationship (see Lee, 2010, p. 22).

To summarize the shared perspectives of Lee (2008, 2010) and Sinclair (2004), PhD students vary in their need for support (including the type of support needed during various stages of their candidature). As a result, it is important that a supervisor combine different supervisory styles, or as postulated by Delany (2008, p. 8): "the effective supervisor moves flexibly between the various models". Grant (1999), on the other hand, uses the metaphor of "walking on a rackety bridge" (p. 1) to describe the essence of supervision as a complex process requiring both situational awareness and flexible posture.

Supervisory activities and various supervisory approaches are explored further in the literature review chapters of the articles used as the basis of this dissertation. Article I details the supervisor's activities and responsibilities. Article II is dedicated to supervisory approaches, defining in more detail the difference between setting the supervisor's focal point on the process *versus* on the product. Article III provides an outline of different approaches to supervision (in addition to approaches offered by Sinclair [2004] and Lee [2008, 2010], authors such as Murphy, Bain and Conrad [2007], Emilsson and Johnson [2007], Burns, Lamm and Lewis [1999], Pearson and Kayroos [2004], and Vilkinas [2002, 2008] are introduced in terms of their approaches to supervision in research) presenting a concise overview in the form of a table (see Article II) illustrating the interrelations between various approaches as based on their focus on the task and focus on the person. Article IV explains the supervisors' behavior in terms of identifying factors that can hinder a student's doctoral studies and presents some options for intervention or support in order to help the student overcome such factors. Article V focuses on the topic of communication styles and relationships between doctoral students and their supervisors.

Therefore, it is realized that, on the one hand, PhD students possess different expectations of supervision and, on the other, prior studies reveal that various supervisory styles and approaches are applied in supervision from which the feasibility of using hands-on and functional supervision approaches have been brought out for the efficiency of doctoral education at the same time emphasizing flexibility when choosing the supervisory style as well as supporting a doctoral student in different areas. Despite several guidelines and instructional materials, the efficiency of doctoral education remains low (extended duration of studies and high dropout rate). Consequently, given that the goals of doctoral education have broadened and that the past decades have witnessed several significant changes in the organization of studies, it is important to understand and know supervisors' conceptions of supervision, the ways in which supervision is described and the factors which are considered to have an influence on the actions of supervisors. Based on the above mentioned, it was considered relevant for the purposes of this dissertation to formulate the following ques-

tions (sub-question of research question 1): *How do former students who have dropped out of doctoral studies describe the role of the supervisor in the process of their doctoral studies?* (see results in Article I); (sub-questions of the research questions 2 and 3): *How do supervisors describe their supervisory process?*; *Which factors are perceived by supervisors as contributing to the stall of a doctoral study?*; *During the doctoral study process, how do supervisors interpret their roles, duties and responsibilities, and those of their supervisees?*; *Which strategies do supervisors say they use in order to assist PhD students through difficulties, and which explanations do they give to these?* These questions are addressed in Articles III and IV.

In addition, since several earlier studies have stated that supervisors' personal conceptions of the aspects of supervision are formed and influenced by prior study and research experience (Barnes & Austin, 2009; Delamont et al., 1998; Hemer, 2012; Lee, 2008; Stubb et al., 2011), it is claimed that one of the key factors impacting the success of supervision is the way the supervisor was supervised. However, the topic lacks empirical studies (e.g. Delamont et al., 1998) although such knowledge would provide a platform for comparison between the supervisors' experiences and descriptions of current practices, which would in turn enable to more clearly comprehend the impact of having been a supervisee on supervisory practices. This would in turn broaden the knowledge of the existence of different supervisory styles and of what supervisors value in supervision. Consequently, the following questions related to the above mentioned were formed in the dissertation (sub-questions of research question 4): *Which activities and events do supervisors bring out as important from their own postgraduate study time?*; *Who and in which roles do supervisors bring forth as meaningful people when talking about their postgraduate studies?*; *Which connections do supervisors describe between their own postgraduate study experience and their current supervising practice?* These questions are addressed in Article V.

2.3. Summary of the Theoretical Framework

The previous sections detailed the aims of doctoral studies via descriptions of the process and the product, explaining the expectations of a rapidly changing society towards doctoral degree holders. A brief overview was provided of the concept of doctorateness, including a model of doctorateness, descriptions of various criteria for high-quality dissertations, as well as some critical aspects regarding the subjectivity of assessment criteria. Further, an outline was given of the main factors involved in a PhD student's study period, acknowledging the existence of various factors that shape the process of doctoral studies, while also stating that the factors can be divided into two mutually influencing categories: student-related factors (personal and interpersonal factors, e.g., motivation, family responsibilities and relationships with significant others, presence of a

personal support system, employment responsibilities, and financial strain) and environmental or organizational factors (e.g., cooperation relationships with other academics and student peers, lack of financial support). With regard to the latter category, special attention was paid to the topic of doctoral supervision, introducing the most widely used models of supervision, functions of the supervisor, and approaches to supervision (*hands on* and *hands off* approach [Sinclair, 2004]; holistic approach to supervision [Lee, 2008, 2010]).

In Figure 3 below, the main theoretical perspectives are assembled in such a way as to identify the mutually influencing factors impacting a doctoral student's course of studies and achievement of doctorateness as the main aim.

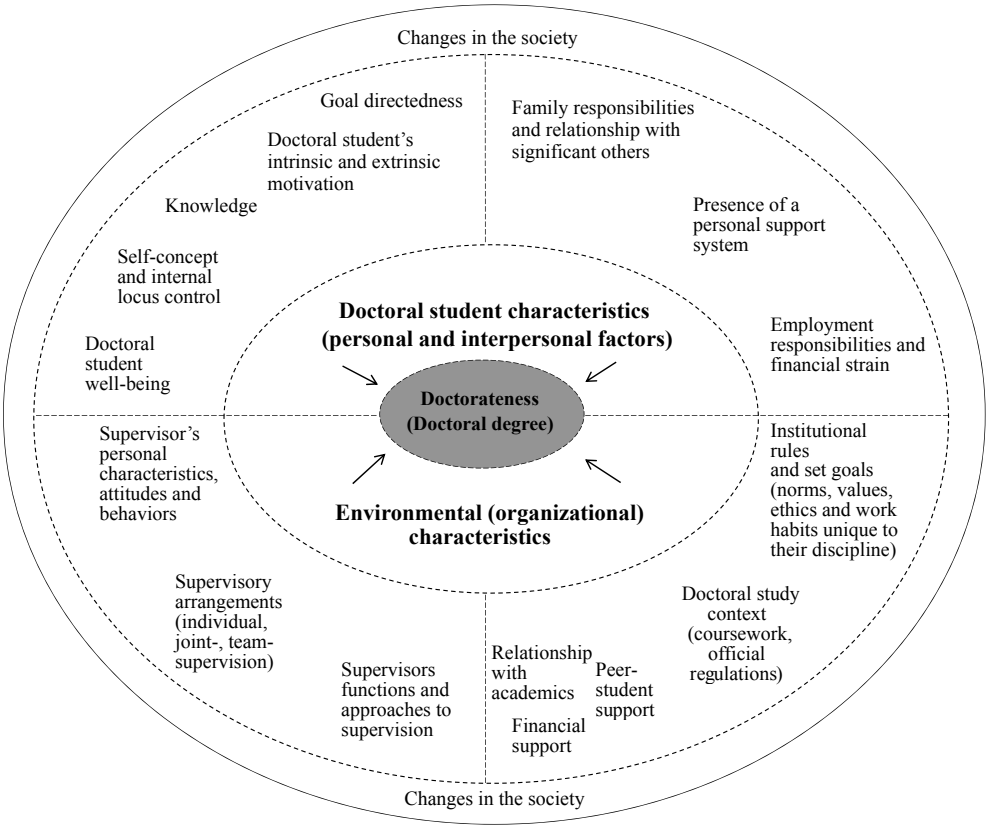


Figure 3. Main factors influencing the achievement of doctorateness

Two empirical studies were designed and conducted in order to answer the research questions and sub-questions outlined in the introduction of the review article and reasoned and specified in the literature review chapter. The aim of Study 1 was to gain a better understanding of the non-completers' course of postgraduate studies and factors related to their discontinuation of studies. The aim of Study 2 was to describe the context of the formation of PhD supervisors in Estonia and their conceptions about doctoral studies, to analyze the super-

visory practices of doctoral supervisors based on their own descriptions and to point out any possible links they perceive between their own postgraduate study experience and their supervisory practices in the context of the changes taking place in the field of higher education in Estonia. The research methodology, the conduct, and the results are reflected on in Chapters 4 and 5 of the current doctoral dissertation review article. Prior to the description of the research methodology, however, a description of the context of Estonian doctoral education is presented in the next chapter (Chapter 3) to provide a background for a better comprehension of firstly, the design of studies, which the dissertation is based on, and secondly, the results presented in the dissertation.

3. DOCTORAL EDUCATION IN ESTONIA

The following subchapter provides a brief overview of the context of doctoral education in Estonia. The organization of doctoral studies in Estonia during the period before the restoration of independence is described in Article V.

It is important to bear in mind, while reading this overview, that regulations governing the organization of doctoral education in Estonia are in a constant state of development. Laws, regulations, and documents shaping the nature of doctoral studies are actively being amended and specified in connection with university practices as well as national (and pan-European) directives. A number of documents affecting the organization of doctoral studies on a fundamental level have come into effect within the past couple of years.

Aims of doctoral studies

In Estonia, doctoral studies constitute studies at the highest level of higher education, during which "a student acquires the knowledge and skills necessary for independent research, development, or professional creative activity" (Standard of Higher Education, 2008, p. 5).

Because Estonian universities have facilitated structural changes in accordance with the pan-European Bologna Process and the creation of a common European higher education area, according to the Framework for Qualifications of the European Higher Education Area (A Framework for, 2005), doctoral degrees awarded by Estonian universities correspond to third cycle qualification awarded to students who "have demonstrated a systematic understanding of a field of study and mastery of the skills and methods of research associated with that field; have demonstrated the ability to conceive, design, implement and adapt a substantial process of research with scholarly integrity; have made a contribution through original research that extends the frontier of knowledge by developing a substantial body of work, some of which merits national or international refereed publication; are capable of critical analysis, evaluation and synthesis of new and complex ideas; can communicate with their peers, the larger scholarly community and with society in general about their areas of expertise; can be expected to be able to promote, within academic and professional contexts, technological, social or cultural advancement in a knowledge based society" (pp. 68–69).

Access to doctoral studies

As previous research has demonstrated the influence that the preparation of doctoral students has on the process of doctoral studies (see, e.g., Lovitts, 2001), an overview is given of the requirements for entering into doctoral studies in the Estonian context.

Pursuant to the Universities Act (2015), the precondition for the commencement of doctoral studies is a Master's level degree or a qualification equal thereto. Admission requirements vary by university, faculty, and/or PhD

program. Most often, however, an examination and/or presentation of a doctoral thesis project and/or entrance interview (i.e., defense of the doctoral thesis project) is required of PhD applicants (Eamets et al., 2014).

Some universities, faculties, and/or programs have applied a two-stage admission procedure in the past couple of years (e.g., the joint curriculum Educational Sciences PhD program [collaboratively organized by the Faculty of Science and Technology and the Faculty of Social Sciences and Education at the University of Tartu]). First, a competition is held in which supervisors apply for PhD student positions. In their applications, potential supervisors are asked to describe their doctoral students' research projects as well as the research groups that they would work in, and the means required for this (e.g., instruments, funding). After this round, potential students compete for PhD positions attached to specific supervisors and their research topics. If a student candidate wishes to write their doctoral dissertation on a topic unrelated to any research projects submitted and approved in the course of the supervisor competition, they can contact a potential supervisor, in cooperation with whom they can submit their topic in the following year's doctoral project competition (see more in, e.g., Doktorantide vastuvõtt haridusteaduste, 2014). The Institute of Educational Sciences at Tallinn University, on the other hand, applies a system where PhD students are admitted to research "priority" topics to ensure a better match between the PhD students and existing research groups, and to provide a better quality of supervision (Vastuvõtt, 2014).

Content of doctoral studies

In line with the Universities Act (2015), the standard period of study for doctoral studies at Estonian universities is three to four years, and the workload is 240 European Credit Transfer and Accumulation System credits (ECTS; one credit in Estonia corresponds to 26 hours of study, i.e., learning in a formal setting, independent studies, and research and preparation for classes or seminars of study).

Doctoral education in Estonia makes use of a system (also called as structured PhD model: Jørgensen, 2012) co-ordinated with the Bologna reform (for more details, see European University Association, 2013). This means that over the period of their studies, PhD students take specialty, elective, and optional subjects for a total of 60 ECTS (proportions vary somewhat between universities; however specialty subjects constitute the highest percentage). Elective subjects are university-wide subjects aimed at developing the students' transferable skills (e.g., leadership skills and academic writing). The most substantial part,180 ECTS, of doctoral studies is allocated to the process of dissertation writing.

A doctoral dissertation can be completed either as a monograph or as a collection of articles. Collections of articles mostly consist of three papers published in internationally distributed peer-reviewed journals, and a short summary including an introduction and discussion (see more in summary by

Eamets et al., 2014, p. 26). For a dissertation written in monograph format, the student is normally required to have published at least one paper in an internationally distributed peer-reviewed journal or a publication of an international academic publisher (for more details on requirements set for doctoral dissertations by the two universities looked at in this study, see Doktorikraadi andmise kord, 2013; Tallinn University Regulations, 2014).

Doctoral studies are completed according to an individual study plan jointly prepared by the student and their supervisor. An individual study plan reflects the composition of subjects taken by the student during each year of their studies, together with descriptions of the different stages of dissertation writing and a proposed schedule for completing each of the stages (see more in Study regulations, 2014; Tallinn University Regulations, 2014).

Progress review

Progress reviews are meetings organized by the attestation committee (i.e., progress review committee) at least once in each academic year. During these meetings, the committee assesses a PhD student's progress in their studies and research activities (i.e., stage of their dissertation) based on their individual study plan (see more in Study regulations, 2014; Tallinn University Regulations, 2014).

Defense of doctoral theses

Defense of a doctoral thesis is part of the candidature and a successful defense will result in the number of credit points required to complete the curriculum (180 ECTS are designated for the dissertation in PhD curricula).

The evaluation process following the completion of the dissertation consists of several stages, and varies within universities and their faculties. At the University of Tartu, the main document governing the issuing of doctoral degrees is the Procedure for Awarding Doctorates (2014) detailing the prerequisites for allowing a dissertation to be defended (e.g., compulsory parts of the dissertation; number of published papers) and guidelines for the dissertation defense. The Tallinn University Regulations for Doctoral Studies and Defence of Doctoral Theses (Tallinn University Regulations, 2014) also provide requirements set for doctoral theses and a description of the defense procedure, while additionally establishing separate guidelines for the preliminary examination before the final defense of the dissertation.

The doctoral studies council, made up of academics that hold PhD degrees themselves, are research-active academic practitioners and are qualified to assess expert knowledge (Procedure for awarding, 2014; Tallinn University Regulations, 2014), evaluate the doctoral thesis jointly with the opponent(s) endorsed by the council.

The defense of a doctoral dissertation is public and carried out in the form of an academic debate at a meeting of the defense committee. The committee considers the opponent's (or opponents') assessment of the dissertation as well as

arguments presented during the public debate, and, in a public vote, makes decision to award the doctorate to the applicant or not.

A person who has completed their doctoral studies is awarded a research degree, the degree of Doctor of Philosophy (PhD), accompanied by an identification of the area of specialization or the field of study.

Funding of doctoral candidates

Doctoral education is publicly funded and students pay no fees. A university has the right to apply tuition fees for students studying as external students (Universities Act, 2015).

Doctoral allowance. All full-time PhD students whose studies are funded by the Estonian government (i.e., those who are studying at state-funded study places) are entitled to receive doctoral allowance during their four-year standard study period. The amount of the doctoral allowance has been EUR 384 per month over the past few years; in 2015 the allowance was increased to EUR 422 per month. PhD students cannot claim allowance during their academic leave.

Study loan. In order to cover their living costs, PhD students in Estonia can take out a study loan. A study loan is a state-guaranteed long-term loan intended to fund the costs of tuition. Only full-time students who are also Estonian citizens or reside in Estonia based on a long-term residence permit or permanent residency are entitled to receive a study loan (Study Allowances and, 2015). The maximum amount of a study loan is EUR 1920 per academic year and, in accordance with the procedures laid down in the terms and conditions of the student loan, the interest rate (approx. 5%) is to be paid on a yearly basis already during the course of the student's studies. The student must commence repayment of the loan within a year after finishing their studies, and repay the loan together with the interest over the course of double the nominal study period prescribed for their specific curriculum. Once the student has discontinued or completed their studies, repayment of the loan commences in accordance with the fixed payment schedule (Õppelaen, s.a.).

Other sources of funding. Doctoral students can also take part in research projects and receive scholarships or stipends from research grants or doctoral schools (for more information about doctoral schools see, Doctoral schools [s.a.]) to supplement their doctoral allowance. Regardless of the arrangements mentioned above, according to Eamets et al. (2014, p. 40), 35% of doctoral students work full-time, while one third work part-time and 14% claim to work overtime (i.e., more than full-time). The vast majority of students in the field of Educational Sciences work full-time during their studies; their employment has little overlap with their PhD studies (Ots et al., 2012). At the same time, working during the candidature period has no effect on the students' eligibility for doctoral allowance.

Research assistant position, social security, and academic leave

In Estonia, PhD students have a student status and access to health insurance. They are, however, excluded from receiving sickness and unemployment benefits.

Since 2012, the government has been promoting, via the Organization of Research and Development Act (Teadus- ja arendustegevuse, 2012), the creation of research assistant positions at universities, encouraging universities to hire doctoral students as research assistants at the availability of the necessary funds. On the one hand, employing PhD students as research assistants has been motivated by a desire to strengthen the cooperation and bond between universities and doctoral students (as early-stage researchers), while also allowing PhD students to earn a research assistant's salary for their work. On the other hand, this provides the students with social security benefits intended for employees (e.g., sickness benefits, pension, i.e., full social security coverage).

Under the Universities Act, doctoral students "have the right to take academic leave, generally of up to one year, and additional academic leave of up to two years for health reasons, of up to one year in the case of undergoing compulsory military service or alternative service, and to care for a child until the child attains three years of age" (Universities Act, 2015, p. 22).

Doctoral studies in numbers

In Estonia, doctoral study programs are available at six public and one private university. The largest of these are the two universities looked at in the studies used as the basis of this dissertation – University of Tartu with 14,470 students and 35 PhD curricula (total number of doctoral students: 1,401) (as at October 10, 2014; Õppestatistika, 2014), and Tallinn University with 9,485 students and 14 PhD curricula (total number of doctoral students: 378) (as at December 31, 2014; Ülikool arvudes, 2014). In total, 70 PhD curricula are available in Estonia (Eesti Hariduse Infosüsteem, 2015); the average yearly number of doctoral students admitted per curriculum is 5–8 (see more in Haridussilm, 2015).

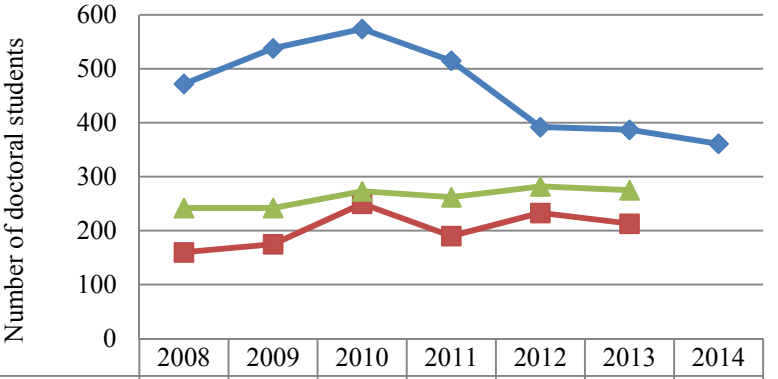
Over the past few decades, the number of doctoral students in Estonia has increased significantly (e.g., 281 students enrolled in the academic year of 2001/2002 [total learners 1196], whereas in 2010/2011, 574 PhD students were admitted [total learners 2928] (Klooster & Tõnisson, 2010; Haridussilm, 2015).

In the academic year 2013/2014, 3% of the PhD students were between 20–24, 38% between 25–29, and 27% between 30–34 of age, while 32% were aged 35 or above. According to the gender breakdown for the academic year of 2013/2014, 42% of the PhD students were female and 58% male (Haridussilm, 2015).

There has indeed been an overall upward trend in the number of students completing their doctoral studies (e.g., 160 successful defenses in the academic year of 2008/2009, 233 in 2012/2013, and 213 in 2013/2014) (Haridussilm, 2015); however, despite an increased percentage of PhD defenses, according to the Estonian Research and Development and Innovation Strategy 2014–2020,

the efficiency of doctoral studies remains low and is not sufficient for the purposes of altering the country's economic structure and meeting societal requirements. As a result, the above-mentioned strategy sets the target level for the number of new doctoral graduates in an academic year at 300 (Eesti teadus- ja arendustegevuse, 2014).

A problem affecting doctoral education in Estonia is the non-completion of PhD studies. Each year, more than 200 students discontinue their doctoral studies and this number has not been showing any signs of decline. A more detailed overview of the number of admissions, graduates, and non-completers over the past six years is presented in Figure 4 below (see also the statistics based on broad fields of study in Haridussilm, 2015).



	2008	2009	2010	2011	2012	2013	2014
Number of admissions	472	538	574	515	392	387	361
Number of graduates	160	175	250	190	233	213	
Number of discontinuations	242	242	273	262	282	275	

Figure 4. Number of admissions, graduates and discontinuations in doctoral studies by academic year (Haridussilm, 2015).

Requirements for doctoral supervisors

Research-active teaching staff and research fellows, who hold PhD degrees themselves, are eligible to act as doctoral supervisors in Estonia. At both Tallinn University and the University of Tartu, doctoral supervisors (of Educational Sciences students) are required to have published, over the previous five years, a minimum of three research publications registered under Estonian Research Information System (ETIS) categories 1.1, 1.2, 3.1 or 2.1 (Tallinn University Regulations, 2014; Doktorantide vastuvõtt haridusteaduste, 2014). In justified cases, a leading practitioner of the student's field of research may be appointed as a co-supervisor regardless whether they hold a PhD degree. At least one supervisor is appointed for each doctoral student; however, co-

supervision is gaining more and more popularity with both Estonian and international researchers becoming involved in the supervisory process.

Doctoral supervision is a duty assigned to academic staff. As yet, no demands have been made for supervisors to participate in mandatory supervisory courses. On the other hand, in the past few years, the topic of supervisory self-development has been addressed in supervision-related documents issued by Estonian universities. For instance, an annex of the Tallinn University Regulations for Doctoral Studies and Defense of Doctoral Theses (Tallinn University Regulations, 2014) lists the rights and obligations of the different parties involved in doctoral education, distinctly stating that the supervisor is obligated "to develop [their] supervising skills" (p. 21). The University of Tartu's Good Practice of Doctoral Studies (see Good practice of, 2014, p. 5) states that a supervisor "regularly undertakes self-improvement in supervision skills". It is, however, worth noting that these changes regarding the inclusion of recommendations for the development of supervisory skills have only emerged in documents conceived within the past few years.

All in all, Estonia as a country is committed to improving the quality of its higher education. The organization of doctoral studies is transparently regulated by various legal acts, regulations, and documents (e.g., Doktorantide vastuvõtt haridusteaduste õppekavale; 2014; Doktorikraadi andmise kord, 2013; Study Regulations, 2014; Tallinna Ülikooli doktoriõpingute ja doktoritööde kaitsmise eeskiri, 2010; Tallinn University Regulations for Doctoral Studies and Defense of Doctoral Theses, 2014; Universities Act, 2015). National records are being kept of the number of students admitted to doctoral studies, as well as the number of PhD students, program completers, and non-completers. Both within and across universities, more and more attention is paid to improving the quality of doctoral education. This is exemplified by the Estonian Universities' Agreement on Good Practice Regarding Quality – a document signed by the rectors of Estonian public universities that highlights the relevance of developing doctoral studies (see Eesti ülikoolide kvaliteedi, 2011). The following measures are a few examples the government has implemented in the past few years in order to increase the efficiency of doctoral studies: no tuition fees for doctoral levels, a national system of study allowances for PhD students, an expressed desire to strengthen the bond between the universities and doctoral students (i.e., beginning researchers) as manifested by the creation of research assistant positions, the availability of social security benefits, endeavors to structure doctoral studies in such a way as to develop the students' transferable skills as well as in-depth specialist knowledge. Research studies carried out in this field (e.g., Eamets et al., 2014; Ots et al., 2012; studies related to this dissertation) have provided a great opportunity for planning and implementing changes in an evidence-based manner.

4. RESEARCH METHODOLOGY

The following chapter provides an overview of the methodology used in this study by discussing the research method and design chosen, the selection of participants, data collection procedures, data analysis, trustworthiness, research ethics, the researcher's role, and potential for bias.

4.1. Methodological Standpoint

The studies used as the basis of this dissertation were conducted using the qualitative approach. A qualitative method was considered appropriate for examining the experiences of doctoral supervisors and dropout PhD students, as relatively little was known about the aspects being studied in the context of Estonia (taking into consideration the changed higher education landscape, and the field of Educational Sciences). A qualitative method therefore allows for previously unknown information to be obtained about the observed phenomenon (an objective of this exploratory study), while also permitting for detailed and in-depth data to be gathered with regard to the field of research (another objective of this study). Consequently, an in-depth understanding provided by a qualitative approach (see more in Bowen, 2005) was desired.

Researchers' practices are always influenced by their epistemological positions. Epistemology provides a philosophical grounding to help the researcher decide which kinds of knowledge are possible, as well as ensure that the knowledge is both legitimate and adequate (Hesse-Biber & Leavy, 2010). Although Mertens (1998) states that the lines between scientific paradigms may not be completely clear, as a researcher designing a study one must identify the epistemology that most closely approximates their own. At the same time, methodology acts as the bridge that brings our philosophical standpoint (ontology and epistemology) and method (perspective and tool) together. This means that methodology serves as a strategic but malleable guide throughout the research experience (Hesse-Biber & Leavy, 2010).

In the case of this research study, the theoretical perspective or worldview guiding the investigation (Guba & Lincoln, 1994) was the interpretivist paradigm, sometimes also referred to as constructionism, as it emphasizes the ability of the individual to construct meaning (Mack, 2010). Crotty (1998, p. 42) defines interpretivism (or constructionism) as "the view that all knowledge, and therefore all meaningful reality as such, is contingent upon human practices, being constructed in and out of interaction between human beings and their world, and developed and transmitted within an essentially social context".

In accordance with this paradigm, the ontological standpoint or assumption about the nature of reality made by this study is relativism, i.e., the design and execution of the empirical study and the writing of the dissertation have been guided by the belief that truth is constructed by humans and is situated within a social context, and that multiple possible interpretations may exist of the same

data. The researcher and participants are linked and are constructing knowledge together, which means that meaning is constructed and not discovered (Creswell, 2009; Guba & Lincoln, 1994). Therefore, based on these ontological assumptions, reality is indirectly constructed based on individual interpretations and is thus subjective; events are distinctive and cannot be generalized, multiple perspectives on one incident are possible, and people interpret and make their own meaning of events. Based on the epistemological assumptions, knowledge is gained through personal experience and arises from particular situations, consequently allowing for differences between people (see more in Mack, 2010, pp. 7–10).

The studies used as the basis of this dissertation are descriptive and exploratory studies (see more in Hesse-Biber & Leavy, 2010, pp. 8–11) with semi-structured individual interviews used as the method of data collection and (inductive) thematic analysis applied as the analytic method. More detailed justifications of the choice of data collection and data analysis methods are provided in the subchapters of this chapter dealing with data collection and data analysis (pp. 40–46). An overview of the major research dimensions (the research nexus) of the studies used as the basis of this dissertation is presented in Figure 5.

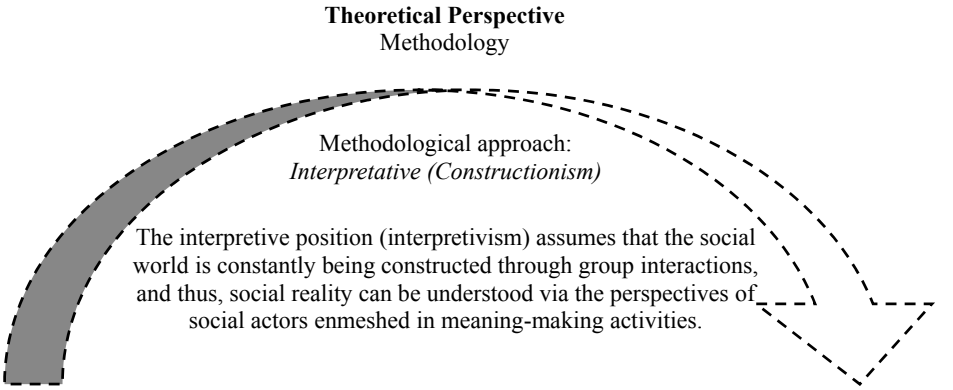


Figure 5. An overview of the major research dimensions (based on Hesse-Biber & Leavy, 2010).

4.2. Design of the Study

4.2.1. Selection of participants

This dissertation is based on two studies: Study 1 (Article I), data set of dropout doctoral students; and Study 2 (Articles II, III, IV, and V), data set of the study carried out among doctoral supervisors.

In line with the qualitative approach, a non-probabilistic (purposive) sampling approach was applied for data collection for both studies. According to Guest, Bunce and Johnson (2006), in the case of purposive sampling, participants are selected according to predetermined criteria relevant to a particular research objective. This means that participants are selected by identifying "where (and from whom) the processes being studied are most likely to occur" (Denzin & Lincoln, 1994, p. 202). Due to the aim of the study, the selected subjects were dropout doctoral students (Study 1) and doctoral supervisors (Study 2).

A more detailed overview of the sampling process and the research subjects of both studies is given below. At the end of the subchapter, a table indicating the participant numbers for Study 1 and Study 2 is provided (by article).

In Study 1 (Article I), the sample consisted of 14 doctoral study non-completers (dropout PhD students), 9 female and 5 male, in Educational Sciences, who had begun their doctoral studies between the years 2000 and 2010 at one Estonian university. During the sampling process, it was considered relevant to include dropout Educational Sciences PhD students from different backgrounds and with possibly varied experiences. Therefore, maximum variation principles (i.e., heterogeneous sampling) were followed in order to capture a wide range of perspectives (see more in Denzin & Lincoln, 1994). For this reason, both male and female subjects were selected; participants of different age groups were included as far as possible, and variation in the doctoral supervisors' background and the students' year of study discontinuation was considered in the selection process. Background information on the research subjects, year of study at the time of discontinuation, and data on the participants' stage of candidature at the moment of discontinuation, is provided in Article I. The 14 non-completers participating in the study had been supervised by 11 different supervisors. In order to ensure confidentiality, no further background information is provided on the subjects.

In Study 2 (Articles II–V), data were gathered in two stages among doctoral supervisors of two Estonian universities. The first stage of data collection was carried out between the years 2011–2012. In keeping with the aim of the study, supervisors of PhD students in the field of Educational Sciences were selected. Both novice supervisors (with no doctoral completions as a principal supervisor) as well as highly experienced supervisors (with six and more doctoral completions) were included (classification based on the study by Ryland, Tennant, Boud, & Hammond, 2010). Supervisors with different experience levels were selected for the study in order to create a heterogeneous sample.

This would allow for maximum diversity in describing the participants' experiences by providing as wide a spectrum of supervisors' opinions or views as possible.

Altogether, 13 PhD supervisors from the field of Educational Sciences, 5 male and 8 female, participated in the first stage of the study. Six of the participants were professors, 3 assistant professors, and 4 lecturers. At the time of data collection, 6 participants had no doctoral completions, another 6 between one and five doctoral completions, and 1 participant more than six doctoral completions. Overall, the participants had previously supervised the defense of 23 doctoral dissertations, and at the time of data collection a total of 59 PhD students were currently being supervised.

During the first stage of data collection, it was decided, as a result of discussions held within the research group, that the study would gain from expanding the sample to include participants from the field of Natural Sciences as graduation efficiency in this field exceeded that of Educational Sciences (see more detailed explanation in the chapters concerning methodology in Articles IV–V). When the decision to include participants from Natural Sciences was made, it was also stated that differences in the arrangement and organization of doctoral studies in these domains could be assumed, and that the emergence (or non-emergence) of such differences would result in added value when it came to interpreting the findings and making recommendations for improvement. According to Hesse-Biber and Leavy (2010), because of the flexible nature of the qualitative method of research, it is acceptable to broaden the sample and specify or expand the initial aim of the study (i.e., alter the methodology during research) as long as the researchers' own ontological and epistemological beliefs allow for modifications, which was indeed the case with this study.

In the second stage of data collection (2012–2013), an additional 6 participants from the field of Natural Sciences were included in the study. The new participants were experienced and highly experienced supervisors, supervisors engaged in laboratory research, and supervisors conducting field research. In addition to interviewing participants from the field of Natural Sciences, for the purposes of achieving data saturation, two interviews were conducted in the years 2012–2013 among experienced supervisors in the field of Educational Sciences.

Overall, 21 doctoral supervisors from two fields of study participated in Study 2. At the time of the data collection, the supervisees of 6 supervisors had not reached their dissertation defense yet; 11 supervisors had 1–5 supervisees who had reached their dissertation defense; and 4 supervisors had 6 or more supervisees who had defended their dissertations. The maximum number of dissertation defenses (per supervisor) was 19. Of all the dissertations defended, supervisors of PhD students in the field of Natural Sciences had supervised 48 dissertations, and supervisors of students in the field of Educational Sciences 29 dissertations. At the time of the study, 88 doctoral students were being supervised: 25 in the field of Natural Sciences and 63 in the field of Educational

Sciences (data from the Estonian Research Information System and the interviewees as at the time of the interviews).

The participants' own postgraduate study background was as follows: 10 supervisors had completed their postgraduate studies at a time before the restoration of Estonia's independence (i.e., during the period when candidate's degrees were awarded; 1970–1991); and 11 supervisors in the independent Republic of Estonia (1992–2008). A more detailed overview of the participants' study background is presented in Article V. In order to ensure confidentiality, no further background information is provided on the subjects.

The number of participants in Study 1 and Study 2 (by article) is presented in Table 4.

Table 4. The sample (number of participants in Study 1 and Study 2 [by article]).

Study	Article (in dissertation)	Participants	Number of participants	Domain/ Disciplines	Dissertations being supervised	Successful dissertation defenses
Study 1	**Article I**	Dropout doctoral students	N=14	Educational Sciences	–	–
Study 2	**Article II**	Doctoral supervisors	N=13	Educational Sciences*	ED=59	ED=23
	Article III	Doctoral supervisors	N=21 (Article II + N=8)	Educational Sciences** (N=15) Natural Sciences (N=6)	ED=63 NA=25	ED=29 NA=48
	Article IV	Doctoral supervisors	N=21 (same as in Article III)			
	Article V	Doctoral supervisors	N=21 (same as in Articles III and IV)			

*ED – Educational Sciences; NA – Natural Sciences; *including 2 in the domain of Science Education; **including 3 in the domain of Science Education.*

4.2.2. Instrument and data collection

4.2.2.1. Choice of data collection method

Individual semi-structured interviews (Kvale, 1996) were used for collecting data for both studies. Semi-structured interviews were chosen as the means of data collection due to the following considerations: according to Cohen, Manion, and Morrison (2007), and Newton (2010), interviews allow for the

exploration of the participants' understandings and views regarding complex and sensitive issues (which the topics of this study – dropping out of doctoral studies and doctoral supervision in general – are), while enabling the researchers to probe for more information and clarification of answers, thus providing an opportunity to generate rich data on a variety of topics, including topics that only came up during the course of the interview. Another consideration in the study design was allowing the doctoral supervisors (i.e., interviewees) to use the interview as an opportunity for self-reflection and professional growth (Murphy et al., 2007); as well as generating data in such a way that it could be analyzed in different ways (in addition to the initial planned data analysis). The latter would allow for the same data set to be analyzed in the future (e.g., subjected to discourse analysis).

4.2.2.2. Development of the data collection instrument and content of the interview guide

A semi-structured interview guide was used for both studies in order to ensure that the interview addressed themes relevant to the research. The interview guide provided clear instructions for the interviewer, which, according to Newton (2010), allows for the collection of comparable qualitative data.
The construction of interview questions was guided by the aim of the research and research questions following from that aim. For both studies, the process of developing the interview guide began with a review of relevant literature, over the course of which the research team established and described, on the basis of the aim of the research and research questions, the areas of interest that should be covered by the interview.

Study 1. For Study 1, the questions included in the semi-structured interview guide were developed by Ä. Leijen, senior research fellow at the University of Tartu, and A. Ots, research fellow at the same university. Studies by Tinto (1993), Lovitts (2001), Kehm (2004) and Lee (2008) were referred to in the process of developing the questions.

All interviews consisted of questions seeking information concerning the dropout doctoral students' recollections of their period of PhD studies. The main principle followed when formulating the questions was to assist the participants in describing their studies as precisely as possible, and to provide complementary examples in order to prevent them from elaborating based on general views and principles. The interview guide was divided into three sets of topics, as follows: (1) organization of studies and completion of courses; (2) supervision in the various stages of the study process; and (3) other obligations at the time of doctoral studies. Participants were also asked to describe the roles of their fellow students, supervisor, and department during the course of their studies.

Study 2. For Study 2, interview questions were prepared on the basis of previous studies (e.g., Lee, 2008; Sinclair, 2004) as well as the aim and research

questions of this study. The interview guide consisted of three sets of topics: (1) description of the supervisor's supervisory activities; (2) the supervisor's beliefs and notions concerning doctoral studies and the supervision of PhD students; (3) ways in which the supervisor's own experience with PhD studies has influenced their supervisory practices. Sub-questions were asked only if a participant did not cover certain topics of interest in their response to the initial main question. These initial and sub-questions were followed by supplementary clarifying follow-up questions (e.g., Could you expand a little on this?; Could you give me an example?), which varied depending on the precise nature of the participants' prior answers. The interview guide also included questions regarding the participating supervisors' background information.

In the case of both studies, the process of drafting the interview questions was followed by internal testing (see more in Mann, 1985), during which the first draft of the interview guide was exposed to colleagues in order to gain a valuable preliminary assessment. Next, the interview guides were amended based on an analytical evaluation of the critical questions and observations offered up by the colleagues. Subsequently, each interview guide was assessed for its content validity by two experts. The experts evaluated the appropriateness and completeness of the interview content, basing their opinions on the aim of the study and the research questions. According to Newton (2010), extensive discussions concerning the inclusion or exclusion of certain questions as well as issues such as the phrasing of questions and the placement of each question in the interview guide are very valuable to the development of the interview guide and essential for further increasing the credibility of the study.

Following this stage where the interview guide was improved and refined, the guide was tested on the target group. For this, pilot interviews were carried out with one dropout doctoral student in the case of Study 1 and one doctoral supervisor in the case of Study 2. The use of pilot interviews not only provided an opportunity to refine the interview guide further, but also allowed one of the interviewers to gain valuable experience conducting an interview, thus serving as a training session before the start of the main data collection. The interviewer was also able to pass their experience on to other interviewers.

As no significant amendments were made to the interview guide, on the basis of the pilot interview, data from both pilot interviews were also included in the studies themselves. The full interview guide used in Study 1 is found in Appendix 2 and the interview guide used in Study 2 in Appendix 3 of this dissertation.

4.2.2.3. Data collection procedure

Study 1. The data for Study 1 were collected between the years 2010 and 2013. In order to gain the contact information of potential study participants, academic affairs specialist at the selected university was contacted. After the specialist had provided the names of such PhD students of Educational Sciences

that had discontinued their studies in the years 2000–2010, background information on the dropout students was analyzed (the students' year of study at the time of dropping out; gender; supervisor; age), and people corresponding to the criteria of the sample were selected. Thereafter, potential study participants were contacted via email and invited to take part in the research. All in all, 14 former doctoral students were contacted and all agreed to paricipate.

The dropout PhD students were interviewed by two researchers (Ä. Leijen and A. Ots). The interviews ranged from 35 to 75 minutes (average 55 minutes) in duration and, with the participants' permission, were audio recorded.

Study 2. The data for Study 2 were collected between the years 2011 and 2013. Contact information for doctoral supervisors corresponding to the criteria was obtained via the Estonian Research Information System (www.etis.ee) by conducting a search using the criteria of the sample. After this stage, potential participants were contacted either via email or telephone and asked to take part in the study. In total, 22 doctoral supervisors were contacted with the participation request and 21 of them agreed to take part in the study.

Individual interviews with the supervisors who had agreed to take part were carried out by four researchers (the author of this dissertation and members of the research group M. Karm, M. Remmik, and A. Sarv). The duration of the interviews ranged from 70 to 115 minutes (approx. 90 minutes on the average), and with the participants' permission, the interviews were audio recorded.

In the case of both studies, at the time of making arrangements for the time and date of the interview, the participants were familiarized with the purpose of the study and provided information regarding the confidentiality of their data. The participants were requested to allow 1.5–2 hours for the interview and asked about their preferences as to the interview location.

At the start of the interview, participants were given a brief overview of the study and its course. It was explained to the interviewees that the study was concerned with doctoral studies at the University of Tartu and Tallinn University, and was part of the ESF Eduko program; they were given an outline of the general course of the interview and assured that participant confidentiality was maintained (see more in the subchapter 4.2.5. Ethical considerations). All interviews were conducted face-to-face either at the participant's office or in a place chosen by the participant.

During the process of data collection, as suggested by Francis et al. (2010), iterations are continued until the description of the experience has become saturated, that is to say, until the point where no new data are added that could provide new information and could therefore help to develop aspects of a conceptual category. In other words, the objective of data collection is to investigate empirically until no further themes are found. The aspect of data saturation was taken into consideration in the design of both studies; however, it was also conceded that each interviewee was able to introduce some new nuances based on their personal experience – or, as stated by Wray, Markovic, and Manderson (2007, p. 1400), "each life is unique, no data are ever truly

saturated". It is therefore fair to acknowledge that complete saturation was indeed not achieved in the process of data collection. On the other hand, it was deemed impractical after discussions within the research team to continue with the interviews; the assumption being that a qualitative study should involve as few interviews as possible and as many as necessary. For data collection, Sandelowski's (1995) principle was applied: to keep the sample small enough to be able to manage the material and large enough to provide "a new and richly textured understanding of experience" (p. 183). In other words, as stated by Fugard and Potts (2015), the decision of whether or not it is the right time to stop gathering data is always a matter of subjective judgment.

4.2.2.4. Background information on the interviewers and preparation for the interviews

As stated above, interviews for the studies used as the basis of this dissertation were carried out by six researchers. In this subchapter, a brief overview is given of the researchers' background and ways in which they were prepared for conducting the interviews.

The use of semi-structured interviews as an effective means of data gathering relies heavily on the researcher's interviewing abilities. Among other things, such skills have a bearing on their ability to ask additional questions, the depth of the "digging" (having a sense for when further inquiry is required; the manner in which additional questions are posed), as well as their capability to listen actively and to create an open and trusting atmosphere suitable for interviewing (see more in Kvale, 1996; Polkinghorne, 2005). In the case of this study, all researchers engaged in data gathering had previous interviewing experience.

As discussed previously, interviews are always influenced by the researchers conducting them. Consequently, it is relevant to provide a brief overview of the interviewers' backgrounds to expose any possible influence of the researchers in the context of data collection.

All interviewers engaged in the gathering of data for Study 1 and Study 2 were academic staff members. Two of the researchers held doctoral degrees at the time of data collection (and had therefore fully experienced the process of doctoral studies) and were also supervising PhD students themselves (none of whom had completed their studies as at the time of the interviews). Three researchers were still in the process of their candidatures and one interviewer had discontinued their doctoral studies. A variety of relationships were present between the interviewers and the interviewees: complete strangers, good acquaintances/friends, co-workers/colleagues, previous or current student-teacher relationships.

Before the interviews, interviewers became thoroughly acquainted with the interview guide, and for each interviewer-interviewee combination the research team discussed their choice of interviewers to get as candid and substantive an

interview from each participant as possible. Possible biases that could affect the course of the interview were also discussed (e.g., the advantages and disadvantages of interviewing one's colleague or former/current teacher; wide age gap between the interviewer and the interviewee) and optimal interviewer-interviewee combinations sought.

As interviewers, the researchers approached the interviews with a goal in mind to keep the interview process as interactive as possible and to consider the participants as experts who were believed to hold "a unique understanding of the constructs" (Castro, Garcia, Cavazos, & Castro, 2011, p. 58). The interviews that were conducted can be described as interviews carried out with "good" participants (see more on "good" participants in Barriball & While, 1994, p. 331), as the research subjects were open and truthful, and answered the questions with good detail.

4.2.3. Data analysis

The following subchapter provides an overview of the data analysis, first describing the preparation of data for analysis and then providing a brief outline of thematic analysis as the qualitative analytic method used in this study. Subsequently, the process of data analysis applied in the studies used as the basis of this dissertation is described, and examples are given of its various stages.

4.2.3.1. Preparation of data for analysis

After the interviews had been conducted and, with the participants' permission, audio recorded, each interview was fully transcribed as per the recommendations of McLellan, MacQueen, and Neidig (2003) to ensure that all content was accurately captured.

Braun and Clarke's (2006) suggestion to "check the transcripts back against the original audio recordings for 'accuracy'" (p. 88) was also heeded in the transcription process. Protection of the participants' identities as well as the choice to provide interviewees with an opportunity to review the transcripts in the name of increasing the trustworthiness of the study are described in more detail in the subchapters on ethical considerations (pp. 64–65) and trustworthiness of the study (pp. 61–64).

In the case of Study 1, transcripts averaged approximately 15 pages per interview and the total volume of transcribed text was 204 pages (Times New Roman, font size 12, line spacing 1.5). In the case of Study 2, similarly formatted transcripts averaged approximately 22 pages per interview, with a total volume of 453 pages.

For Study 1 (Article I), the interview transcripts were uploaded into the QCAmap software (a software for Qualitative Content Analysis, see more at https://www.qcamap.org); for Study 2 (Article II) the Atlas.ti software (The Qualitative Data Analysis & Research Software; http://atlasti.com) and for Articles III–V the QCAmap qualitative content analysis software were used.

4.2.3.2. Data analysis process

In the studies used as the basis of this dissertation, thematic analysis was used. This is a foundational (descriptive) method for qualitative analysis, characterized by Braun and Clarke (2006) as "a flexible and useful research tool, which can potentially provide a detailed and rich, yet complex, account of data" (p. 78). This form of analysis, described by Braun and Clarke (2006) and Ryan and Bernard (2003), is a method for "identifying, analysing and reporting patterns within data" (Braun & Clarke, 2006, p. 79). The essence of this method lies in the researcher identifying common threads that extend a set of interviews (Vaismoradi, Turunen, & Bondas, 2013). In addition to the above, thematic analysis was preferred as the method of data analysis due to its flexible nature, which makes it especially suitable for researchers who wish to employ a relatively low level of interpretation (Braun & Clarke, 2006). Considering the aim of this research, this was a feature that was required for describing the experiences of dropout doctoral students and the activities of PhD supervisors. Nevertheless, thematic analysis also allows for a very detailed description of the results.

First, a glossary of important terms used in thematic analysis is provided in Table 5, together with examples linking the terms to the studies used as the basis of this dissertation.

Inductive thematic analysis of the data was carried out in several phases, allowing for incremental levels of information extraction. In the course of the analysis, guidelines for the phases, described in depth by Braun and Clarke (2006, pp. 87–93), were followed. Phases of the data analysis, process descriptions, and results attained by the end of each phase (together with examples) are presented in Table 6.

Although the process of data analysis is depicted as a succession of distinct phases in the table below, it is important to keep in mind that guidelines regarding qualitative analysis are not rules (as also pointed out by Braun & Clarke, 2006), and were therefore also not followed as rules in the case of the studies used as the basis of this dissertation. Instead, basic precepts were applied during the analysis, while moving back and forth between the phases as necessary.

Table 5. Terms used in thematic analysis as applied to the studies used as the basis of this dissertation (based on Braun & Clarke, 2006; Ryan & Bernard, 2003; Vaismoradi et al., 2013).

Glossary		Example
Theme	"A theme captures something important about the data in relation to the research question, and represents some level of patterned response or meaning within the data set" (Braun & Clarke, 2006, p. 82). *A theme* is a coherent integration of the disparate pieces of data that constitute the findings.	Themes presented in the results of the articles (e.g., "the process of doctoral study", Article I).
Data corpus	*Data corpus* refers to all of the data collected for a particular research project.	For Study 1: 14 interviews with dropout doctoral students. For Study 2: 21 interviews with doctoral supervisors.
Data set	*Data set* refers to all of the data from the corpus that are being used for a particular analysis. The data set might be identified by a particular analytic interest in some topic in the data.	For Study 1: full interviews. For Study 2: parts of interviews (sections) corresponding to the subject of the article. E.g., for Article V: descriptions of supervisors' own experiences as a supervisee.
Data extract	*Data extract* refers to an individual coded chunk of data which has been identified within, and extracted from, a data item.	Examples of data extracts are presented in the articles as quotations from the interviewees. See example in Appendix 4.
Code	*Codes* identify a feature of the data that appears interesting to the analyst, and refers to "the most basic segment or element of the raw data or information that can be assessed in a meaningful way regarding the phenomenon" (Boyatzis, 1998, p. 63; as cited in Braun & Clarke, 2006, p. 88).	See example in Appendix 4.

Table 6. Process of data analysis in thematic analysis (adapted from Braun & Clarke, 2006; Vaismoradi et al., 2013).

	Phase	Description of the process	Explanation/Examples
Preparation phase	**Familiarization with the data**	Transcribing data. Reading and re-reading the interview transcripts in an active way in order to become familiar with the content of the data set (especially important if interviews were conducted by someone else). Noting down initial ideas during the reading (taking notes and marking ideas for coding).	In line with the research questions (the analysis was guided by the research questions), an initial list of ideas was generated about what was in the data and what was interesting about the data.
Organizational phase	**Generation of initial codes**	Identifying interesting aspects of the data by tagging and naming sections of the text – generating the initial codes and identifying where and how patterns occur. Data are collapsed into labels (through data reduction) in order to create categories for more efficient analysis.	While coding, it was taken into account that individual extracts of data can be coded into as many different themes as they fit into. A codebook was formed out of the initial codes.
	Searching for themes	Collating codes into potential themes (and sub-themes); gathering all data relevant to each potential theme and sub-theme.	An initial thematic map was created.
	Reviewing themes	Checking if the themes work in relation to the coded extracts and the entire data set; generating a developed thematic map and checking if the themes cohere and account for all the coded extracts and the entire data set.	A developed thematic map was created. An example of a developed thematic map can be seen in Appendix 5 (the example comes from the analysis presented in Article I).
	Defining and naming categories	Defining and refining the themes and sub-themes identifying the "essence" of what each theme is about: what the themes mean; which aspects of data are being captured in each theme, and what is interesting about the themes. Generating names for each theme.	Themes and sub-themes were defined. As recommended by Braun and Clarke (2006), at this phase themes were summarized using a couple of sentences.
Reporting phase	**Producing the final report**	Selection of vivid extracts or examples capturing the essence of the point being demonstrated. Creating an analytic narrative for making an argument in relation to the research questions.	Results (results of the thematic analysis – write-up of the analysis, including data extracts) are presented in Articles I–V of the dissertation.

Several steps were also taken during the data analysis process to increase the trustworthiness of the study. These steps are described in more detail in the subchapter below.

4.2.4. Trustworthiness of the study

Although Graneheim and Lundman (2004) note that qualitative studies dealing with textual material always include a degree of interpretation, it is still important that researchers consider ways to confirm the trustworthiness of their study. In the case of qualitative research, this is done by confirming the credibility, dependability, and transferability of the study (see more in Graneheim & Lundman, 2004; Guba & Lincoln, 1994). In brief, credibility is focused on the research and refers to the level of confidence in the data and the process of data analysis (and its level of detail) addressing the intended focus. To increase dependability, the researcher should consider the ever-changing context surrounding the study. It is the researcher's task to describe the changes taking place, and to expose the effects that such changes may have on the study. Transferability refers to the extent to which the results can be transferred to other settings or groups (Graneheim & Lundman, 2004; Guba & Lincoln, 1994; Rolfe, 2006).

For the studies used as the basis of this dissertation, several methods were applied in order to facilitate trustworthiness. Below, an overview of these methods is provided in the form of descriptions of activities performed during the various phases.

4.2.4.1. Preparation phase

In the data collection phase of the studies, the credibility of the studies was increased by means of three measures: (1) discussing the content of the interview guide with experts (i.e., colleagues) and conducting a pilot interview; (2) selecting participants with varying experiences; and (3) uncovering the entering beliefs of the researchers.

Starting from the phase of study design, Elo et al. (2014) have noted the importance of pre-interviews (i.e., pilot interviews), which are helpful in establishing whether or not the interview questions are suitable for obtaining rich data, and are therefore useful in finding answers to the research questions. For both Study 1 and Study 2, discussions were held with experts during the process of developing the interview guides, followed by initial amendments and thereafter the pilot interviews (described in more detail in the subchapter "Development of the data collection instrument and content of the interview guide" [pp. 53–54] and "Data collection procedure" [pp. 54–56]).

Selecting participants characterized by diverse experience is another way to increase credibility (Graneheim & Lundman, 2004), and this was also applied in the planning of both studies. The inclusion of participants with assorted experience increased the possibility of shedding light on the research questions from a

variety of aspects, and also allowed to take a richer variety of phenomena under study.

Another significant means for enhancing the credibility of a qualitative study is, according to Creswell and Miller (2000), the disclosure of the researcher's role or bias. That is to say, the researchers must analyze and self-disclose their assumptions, beliefs, and biases already in the planning phase of the study. For this reason, the possible influences of the researcher's role were discussed within the research team, and personal beliefs, values and biases were recorded in a researcher diary both during the initial phase of the study (entering beliefs and biases) as well as in the later phases. The researcher's role (the role and bias of the author of this dissertation) is discussed further in the subchapter 4.2.6 ("Researcher's role and bias").

4.2.4.2. Organizational phase

During the phase following data collection, several steps were taken in order to increase the trustworthiness of the study. For example, an interview guide was used during the interviews in an attempt to minimize inconsistency; interviewees were asked to amend interview transcripts in case of any possible inaccuracies; a researcher diary was kept; memos were written during the data analysis; and the peer debriefing technique was used. Below, these steps are described in more detail.

In order to facilitate the dependability of the study, the risk of inconsistencies during data collection was reduced by presenting all interviewees with the same main questions as established in the prepared semi-structured interview guide.

For the study involving doctoral supervisors, confirmability was increased by asking the interviewees to review their transcripts in cases where the research group encountered any issues during the transcription process (e.g., it was difficult to understand what was being said, or the idea of what was being said was unclear in the transcript). In such instances, the participants were told that their role was to check the accuracy of their transcript and to add clarifications, set apart from the surrounding text, where needed. For this, the interviewees either made use of the *track changes* function of their word processor or included the necessary sentences or sentence fragments in brackets.

In order to increase the conformability and dependability of the research, data analysis for both studies (i.e., all articles) was carried out by more than one researcher. This was done to increase comprehensiveness and to ensure that data were interpreted according to high quality standards and in a justified manner. During the entire process of data analysis, the researchers remained aware of the fact that theme identification and coding would not produce a unique solution (see Graneheim & Lundman, 2004); however, validity of the concepts was increased by the collective judgment of the researchers (by means of assuring consistency of the themes as well as expanding the range of themes).

Throughout the process of the study, a researcher diary was kept in order to document the researchers' thoughts and observations during the data collection and analysis. Memos were especially beneficial for analyzing the data and describing the findings and conclusions.

As one means for facilitating credibility, the technique of face validity (Elo et al., 2014) was used for both studies. That is to say, study results were introduced to people familiar with the topic, who then evaluated the correspondence of these findings to reality and provided feedback to researchers.

4.2.4.3. Reporting Phase

In the reporting phase, trustworthiness was primarily increased by providing precise background information and describing the context, as well as using direct quotations from interviewees to corroborate and illustrate the results.

From the perspective of trustworthiness, in this phase it is essential to consider means that could be provided to the reader in order to evaluate the transferability of the results, i.e., the degree to which the results could be transferred to other settings or groups (Elo et al., 2014; Graneheim & Lundman, 2004). According to Guba and Lincoln (1989), the original context must be described in a manner precise and clear enough so that a judgment of transferability could be made by readers.

To enhance the transferability of the results, descriptions of the research context were provided in the articles and, to a more thorough extent, the review article of this dissertation (see more in Chapter 3, "Doctoral Education in Estonia"). The purpose of this was to allow anyone reading the results of the study and wishing to transfer the results to a different context to be able to judge the sensibility of the transfer for themselves.

To increase the confirmability of the results, quotations were used in the presentation of findings (while avoiding overuse thereof). This ensures the reader that the results do indeed reflect what was said by the participants instead of the researchers' own biases or perspectives (Guba & Lincoln, 1989), demonstrating a clear link between the data and the results.

Additionally, as mentioned above, throughout the process of the study, a researcher diary was kept by the researchers. The researcher diary was not analyzed as an individual data set, but rather used as supporting material to assist with the analysis.

The subject of trustworthiness is best summarized in the words of Krippendorff (2004), according to who the best way to assess the quality of findings is by looking at the extent to which the study offers new insights into the phenomenon being studied. Thus, as put by Rolfe (2006): "A study is trustworthy if and only if the reader of the research report judges it to be so" (p. 305).

An overview of activities performed by the researchers to facilitate trustworthiness is presented in Figure 6.

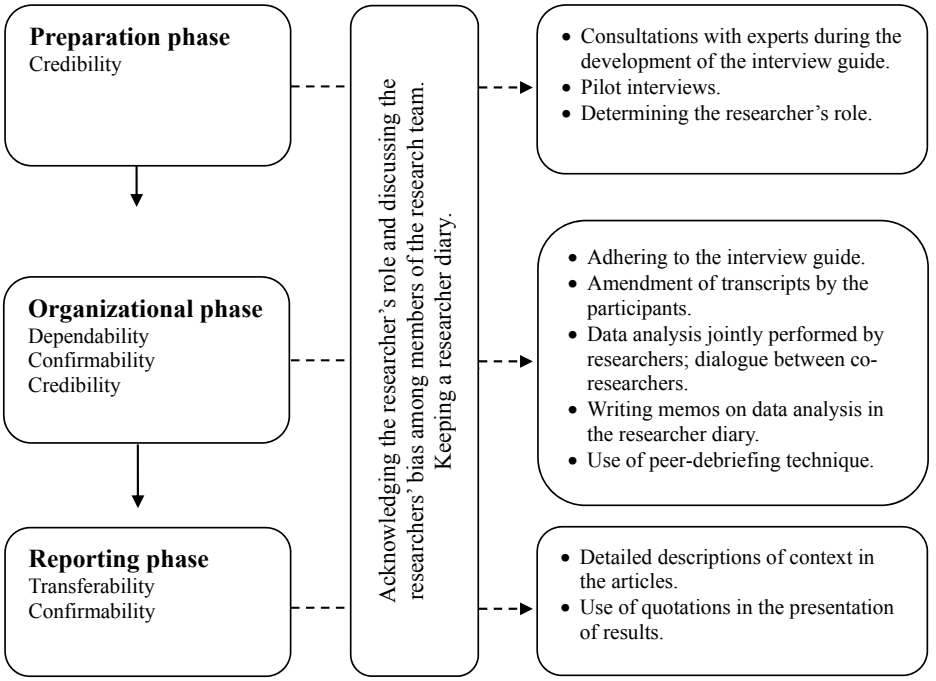


Figure 6. Steps taken to enhance the trustworthiness of the studies.

4.2.5. Ethical considerations

A researcher is always obliged to protect the human rights, dignity, health, and safety of the people participating in their research. Hence, researchers should follow a number of fundamental principles. The most important principles, according to The Economic and Social Research Council, are as follows: (1) research must be designed, reviewed and undertaken to ensure integrity and quality; (2) both researchers as well as participants must be informed of the purpose, methods and intended possible uses of the research; (3) confidentiality of the information must be respected; (4) participants must take part in the research voluntarily; (5) any harm to participants must be avoided; and (6) any conflicts of interest or partiality must be explicit and the independence of research must be clear (ESRC Framework for, 2015, p. 4).

All of the principles listed above were followed during the design, execution, and presentation of results of the studies used as the basis of this dissertation. Below, an overview is provided of the activities performed and procedures followed in order to adhere to research ethics while carrying out the research and presenting the results.

Informed Consent. At the time when interview appointments were made with the participants. They were informed of the purposes of the study via email or orally. The purposes of the study were explained to the participant again,

before the start of each interview, and they were offered a chance to ask further questions regarding these purposes. The interviewees were also informed of their right to withdraw from the study during the interview; it was explained that they could end the interview at any point if they did not wish to continue for any reason. Requiring the signing of a written Informed Consent Form was discussed within the research group, but was deemed to be unnecessary.

Pseudonyms. In order to protect the privacy of the participants and to take all reasonable steps to ensure that an individual could not be identified, the participants were informed that for the sake of confidentiality all actual names of participants would be replaced with pseudonyms starting from the transcription phase.

Throughout the research process, participants were also referred to by their pseudonyms by the researchers in their communication with each other. For the sake of protecting the participants' confidentiality, different pseudonyms were used for the same participants in the articles written on the basis of Study 2. This was done to prevent a situation where a participant could be identified by a combination of several of their sentences quoted in different articles.

In situations where researchers communicated with the participants outside of the framework of the study (e.g., as colleagues), issues disclosed by the participants during the interviews were not discussed at the researchers' initiative. The principle of confidentiality was also respected in cases where the subject of doctoral supervision came up, e.g., in conversation with a participating supervisor's supervisee.

Data collection and storage. Audio recordings and transcripts of the interviews were only accessible to the researchers. The names and pseudonyms of the interviewees were recorded in a separate document that only the researchers had access to.

Independence of research. Although the study was funded by projects of the European Social Fund (ESF), this did not affect the results of the study. The research design enabled independence throughout the process and there were no conflicts of interest brought on by the funding.

4.2.6. Researcher's role and bias

In qualitative research, the researcher plays a significant role both in data collection as well as further analysis of the data. According to Mehra (2002), the mere fact of what we choose to study is a reflection of who we are and what we value as people and researchers: we choose to study things to which we have a personal connection on some level. As repeatedly stated above, in a qualitative study, the researcher's role is crucial to the process. Consequently, it is relevant to point out ways in which the researcher's own background might influence the process of the study. This is also supported by Creswell (1998), according to whom it is important for a researcher to disregard any pre-existing notions about the phenomena being studied in order to view and interpret the

data objectively. Below, the role and bias of the author of this dissertation are described from the more personal first person perspective.

I have been a doctoral student of Educational Sciences at the University of Tartu since 2010, while also working full-time at the Institute of Education as an assistant and, over the last three years, as a lecturer. In 2011, the opportunity arose to be included together with my first supervisor and two close colleagues in a research group studying the perspectives and activities of doctoral supervisors in the framework of the Eduko project, and to be present at the formation of the research group. For me, working in a research group meant communicating with other members of the team on an even footing, and an opportunity to discuss a study from its very beginning with a variety of people (both members of my own research group as well as other faculty members researching this field). This, in turn, motivated and encouraged me to engage with the research project, and supported me in the process of article writing that followed. Therefore, when conducting the study on doctoral supervisors, I already held a clear impression from the planning phase onwards that working in a research group was beneficial for me as a PhD student (and PhD students in general), as it encouraged growth and helped one to progress faster and more steadily in both their studies as well as dissertation writing. This was an understanding that was repeatedly discussed with other members of the research group at the time of the study, as it was necessary to avoid having this belief interfere with the data analysis and further interpretation of the results.

Starting from 2010, I have supervised both Bachelor's and Master's theses at the university. Acting as a supervisor myself has provided me with an opportunity to draw parallels between my own supervision practices, being a supervisee, and the experiences of the interviewees of the study discussed in this dissertation. It has also helped me to see problems that may occur in a supervisory relationship (e.g., the supervisee going "missing" for a long period; too little time for thesis writing because of work; insufficient language skills as a factor hindering thesis writing). Because of this, it was my belief at the beginning of the study that the entire responsibility for the supervision cannot lie with the supervisor alone, as the student must also make an effort to attain results. On the one hand, my holding this belief was helpful when it came to conducting the interviews (encouraging me to ask follow-up questions). On the other hand, it was necessary to be aware of it so that as an analyst I would not by any means take an accusatory stance towards the research subjects (e.g., in the case of Article I).

For me as a researcher, one of the more difficult aspects was keeping apart the research and collegial relationships. Hearing about the participating supervisors' experiences of being supervised, their joys and troubles with postgraduate studies, what they consider to be the aims of doctoral studies etc. also gave me an improved and deeper understanding of them as colleagues. At the same time, it was necessary to keep the study data separate from my professional life at all times, as required by the confidentiality principles, which

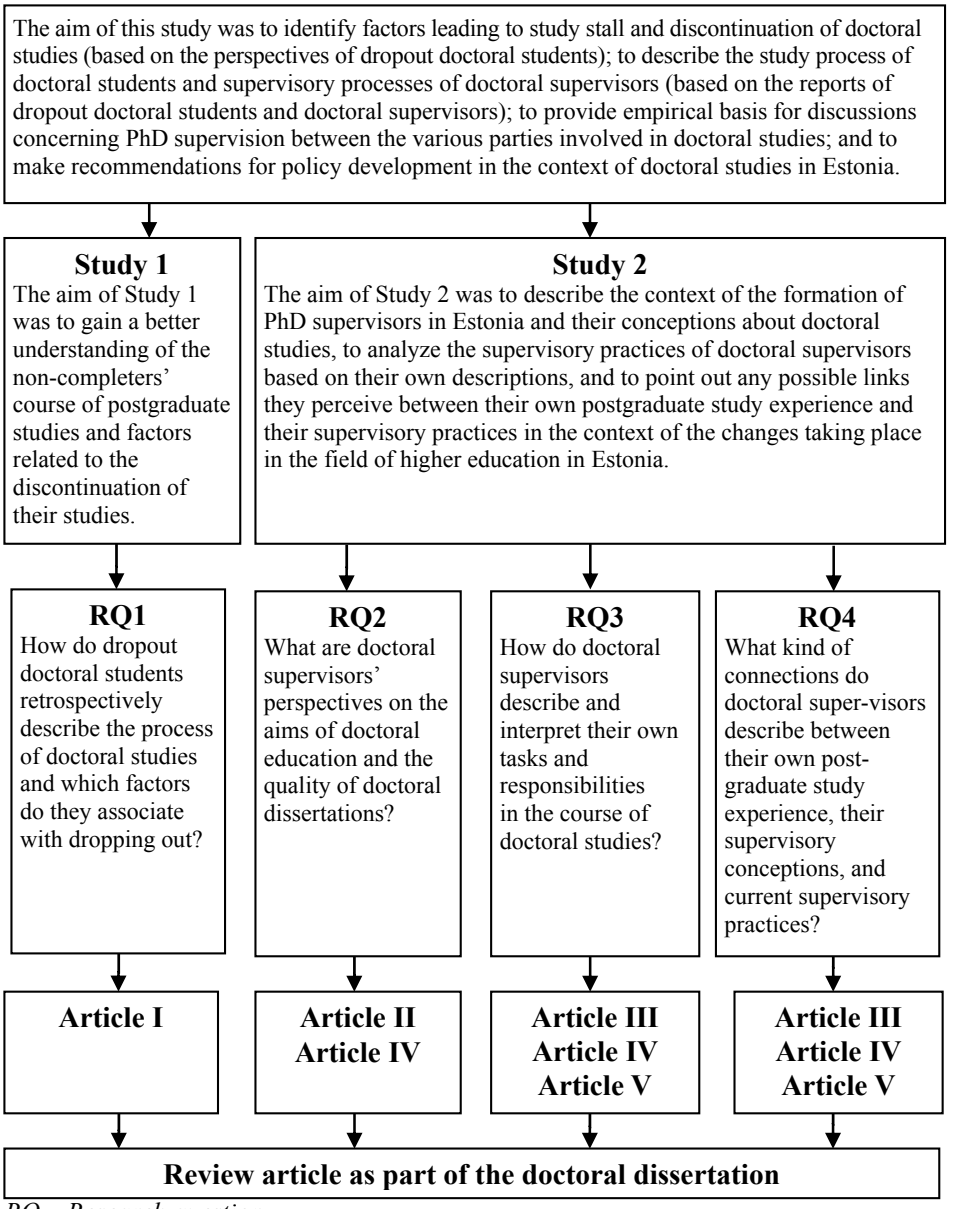
was assured to the participants. As I did not conduct all of the interviews for both studies myself, this posed an ethical dilemma for me as a researcher as well as on a personal level; namely, I knew fairly personal things about people who did not know me in person. Thus, I reflected on this problem in the researcher diary (some extracts from the researcher diary can be found in Appendix 6). This reflection also helped me to differentiate more clearly between my roles as a researcher, colleague, and doctoral student.

Reflecting on my role as a researcher, then, it has not always been easy to keep my personal experience (things I have experienced during my own studies or as a supervisor, or things I have heard of my fellow students' experiences) completely at bay while conducting interviews, analyzing data, and interpreting results. However, since throughout the process the members of the research group worked together (whenever necessary), these possibly problematic issues were repeatedly discussed in depth.

All in all, being a PhD student of Educational Sciences, it can be said that, as a researcher, I clearly held my own personal experiences, attitudes, and opinions, which could on the one hand, be viewed as something of a limitation (e.g., the issue of keeping personal experience from interfering with the interpretation of data). However, on the other hand, the experience of having been in the field of research is necessary in order to be aware of the "internal goings-on" of the field and understand it on a deeper level.

5. RESULTS

The next section provides an overview of the main findings that are based on the research questions of the current study. A more thorough account of the study results together with interview excerpts and discussion of the results are provided in Articles I–V. An overview of the interrelations between the studies, research questions, and articles is presented in Figure 7.



RQ – Research question

Figure 7. Interrelations between the studies, research questions, and articles.

STUDY 1

The aim of Study 1 was to gain a better understanding of the non-completers' course of postgraduate studies and factors related to the discontinuation of their studies based on the example of former doctoral students who had discontinued their studies in the field of Educational Sciences. The study was carried out among 14 former PhD students in this field. A more detailed account of the results is provided in Article I.

5.1. Dropout Educational Sciences PhD Students' Descriptions of the Process of Doctoral Studies and Factors Associated with Their Discontinuation of Studies

This study sought to answer the first research question of the dissertation: "How do dropout doctoral students retrospectively describe the process of doctoral studies and which factors do they associate with dropping out?"

Results of the study are presented in three main sections: the overall study process of dropout students; the role of the supervisor, student peers, and the department during the study progress; and the doctoral students' non-academic commitments during their study. The presentation of results follows the identified main themes and sub-themes.

5.1.1. Overall study process of non-completers

The road to doctoral studies. According to the results, dropout PhD students recollected two main aspects of their studies: (1) their incentive for enrolling in doctoral studies had been their interest in research and career opportunities at the university; (2) their future doctoral supervisor had invited them to enroll. More specifically, it is interesting to note that students did not enroll in PhD studies with a specific research topic in mind, but rather out of interest in the field of study or the supervisor's research topic. In line with this, former students pointed out that preparations had been minimal or non-existent and the idea of enrolling in doctoral studies had arrived quickly and spontaneously, especially in cases where the incentive for enrolling had been the supervisor's invitation and the participants themselves had not previously contemplated this option. Enrolling in doctoral studies at the supervisor's invitation without sufficient intrinsic motivation, as well as a lack of preparation, were also perceived as factors associated with dropping out from studies by the former students.

Review of doctoral curriculum courses. According to the participants, successful completion of the doctoral curriculum courses did not pose a problem and most of them had completed the courses with a positive result by the time of their discontinuation. The participants held different opinions on whether the courses had been pleasant and useful. The interviewees who did

agree that the courses had been pleasant and useful pointed out that the courses had offered an opportunity to discuss topics relevant to the academic field in general and valued the study materials received from the lecturers. However, although the courses were mostly described as pleasant and useful in the sense of broadening the students' horizons, in terms of assisting the progress of the doctoral dissertation, the participants largely described the benefit of the courses as minimal. In many of these cases, the participants perceived that lecturers failed to support connecting the course materials with the students' own research.

Conducting research during studies. More than half of the non-completers participating in the study said that they had not yet started working on the empirical part of their doctoral dissertation as at the time of dropping out. The main reason given for this was a lack of financial resources, and therefore a lack of time for working on the dissertation. The prevalent modest progress in research is surprising as several of these students had reached the last year of their studies (see in Article I; see also doctoral studies atestation rules in Study regulations [2014, pp. 15–16], and Tallinna Ülikooli doktoriõpingute [2010, pp. 5–6]). In addition to the lack of financial resources and time, other reasons for dropping out named by the participants were a lack of methodological competence and disagreements with supervisors regarding methodology. It emerged from the results that by the time of dropping out, only three of the non-completers had published research papers in the framework of their doctoral dissertations. One of the reasons cited for this was a lack of academic writing skills; however, some of the participants had also been confused by contradictory feedback received from journal reviewers in response to their manuscripts.

5.1.2. The role of the supervisor, student peers, and the department during the study progress

Role of the supervisor. The non-completers' overall descriptions of their relationships with their supervisor were positive – the supervisors were characterized as kind and warm people whom the students had had friendly interactions with during their studies. The supervisors were mostly referred to as experts in their academic field with broad horizons and in-depth knowledge in their area of research.

According to the participants, supervisory meetings had been initiated by the doctoral students, and some of the participants were in complete agreement with this approach as they perceived it to conform to the idea of being an adult, self-regulated learner. One of the interesting findings, however, was that according to one half of the participants, the supervisor had showed rather little interest in their supervision. These participants said that the supervisors had not taken an interest in the supervision, and that this may sometimes have been due to the student's dissertation topic not being closely related to the supervisor's own field of research. The supervisors were also criticized in connection with the clarity and quality of their feedback. As some of the supervisees found that they

had received insufficient and unclear feedback, and also given that supervisory meetings had only been held at the students' own initiative, some of the interviewees retrospectively considered this to be a contributing factor towards them discontinuing their studies.

Role of student peers. According to the participants, their relationships with their fellow students had been good; still, for many of them, the only communication with their student peers had taken place whenever they met during the courses. Although it was mentioned by participants that the more active PhD students of each year had also organized informal gatherings where, among other things, issues relevant to the students' candidatures had been discussed, several of the interviewees had not attended these gatherings due to a lack of time or other obligations outside of their studies. Overall, these participants said that they had quite often felt alone during their studies and that more frequent contacts with their fellow students could have helped them to progress in their studies.

Role of the department/institute. Participants were not often aware of their department's or institute's role in their studies. When asked about the role, it was mainly associated with the progress reviews, but also with the work of the academic affairs secretary and university's financial support.

In connection with progress reviews, the participants disclosed that they had hoped to engage in academic dialogue with, and receive advice from the members of the progress review committee. However, mostly the proceedings of the committee were perceived as *pro forma*. Participants felt that the committee had provided little substantive feedback and positive evaluations had been granted even in cases where the students themselves felt that they had not made sufficient progress in their doctoral research. The interviewees were of the opinion that, had the discussions at the progress review committee been more substantive and had the committee offered any helpful recommendations, it would have assisted them in progressing in their studies.

The role of the academic affairs secretary was mainly described through communication with candidates and the transmission of study related information. Neither of these were associated with the actual monitoring of the doctoral study. Themes associated with the university's financial support were linked to providing funding for students for going to conferences and organising scholarship payments. More commonly, non-completed doctoral students indicated that the department/institute did not have any substantive role in either hindering or supporting their study.

5.1.3. Non-academic commitments of doctoral students during their studies

Work in addition to studies. All of the dropout doctoral students participating in this study had worked in addition to their studies, and 12 out of the total 14 participants had done so full-time. According to the participants, their reasons

for working in addition to studying were economic, as scholarships were not sufficient for them to manage their daily lives otherwise. The interviewees named their daily work and the work not being integrated into or connected with their doctoral dissertation as an important factor contributing to them dropping out of their studies.

Family responsibilities. All of the former PhD students had had at least one additional member in their household at the time of their studies. Although most indicated that these family members had been understanding, patient, and aware of the student's academic responsibilities, the participants said that they had still felt the need and responsibility to fulfill family commitments, resulting in doctoral study work being pushed to the background. Combining family life, work, and studies had ended up posing such difficulty for most of the participants that they cited the unfavorable mixture of these factors as the main reason for discontinuing their studies.

To sum up the participants' views, the doctoral student's own intrinsic motivation and preparation for doctoral studies were two of the most significant factors contributing to their continuation of their studies. Another important factor mentioned by the participants was the lack of sufficient social guarantees during their period of PhD studies, which had kept them from committing to their studies without reserve; instead, they had worked in other positions unrelated to their doctoral research. Regarding the role of the university, the non-completers retrospectively said that they had expected to experience more substantive and more regular supervisory cooperation with their supervisor, as well as greater interest towards their doctoral dissertation on the part of their supervisors. As to their curriculum courses, the participants had expected the course content to have greater overlap with their own doctoral dissertations, and had wished for more overall support in acquiring methodological competence and academic writing skills. The participants' expectations toward university support during the study period mainly had to do with more substantive progress review meetings. Although the interviewees had been satisfied with the work of the academic affairs secretary, in hindsight, they also noted that this could have involved more substantive support. Support from family members and student peers was also deemed necessary during the study period. All in all, the dropout doctoral students associated several factors and combinations of factors with their discontinuation of studies.

The non-completers' course of postgraduate studies and factors related to their discontinuation of studies are described in more detail in Article I.

STUDY 2

In addition to exploring the perspectives of dropout PhD students, this dissertation aims to analyze the supervisory practices of doctoral supervisors. To meet this objective, Study 2 was devised and three research questions were posed. Below, the results of the study are presented by research question.

The aim of Study 2 was to describe the context of the formation of PhD supervisors in Estonia and their conceptions about doctoral studies, to analyze the supervisory practices of doctoral supervisors based on their own descriptions, and to point out any possible links they perceive between their own postgraduate study experience and their supervisory practices in the context of the changes taking place in the field of higher education in Estonia.

The study was based on semi-structured interviews with 21 supervisors (11 male and 10 female; 15 from the field of Educational Sciences and 6 from Natural Sciences) of two Estonian universities.

5.2. Doctoral Supervisors' Perspectives on the Aims of Doctoral Education and the Quality of Doctoral Dissertations

The following section gives an overview of the most relevant findings regarding the research question "What are doctoral supervisors' perspectives on the aims of doctoral education and the quality of doctoral dissertations?" The presentation of the results follows the identified main themes, the first two of which focus on the aims of doctoral education ("The academic growth of doctoral students over the course of their studies"; "The importance of doctoral studies and doctoral dissertations in the development of the academic field and creation of new knowledge"), and the third on issues surrounding the quality of doctoral dissertations ("Quality of doctoral dissertations"). A more thorough analysis of the results can be found in Articles II and IV of the dissertation.

Based on the opinions of doctoral supervisors participating in the study, there are two primary aims to doctoral studies: the academic growth of doctoral students over the course of their studies, and development of the academic field together with the creation of new knowledge. The participants also noted that a doctoral thesis should be a high-quality academic research publication corresponding to all academic research standards. The following subchapter provides a more thorough overview of each of these aspects.

5.2.1. Academic growth of doctoral students over the course of their studies

The supervisors participating in the study named the doctoral student's study process and journey towards becoming an independent researcher as the aims of doctoral studies. They noted that students both acquire skills as well as develop on a personal level during their studies. According to the supervisors, doctoral curriculum courses are necessary, as they serve to broaden the PhD students' academic horizons while teaching new skills needed for a career as a researcher. On the other hand, some of the supervisors said that the range of courses offered by the doctoral curricula is limited and not flexible enough to accommodate for

PhD students' individual needs. In other words, there are courses being taught that do not serve to help the students achieve their doctorates, and where the students also find the acquired course material to be complicated (see Article II).

According to the supervisors, among the important skills that doctoral students should acquire during their studies are academic writing, critical thinking, and cooperation skills, as these abilities are necessary for the students' future research careers. Furthermore, the students' independence was also emphasized: according to the interviewees, students should have acquired independent working skills by the end of their candidature, so as to be able to continue their careers as independent researchers, be it as members or leaders of research teams. At the same time, the supervisors noted that doctoral studies were indeed an intermediate step in the process of becoming a credible researcher, and that students continue their growth as researchers after their dissertation defense.

In addition to academic competence and skills, the participating supervisors also highlighted the importance of broadening the students' perspectives in a wider sense. Notwithstanding, several of the supervisors elaborated that they did not view such broadening of the perspectives to be part of their supervisory tasks, saying that, as supervisors, they engaged in supervision of the student's doctoral dissertation writing rather than anything else, thus implying a distinction between those two tasks.

From the perspective of the PhD students' academic growth, the supervisors view the exceeding nominal study period as an inevitability that can even be helpful. During a longer study period, the student can spend more time in the academic environment, broadening their perspectives. Consequently, the supervisors participating in the study did not perceive graduation within the nominal study period to be an objective in itself or one that should be achieved at any cost. Specific attributes of the academic field were also pointed out as reasons for extended study periods, for example, doctoral students employment in fields unrelated to their doctoral research at the time of their studies and are therefore unable to progress at the tempo demanded by the nominal study period. Some of the other explanations given for the exceeding of nominal study periods were that longitudinal studies do not, because of their nature, fit into the time framework of the study period, but also that the process of publishing articles is very time-consuming (see more in Article IV).

5.2.2. The importance of doctoral studies and doctoral dissertations in the development of the academic field and creation of new knowledge

In the supervisors' interviews, the mission of the university and the supervisors to train new researchers in the course of doctoral studies emerged as the aim of doctoral education. The overall opinion was that doctoral education should provide a broader training rather than serve simply to replenish the research staff at a university. The supervisors suggested that doctorate holders could also

work in the private sector or in public institutions, while conceding that since graduation rates were low, the graduates were primarily needed at the university itself.

It emerged from the supervisors' descriptions that doctoral theses of PhD students play a significant role in the development of the academic field on an international level, as well as advances in local practices. As examples of such contributions, the supervisors listed research papers authored (or co-authored) by doctoral students and published in English, as well as conference participations. It was also pointed out that it was "easier" to achieve an international contribution of new knowledge during doctoral studies when working in a research team (mainly in the field of Natural Sciences), while creating new value for international research was often more difficult by means of solo research (in the field of Educational Sciences). At the same time, supervisors (of Educational Sciences) also noted on the relevance of developing local practices through applied research, seeing it as an opportunity to solve practical problems affecting Estonian schools in particular. Some of the interviewees also expressed concern over their observation that doctoral-level research was indeed resulting in new knowledge, while the applicability and implementation of this knowledge remained poor.

To sum up, it can be said that on the one hand, the aim of PhD studies according to doctoral supervisors is the development of the students' competences and skills, complemented by a general broadening of the students' horizons in addition to gaining new knowledge within their discipline. On the other hand, the supervisors find it important that doctoral studies should contribute towards creating new knowledge within the field. Doctoral studies are mainly viewed as a training process for new academic staff by the participants, while also acknowledging the need for doctorate holders in other sectors. The participants also highlighted the necessity of the student developing into an independent researcher over the course of their studies, yet noted that doctoral studies are an intermediate step on the road to becoming a credible researcher. A detailed overview of the doctoral supervisors' perspectives on the aims of doctoral studies is provided in Article II.

5.2.3. Quality of doctoral dissertations

Describing their opinions of which requirements should be met by a doctoral dissertation, the doctoral supervisors participating in the study noted that a doctoral dissertation is a research paper that should feature all characteristics of scientific research, and should be a high-quality academic paper that introduces new knowledge on an international level.

There were also those among the supervisors who expressed a belief that there was no difference between research carried out by doctoral students and "real" research, as a research paper must be of high quality and international value. Some of the supervisors thus found that doctoral dissertations defended

at Estonian universities did generally meet the quality criteria for research papers and also had international value. Another segment of the participants, on the other hand, expressed doubts about some of the defended theses, saying that there had been inconsistencies in their conformity to standards. Elaborating on their opinions, the supervisors (of Educational Sciences) mostly expressed criticism of article-based dissertations. It was pointed out, for instance, that in the case of several collections of articles, the authors had not adhered to the principle of conformity, while the supervisors expected doctoral theses to be written on the basis of one study or to add up to an integral whole, while solving one particular research problem. The lack of such conformity casts a doubt on the quality of such doctoral dissertations. Doubts were expressed whether it was even possible for a PhD student to gain a wide and thorough overview of the academic field by writing an article-based dissertation, especially in cases where the collection of articles was based on a number of different studies, and the articles themselves had been co-authored with other researchers.

In their interviews, the participating supervisors pointed toward a need for clear agreements concerning the quality of doctoral dissertations, as well as a specification of general requirements. The supervisors proposed to consider the quality of theses in the context of their own universities and across different universities to ensure that doctoral students were treated as fairly as possible. A shared understanding of what constitutes a high-quality doctoral dissertation would also help the supervisors to better supervise the students.

To sum up, according to the supervisors participating in the study, a doctoral dissertation should be a high-quality research paper that features all the characteristics of scientific research and contributes to research on an international level. The participants found that the requirements for doctoral dissertations should be specified and standardized, as the presence of clear quality criteria which supervisors would also be made aware of would help them to supervise their students in a more purposeful manner.

A detailed overview of the doctoral supervisors' perspectives on the aims of doctoral studies and the quality of doctoral dissertations is provided in Articles II and IV.

5.3. Supervisory Tasks and Responsibilities in the Course of Doctoral Studies

This subchapter outlines the main findings regarding the research question "How do doctoral supervisors describe and interpret their own tasks and responsibilities in the course of doctoral studies?"

Elaborating on the tasks of supervisors, the supervisors first described their own activities prior to the student being admitted to the PhD program, proceeding then to tasks performed at the beginning of the doctoral study period. After sections dedicated to these tasks, the common supervisory process is out-

lined, and a brief overview is given of the supervisor's activities in the final phase of the study period, i.e., before the thesis is submitted and during the student's preparation for defense. A more detailed overview of findings relevant to the research question is presented in Articles III and IV of this dissertation. An overview table of the participants' supervisory activities is provided in Appendix 7.

5.3.1. Supervisory tasks prior to the student being admitted to the PhD program

The doctoral student's path to their supervisor. According to the supervisors' accounts, a supervisory relationship may begin in one of three ways: (1) the supervisor invites a potential doctoral student; (2) the prospective doctoral student approaches the potential supervisor; (3) the supervisee is allocated by the administration.

(1) The supervisor invites a potential doctoral student with whom they have had contact at a previous level of study to enroll in the PhD program. A beginning like this was regarded as a positive factor contributing to the success of the supervisory relationship, as the supervisor is aware of the doctoral student's competences and skills and both the student and the supervisor are acquainted with each other's idiosyncrasies.

(2) The prospective doctoral student approaches the potential supervisor with a wish to have that specific supervisor supervise their research, or a wish to write a doctoral dissertation on their selected topic corresponding to that supervisor's area of research. In cases where they had been approached in this manner, the supervisors disclosed that in addition to interviewing the PhD student candidates, they had mostly also engaged in some background research (internet searches, discussions with colleagues) in order to gain some understanding of the prospective student's academic abilities and work ethics.

According to the study participants, supervisors in the field of Educational Sciences have previously been open to supervising dissertations written on fairly broad topics. Consequently, prospective doctoral students often approached supervisors with topics that did not match the supervisors' own active research topics that they were deeply familiar with. Participants from the field of Educational Sciences noted, however, that the range of topics had been narrowed down over the past few years and students were now being admitted with research topics more closely related to those of their supervisors. One reason given for this transition was that supervisors have perceived such PhD students to complete their studies sooner. On the other hand, there are still supervisors who will allow for a very broad range of dissertation topics. For them, the rationale is that somebody needs to supervise the topics that students themselves enroll with and for which there are no dedicated experts available in Estonia.

(3) According to the participants, the third way for prospective doctoral students to reach their future supervisors is for the supervisee to be allocated by the administration. Allocated supervisees had come to the participants due to strategic reasons: either the research statistics of their previous supervisors had not been sufficient for supervision or the number of supervisors in specific subject areas had been limited. Supervisory relationships based on this type of beginnings were, in the supervisors' experience, mostly less successful than the two other types described above. According to the supervisors, the main reason for this is that personal differences can lead to a nonfunctioning supervisory relationship, but also that in the case of supervisees allocated in this way, the supervisors are not always sufficiently motivated.

Purposeful preparation of the doctoral student. All participants from the field of Natural Sciences, as well as some from the field of Educational Sciences, described the purposeful preparation of future doctoral students over a longer period of time prior to the official start of the doctoral study period. The supervisors described commencing fundamental cooperation with such students already at Bachelor or Master's level. There, future supervisees received in-depth preparation with regard to their field of research and methodology. Supervisors who prepared their PhD students in this way also expressed more satisfaction with the competences and skills when talking about the later course of doctoral studies, noting that with the help of such additional preparation, academic capabilities of doctoral students were generally not an issue when it came to advancing in their studies (see more in Article IV).

Finding sources of funding. Participating supervisors of Natural Sciences noted that it is the supervisor's task to find sources of funding and thereby secure a doctoral student's employment before accepting them for doctoral studies. Members of the same group also pointed out that the presence of funding is a precondition set by their institution for being granted a PhD student. Therefore, in this field, the supervisor-supervisee relationship is also an employer-employee relationship. The vast majority of participants from the field of Educational Sciences said that as there were few research projects in their field and funding was difficult to obtain, funding was generally not associated with being granted a doctoral student and no purposeful action was taken in order to guarantee a student full-time employment in the framework of a research project (see more in Article IV).

Joint planning of the research project. The interviewees also indicated the planning and coordination of the research project presented by the student at their enrollment as one of the activities that takes place before the start of the official supervisory relationship.

According to the participants, they had counseled their supervisees to varying degrees in the process of drawing up their research projects before giving their approval, from simply providing their signature to substantive recommendations and providing feedback in several iterations, to even writing

the project themselves instead of letting the doctoral student do it (see more in Article III and IV).

Role of the admissions committee in the admission of doctoral students. In addition to the supervisor's own activities, the participants also highlighted the importance of the function of admissions committees in the admission of doctoral students. Across the two disciplines, it emerged that in the case of Natural Sciences, the admissions committee plays a formal rather than an essential part in the selection of suitable PhD students due to preliminary work carried out with specific candidates.

Several participants from the field of Educational Sciences, on the other hand, expressed a clear notion that the admissions committee could and should do a better job in order to admit candidates who are indeed academically capable and suitable for doctoral studies. Therefore, according to supervisors of Educational Sciences, the extent to which the admissions committee succeeds in appraising the candidates' suitability for doctoral studies is another important factor influencing the students' level of success during the course of their candidature. Several of the participants noted that a more strict selection procedure would lead to doctoral students making better progress, and also make the supervisor's job easier (see more in Article IV).

5.3.2. Beginning of the supervisory process

Once a student is officially enrolled in the PhD program, the supervisory activities of the study participants were, at the beginning stage of the studies, mostly focused on drawing up the student's individual study plan, determining the topic and methodology of the student's research, and activities and advice related to recommending literature for the student. At this stage, the doctoral student's main task according to the supervisors is to focus on their curriculum course participation.

Drawing up an individual study plan. At the initial stage of a PhD student's studies, the student's individual study plan is discussed and drawn up in cooperation with the supervisee. Supervisors provide different levels of counseling regarding the choice of elective and optional subjects based on how well the student is acquainted with the subjects offered in the curriculum. There were those among the participants who had offered direct recommendations for the selection of elective and optional subjects, as well as those who admitted to lacking a general overview of the essence of the different subjects in the course curriculum and were therefore unable to recommend courses to their students.

Determining the topic and methodology of the student's research. The supervisors named determining the topic and methodology of the student's research as their main activity during the initial stage of the student's PhD studies. At the same stage, an initial decision is also often taken with regard to whether the dissertation will be compiled as a monograph or as a collection of articles. According to the participants from the field of Natural Sciences, their

supervisees compiled article-based dissertations without exceptions, while those of Educational Sciences said to accept both while commenting on a trend towards article-based dissertations.

Recommending literature. When it comes to the provision of reading recommendations, there are supervisors who present their doctoral student with a pre-prepared package of articles, asking the student to read it through and start drawing up a literature review based on those articles. There are also those who only offer general recommendations regarding the subject areas that the student should read up on in order to gain an overview of the research results in their field, leaving the more detailed search for literature up to the student (for a more detailed overview of the beginning of the supervisory process, see Article III).

5.3.3. Common supervisory process

The common supervisory process was mostly described by the interviewees as follows: (1) group meetings at supervisory seminars and working meetings of the research group (mainly supervisors of Natural Sciences); (2) individual meetings, including communication via email. With regard to the regularity and initiation of supervisory meetings, two distinct avenues emerged: regular supervisory meetings initiated by the supervisor and individual meetings initiated by the supervisee. The following section provides an overview of these two approaches.

Regular supervisory meetings initiated by the supervisor. Supervisory seminars are held by supervisors who supervise more than one student at the same time. According to the supervisors, such meetings usually take place once or twice a month, and in the case of research groups (in the field of Natural Sciences) occasionally even more frequently, as demanded by necessity. In their view, the benefit of such seminars is that they allow supervisors to receive more information about the doctoral student's dissertation while also contributing to the development of communities of practice among PhD students.

Next to supervision at group meetings, participants from the field of Natural Sciences also pointed out that for them, supervision took place in the course of daily collaboration in the lab. This means being able to monitor all proceedings in person, thus also being able to monitor the doctoral student's work. Any problems or questions arising with regard to the student's research are discussed in the course of work.

Individual meetings (including communication via email). With only a few exceptions, both individual meetings with PhD students as well as consultations via email were described by the supervisors as taking place at the initiative of the doctoral students. The participants noted that since doctoral students are grown-ups, they should be able to identify situations where supervisory consultation is needed. Doctoral students were expected to take the initiative with regard to scheduling supervisory meetings. According to the supervisors, individual meetings usually consisted in supporting the student's writing process by

providing feedback on their manuscript (discussion of comments), and discussing the course of their research.

Supporting the doctoral student in becoming a member of the academic community. As reported by most of the study participants, a part of the common supervisory process is helping students to become members of the academic community. Hence, supervisors aim to find funding for their students during their studies in order to, e.g., attend conferences together (and introduce their supervisee to other researchers), or alternatively, students are encouraged to attend conferences on their own. According to the supervisors, the doctoral school system currently in effect in Estonia (see also Doctoral schools, s.a.) offers great opportunities for this and funding is also sought from other projects (mainly in the fields of Natural Sciences and Science Education). Several of the supervisors even considered it one of the most important tasks of the supervisor throughout the supervisory process to procure funds for the doctoral student to be able to go abroad and gain new experience while also sharing theirs.

5.3.3.1. Supervisory tasks in case of a study stall

In addition to the tasks described above, a number of activities emerged that supervisors perform in a situation where their supervisee is not progressing in their studies at a pace deemed sufficient by the supervisor. This subchapter provides an overview of the supervisors' main activities in such cases.

Noticing the stall and communication with the doctoral student during breaks in studies. According to the participants, one of the signs of a study stall is the "disappearance" of the student in question. In this regard, the interviewees' descriptions of their activities differed depending on their organization of research. Supervisors of Educational Sciences participating in the study were of the opinion that as adults, PhD students must engage in self-regulated learning and are therefore solely responsible for their own studies. Consequently, only a few supervisors admitted to contacting a "disappeared" doctoral student themselves in order to inquire about the current stage of the student's doctoral dissertation and find out what kind of assistance the student needs. More often than that, the supervisors would wait for students to contact them and ask for supervision. Supervisors of Natural Sciences, on the other hand, differed from their counterparts from the field of Educational Sciences in that their supervisees are members of the supervisors' research teams. There is a direct employer-employee relationship between a supervisor and their supervisee. Therefore, no such extended periods of individual work can occur, preventing any interruptions or disappearances similar to those described above (see more in Article IV).

In the supervisors' own opinion, besides the fact that PhD students are seen as adult self-regulated learners, the main reason for this understanding attitude in the field of Educational Sciences is that already at admission, the supervisors are fully aware that the students need to be employed elsewhere during their period of doctoral studies, and thus the doctoral research is not going to be their primary

job. Therefore, supervisors from this field saw PhD students working alongside their studies as a necessity, since neither the supervisors nor the university have sufficient resources to allow the students to concentrate on doctoral research only. Consequently, longer breaks in studies caused by other commitments were seen as natural by Educational Sciences supervisors (see more in Article IV).

Shortcomings in the academic preparation of the doctoral student. The participants identified methodological competence, academic writing, and foreign language skills as the second largest set of factors influencing study stalls and as essential components for making satisfactory progress toward the doctoral degree. In cases where the supervisor noticed a deficiency in those areas, and this deficiency was keeping the doctoral student from progressing in their studies, the supervisors of Educational Sciences mostly described referring the student to courses that would help them to gain an understanding of the areas. At the same time, the supervisors found that PhD students were not always able to transfer what they had learned to the context of their own research. Few supervisors described teaching their PhD students certain skills (e.g., data analysis) themselves. Supervisors of Natural Sciences noted that in order to analyze data for doctoral dissertations, statisticians are involved in the process. The statisticians complete all the difficult steps of data analysis and the doctoral student obtains the general principles of analysis.

The supervisors participating in our study also named the PhD students' perceived lack of academic writing skills as one of the factors causing study stalls. This, in turn, puts extra pressure on the supervisor, as students must therefore be given feedback on their writing repeatedly and in detail. A few supervisors also mentioned having been the one to teach academic writing skills to their supervisees.

According to the supervisors, another factor that inhibits the students' progress in their PhD studies is a lack of foreign language skills. The interviewees noted, however, that there has been an improvement in this regard over the past few years. In cases where a student's foreign language skills were insufficient, the supervisors had suggested the student to take a language course, and/or efforts were made to fund the translation and proofreading of the student's manuscripts.

Motivation of the doctoral student. In case of motivation problems with a capable doctoral student, the supervisor tried to talk to the student and help them to see their long-term goals. In case the supervisor recognized that student's academic skills and diligence are insufficient for the completion of studies, nothing was done in order to motivate the student.

Personal events in the doctoral student's life. If a study stall was caused by events in the doctoral student's personal life (e.g., birth of a child, relationship problems, illnesses), the supervisors claimed to be sympathetic and invited the student to talk about their problems if they wish. On the other hand, there were supervisors who would rather see the students set their studies at the top of their list of priorities for the duration of their studies. Parental leaves were ascribed

more critical importance by supervisors of Natural Sciences: the supervisors claimed that in cases where doctoral students returned from paternal leave, they often found it difficult to readjust themselves to research and work routines (see more in Article IV).

5.3.4. Supervisory tasks prior to submission of the doctoral dissertation and preparation of the student for the defense procedure

The final stage of the dissertation writing process was described as starting from the moment that the student is ready to submit their thesis and/or their supervisor deems the thesis ready to be submitted. The supervisors had had experience with both PhD students who needed to be encouraged to submit their dissertations for defense (students who would rather keep perfecting and improving their paper) as well as students whom they had had to inform of their thesis not being ready for submission (even though the student had been of the opposite opinion). In the latter case, the supervisors had needed to be prepared for tensions arising in their communication with such a student.

A majority of the participants noted that once their dissertation had been submitted for defense, doctoral students mainly needed encouragement and moral support for the duration of the process leading up to the defense itself. Some of the supervisors said that they had also reviewed their supervisees' defense presentations and helped them to prepare for answering the opponent's questions. Those supervisors also gave their students general advice on how to interact with the defense committee and their opponent, familiarizing the student with the defense procedure where necessary. Other supervisors regarded dissertation defense as a part of the study process where the supervisee did not need a significant amount of support, as they had previously presented their papers at several international conferences and gained valuable experience in this way. As a result, those supervisors left preparation for the dissertation defense up to the PhD students themselves.

Consequently, to sum up, the overall descriptions of the supervisors participating in our study indicate that on the one hand their supervisory practices are shaped by the specific features of their field of research. On the other hand, supervisory practices can also be linked to the values held by the supervisor themselves. Responsibility for progressing in their candidature is thus still placed on the students themselves, and supervisors see themselves as only able to provide support if the supervisee is keeping contact with them. Based on an analysis of the interviews conducted with supervisors from the field of Educational Sciences, in the initial stage of the supervisory process, communication between the supervisor and the supervisee is distinctly aimed at specific tasks. The work process that follows was mostly described as supervision within the framework of work done in supervisory seminars or individual supervision at the student's initiative. Participants from the field of Natural Sciences noted that

they had an employer-employee relationship with the supervisees. As for preparing the student for their dissertation defense, moral support and encouragement were deemed important, as well as reviewing the student's defense presentation and discussing the questions posed in the review.

A more detailed overview of the supervisors' perceptions and interpretations of their tasks and responsibilities in the course of doctoral studies is presented in Articles III and IV.

5.4. Connections Between the Supervisors' Own Postgraduate Study Experience, Their Supervisory Conceptions, and Current Supervisory Practices

The following subchapter outlines the most significant findings regarding the research question "What kind of connections do doctoral supervisors describe between their own postgraduate study experience, their supervisory conceptions, and current supervisory practices?"

First, a concise overview (a more in-depth overview is provided in Article V) is given of the distinguishing characteristics of the era during which the supervisors participating in this study completed their postgraduate studies. Thereafter, three broader topical categories are introduced that emerged from the connections pointed out by supervisors between their own postgraduate study experience and current supervisory conceptions, which the supervisors claim to have carried along from their prior experience to their current supervisory practices. A more detailed discussion of these results can be found in Articles III, IV (descriptions of supervisory activities), and V (connections indicated by the supervisors themselves) of the dissertation.

Characteristics of the postgraduate study period of the supervisors participating in the study. The supervisors participating in this study had completed their postgraduate studies between the years 1970–2008. From the supervisors' own descriptions of their period of postgraduate studies, qualities characteristic of their respective eras emerged. For instance, several of the supervisors who had been in postgraduate programs during the Soviet era had had supervisors outside of Estonia (in Moscow or Kiev). As a result, supervision took place long-distance and contacts with the supervisor were rare. Dissertations were also defended abroad, as there were no defense committees for some of the disciplines in Estonia. Some of the era-specific characteristics mentioned by the supervisors were the necessity of writing party slogans into their dissertations and restrictions on traveling to Western countries. The role of the Committee for State Security as a factor limiting available study opportunities, and a shortage of specialized literature were also mentioned, as well as a lack of test instruments in the field of Natural Sciences.

Several of the supervisors who had defended their degrees after the restoration of Estonia's independence (but had a Soviet-era background) noted that they worried about their foreign language skills. On the positive side, those participants recalled that during the time of their postgraduate studies, new opportunities for broadening one's perspectives arrived as it became possible to travel abroad to attend conferences and seminars, or to read in foreign libraries. The experience of interacting with the scientific community outside of Estonia was retrospectively deemed as a valuable experience by the supervisors.

Regardless of the era of their postgraduate studies, three topical categories emerged from the supervisors' descriptions of their own postgraduate study experience and supervisory practices for which connections can be detected between their postgraduate studies, current supervisory conceptions and supervisory practices: placing high value on the postgraduate student's independence and work ethics; communication on equal grounds and substance of the supervision; support in becoming a member of the community. The following section gives a brief overview of the participants' memories of their time as supervisees within these three categories, and to describe the consequent connections between the supervisors' own experiences, supervisory conceptions, and current supervisory practices. A more thorough overview of the connections pointed out by the supervisors can be found in Article V.

5.4.1. Placing high value on the postgraduate student's independence and work ethics

The results of this study indicate that the current supervisors' own experience as supervisees has a relation to their current supervisory conceptions and practices. First, findings from the Educational Sciences supervisors is described.

Study participants from the field of Educational Sciences prevalently believed that students become independent researchers through working independently for extended periods of time, and that as adult learners, PhD students should be self-regulated and motivated enough to contact their supervisor at their own initiative whenever they feel the need to do so. As a result, it was described as uncommon in this field for supervisory meetings to be held regularly or for supervisors to set deadlines for their students. Because the supervisors had been independent in their studies as supervisees, and only turned to their supervisors whenever the need arose, they also expected current doctoral students to behave in the same way. The current supervisors viewed themselves as people who were always there for their PhD students. Therefore, this model of student independence that the supervisors acquired during their time as supervisees is being repeated in their own supervision of current PhD students. On the other hand, interviewees who retrospectively noted having needed clearer and more specific supervision during their own doctoral studies reported making efforts to provide more support to their supervisees.

For the supervisors of Natural Sciences participating in the study, reports of their own period as supervisees focused on work in labs and working groups. Meetings with their supervisor and other members of their working group had taken place daily, and the supervision of their current students was described in the same way by these supervisors.

The participants mostly recalled themselves as postgraduate students as motivated, dedicated, diligent students with good time management skills. Several of the interviewees reported that they saw parallels between themselves as postgraduate students and their current supervisees with regard to their work ethics and dedication to studies. Such supervisors noted that they had chosen to adopt a similar method of supervision because their current doctoral students resemble themselves in their motivation and work ethics. At the same time, there were also participants who said that they could not comprehend the reasons their current doctoral students seemed to work with less intensity and eagerness than they had in their time (see more in Article V).

5.4.2. Overall supportive attitude of the supervisor and the substance of their supervision

Academic discussions with their supervisors at the time of their studies, as well as enjoying a cordial and friendly relationship with the supervisor, and communicating with them on what was perceived to be even grounds (with some exceptions where the relationship had remained a top-down supervisor-supervisee relationship until the very end) was appreciated by interviewees.

Based on the supervisors' descriptions of their own supervisory practices, it can be said that most of the participants had transferred their experiences to their own supervisory practices. Supervisors described their PhD students as dialogue partners, to whom they were giving feedback and recommendations based on their research experience. Because at the time of their postgraduate studies, the interviewees had experienced a supportive attitude from their supervisors and taken part in substantive and constructive academic discussions at the supervisory meetings, they also found it important to provide a similar environment conducive to learning and growth for their own doctoral students.

Conversely, there were also those among the study participants who, in retrospect, expressed discontent regarding the substance of their supervision. According to those interviewees, the level of focus by their former supervisors on their postgraduate research had been insufficient and the supervisors had provided little material or constructive feedback regarding the various parts of the interviewees' dissertations. The participants who deemed their own former supervisor's supervision as inadequate noted that in their own work as supervisors they tried to make the time for their supervisees, and guide the process by means of useful and constructive feedback, as well as academic discussions.

5.4.3. Support in becoming a member of the community

It emerges from the results of this study that the participants had appreciated it when their supervisors had found ways to help them to integrate into the academic community. As examples of such support, the interviewees mentioned joint conference attendances, the supervisor's role in cooperation in finding cooperation opportunities with an international research team, and the supervisor's support in seeking funding for assignments abroad.

This means that the supervisors have transferred from their own postgraduate studies to their supervisory conceptions and practices the notion that being part of the community is essential during postgraduate studies and that it is the supervisor's task to assist their students in integrating into this community. When being supervisors by themselves, according to the interviewees, they tried to find opportunities for their current supervisees to attend conferences abroad as well as introduce their students to other researchers at these conferences. With regard to research, only a few of the supervisors commented on the relevance of cooperation and networking with researchers from other Estonian universities; in recollections of their own study period, participants also primarily mentioned cooperation with researchers of their home university.

Participants whose supervisors had not assisted them in socializing and integrating into the community of their academic discipline said that as current supervisors they are aware of the importance of socialization and being a member of the community and try to support their supervisees in this process of integration.

Although mainly only participants from the field of Natural Sciences reported having had the opportunity to work in research teams during their postgraduate studies, most of the supervisors participating in the study were of the opinion that working in research groups was something that could help their students to make better progress in their studies. Consequently, the supervisors were also trying to find opportunities for their supervisees to conduct their research in research groups.

Thus, in general, the supervisors' own experience as supervisees does indeed have an impact on their supervisory conceptions and practices. The aspects carried forward from their personal study period to current practice is, however, impacted by the meaning they ascribed to the experience. At the same time, different meanings were ascribed to descriptions of similar situations (see Article V for more detail). For instance, one of the aspects that many participants highlighted about their period of postgraduate studies (and which was ascribed both positive and negative meanings to incompatibly) was the ability to be independent and only turn to their supervisors whenever they found it necessary. Consequently, if extensive periods of self-governing work and substantial independence were ascribed positive meaning to, then this pattern was also transferred to their own supervisory practices. Participants who said that they retrospectively wished that their supervision had been more substantive were now indeed more inclined to offer their PhD students support and consultations

regardless of time. However, the results of our study indicate that regular supervisory meetings with supervisees are still an exception to the general rule.

To sum up, open and supportive communication on even grounds, academic dialogue, commitment to focusing on their doctoral student's research and providing substantive feedback, and supporting the student in becoming a member of the community were described as activities that the participants had tried to incorporate into their own supervisory practices. In cases where the interviewees had been dissatisfied with their supervisors' supervision in some of the aspects, they made efforts to act differently with their own current supervisees and offer them support in these respects.

The most relevant findings regarding the connections described by supervisors between their own postgraduate study experience, supervisory conceptions, and current supervisory practices are presented in Articles III, IV, and V.

6. DISCUSSION

The aim of this study was to identify factors leading to study stall and discontinuation of doctoral studies; to describe the study process of doctoral students and supervisory processes of doctoral supervisors; to provide empirical basis for discussions concerning PhD supervision between the various parties involved in doctoral studies; and to make recommendations for policy development in the context of doctoral studies in Estonia. In the following chapter, the key findings are discussed in light of theoretical and practical contribution to the field of study. Thereafter, an overview is provided of the limitations of the study, and finally some suggestions are made for further research. The results of the studies (Study 1 and Study 2) are discussed in more detail in the discussion chapters of Articles I–V.

6.1. Discussion of the Key Findings

The Aims of Doctoral Education and the Quality of Doctoral Dissertations

Results of the study reflect that according to the opinions of doctoral supervisors participating in the study, the aims of doctoral education are the academic growth of doctoral students over the course of their studies and creation of new knowledge and development of the academic field (Article II). It emerged from the findings that for supervisors, a doctoral dissertation is a high-quality research paper that needs to meet all the criteria set for scientific research. The participants also noted that for a doctoral student, PhD studies are an intermediate step in the road to becoming a credible researcher. This indicates that supervisors emphasize both the process, on the one hand, as well as the product on the other, echoing both Park's (2005) findings, as well as the goals of doctoral education as suggested in the European University Association's (2010) document Salzburg II Recommendations. A certain contradiction can thus be noted in the supervisors' conceptions regarding their orientation to product *versus* orientation to process. On the one hand, the doctoral dissertation is seen as a product, a high-quality piece of academic writing comparable to those of other researchers in the same field. On the other hand, when seen as an intermediate step in the journey towards becoming a researcher, value is ascribed to the doctoral student's academic growth, and the visibility of such growth in the various sections of the student's dissertation. However, setting these different goals for doctoral studies results also in different perspectives on the quality and assessment of doctoral dissertations as well as on supervision of doctoral students. Therefore, based on the abovementioned, the parties of doctoral education face a challenge in deciding whether and how to integrate the two traditions in a way that ensures high quality of doctoral dissertations while developing the doctoral student into an autonomous scholar. This topic requires thorough discussion between different concerned parties.

Another interesting aspect of the results concerns the learning outcomes of doctoral studies as the supervisors mostly evaluated contributions made by PhD students and their doctoral dissertations on an international scale, emphasizing the importance of contributing to the advancement of the academic community outside of Estonia, and international research in general. The supervisors' conceptions are therefore in line with guidelines outlined in documents governing the organization of doctoral studies in Estonian universities (see, e.g., Procedure for Awarding, 2014, p. 2) that place a similar emphasis on the international community ("A dissertation is an independent research paper /…/ whose results are *published in international professional literature*"). Nonetheless, the European University Association's (2010) document Salzburg II Recommendations meant as a set of guidelines for a diverse landscape of doctoral programs in Europe, for instance, do not necessarily define the academic community that each doctoral dissertation should contribute to as "international". The document states: "The main outcome of doctoral education are the early stage researchers and their *contribution to society* through knowledge, competences and skills learnt by undertaking research /…/" (p. 5). Therefore, one option to consider in Estonia is a shift of emphasis towards the development of local practices, and promoting research papers with a practical value for the benefit of the local community. In addition, as indicated by the results of this study, the field of Educational Sciences is moving gradually towards article-based doctoral dissertations, which are mostly written in English with international distribution in mind. This, however, could result in a situation where in-depth presentations of research results in Estonian become rare.

With regard to supervisors' conceptions of the quality of doctoral dissertations, the results implied that most of the criticism was aimed at article-based doctoral dissertations defended in the field of Educational Sciences. Thus, of note is the result providing the supervisors' perspective on the most important features of high-quality article-based dissertations. While there have indeed been previous studies focusing on the significance of synergy in doctoral theses (Trafford & Leshem, 2009), none of such studies have been dedicated explicitly to describing the bottlenecks unique to article-based dissertations when it comes to achieving synergy. The findings presented in Article II are therefore substantive, demonstrating that, in collections of articles, a lack of coherence in the review article between the different studies is considered problematic, as well as the notion that the article-based dissertation format does not allow the doctoral student to gain a deeper understanding of their research topic. The above-mentioned, on the one hand, could naturally be seen as criticism aimed at doctoral students who had failed to write adequate dissertations. On the other hand, this criticism could also be seen to reflect bottlenecks in the supervisory process, especially when it comes to the initial planning stage of the dissertation. This leads to two somewhat provocative questions: (1) To what extent did such dissertations warrant more in-depth study planning on the part of the doctoral student and the supervisor, so as to prevent the problems that ensued?

(or: To what extent would a *hands on* approach (Sinclair, 2004) have been helpful in improving the quality of such dissertations?); (2) To what extent is the issue of such doctoral dissertations being eclectic even one that can be traced back to the doctoral student? Therefore, as a practical recommendation based on this finding, it is relevant in the broader context of doctoral studies to discuss the supervisor's role in assuring the quality of doctoral dissertations; even more because articles used in article-based dissertations are usually co-authored, and the supervisor should thus have an understanding of the way these articles would be combined into a coherent whole.

All of the above indicates that the issue of the quality of doctoral dissertations is a relevant topic of discussion. This is also confirmed by the results of this study, namely in that the supervisors expressed uncertainty with regard to the requirements and rules set for doctoral dissertations, simultaneously highlighting the importance of enforcing more clearly worded agreements on the quality criteria for doctoral dissertations both within and across universities. The sense of security provided by such agreements would aid both supervisors and doctoral students already in the planning and writing stages of the doctoral dissertation, and also help to prevent situations where only "at the time of defense and during the defense procedures do the supervisors learn about and coordinate their understandings of the requirements for doctoral dissertations" (Karla, ED). Instead, the supervisors would arrive at shared conceptions already in the course of prior discussions and agreements. This is endorsed by Park (2005), according to whom doctoral examinations during the vivas can be viewed as socially constructed encounters in contrast to completely objective and impartial processes, making negotiations and agreements in this matter especially critical.

Consequently, to sum up the theme of *the aims of doctoral education and the quality of doctoral dissertations*, it could be said that based on the conceptions of supervisors, the theoretical contribution of the current dissertation lies in pointing out the disadvantages of article-based dissertations. Some practical implications include the need to initiate discussions between different concerned parties over the necessity and possibility of the professional doctorate system. In addition, it is of importance to reach a common understanding of the requirements a doctoral dissertation should meet in Estonia, main aims of dissertations, how to eliminate current drawbacks concerning the quality of doctoral dissertations as well as of the role and responsibility of a supervisor in ensuring the quality of a doctoral dissertation.

The Study Period of Dropout PhD Students and the Factors Associated with the Discontinuation of Studies

The findings of the study conducted among dropout doctoral students indicated that the decision of discontinuing their studies had been the result of a combination of several factors for the participants. Both personal and interpersonal factors were cited, including a lack of support with regard to curriculum

courses, issues related to supervision, and an overall lack of community support. The results of the study are therefore in line with earlier studies (Ampaw, 2010; Bair & Haworth, 2004; Lovitts, 2001; Nelson et al., 2001; Smith et al., 2006) demonstrating similarly that the reasons behind doctoral students' progress and dropping out are often intertwined.

Compared to previous studies, one of the new angles discovered was that one of the motivational aspects influencing the students' decision to enroll in doctoral studies had been the supervisers' invitation, whereas the students themselves had minimal personal interest in enrolling. Earlier studies have indeed listed several factors contributing to the decision of commencing doctoral studies (e.g., Wellington and Sikes [2006], intrinsic and extrinsic motivations), however there have been no prior descriptions of situations where the main incentive for enrolling had been the invitation of a third person (the supervisor). Once a PhD student has enrolled in doctoral studies in this way and the student does not develop intrinsic motivation over the course of their studies or in case the intrinsic motivation is not supported by environmental factors, the decision to discontinue their studies comes easily. Thus, the distinction of "being invited by the supervisor" as a motivational factor in the results of this study adds one more example of possible extrinsic motivational factors to research concerned with PhD students' motivation.

As it emerged from the results of the study that this extrinsic motivating factor had been highlighted by the dropout doctoral students as an element that made it easy for them to discontinue their studies, special attention should be paid to this factor in the process of selecting suitable students for doctoral studies. By doing so, the situation pointed out by Gardner (2009), where people simply drifted into doctoral studies and were therefore both improperly suited as well as inadequately motivated for doctoral studies, will be minimised. It emerges therefore from the results that it is indeed important to discover a student candidate's actual motivation for applying before admitting them to doctoral studies.

One option for this would be to introduce a system of pre-PhD programs as suggested by Sonneveld (2015). The role of this system would be to test student candidates' motivation (i.e., the student's ambitions), while also helping the student to develop their research plan and allowing them to communicate and build a relationship with their supervisor. This would also improve the situation described by several doctoral supervisors in their interviews as worrisome and dissatisfactory; namely, people studying in PhD programs whose academic capabilities and personal characteristics were not sufficient for this aim. The presence of such opinions among supervisors further supports the notion that students suitable for doctoral studies should be prepared in a more purposeful manner, as this would be helpful in discovering the student candidates' motivation as well as their capabilities and work ethics even prior to their enrollment. Additionally, such preparation would let the students know what their future studies would entail and whether or not they are fundamentally ready for

this period of studies. At the same time, a situation should be avoided where the development of doctoral studies becomes too focused on selecting the best candidates during the application period, neglecting the development of the content and organization of PhD studies (Lovitts, 2001). Rather, the organization of doctoral studies should move towards a systematic, purposeful, and substantive preparation of doctoral students, with the functional cooperation between the doctoral applicant and their potential supervisor commencing already at a previous level of study. Moreover, it is also important to make efforts to maintain the PhD students' motivation during their studies, especially in light of the results of this study indicating that doctoral students of Educational Studies both study and work in other positions simultaneously, and are having trouble coordinating their professional life with their studies (see also Eamets et al., 2014).

In relation to passing curriculum courses, the results of the study carried out among dropout doctoral students indicate that the students had mostly completed all of their curriculum courses by the time of discontinuing their studies. The results are thus in agreement with Lovitts' (2005) study indicating no correlation between the completion of curriculum courses and dropping out.

It is, however, relevant to point out that the former doctoral students were critical of the low level of interconnection between the curriculum courses and their doctoral dissertations. One side of this issue is the question of whether it should even be the aim of curriculum courses to support each individual student's dissertation writing process or if the courses should rather aim to develop the students' broader transferable skills, leaving the choice on specific curriculum courses that would support the student in their dissertation writing up to the supervisor and the supervisee themselves (allowing them to also jointly select, e.g., international courses that would help the student acquire the skills and competences they need). This idea is also supported by the results of the study carried out among doctoral supervisors (Study 2). There were those among the study participants who said that the choice of courses offered in the curriculum was limited and that the curriculum courses could therefore not adapt to the needs of each individual doctoral student. The need to critically review the contents of courses in doctoral curriculum is also supported by a study of Smeby (2000), the results of which demonstrated that coursework might be the reason why a PhD student lacks time to deal with their dissertation for which reason the duration of studies is extended. Therefore, it is relevant to consider the necessity of each course in the curriculum precisely from the perspective of student's development and the writing of the dissertation, thus, a practical implication would whereat be having a broader discussion involving feedback gathered from both doctoral students and their supervisors with regard to curriculum content. An important facet of this discussion should be the issue of offering more choice, so that the PhD students could complete their curriculum courses in a more flexible way. This, in turn, would allow doctoral students to engage in further cooperation with other PhD students from different

academic communities throughout their studies. Regarding the improvement of existing courses, it is important that the lecturers of PhD level courses be aware of the research topic of each doctoral student taking their course and try to create opportunities for discussion in order to support the students in transferring the material.

The results also suggest that it would be necessary to reconsider the methods used for ensuring the PhD students' transition from the dependent stage of participating in their curriculum courses during the first year(s) of their studies to the independent stage where they have no (or very little) regular university-related responsibilities. The dropout PhD students of Educational Sciences participating in the study described the course of their studies following the completion of their curriculum courses as largely independent work only supported by supervisory meetings mainly initiated by the doctoral students themselves. The findings of the study carried out among doctoral supervisors also confirmed that supervisors of Educational Sciences largely leave the initiation of supervisory meetings up to their supervisees. Lovitts (2005) point out that the transition from dependence to independence is a critical phase for the doctoral student, as they may not be prepared for such a level of independence. The smoothness of this transition can certainly be helped significantly by both the supervisor as well as the institution in a broader sense. For instance, Floresh-Scott and Nerald (2012) find it necessary that doctoral students be guided to further identify themselves with other members of their community by engaging in the creation of both formal and informal communication opportunities on an institutional level. This recommendation should also be followed in the development of Estonian doctoral education.

An important element pointed out by the former PhD students participating in our study as a contributing factor towards their discontinuation of studies and by doctoral supervisors as a contributing factor towards students study stalls was doctoral students having work responsibilities unrelated to their doctoral dissertation. A lack of financial means resulting in time constraints and overload for doctoral students has also been indicated as a cause of prolonged study periods and study discontinuation in other studies (Ampaw, 2010; Ampaw & Jaeger, 2011; Lovitts, 2001; Tinto, 1993). This leads to the conclusion that from the perspective of the universities, offering funding opportunities for doctoral students could be an important means for preventing PhD students from becoming encumbered with other activities, thus facilitating their concentration on their dissertation. An analysis of the activities of participating supervisors from the field of Natural Sciences (but also those of Science Education and, in a few rare cases, Educational Sciences) reveals that securing funding for the student is something that they do even prior to the official start of their supervisee's doctoral study period. Writing research projects, gaining additional funding, and thereby making it possible for the university to employ the doctoral student also appears to be a positive solution from the perspective of functional supervision (Lee, 2008), as it also leads to a more *hands on* super-

vision approach proved to be more effective than less functional approaches and *hands off* supervision (Sinclair, 2004).

Based on earlier studies (e.g., Austin, 2002; Floresh-Scott & Nerald, 2012; Gardner, 2010; Golde, 2005; Lovitts, 2001; Stubb, 2012), doctoral students communicating with other members of the community actively, and such interaction being perceived as positive by the PhD students, has a positive effect on the students' level of satisfaction with their studies, leading to a reduced likelihood of study discontinuation. The participating dropout students described their former relationships with their student peers as friendly and supportive, while also noting that due to having been engaged in other work activities at that time, their interactions with their peers had often been quite infrequent outside of the studies. The participants conceded that in retrospect, more frequent contact with their peers could have facilitated their study progress. Therefore, another option that should be considered more frequently in the development of the organization of doctoral supervision and that of doctoral studies in general is the creation of means for peer support even after their curriculum courses have been completed. This measure would ensure the engagement with various people from within the academic community, as described by Weidman et al. (2001), and Stubb (2012). One way for this to happen would be to regularly arrange common events for doctoral students where the students could provide each other with emotional support, general advice, as well as recommendations with regard to specific content knowledge, as suggested by Austin (2002). A part of such events, students could meet and socialize with other members of the academic community, as the participating non-completers also commented in their interviews on additional pressures during their studies arising from the fact that certain doctoral students ("insiders") had been preferred to others precisely because they had been familiar with the lecturers outside of the classroom. By enjoying more opportunities for interaction, it would also be easier for PhD students to integrate into their community, which is necessary in order for them to gain a deeper understanding of the community rules and standards, as also pointed out by Golde (1998) and Stubb (2012).

The study conducted among dropout doctoral students indicates that the participants found fundamental deficiencies in both the assessment as well as constructive feedback aspects of the progress review committee meetings. Nevertheless, on the one hand, progress reviews constitute a means for monitoring the students' study progress (see more in Study Regulations, 2014; Tallinn University Regulations, 2014), the review meetings should, on the other hand, also serve to help the doctoral student to make progress in their dissertation writing, allowing the student to gain suggestions from experts other than their supervisor for the further development of their thesis. However, a question could be raised to which extent it is possible to achieve these two goals together (control/assessment and constructive feedback/support), or how justified it would be. In fact, these are in essence conflicting functions, which should be separated for the purposes of proper evaluation of and constructive feedback on

doctoral dissertations. For instance, the evaluation of a PhD student's completion of the curriculum, and thus, the formal quality control of the performed work could be carried out based on separate (attestation) documents on the grounds of formal parameters, to establish and enforce stricter requirements for progress reviews and to provide additional support for students who fail to meet these requirements. Yet, the meaningful consultation of a PhD student which takes into consideration each student's needs could take place separately. Therefore, a suggestion at this point would be to constitute a consultative committee of specialists following from the particular PhD student's doctoral dissertation and its particularity that would also include members of the future defence committee. This would enable the members of the committee to go in-depth in their work whereas the PhD student, in addition to receiving content-rich and constructive feedback from experts in the particular research topic, would also be asserted that the members of the future defence committee are aware of the developments of the dissertation. Based on the above, one recommendation for the decision makers engaged in the organization of doctoral studies would be to reshape the progress review system allowing the PhD student to gain as much constructive feedback on their work as possible.

In addition to the factors impacting the course of studies pointed out by the students who have discontinued their studies, a research (Study 2) carried out among doctoral supervisors also added new knowledge with regard to the reasons leading doctoral students to extend their study period (see more in Articles III and IV). While most of such reasons (insufficient funding, doctoral students' skills and competences, motivation) have already been mentioned in existing literature (e.g., Bair & Haworth, 2004; Lovitts, 2001; Manathunga, 2005), this study provides new knowledge by adding the process of article publication to the list of factors interfering with study completion within the nominal study period. This factor becomes especially problematic in cases where a doctoral student (of Educational Sciences) starts with their research independently from the very beginning and is unable to co-author articles as part of a research team. In connection with the above, the supervisors also mentioned poor English language skills as an additional factor further hindering the student's study progress. This study, therefore, expands the list of factors contributing to the extension of studies by adding to it the length of the article writing process (and related problems), and doctoral students' poor foreign language skills.

Consequently, to summarise the abovementioned, it could be said that with regard to the theme of dropout Educational Sciences PhD students' descriptions of the process of doctoral studies and factors associated with the discontinuation of studies, the theoretical contribution of the current dissertation lies in the emergence of the motivational factor *"being invited by the supervisor"* from the results of the study, thus, adding a novel factor to the description of extrinsic motivation. Likewise, value can be seen in the results of researching supervisors which demonstrated, in addition to prior studies, that the study period is also extended by the length of the article writing process and doctoral students' poor

foreign language skills. Practical implications include giving special attention to eliciting the intrinsic motivation of PhD students at admission; content analysis of the courses in the doctoral curriculum (based on the feedback from different concerned parties and the aims of doctoral education) in order to understand how essential the courses from the perspective of students' development and the completion of doctoral dissertation are to achieve optimal balance between the courses in the curriculum and the courses agreed upon in the process of flexible co-operation between the supervisor and supervisee. In addition, it would be necessary to increase doctoral allowances on the university as well as national level as it would enable to commit to studies full time and also to guide supervisors in raising additional finances to enable the PhD students' work in research groups. More purposed attention should be given to the development of co-operation between the PhD student and the academic community to allow for interaction with fellow PhD students as well as with other academic peers. What is more, the progress review system should be reorganized to enable adequate assessment of student's progress in doctoral studies, and should the need arise, to direct the student to take advantage of consultations or support systems. At the same time, it should be ensured that students receive constructive feedback and meaningful suggestions for the development of their work not only from the supervisor but also from specialists of the particular field.

Supervisors' Tasks and Responsibilities in the Course of Doctoral Studies

When analyzing supervisory activities based on the model of Lee (2008, 2010), the results indicated that the participating doctoral supervisors' descriptions of their supervisory activities included all five aspects of the holistic approach to supervision. The functional approach, described by Lee as the backdrop to all supervision, was prevalent in the Educational Sciences supervisors' descriptions of their supervisory activities only as part of the initial phase of the supervisee's doctoral studies. At this time, the PhD student's individual study plan was drawn up and the focus and methodology of their research study were established. After this, the standard supervisory process shifted towards the doctoral student's initiative and stopped featuring regular meetings between the supervisor and the supervisee, defined by Sinclair (2004) as the *hands off* approach. According to the study results, there were two main reasons for this. On the one hand, the supervisors were accepting of the fact that their students worked full-time in addition to their doctoral studies, and could therefore only make progress in their studies whenever they had the time. On the other hand, it was the supervisors' view that a doctoral student would grow into an independent researcher by working independently and that it was therefore necessary to allow the student to progress at their own pace, only consulting with the supervisor in case of any problems or whenever they felt the need to do so. By aiming at student independence, the supervisors therefore reinforced another aspect of Lee's (2008, 2010) approach: emancipation. This aspect is focused on the personal growth and development of the PhD student.

Placing value on the independence of students is also in line with several documents describing the outcomes of doctoral studies. For instance, emancipation is listed as an outcome of doctoral studies both in the Estonian Qualifications Framework (2008), and in, e.g., the European University Association's (2010) document Salzburg II Recommendations document ("*The goal of doctoral education is to cultivate/.../ intellectual autonomy*" [p. 4]). At the same time, leaving a PhD student to their own devices in order to encourage their emancipation may not be an optimal approach in terms of facilitating the student's study progress. For instance, Sinclair (2004) also notes in his description of the *hands on* approach to supervision that while it is important to endorse a PhD students' emancipation and development into an independent researcher, this does not mean that the student should work completely alone and also be the only instigator of supervisory meetings. One of the reasons that it may not always be practical to wait for the supervisee to initiate a meeting is that doctoral students are not always aware of when and what kind of assistance they need, as pointed out by Manathunga (2005) in her study. The supervisor's lack of initiative, even if it is the student's wish to progress at their own pace and maintain the initiative, allows the doctoral student to keep postponing the supervisory meetings. This results in the supervisor not having a sufficient overview of the PhD student's progress in their work. Regular meetings would, therefore, help the supervisor to be better informed of the student's progress, while also setting attainable intermediate goals for the student and guiding them to work in a more purposeful manner, as also suggested by Lee (2008) and Manathunga (2005). Thus, this means that functional supervision is necessary to be kept as the baseline throughtout the doctoral study process.

In the context of functional supervision, supervisors from the field of Natural Sciences were different from the group of Educational Sciences supervisors in reporting the everyday co-operation between the supervisor and the student (the ongoing work in the research group, and thus, the regular co-operation in supervision): supervision that can clearly be described as functional and *hands on* supervision. Considering that supervisory styles characterized by functionality and a general *hands on* approach are conducive to PhD students progressing faster in their studies, it would be desirable for Eductional Science doctoral supervisors to become more aware of the essence of this approach. At the same time, it is of relevance that attention is given to the disadvantages of the *hands on* approach to avoid a situation in which the development of a doctoral student into an autonomous scholar during doctoral studies is little supported or even suppressed.

One particularly noteworthy aspect of Lee's (2008) approach is the acknowledgement of an enculturation approach as an important part of supervisors' supervisory conceptions. According to the results of the study, supervisors mainly support enculturation in their supervisees by means of helping them to become members of the international research community. At the same time, the supervisors did not mention any activities aimed at supporting the integration of their PhD students into the local community, with the exception

of facilitating cooperation between doctoral students during their supervisory seminars and, in the case of supervisors from the field of Natural Sciences (and Science Education), providing the students opportunities for work in research groups. Considering, then, that doctoral students should also acquire the disciplinary norms and conventions of their field (Austin, 2009; Gardner, 2010) prevalent within the local (Estonian) community of researchers, this could be facilitated by creating as many opportunities as possible for the PhD students to interact with researchers in their field. This, in turn, would require purposeful action on the part of the supervisor. In this regard, it emerged from the results that supervisors from the field of Natural Sciences already referred to their doctoral students as equal community members.

According to the interviews carried out for this study, supervisors mainly support the development of their doctoral students' critical thinking ability (Lee, 2008, 2010) by means of discussions held at supervisory meetings and through feedback provided for the students' articles and segments of their dissertation manuscripts. In some cases, the supervisors also reported instructing their student on how to synthesize literature and question the sources as a part of teaching them academic writing skills.

All of the participating supervisors said that they considered it important to have a good relationship with their supervisees and to engage in relationship development, as explained by Lee (2008, 2010). It was also considered favorable in terms of the relationship to be familiar with the doctoral student from their previous levels of study. The results did not, however, help to ascertain whether the supervisors made any targeted efforts to improve their relationships. According to Sinclair (2004), purposeful cultivation of a trusting relationship with the supervisee is one of the features characteristic the *hands on* supervisory approach resulting in higher rates of study completion. It is therefore important that supervisors also consciously engage in cultivating and maintaining such trusting relationships. The existence a trusting relationship between the supervisor and the supervisee makes it easier for the supervisor to recognize, over the course of the supervisory process, when the doctoral student is experiencing problems and to identify these problems, allowing them to intervene in an appropriate and timely manner. For the supervisees, having a trusting relationship with their supervisors would allow them to approach their supervisors with confidence.

All in all, the supervisors made use of both *hands on* and *hands off* approaches (Sinclair, 2004), as well as a combination of the elements of Lee's approach (Lee, 2008, 2010): functional, enculturation, critical thinking, emancipation, and relationship development concepts were being applied, according to the participant's descriptions of their own supervisory activities.

Another valuable result of the study conducted among doctoral supervisors is that, on the one hand, supervisors do not see the completion of studies within the nominal study period as a goal in itself and, on the other hand, that according to the supervisors' perceptions, it would be unreasonable to expect

faster study progress from the PhD students, as they are simultaneously working in other positions in addition to their doctoral studies. Therefore, if Lee (2008, 2010) in her approaches to supervision refers to functional supervision as the foundation for fast and efficient study progress (similarly to Sinclair's [2004] broader *hands on* approach), the results of this study indicate a direct connection between the use of functional supervision and the supervisors' conceptions with regard to whether or not it is possible for a doctoral student to develop into a "fully grown" novice researcher in the course of four years, as well as any other environment factors facilitating the adoption of a functional approach. Thus, it can be said that a supervisor's choice concerning whether or not they should apply a functional method of supervision (thus, in a broader sense, a choice between Sinclair's [2004] *hands on* and *hands off* approaches) is influenced by their conceptions as to the aims of doctoral studies (emphasis on the process or the product, according to Park [2005]) as well as environment factors.

Consequently, it can be said that in relation to supervisors' tasks and responsibilities in the course of doctoral studies, the theoretical contribution of the particular dissertation can be seen in the result according to which supervisors' choice of functional and *hands on* approach (or rather the application of limited functional supervision and *hands off* supervision) is influenced by supervisors' conceptions of the aims of doctoral study as well as of the funding opportunities of the student. Based on the study results, practical implications include the importance of identifying supervisors, doctoral students, and institutions' expectations towards doctoral studies and designing further strategies on the basis of this roadmap. It would be relevant to plan different discussions that would focus on varied supervisory styles and the harmony between supervisors' conceptions and supervisory practices and the aims of doctoral studies and the possibility of completing the degree in nominal period of study. Knowing that PhD students also often work full-time while in doctoral studies, it is relevant to be based on these understandings when adapting different scenarios in doctoral studies (with regard to the duration of the study period as well supervisory styles), while still ensuring the development of the doctoral student in all aspects pointed out by Lee (2008, 2010). At the same time, it should be monitored that carrying out studies on doctoral level remains financially acceptable for universities.

Connections between the Supervisors' Own Postgraduate Study Experience, Their Supervisory Conceptions, and Current Supervisory Practices

Findings concerning the doctoral supervisors' activities that they reported to have transferred to their current supervisory practices from their own experience as a supervisee corroborate the results of Delamont et al. (1998), confirming the relations between current supervisory practices and prior experience. Aspects such as placing value on the student's independence and the conscious adoption of a *hands off* approach, emphasizing the importance of being a member of the community, and allowing supervisory communication with the student to take

place on even grounds were all listed by the supervisors as perceptions and activities transferred to their practices in this way. The emergence of the abovementioned aspects in the results of the study adds to previous research (e.g. Delamont et al., 1998) more detailed descriptions of the factors transferred from supervisors' own experience of being a supervisee to current supervisory practices while also highlighting the context characteristic to the period as the shaper of current supervisory conceptions (see Article V).

It is also important to highlight a result that in some of the cases, supervisors own degree studies had been hindered by continuing their doctoral/postgraduate studies with the same supervisor that they had had as their supervisor at the previous level of study (i.e., the supervisor of their Master's thesis) (see more in Article V). To the knowledge of the author, no previous studies have clearly indicated this set of problems described by the study participants as a vertical relationship between the teacher and the student, a relationship that, in their case, at the time of their postgraduate studies, had not allowed them to feel as an equal discussion partner in the supervisory process. The present study, therefore, also provides new insights by demonstrating that it is possible for doctoral students to experience their supervisory relationship from a previous level of study as a hindering factor with regard to their studies and growth. On account of this, with such supervisory relationships, supervisors should pay attention to this aspect in particular.

In addition to the abovementioned, what is significant about these results is that the supervisors' own experiences from their period of being a supervisee are heterogeneous and that the supervisors also ascribe different importance to their experience. Therefore, it would be beneficial to provide opportunities in the course of various training courses and seminars for supervisors to discuss their experiences, listen to other supervisors, share and analyze their supervisory practices, and thus become more aware of the variety of supervisory methods available as well as the necessity of combining different methods.

In general, it should also be noted that in spite of the fact that the study carried out among doctoral supervisors was small-scale and used a disproportionate sample, it is possible to point out that the conceptions and descriptions of activities of doctoral supervisors from the field of Educational Sciences displayed a greater variety than those of supervisors from the field of Natural Sciences, with regard to both recollections of their own studies as well as descriptions of their current supervisory practices. The supervisors from the field of Science Education were more similar to the latter in their conceptions and descriptions of their supervisory activities. At the same time, as shown above, their current day supervisory principles and practices were also more diverse that these of colleagues from the natural sciences, indicating that the diversity of experiences may have effected the cacophony of modern day supervisory practices in Educational Sciences.

To conclude, it can be said that in relation to the topic of connections between the *supervisors' own postgraduate study experience, their supervisory*

conceptions and current supervisory practices, the theoretical contribution of the current dissertation lies in its results (Article V), which confirm the results of the few prior studies on the particular subject (Delamont et al., 1998; Lee, 2008), thus, expanding on the previous studies on the connections between postgraduate studies and later supervisory practices. Similarly, pointing out the role of the context characteristic of the period is of value. Therefore, the current study specified and expanded on previous knowledge of the existence of different supervisory styles from a historical aspect (e.g. supervision on single accounts, supervision from long distances, public defence in an unknown community). In addition, the study provided additional information about the risk related to the communication between a PhD student and a supervisor by pointing out the vertical style of communication as a factor hindering studies in a situation where such supervisory relation has existed between the same supervisor and supervisee on the previous level of study. Since the current study implied that supervisors' own postgraduate experiences differ and different meanings are ascribed to experience, a practical implication would hereat be to offer supervisors the opportunity during various trainings and seminars to contemplate on their experience, analyse their supervisory practices (it would be necessary to hold joint discussions with supervisors from different areas) to become more aware of the diversity of supervisory methods and of the necessity of combining these.

Based on the results of the studies underlying the current dissertation, recommendations (intended for supervisors, aimed at faculties/departments, and broader recommendations aimed at universities and policy makers) are summarized in Appendix 8.

In conclusion, the doctoral student's contribution to their doctoral studies together with the supervisor's contribution to the supervisory process has an impact on the achievement of the aims of doctoral studies, as well as doctoral studies in the overall sense.

6.2. Limitations of the Study

Despite this dissertation making a valuable theoretical as well as practical contribution to the development of doctoral studies and having, in the author's estimation, reached its aims, there exist also a number of limitations to the studies. The following subchapter gives an overview of the limitations, explaining their causes and possibilities for future avoidance, while also assessing the impact of each limitation on the results of this dissertation.

One of the limitations of the study has to do with the adequacy of the sample for the study carried out among doctoral supervisors (Study 2). Altogether, 15 doctoral supervisors from the field of Educational Sciences (including 3 from the field of Science Education) and 6 supervisors of Natural Sciences took part in the study. Although the inclusion of participants from the field of Natural

Sciences was justified (see justification in the methodology chapter) from the aspect of creating a reference group, the subgroups are nonetheless unequal in their size (N=15; N=6). Because the supervisors were divided into additional three subgroups based on their supervisory experience (supervisors with no doctoral completions [N=6]; supervisors who had supervised between 1 and 5 successfully defended doctoral dissertations [N=11]; and supervisors who had supervised 6 or more successfully defended doctoral dissertations [N=4]), they were further categorized into smaller subgroups within the two disciplines. The sizes of the subgroups had not been given special consideration in the creation of the study sample. Although it was not an aim of the study to directly contrast the groups with each other, a more deliberate and balanced sample would have been helpful in highlighting any possible distinctive patterns that emerged on a subgroup basis. This limitation of the sample selection may, therefore, interfere with the transferability of the study results. In any future studies, it would be useful to pay significantly closer attention to the equal division of possible subgroups in the sample already in the planning phase of the data collection.

Another limitation to do with the sample could be that this study did not take advantage of the opportunity to purposefully include student-supervisor pairs in the sample (dropout doctoral student, Study 1; supervisor of the same student corresponding to the sample criteria, Study 2). The inclusion of such participant pairs would have been helpful in highlighting in more detail the factors related to the discontinuation and extension of doctoral studies. Although several non-completer/supervisor pairs could be identified in the data analysis phase, it was considered ethically inappropriate to combine the data retroactively. It should, however, be kept in mind in the planning and data collection phases of any future studies that the sample should be as detailed and "proactive" as possible with regard to any potential points of interest. The future areas of study could include, e.g., the overlap and differences in the supervisors' and supervisees' descriptions of the supervisory cooperation, as well as the possible transference of supervisory patterns to the next generation.

The third significant limitation of the study has to do with the limitations of the instrument. In spite of pilot interviews having been conducted, it emerged in the course of data analysis that both the dropout doctoral students as well as the doctoral supervisors had pointed out academic writing skills as a factor influencing the students' study progress, and that at same time, both groups considered academic writing skills to be important for the successful completion of doctoral studies and for a future research career. In light of this, it is the author's retrospective opinion that the interview guides for the studies used as the basis of this dissertation should have included more (in-depth) questions relevant to this topic. Therefore, a topic as important as support for doctoral students' academic writing skills and doctoral supervisors' practices in this regard received rather general treatment in the data set of the study and has not been explored in further detail in the results of this dissertation. Acknowledging that the topic of doctoral students' writing activity and supervisory support of this

activity could provide significant information for the development of supervisory practices, the author of this dissertation together with her colleagues have started collecting new data specifically on the topic of the academic writing habits of doctoral students.

It is the author's opinion that the choice of thematic analysis as the method of data analysis used in this study allowed the study to achieve its objectives, and was therefore justified. There exists, however, a certain inconsistency in the presentation of the study results in connection with the use of verbal counting. On the one hand, the researcher has noticeably attempted to avoid verbal counting (using phrases such as *one part*/*another part of the participants*), while, on the other hand, there are also instances where verbal counting has been used (quantifiers such as *few*, *several*, *rare*, *sometimes*, etc.). As a researcher conducting a qualitative study, the author had a choice of at least two different approaches. On the one hand, Wainwright (1997, as cited in Pyett, 2003, p. 1174) states that in the case of data collected by means of interviews "it is the quality of the insight that is important, rather than the number of respondents that share it", as well as that "counting responses misses the point of qualitative research, as frequency does not determine value" (Pyett, 2003, p. 1174). Thus, the author could have based the presentation of results on the assertion that if a theme that emerges in the course of a thematic analysis is important and insightful from the perspective of the research question, its significance is not necessarily determined by the number of participants mentioning that particular theme. From this point of view, it would have been appropriate to avoid using any quantifiers at all in the presentation of results. On the other hand, a different position is also widespread in the methodological literature (e.g., Sandelowski, 2001). According to this approach, counting is integral to the process of analysis, and presenting the results of a qualitative study in a numerical form provides an opportunity to "make patterns emerge more clearly or, generate new questions or new lines of analysis, it can also clarify meaning" (Sandelowski, 2001, p. 233). According to this stance, the author could have presented numeric information more extensively (e.g., presented the numerical data at least in the stage of data analysis and decided thereafter whether the presentation of numerical data would serve the objectives of the study at hand or improve the readability and transferability of the results from the readers' perspective).

6.3. Suggestions for Further Research

Although this dissertation focused on several important aspects with regard to the experiences of doctoral supervisors and dropout PhD students, there are a number of issues in addition to the above that would need to be examined in future studies, and a number of aspects that raised some new questions during the discussion of results. Below, some of the more relevant suggestions for further research are presented.

Firstly, as several of the supervisors participating in this study said the quality of doctoral dissertations to be uneven and cited a need for the requirements set for dissertations to be refined and coordinated. Future research should focus specifically on the quality of doctoral dissertations, including the practices of progress review committees (providing feedback for the doctoral dissertation and a final assessment of the dissertation). The need for further research on this topic was also pointed out at the 8th Annual Meeting of the European University Association Council of Doctoral Education by Sonneveld (2015).

Secondly, as one of the groups of participants in this study was made up of dropout doctoral students, it would also be valuable to investigate the success stories of doctoral studies, successful doctoral students who have completed their studies within the nominal study period, in order to learn about, e.g., their perspectives on their period of studies, as well as any factors associated with study progress and successful completion of studies. This data could then be contrasted with the results concerning dropout doctoral students with regard to, e.g., motivation, funding, and socialization, giving cause for a discussion on the true nature of the requirements that need to be met by the doctoral student and their environment for the successful completion of doctoral studies.

Thirdly, it might be of interest and value to create a blueprint of the kinds of support systems in place in different countries for doctoral supervisors and the supervision monitoring systems in place; and to study the opinions of the Estonian doctoral supervisors in relation to the possibility of applying such systems.

In conclusion, as this study was mainly focused on the field of education, it would be necessary to include other areas in the study of doctoral students and supervisors within Estonia. In addition to the extension of the field of study, another possible step could involve broadening the sample in terms of different academic fields. In this context, it should also be thoroughly analyzed whether it is really possible or necessary to directly transfer practices from one discipline with long research transitions (e.g., Natural Sciences and Educational Sciences) to another.

In future research of doctoral studies, a more extensive use of method triangulation (e.g., collection of quantitative data in addition to qualitative data or carrying out additional data analysis such as phenomenographic analysis) would allow for a deeper understanding of the subject.

There is, however, certainly a need for further studies exploring the topic of supervision, as this would allow the different parties (both supervisors, doctoral students, as well as the institutions responsible for the organization of doctoral studies) to learn from the experience of others.

APPENDICES

Appendix 1. Learning outcomes of doctoral degree qualifications

Table is based on the Aarna et al., (2012, pp. 39–41) and Estonian Qualifications Framework (2008, p. 2).

Learning outcomes of doctoral degree qualifications	**Explanations**
Knowledge (theoretical and/or factual) – at the most advanced frontier in the field of work or study and the interface between fields.	• Have broad knowledge and a systematic overview within their field of research, and an in-depth and up-to-date knowledge within a narrower sphere of the field of research. • Understand the meaning and scope of the existing knowledge and research methods within the field of research as well as between fields to extend, re-evaluate, and formulate them as necessary. • Have a command of research methods in their field of research.
Skills (cognitive skills) – the most advanced and specialized skills and techniques, including synthesis and evaluation, required to solve critical problems in research and/or innovation, and to extend and redefine existing knowledge or professional practice.	• Be able to independently and critically analyze, synthesize, and evaluate new and complex ideas relating to the specialty, and creatively and with scientific accuracy identify and formulate research questions. • Be able to conceive, design, implement, and critically evaluate research and development projects leading to new knowledge and new procedural solutions. • Be able to present orally or in written form to both specialist audiences and in communication with non-specialists the problems and conclusions relating to their branch of science, their own research, and the underlying theories. Be able to present their reasoning and participate in relevant discussions in the language of instruction as well as a foreign language essential for their specialty, and publish original scientific results in internationally pre-reviewed academic publications. • Be able to analyze social norms and relationships, comply therewith, and act to change them as necessary. • Be able to provide scientific ethical assessments, show insight into the possibilities and limitations of science, the social role of science, and the responsibility of people in the use of scientific achievements.

	• Have the ability to identify their own need for developing further knowledge or skills, and support the studies of others in the context of both education and science and on a wider societal level. • Be able to impart with competence their knowledge by teaching, instruction, or in another manner.
Scope of responsibility and autonomy – demonstrate substantial authority, innovation, autonomy, scholarly and professional integrity, and sustained commitment to the development of new ideas or processes at the forefront of work or study contexts, including research (Estonian Qualifications Framework, 2008, p. 2).	• Be able to act independently in a complex and also international work and study environment, including in research requiring leadership and teamwork skills, innovative thinking, and the ability to make strategic decisions (Aarna et al., 2012, pp. 39–41).

Appendix 2. Interview guide for Study I

Interview topics:
1. Course of doctoral studies until dropping out (discontinuation of studies).
2. Factors believed by the former PhD student to have led to their discontinuation of studies.

Background questions
• Why did you decide to enroll in doctoral studies? • When did you enroll? • Which curriculum and institution (faculty, department)? • Which year of study were you in at the time of deletion from the matriculation register (i.e., discontinuation of studies)? • Please speak about the progress you achieved in the course of your studies (e.g., completion of curriculum courses, progress of dissertation writing, publications, work remaining until the completion of the program)?

Main questions	**Follow-up questions (and comments/reminders)**
I. Studies	
• What was your study load?	• Do you remember when and how you changed it (it was changed)?
• What percentage of the intended study activities did you participate in – e.g., curriculum courses, supervisory seminars?	
• Please describe in retrospect the emotions you associate with attending your lectures and seminars?	• Was it rather pleasant or not for you to take part in the study activities o If one, ask about the other as well? • Which part of the study activities do you associate with this/these emotion(s)?
• Could you name some teachers from your main studies that you really enjoyed studying with? • Whose lecture material seemed extremely interesting or important?	o Please elaborate – why them?
• Could you name some fellow students that you enjoyed your time together with?	• Within the framework of your studies? Or otherwise? o Please elaborate – why them?
II. Research work and supervision	
• Please try to remember your research study and describe it briefly.	• What kind of a research study was it?

• Starting from your enrollment, when were you able to begin with your research study?	
• Were you able to be engaged in conducting the research study continuously? Or were there interruptions?	• If there were any interruptions or delays, what were the reasons and when did they happen?
• Did you have to alter your research topic or the planned course of your study?	• Why? o Please elaborate – what exactly did you change?
• What kind of feedback did you receive for your research study (project, some stage of the dissertation, article) during the course of your studies?	• Please give some examples.
• Please describe the cooperation arrangement with your supervisor – in which kinds of situations and how often did you receive supervision? • What kind of tasks did your supervisor give you? • What did they focus on during their cooperation with you?	• In the preparation phase of the study; while the study was being conducted; during the presentation of results and publication . o Please give some examples.
• Did your supervisor monitor your progress and motivate you to keep moving forward? In what way?	o Please give some examples.
• What did you like about your supervisor?	• What kind of activities or situations emphasized those characteristics? o Please give some examples.
• What did you dislike about your supervisor? What kind of activities or situations emphasized those characteristics?	• What kind of activities or situations emphasized those characteristics? o Please give some examples.
• What kind of support did your supervisor provide for your dissertation writing:	• In connection with their influence and connections? • When it came to instruments and funding? • By expressing sympathy and human connection? o Please give some examples.
• What kind of support for your dissertation did you receive from the university department organizing your doctoral studies?	o Please give some examples.

III. Personal life during the studies	
• What was your household situation during the time of your studies? Were there any changes throughout your studies?	• Number of household members • Number of dependents • Number of persons under curatorship
• What was your employment situation during your studies? Were there any changes throughout your studies?	
• Where there any conflicts or troubles at that time in your life that you could link to your participation in doctoral studies?	• In connection with loved ones. • In connection with work or other activities outside of your studies.
IV. Discontinuation of studies	
• Please try to recall at which point during your studies did it become clear to you that you would probably not complete your studies?	• Could you please point out a certain circumstance or event, or a combination thereof? • Please describe the process in more detail.
• During the period before your discontinuation of studies (while it was already known that this was happening) as well as while it happened, what were the following people's attitudes towards you: o Your supervisor o Your institute or chair o Your loved ones	o Please give some examples.
• How do you see dropping out of your studies today (after your discontinuation)?	• Emotions • Profitability – what has been the impact of the discontinuation? • Is there a wish to continue studying, start again? • Please give some specific examples.

The interview guide also contains questions that were not analyzed in the framework of this dissertation.

Appendix 3. Interview guide for Study 2

Interview topics:
1. Description of the supervisor's supervisory activities.
2. Doctoral supervisors' conceptions of and views on doctoral studies and doctoral supervision.
3. The formative background of supervisors as an influence on their supervisory practices (the supervisors' own postgraduate study experience).

Main questions	**Follow-up questions (and comments/reminders)**
I. Description of the supervisors' supervisory activities	
• **In what way do you normally find your supervisees?**	• How does your contact with a potential supervisee normally begin? (assignment, student contacting you) • Which factors are important when considering a supervisee? (Academic capabilities of the student candidate, research topic, motivation – how do you find out about these things?) • Which factors are decisive in your accepting a supervisee? • Are there issues that need to be discussed and agreed upon before you make your decision?
• **Please describe your usual supervisory activities?** (e.g., take one case from among your supervisees that you would consider typical and start from the very beginning)	1. Planning • Is the writing process of the doctoral dissertation planned out together and if so, how does the planning take place? • Do you conclude any agreements on supervision – when and in which regards? • Who decides the format of the PhD student's dissertation (monograph or collection of articles)?
	2. Defining the research problem, beginning of research activity • When is the research problem defined? • Who has the initiative; whose research problem is it? (the supervisor's, research team's, shared?)
	3. Conducting the study • How often do you meet with your supervisee? (once a month 1–1, in a group?) o Pros and cons of different formats • What is the supervisor's role as a socializer? o To whom, when, and how is the supervisee introduced; which things are they included in, etc. ▪ What are the benefits according to the supervisor? What influences all of this? • What is the supervisor's role in procuring resources for their supervisee?

	○ Which kinds of resources are passed on to the student; what is the source? • What does the supervisor do in cases where the lack of a resource is clearly impeding the progress of a dissertation? (examples) • How was planning affected by the introduction of the requirement of annual plans and reports on doctoral studies? • Thoughts on progress review (is it necessary?; what are the pros and cons?; what is done before the meeting?) • Do you think the doctoral curriculum supports the acquisition of skills necessary for research work? ○ How well does the supervisor know the curriculum?; ○ What could be changed about the curriculum – e.g., giving the supervisor more/less freedom of decision?; which courses should be added?) • What does the supervisor do to support the acquisition of research skills? (what do they teach and how?) • How does your activity or your communication with the supervisee change over the course of the supervisory process? • What has prompted you to make changes? ○ Please give some examples /elaborate. • When do you see the need to make some changes? ○ What do you base your decision on?
	4. Publication • How is the idea for an article or monograph conceived? • The supervisor's preference and reasons (why they would like the student to prefer one or the other) • How often do you write together and in what way? ○ Describe the process in as much detail as you can – What is the supervisor's role during the writing process? Who is involved? Why? • What are the supervisor's tasks during the writing and publication process of an article? • What are the problems in connection with writing? (For both the student and the supervisor – e.g., the doctoral student's writing skills, publication in journals) • How are journals selected (based on which criteria)? • When is the name of the author decided and whose name is it?
	5. Writing the dissertation/review article and preparation for defense • What are the supervisor's activities in the final phase of dissertation writing? ○ When does it begin?; What does the supervisor do?

	• To what degree and in which aspects have you had to prepare your supervisees for defense? • Describe the defense procedure the way you see it as a supervisor o What do you experience?; What would you like to change?
• **How do your activities or communication with the supervisee change over the course of the supervisory process?**	• When have you had to alter your supervisory activities due to your activities thus far not leading to the desired result? Please give some examples. • What are your experiences with students who tend to "disappear" and give up – what do you do in these occasions? o What have been the critical instances – when do you get involved, why? How? • In your opinion, what causes such disappearances? (external factors [finances, family life, etc.], internal factors [motivation, the student's academic capabilities, etc.]) • What do you think are the conventions within your faculty? • What could the faculty and the university do in order to minimize the "loss"?
• **What are your positive experiences from being a supervisor?**	• How do you know that the supervisee is happy with their supervision? • What have been your most positive moments regarding supervision? • What makes you a good supervisor? • When would you consider a supervisory process to be successful? o What are the things that need to be guaranteed and working in such cases?
• **What are your negative experiences from being a supervisor?**	• Which negative supervisory episodes have you learned from and know to do better now? • Which were the negative supervisory episodes where you recognized that the mistake might have been yours, but that were left unresolved? • What are your experiences with doctoral students who "disappear" or give up – what do you do in these instances? • Which cases have been critical – when do you intervene, why, how? • What, in your opinion, is causing study stall and discontinuation of studies in doctoral students? • How do you cope with the fact that your supervisees are, in a sense, your competitors?

	• How do you cope when you sense that your supervisees know more than you do? (if applicable) • It has been said that there is a point in time where the supervisees hate their supervisor (approx. halfway through) – how do you cope with that? What do you do to prevent that? • When has the supervisory process failed? o Please give some examples of when your supervision failed. What led to up to it?
II. Doctoral supervisors' conceptions of and views on doctoral studies and doctoral supervision	
MEMO: Make sure that the questions in bold in this segment are always asked using the exact same phrasing. ** if one thing in particular is pointed out, ask about other important aspects* ** when discussing the achievement of aims, ask about the narrower (the student) and the more general sense (university, society, world)*	
• **What do you think research is?** • **What is the aim of doctoral studies?** • **What is the output of doctoral studies?**	• Which kind of career is a doctoral student being prepared for during their doctoral studies? • Which qualities should the student possess to be admitted to doctoral studies? • How should a doctoral student "change" during their doctoral studies? • What does a doctoral student learn and master during their doctoral studies? • What should the curriculum courses provide a doctoral student with?
• **What is a doctoral degree?** • **What is the output of a doctoral degree?** • **What is the aim of a doctoral dissertation?**	• Could you expand a little on this?
• **What should a high-quality dissertation reflect?**	• Please give some examples of the ways in which this has been achieved in defended dissertations. • What are the strengths of the theses that have been defended? • What are the greatest deficiencies?
• **What is your message to those in charge of developing doctoral studies in Estonia?**	• What could be done in order to make doctoral studies and supervisory opportunities correspond to your demands?

III. The influence of the supervisor's formative background on their supervisory practices	
• **Please tell the story of your growth from a doctoral/ postgraduate student to a doctoral supervisor**	• Describe the way you became a doctoral/postgraduate student o When, why, what were the incentives, why not sooner, how – who proposed to enroll? o What/who gave you confidence, what hindered?
• **Please describe your own postgraduate studies.** • **Describe the way you were supervised during your postgraduate studies**.	• What was your connection to the university at the time of your postgraduate studies? • Please describe your own and your supervisor's work organization at the time of your postgraduate studies. • What did you appreciate especially about your supervisor? o Please elaborate. • In what way would you like to be different from your supervisor? • Do you still maintain professional contact with your supervisor? What is your relationship like? • What is your own opinion of your doctoral/postgraduate study period as a whole? o Please elaborate on the reasons.
• **How has your postgraduate study experience influenced your supervisory practices?**	• What do you do similarly to what your supervisor did when supervising you? o Please give some examples and elaborate. • What do you do differently from what your supervisor did and why? o Please give some examples and elaborate. • What do you do in a completely different way and why? o Please give some examples and elaborate.

Background questions

Name ..... **Pseudonym.....**
Date:
Start of the interview: **End of the interview:**
Interviewer:
Background information on the interviewee:

- Age:
- Year of commencing own doctoral studies:
- Year of finishing own doctoral studies:
- University where the degree was defended:
- Faculty where the degree was defended:
- Supervisor of the interviewee under whom the dissertation was defended: (as many background data as possible – earlier supervisory experience, specialty, etc.):
- Supervisory processes in progress (how many, stages):

The interview guide also contains questions that were not analyzed in the framework of this dissertation.

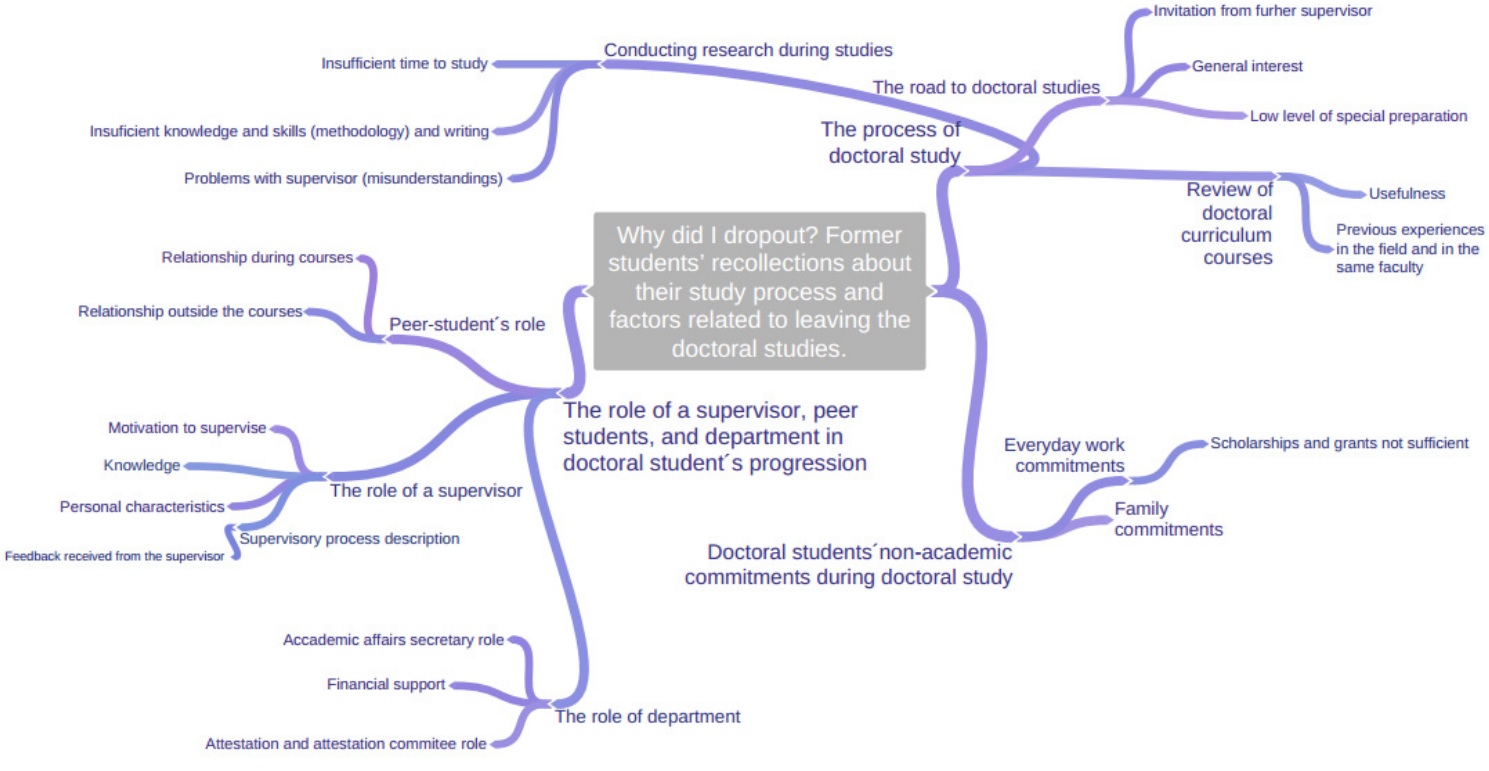
Appendix 4. Data extract with code applied, sub-theme, and theme

Data analysis sample from the Study 1 Article I (Leijen et al., 2015).

Data extract	Code applied	Sub-theme	Theme
My supervisor suggested a really long list of articles to read in order to further develop the research topic I had chosen by that time. So I read these articles and did not understand how they were connected to my research topic/.../Her/his main supervisory activity was telling me to read, read, read (Siim).	Feedback received from the supervisor	The supervisor's role	Role of the supervisor, student peers, and department in a doctoral student's progression
The main thing she/he had to say was to avoid vagueness. This comment was spot on/.../It was true and I am grateful to her/him for it. She/he did say that, but at the same time she/he couldn't say what should be there instead (Linda).	Feedback received from the supervisor		

Appendix 5. Sample of the final thematic map from Study I

Final thematic map, showing the final main themes and sub-themes (see Leijen et al., 2015)



Appendix 6. Researcher diary

(only some samples from the researcher diary extracts are presented below)

xx.yyyy. 2011	Interview 1 – XX I think the interview went well. I feel like I'm constantly comparing what the interviewee is doing with their supervisees to what is being done with me. The division of research into different stages is still a little hazy to me. This division into four parts seems artificial in a way. We should consider if we really can get all the necessary data from someone with so little supervisory experience. We should make separate leaflets for background information (to be taken along at any time).
xx.yyyy.2011	I'm a little confused… I just read interview number 6. It's so sad. I actually know how confused this person's supervisees are and how he/she doesn't supervise them at all. Now it emerges from this interview that there isn't anyone capable enough among the PhD students and that he/she thinks it to be normal to supervise in this way (to let the student fumble on their own and think that this is how they will become independent). But I will keep this background knowledge to myself and not let myself be affected by this during the analysis.
xx.yyyy. 2011	Interview 8 – YY The interview went well. I promised the interviewee that we would send them the transcript for review. I was a little bothered by the fact that I started suggesting examples from what the previous interviewees had said (e.g., "there have been these kinds of approaches", etc.) – this should be avoided. I am bothered by people who are smart. It would be easier to interview them if I felt myself to be their equal. I have this feeling of being stupid and green and without any achievements.
xx.yyyy. 2012	Help! I have just read the interview Marvi conducted with KK. I was thinking that I should write an article titled "What KNOWING ALL OF THIS does to me as a doctoral student"… All of that is very therapeutic for me. And it is so interesting that (I believe) I can get the picture about a person behind an interview just by reading that one interview. That KK seems especially sympathetic in that regard… Ohhh (the kind of supervision). How can people be so different… At the same time these interviews (extracts of them) could be used on other doctoral students as well – to let them read two especially contradictory interviews (extracts of them) and then organize a focus group… When do we start?

xx.yyyy.2013	I have constant doubts about whether I should describe the results in two groups in the article when there is a clear difference, or try to express this comparative aspect in a more subtle way. My supervisors can't get themselves to agree with each other about this one. Therefore, I will do it the way the reviewers deem more fit in the articles – another risk at the defense. Actually, it still seems reasonable to me that in spite of the 15–6 ratio, it is still important to indicate other, clearly different views or approaches. But I'm certain that I will receive criticism for that even as I submit my thesis.
xx.yyyy.2014	This is so difficult! I don't get why she thinks that all of us have the same kind of schemes inside our heads and everything falls into place exactly the same way. God, how difficult it is for me to give up my own schemes and listen to see if she may be actually right. Still, I will write it down here for the moment: Article 5: *selection of doctoral students* as an activity goes together with *prevention.* For me, it is clearly categorized under the topic of *regular supervision*. Needs more reading, analysis, and discussion.
xx.yyyy.2015	It seems to me that writing the review article is an endless work (something that is never quite done, because you always want to read new things in addition). Often, things that I've written seem quite feeble compared to what I've read (they are feeble). There is always this sense that it's not OK enough, no new and original knowledge, no synergy… In addition to that, I have a constant sense of what feels like fear… I'm not supposed to (and don't want to) hurt anyone with my study, but it's not like I can hush up some of the more critical results (accompanied by some colorful quotations). But I'm sure my supervisors will perhaps notice these critical [results] and then we'll see from there. I wish this all would end already.

Appendix 7. Activities of the participating doctoral supervisors in the course of doctoral studies

(based on the participants' descriptions)

Supervisory activities at the various stages of doctoral studies	
Before the start of the doctoral student's PhD studies	• The supervisor invites the student to doctoral studies/the supervisee contacts the supervisor at their own initiative (background checks). o Purposeful preparatory work with the student candidate at their previous level of study in order for them to be admitted to doctoral studies. • Coordination of the research project (or joint preparation thereof). • Finding the necessary funds for employment (mainly NA). • Responsibility of admissions committees in selecting suitable doctoral students.
The beginning of the supervisory process /1–2 years/	• Discussion of the individual study plan (curriculum courses, research plan). • Specifying the aims of the study, deciding on the type of dissertation (initial plan). • Reading recommendations.
Common supervisory process and supervisory activities in case of a study stall	• Supervision primarily 1–2 times a month in seminars (if the supervisor has several doctoral students). Daily supervision in the lab (NA). • Individual meetings at the doctoral student's initiative (the notion that doctoral students are motivated self-regulated learners) – discussion of feedback. Discussing future steps of the research plan. • Support in helping the student to become a member of the community (joint conference visits).
	• During longer periods of absence ("disappearances"), it is quite rare for supervisors to contact their supervisees (doctoral students must be motivated self-regulated learners) (ED). According to supervisors from the field of Natural Sciences, no longer periods of absence are possible due to the student working in the lab and being part of the research team. • In case of problems with methodology, academic writing, or language skills, the student is recommended to take courses (ED) or involve specialists (mainly NA); supervisors also teach on their own (methodology, academic writing). • In case of motivation problems, the supervisor tries to talk to the student and tries to help them see their long-term goals (motivate them that way). If the supervisor recognizes that student's academic skills and diligence are insufficient

	for the completion of studies, nothing is done in order to motivate the student. • In case of problems in personal life, the supervisor sympathizes with the students and listens to them.
During the preparation of the doctoral student's dissertation for defense	• Encouraging the student to either submit their dissertation or warning them against it. • Moral support. • Reviewing the supervisee's presentation and discussing the defense procedure.

ED – Educational Sciences; NA – Natural Sciences

Appendix 8. Summarizing overview of the recommendations

An overview of the recommendations presented in the discussion chapter of the review article, as well as in all of the articles used as the basis of this dissertation, is given in the table below.

The table differentiates between recommendations intended for supervisors, recommendations aimed at faculties/departments for the development of doctoral studies, and broader recommendations aimed at universities and policy makers.

Table 1. Recommendations for the development of doctoral studies aimed at supervisors, faculties/departments, universities, and policy makers.

	Recommendations	
	During the period before the PhD student is admitted	**During the PhD student's period of studies**
Supervisors	• Substantive long-term preparatory work on drawing up the student's dissertation project and preparing the student for doctoral studies (skills and competences, expectations regarding cooperation). • Identifying expectations and building up a relationship. • Finding additional funding opportunities by writing research projects to allow the PhD student to work full-time in a field related to their dissertation (i.e., to ensure an employer-employee relationship).	• Supporting the doctoral student in their transition from the dependent to the independent stage (by means of regular supervisory meetings). • Monitoring the PhD student's study progress in a regular and substantive way by means of regular supervisory meetings. Regular contact with the PhD student (regularity of the meetings); specific deadlines (systematic monitoring). • Organizing a peer support system in order to allow for both formal and informal interaction outside of the studies. • Creating opportunities for everyday communication within the local research community (increasing discussion opportunities with other lecturers). • Modeling the research process. • Increasing the proportion of direct teaching (as necessary).

Faculties/ Departments	• Developing the content of and launching a preparatory pre-PhD program. • Identifying the doctoral student candidates' motivation and existing skills and competences prior to their admission. • Providing self-analysis and self-reflection opportunities for doctoral supervisors.	• To reshape the progress review system, organizing it in two parts: 1) evaluation of advancement in studies based on documents and when deficiencies appear, particular consultation and offering consultation opportunities, if needed; 2) providing systematic student-based substantive feedback (and feedforward) from experts summoned based on the particularity of the PhD student's dissertation (outside the current progress review meetings system). • Organizing a peer support system in order to allow for both formal and informal interaction between the students outside of their studies. • Creating opportunities for PhD students for everyday communication within the local research community (increasing discussion opportunities with other lecturers). • Systematically monitoring the supervisory activities (non-anonymously).
University and policy makers	• Increasing the state-funded monthly allowance to improve the socio-economic status of PhD students and allow them to support themselves with-out additional work. • To consider designing more flexible study pro-grams in case students are employed and enable allowances for periods of more intensive work on the dissertation (according to an individual plan). • Establishing more detailed requirements for the con-tent and quality of doctoral dissertations.	• Supervisory training courses (to increase awareness of the various supervisory methods and styles; provide opportunities for self-reflection; learn from experience). • Monitoring the supervisors' workload and work practices; regularly gathering substantive and non-anonymous feedback on supervision and analyzing such feedback.

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SUMMARY IN ESTONIAN

Doktoriõppe eesmärgid ja õpinguid mõjutavad tegurid erinevate osapoolte vaatenurgast

Viimasel kümnendil on doktoriõpet korraldavates poliitilistes dokumentides ja doktoriõpet käsitlevates uurimustes välja toodud suurenenud vajadust doktorikraadiga inimeste järele, mis ühe meetmena aitaks jõuliselt toetada ühiskonna arengut teadmistepõhise ühiskonna suunas (nt Bogle et al., 2011; European University Association, 2010; Jørgensen, 2012). Ühiskonna vajadus doktorikraadiga inimeste järele ja doktoriõppe eesmärkide mitmekesistumine seab seega kõrgendatud nõudmised doktoriõppe korraldusele ja selle pidevale teaduspõhisele ja seega läbimõeldud arendusele, eriti oludes, kus nii Eestis kui ka maailmas laiemalt on probleemiks doktoriõpingute nominaalaja ületamine ja katkestamine. Eestis, sarnaselt mitmete teiste riikidega (nt USA, Austraalia, Soome) on doktoriõppest väljalangevus kõrge ja seejuures on nominaalajaga lõpetamise efektiivsus eriti madal haridusvaldkonnas, jäädes 25–30% juurde. Seega on vajalik doktoriõppe teema uurimine, et suurendada erinevate osapoolte rahulolu protsessi ja väljundiga ning selle kaudu parandada doktoriõppe tulemuslikkust ja kvaliteeti.

Käesoleval doktoritöö eesmärgiks oli selgitada välja haridusvaldkonnas doktoriõppe katkestamisega ja õpingute venimisega seonduvad tegurid (doktoriõppe katkestanud doktorantide arvamuste põhjal), kirjeldada doktorantide juhendajate juhendamisprotsessi (õpingud katkestanud doktorantide ja doktorantide juhendajate kirjeldustele tuginedes), anda empiiriline alus dialoogiks erinevate doktoriõppega seotud osapoolte vahel doktoriõppe juhendamise teemadel arutlemiseks, ning pakkuda soovitusi Eesti doktoriõppe poliitika kujundamiseks.

Varasemad uurimused on näidanud, et doktorandi õpingute rahulolu ja õpingutes edasijõudmisega seonduvate teguritena on välja toodud nii doktorandiga (nt Martinsuo & Turkulainen, 2011; Ots et al., 2012) kui ka keskkondlike tegurite, sealhulgas juhendaja juhendamistegevuste ning -stiiliga (nt Brew & Peseta, 2004; Lee, 2008, 2010; Sinclair, 2004) ning kogukonna toetusega seonduvaid aspekte (nt Delamont et al., 1998; Martinsuo & Turkulainen, 2011; Pyhältö et al., 2009). Nimetatud teemad, lisaks doktoriõppe eesmärkide ja doktoritööle esitatavate nõuete kirjeldamisele leidsid käsitlust doktoritöö ülevaateartikli teoreetilise ülevaate osas. Lisaks avati ülevaateartiklis ka doktoriõppe üldine kontekst Eestis, eesmärgiga uurimuste tulemusi paremini mõista ning seeläbi soodustada sobivusel ülekantavust.

Käesoleva doktoritöö empiiriline osa koosnes kahest eraldiseisvast uurimusest. Metodoloogilise raamistikuna kasutati kvalitatiivset lähenemisviisi, kogudes andmeid poolstruktureeritud intervjuudega ning analüüsides andmeid temaatilist analüüsi kasutades (tuginedes Braun ja Clarke [2006] analüüsi etappidele).

Esimene uurimus korraldati 14 doktoriõpingud katkestanud endise haridusteaduste doktorandi hulgas, leides vastuse doktoritöö esimesele uurimisküsimusele: Kuidas kirjeldavad doktoriõpingud katkestanud doktorandid tagasivaatavalt doktoriõppe protsessi ja milliseid tegureid seostavad õpingute katkestamisega? (selle raames on kirjutatud doktoritöös artikkel I). Teine uurimus korraldati 21 doktorantide juhendaja hulgas. Lisaks 15 haridusvaldkonna juhendajale osales uurimuses võrdlusalusena ka 8 loodusvaldkonna (kui doktoriõppes haridusvaldkonnast kõrgema lõpetamisefektiivsusega valdkonna) doktorantide juhendajat. Juhendajate hulgas läbi viidud uurimusega vastati kolmele doktoritöö uurimisküsimusele: Missugused on doktorantide juhendajate arusaamad doktoriõppe eesmärkidest ja doktoritöö kvaliteedist?; Missugusena kirjeldavad ja tõlgendavad juhendajad enda ülesandeid ja vastutust doktoriõpingute protsessis?; Missuguseid seoseid kirjeldavad juhendajad enda kraadiõpingute kogemuse, juhendamisarusaamade ning praeguse juhendamispraktika vahel? (doktoritöö artiklid II–V).

Õpingud katkestanud doktorantide hulgas korraldatud uurimuse tulemustest selgub (uurimisküsimus: *Kuidas kirjeldavad doktoriõpingud katkestanud doktorandid tagasivaatavalt doktoriõppe protsessi ja milliseid tegureid seostavad õpingute katkestamisega?)*, et uuritavate jaoks oli doktoriõppe katkestamine seotud erinevate teguritega ja nende kombinatsioonidega. Doktorandi enda sisemine motivatsioon ja ettevalmistus doktoriõppes õppimiseks (nende vähesus või puudumine) oli uurimuses osalenud endiste doktorantide sõnul oluliseks teguriks doktoriõpingute katkestamisel. Doktoriõpet alustades oli motivaatoriks mitmetel juhtudel juhendaja kutse ja hilisema õpinguteaja jooksul ei tekkinud doktorantidel piisavat sisemist motivatsiooni, et õpingud edukalt lõpuni viia. Oluliste õpingute katkestamisega seostuvate teguritena toodi uuritavate poolt välja ka ebapiisavaid sotsiaalseid garantiisid doktoriõppe jooksul, mille tõttu ei saanud doktorandid täielikult pühenduda õpingutele, vaid finantside puudumise tõttu tuli doktoriõppe kõrvalt töötada muudel doktoritööga mitte seotud ametikohtadel. Ülikoolipoolselt juhendajalt oodanuks uurimuses osalenud õpingud katkestanud doktorandid tagasivaatavalt sisulisemat ja regulaarsemat juhendamiskoostööd ning juhendajapoolset suurema huvi üles näitamist doktorandi doktoritöö vastu. Aineõpingutes toodi intervjuudes välja varasema valdkonnaga seotuse ja samas ülikoolis samade õppejõudude (kelle juures õpiti ka eelmistes õppeastmetes) juures õppimise teema, tõdedes, et see mõjutas osalejate hinnangul nii õpingute kasutegurit kui ka doktorandi üldist heaolu õpingute ajal. Aineõpingutest oodati suuremat sisulist seotust doktorandi enda doktoritööga ning peeti oluliseks, et aineõpingud toetaksid kogetust enam metoodika alaste teadmiste omandamist ning akadeemilise kirjutamise oskuste arengut. Laiemalt ülikoolipoolset toetust õpingute käigus oodatuks peamiselt seoses sisukamate ja doktoranti doktoritöös edasiaitavate atesteerimistega. Atesteerimisi kirjeldati peamiselt kui formaalsust. Kuigi õppekorraldusspetsialisti tööga oldi rahul, siis nimetati tagasivaatavalt ka seda, et selles valdkonnas võinuks olla enam sisulist suunamist. Oluliseks peeti õpingute ajal ka perekonna ja kaasõppijate toetust.

Doktorantide juhendajate hulgas läbi viidud uurimuse tulemused (uurimisküsimus 2: *Missugused on doktorantide juhendajate arusaamad doktoriõppe eesmärkidest ja doktoritöö kvaliteedist?)* näitasid, et ühelt poolt on doktorantide juhendajate arusaamade kohaselt doktoriõppe eesmärgiks doktorandi teadmiste ja oskuste arendamine, mille juurde kuulub lisaks erialaselt teadlikumaks saamisele ka üldise silmaringi laienemine. Teisalt peetakse oluliseks, et doktoriõppe kaudu loodaks valdkondlikult uut teadmist (nii rahvusvaheliselt kui ka Eesti siseselt olulistel uurimisteemadel). Seega oli juhendajate arusaamades rõhuasetus nii doktoriõppe protsessil, mille käigus doktorant areneb, kui ka lõpptulemusel, mis doktoritöö kujul annaks teadusmaailmale uut teadmist ja arendaks seeläbi valdkonda.

Peamiselt kirjeldasid uurimuses osalenud juhendajad doktoriõpet küll ettevalmistusena ülikooli akadeemilise järelkasvu kasvatamisel-õpetamisel, kuid samas mõisteti, et vajadus doktorikraadiga inimeste järele on olemas ka muudes sektorites. Uuritavad pidasid oluliseks, et doktorandist kujuneks õpingute jooksul iseseisev uurija, tuues samas välja, et doktoriõpe on vaid vahe-etapp uurijaks kujunemisel.

Uurimuses osalenud juhendajate arusaamade kohaselt peab doktoritöö olema kõrgetasemeline kõikidele teadustöö tunnustele vastav rahvusvahelisse teadusesse panust andev teadustöö. Mõningaid probleeme on uuritavate hinnangul olnud aga seni kaitstud doktoritööde kvaliteedi ühtlusega. Probleemseimana kirjeldati seejuures intervjuudes artiklipõhiste tööde puhul terviklikkuse saavutatust erinevate uurimuste põhjal kirjutatud artiklite ja ülevaateartikli vahel. Uurimuses osalejate sõnul vajaks nõuded doktoritöödele täpsustamist ja ühtlustamist. Selgete kvaliteedikriteeriumite olemasolu ja juhendajate teadlikkus nendest võimaldaks juhendajatel endi sõnul ka eesmärgipärasemalt juhendada.

Juhendajate ülesannete kirjeldamisel (uurimisküsimus 3: *Missugusena kirjeldavad ja tõlgendavad juhendajad enda ülesandeid ja vastutust doktoriõpingute protsessis?)* tõid uurimuses osalenud juhendajad välja tegevusi, millega nad tegelevad enda sõnul enne doktorandi doktoriõppesse vastu võtmist (nt eeltöö eelmises õppeastmes doktorandi parema ettevalmistuse nimel (peamiselt loodusvaldkonna juhendajate puhul), potentsiaalse doktorandi taustauuringud; rahastustaotluste kirjutamine, võimaldamaks doktorandile töötamist uurimisrühmas (loodusvaldkond, aga ka uuritavad loodusteadusliku hariduse valdkonnast); doktorandi doktoriõppesse sisseastumisprojekti koostamine või doktorandi konsulteerimine projekti koostamisel) ja tegevused, mida tehakse doktoriõppe algusperioodil (uurimuse fookuse paikasaamine, töö metoodika valikuga ning uurimuse metoodika täpsustamine; lugemissoovituste andmine; doktoriõppe individuaalplaani läbiarutamine).

Tavapärase juhendamise juures näitasid uurimuse tulemused mitmeid valdkondlikke erisusi juhendamispraktika kirjeldustes. Näiteks, juhendamise algusetapil on juhendaja ja juhendatavate kontakt haridusvaldkonna juhendajatega läbi viidud intervjuude analüüsi põhjal küll konkreetsetele ülesannetele suunatud, aga edasist tööprotsessi kirjeldati enamasti kui juhendamist õppetöö raames

juhendajaseminarides (kui juhendajal on mitmeid doktorante ja see aine on õppekavas) või individuaalselt (nii individuaalsetel juhendamiskohtumistel kui ka e-kirja vahendusel). Peamiselt kirjeldati individuaalseid juhendamiskohtumisi kui mitte regulaarselt ja doktorandi initsiatiivil toimuvaid vajaduspõhiseid kohtumisi (kohtumisi siis, kui doktorant selleks soovi avaldab). Uurimuses osalenud loodusvaldkonna uuritavate sõnul on neil juhendatavatega töösuhe ja seega juhendamine laboris ka igapäevane. Juhendamise regulaarsust ja juhendaja "surve avaldamist" doktorandile kiiremaks tööga edasiliikumises kirjeldati seoses rahastusvõimaluste pakkumisega ülikooli poolt. Juhtudel, kui doktorandid töötavad õpingute kõrvalt muudel, doktoritööga mitte otseselt seotud ametikohtadel, toodi välja ka vähem juhendajapoolset initsiatiivi, olles mõistvad, et doktorant panustab doktoritöösse siis, kui tal selleks ajaliselt võimalik on. Samas leidsid uuritavad, et nominaalajast pikemaks venival õpinguteaeg võimaldab doktorandil pikemat akadeemilises keskkonnas viibimist ja on seega teadmiste ja oskuste arengule positiivselt mõjuv. Seega ei ole juhendajate arusaamades nominaalajaga lõpetamine eesmärk omaette. Doktorandi doktoritöö kaitsmiseelse ettevalmistuse puhul peeti oluliseks enda kui juhendaja moraalset toetust doktorandile ja üldist julgustamist, aga ka kaitsmisel esitatava esitluse ülevaatamist ning retsensioonis esitatud küsimuste läbiarutamist.

Seega uuritavate tavapärast juhendamist mõjutab nende endi sõnul ühelt poolt valdkondlik eripära (nt tööviis laboris/uurimisrühmas või indviduaalselt töötades; rahastusvõimalused doktorantide töölevõtmiseks; doktorandi töökohustused mujal ja sellest tulenev juhendaja kannatlik ootamine ning mõistev suhtumine õpingute takerdumise korral). Teisalt on need seostatavad sellega, mida juhendaja ise tähtsustab (nt doktorandi uurijate kogukonna liikmeks saamise toetamine; aga ka ootus, et täiskasvanud õppija suudab ise oma õppimist juhtida). Vastutus on juhendajate hinnangul doktoriõppe protsessis edasiliikumisel aga siiski doktorandil endal ja juhendajal on võimalus doktoranti toetada siis, kui juhendatav selleks soovi avaldab.

Juhendajate endi juhendatavaks olemise kogemus mõjutab nende juhendamisarusaamu ja -praktikat (uurimisküsimus 4: *Missuguseid seoseid kirjeldavad juhendajad enda kraadiõpingute kogemuse, juhendamisarusaamade ja praeguse juhendamispraktika vahel?).* Tegevused, mida oma juhendamise puhul tajuti positiivsena, on püütud üle võtta ka oma juhendamispraktikasse (nt avatud ja toetav, võrdsel tasandil suhtlus doktorandiga, akadeemilise dialoogi võimaldamine, juhendaja pühendumus doktorandi töösse süvenemisel ja sisulise tagasiside andmine artiklite/väitekirja mustandile, kogukonda kuulumise toetamine läbi ühiskonverentsidel käimise ja teadlastekogukonna liikmete tutvustamise). Juhtudel, kui oma juhendatavaks olemise ajal oldi juhendamisega mingites eelpoolnimetatud aspektides rahulolematud (nt tajuti, et juhendaja ei süvenenud juhendatava töösse, ei andnud piisavalt kiiresti ja edasiviivat tagasisidet kirjalikele käsikirja osadele), siis püütakse oma juhendatavatele selles osas endi sõnul vastupidist toetust pakkuda. Kuna paljud uuritavad pidasid oma kraadiõpet meenutades oluliseks just seda, et oldi (ja saadi omal valikul olla) ise-

seisvad ja pöörduda juhendaja poole siis, kui ise selleks vajadust tunti (mis oli mitmetel juhtudel ka pikkadest vahemaadest tingitud, kuna juhendajad asusid kraadiõppe ajal Venemaal), siis kantakse seda juhendamismustrit edasi ka oma juhendamistes. Uuritavad, kes oleks endi sõnul soovinud oma õpinguteajal sisukamat juhendamist, olid küll juhendajatena valmis oma juhendatavaid rohkem toetama ja igal ajal konsulteerima, kuid uurimuse tulemuste põhjal saab öelda, et regulaarsed kokkusaamised (ja juhendaja poolt initsieeritud kokkusaamised) doktorantidega on haridusvaldkonnas pigem erand kui reegel. Ometi on reguulaarsust juhendamiskohtumistel, seega ka funktsionaalset juhendamist (Lee, 2008, 2010) ja laiemalt osalevat (*hands on*) juhendamist (Sinclair, 2004) peetud lõpetamisefektiivsust toetavaks.

Käesoleva töö tulemused toovad esile mitmeid valdkondi, mille üle tuleks erinevate doktoriõppega seotud osapooltega arutada (nt doktorandid, juhendajad, instituutides/ osakondades doktoriõppe eest vastutavad isikud, ülikoolipoolsed doktoriõpet korraldavad isikud, laiemalt riikliku tasandi otsustajad). On oluline mõelda, kuidas tagada motiveeritud ja piisava akadeemilise ettevalmistusega doktorantide vastuvõtmine doktoriõppesse; leida rahastusvõimalused (tegeleda ka vajadusel juhendajatena selle hankimise nimel), et doktorandid saaks doktoriõppe ajal pühenduda õpingutele ja doktoritöö koostamisele; arutada, kuivõrd vajalik ja võimalik on nominaalajaga lõpetamine; kuidas korraldada regulaarseid sisulisi juhendamiskohtumisi, mis annaks juhendajale võimaluse jälgida doktorandi arengut ja toetada seda sobival viisil, jättes samas võimaluse doktorandi iseseisvaks uurijaks kujunemiseks. Samuti oleks instituudi ja ülikoolide poolt laiemalt vajalik läbi arutada doktoriõppe eesmärgid ja sisu ning täpsustada doktoritöödele esitatavad nõuded (ühtlusada nõuded nii ülikoolide siseselt kui ka ülikoolide üleselt); pakkuda juhendajatele eneseanalüüsi ja refleksioonivõimalusi ning oma kogemuste jagamise ja teiste juhendajate kogemustest õppimise võimalusi. Juhendajate juhendamise sisuline monitooring ning juhendamiskoolitustel osalemise "kohustuslikkus" on samuti teemad, mis vajaks arutlust.

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> In Estonian: *Aitäh, ema, et sa ootasid kõik need aastad Trondi ja Triinet igal koolipäeval koolist koju, aitäh, et sa aitasid neil õppida, kui mina olin Tartus, aitäh selle emaliku hoolitsuse eest, kui ma olin ennast teie*

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Antslas
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Teadustegevus:

Teadustöö põhivaldkonnad:
- üliõpilaste teadustööde juhendamine
- õppejõu professionaalne areng ja õppimine

DISSERTATIONES PEDAGOGICAE UNIVERSITATIS TARTUENSIS

1. **Карлеп, Карл.** Обоснование содержания и методики обучения родному языку во вспомогательной школе. Tartu, 1993.
2. **Ots, Loone.** Mitmekultuurilise hariduse õppekomplekt eesti kirjanduse näitel. Tartu, 1999.
3. **Hiie Asser.** Varajane osaline ja täielik keeleimmersioon Eesti muukeelse hariduse mudelitena. Tartu, 2003.
4. **Piret Luik.** Õpitarkvara efektiivsed karakteristikud elektrooniliste õpikute ja drillprogrammide korral. Tartu, 2004.
5. **Merike Kull.** Perceived general and mental health, their socio-economic correlates and relationships with physical activity in fertility-aged women in Estonia. Tartu, 2006.
6. **Merle Taimalu.** Children's fears and coping strategies: a comparative perspective. Tartu, 2007.
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