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Supervision and research training within  
the professional research community:  
Seeking new challenges of doctoral  
education in Estonia



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## LIST OF ORIGINAL STUDIES

This dissertation is based on the following studies, which will be referred to in the text by their respective Roman numerals. The studies are organized around three modes of scholarship in order to address the dissertation's research questions: the author's international peer reviewed publications; the author's publications that are not peer reviewed but that are still relevant to the dissertation; and the dissertation summary survey form.

### **STUDY I. Efficiency of doctoral education from the perspective of Ph.D. candidates' motives to obtain doctoral degree**

**Kärner, A.,** Kukemelk, H., & Herdlein, R. J. (2005). Motivation for obtaining the Doctor of Philosophy degree in the post-Soviet era: The case of Estonia. *International Education*, 35, 1, 24–35.

Related publication and a conference paper:

Puura, V., **Kärner, A.,** & Preeden, U. (2008). Eesti avalike ülikoolide doktoriõppe tulemuslikkus 1991–2008 [The efficiency of doctoral studies in Estonian public universities 1991–2008]. In V. Puura, A. Kärner, U. Preeden, M. Saluveer, E. Voolaid (toim.) *Eesti doktoriõppe kvaliteedi, tulemuslikkuse ja jätkusuutlikkuse tagamise süsteem*. Artiklid ja kokkuvõtted. IV (pp. 30–58). Tartu: Tartu Ülikooli Kirjastus (in Estonian, summaries in English).

**Kärner, A.,** Kukemelk, H., & Preeden, U. (2006). The Success of Doctoral Education in a Changing Society – Estonian Case. In: AARE 2006 International Educational Research Conference. Abstracts of Papers: AARE 2006 International Educational Research Conference. Engaging Pedagogies; Adelaide; 26–30.11.2006. Adelaide, Australia; 2006, 122.

### **STUDY II. Meeting expectations of a society requires new approaches to the doctoral education**

**Kärner, A.,** & Puura, V. (2008). Doctoral education in transition to knowledge-based society. *TRAMES*, 12, 1, 95–109.

Related publications:

**Kärner, A.,** Puura, V., Reino, A., Tolmats, E., & Voolaid, E. (2006). Doktoriõppe osapooled tulemuslikkuse parandamise võimalustest [Stakeholders of doctoral studies about improving mutual cooperation]. In V. Puura, A. Kärner, E. Voolaid, M. Saluveer (toim.) *Eesti doktoriõppe kvaliteedi, tulemuslikkuse ja*

*jätksuutlikkuse tagamise süsteem*. Ettekanded ja uurimused. II (pp. 137–155). Tartu: Tartu Ülikooli Kirjastus (in Estonian, summaries in English).

Rutiku, S., Vooremäe, A., **Kärner, A.**, Udam, M., & Kährik, A. (2007). Kaasaja väljakutsed kõrgharidusõppekavadele, tulevikuprognosisid ning näiteid eri riikide (Suurbritannia, Saksamaa, Skandinaavia, Ameerika) kõrgharidusõppekavade arendamisest [Meeting challenges of higher educational curricula; prognoses and examples of development of higher education curricula in different regions (Great Britain, Germany, Scandinavia, North America)]. In T. Lehtsaar, S. Rutiku (toim.). *Õppekavaarendus kõrgkoolis* (pp. 97–134). Tartu: Tartu Ülikooli Kirjastus

### **STUDY III. Concepts of research training and supervision; PhD graduates' experiences of supervision**

**Kärner, A.** (2008). Doctoral supervision: New concepts and dilemmas. In J. Mikk, M. Veisson, P. Luik (Eds.) *Reforms and innovations in Estonian education* (pp. 61–76). Baltische Studien zur Erziehungs- und Sozialwissenschaft. Herausgegeben von Gerd-Bodo von Carlsburg, Algirdas Gaizūtis und Airi Liimets, 16. Frankfurt am Main, Berlin, Bern, Bruxelles, New York, Oxford, Wien: Peter Lang Internationaler Verlag der Wissenschaften.

Related publication and conference papers:

**Kärner, A.**, Kutsar, D., & Puura, V. (2008). Doktorantide juhendamine – õppejõutöö suurim väljakutse [Supervising doctoral students – the greatest challenge for an academic person]. In V. Puura, A. Kärner, U. Preeden, M. Saluveer E. Voolaid (toim.) *Eesti doktoriõppe kvaliteedi, tulemuslikkuse ja jätkusuutlikkuse tagamise süsteem*. Artiklid ja kokkuvõtted. IV (pp. 59–82). Tartu: Tartu Ülikooli Kirjastus (in Estonian, summaries in English).

**Kärner, A.**, & Puura, V. (2007). Fresh Ph.D. Holders' and Ph.D. Students' Perceptions towards Supervision: The Case of Estonia. In: Postgraduate Supervision. State of the Art and Artists. Conference papers: Postgraduate Supervision. State of the Art and Artists; Stellenbosch, South Africa; 23–27 April 2007. Stellenbosch University: African Sun Media, 2007, 197–207.

Kutsar, D., & **Kärner, A.** (2008) The threshold concepts in exploring societal transitions: the case of post-communist Estonia. "Threshold concepts. From theory to practice". June, 18–20. Queen's University, Ontario, Canada.  
<http://thresholdconcepts.appsci.queensu.ca/documents/AnitaKarnerandDagmarKutsar.doc>

**The contribution of the author (Kärner, A.) of the doctoral thesis to these studies is as follows:**

Study I and III: Kärner developed the idea of research about doctoral study from the perspective of individuals recently awarded a Ph.D. She elaborated the questionnaire of the study, carried out the interviews, analyzed the data, and composed publications related to the studies.

Study II: Kärner developed the idea of the micro study with Ph.D. stakeholders. She participated in the elaboration of the questionnaires for the Delphi and focus group study, performed the analysis of the data, carried out a comparative analysis of the aims and outcomes of doctoral curricula, and carried out a comparative analysis of the 'best practice' codes of supervision and requirements in the context of Estonia and other countries.



## INTRODUCTION

Various scientific discussions on higher education, including the crisis of doctoral education, the newly set requirements, the overproduction of university academic staff, the need to increase the awareness of the broader public about the content of doctoral education, and its usefulness for the development of economy, have taken place during the last decades in Europe, USA, Australia and other parts of the world. Supervision of doctoral candidates is regarded as one of the critical issues in providing successful doctoral education. Such supervision has a direct impact on the candidates' satisfaction with their post-graduate experience (e.g. Taylor, 2004; Zuber-Skerritt & Roche, 2004; Reinhardt, 2006).

Up until the last quarter of the 20th century, a Ph.D. degree was the domain of academic scholars; nowadays holders of a Ph.D. are as likely to be engaged as either a senior official in the public sector or a product developer in the Research and Development (R&D) department of an enterprise. This not only means the outcome of doctoral studies is targeted at universities and the non-academic sectors, but also that the required knowledge and skills, which holders of Ph.D. degrees are assumed to have, will also change. The essence of doctoral education is summarized by Shulman (Walker et al., 2008, p. XIII) in his foreword to the Carnegie Initiative on the Doctorate: "Doctoral education is a set of experiences that incorporates *training, education, and formation*<sup>1</sup>. It is a process led by faculty and brought to life by students." The creation of new knowledge which may come through advanced scholarship is stressed by Taylor (2004, p. 248) in the UK doctoral education context. The collaboration between a Ph.D. candidate and the academic scholars representing the institution awarding the Ph.D. degree emerges as a result of any of the following definitions of a doctoral education.

Graduate education (including doctoral education) is described as a wide range of educational activities with the primary focus on advanced study. The unique American arrangement, since last quarter of 19<sup>th</sup> century, consisted of graduate programs which offered the most advanced levels of specialized knowledge and skill training beyond the first-degree level. Gumpert (1998) stressed the importance of special research training at the doctoral level. The nature of research training is mediated by the nature of inquiry in any particular discipline (Biglan, 1973) but also important are the skills, knowledge, values and attitudes that doctoral degree programs offer for professional socialization of doctoral candidates to become highly qualified specialists (Larson, 1977).

In 2003, European Ministers of higher education considered it necessary to include the doctoral level as the third cycle in the Bologna Process (EUA, 2003) to go beyond the focus of the two main cycles (Bachelor and Master's) of higher education. European universities declared the core component of doctoral education as "the advancement of knowledge through original research"

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<sup>1</sup> Author's italics (A. Kärner).

(EUA, 2005a, p. 2), at the same time doctoral training should meet the needs of the employment market. The crucial role of supervision is stressed, which is based on a transparent framework between the doctoral candidates, supervisors and the institution.

The current dissertation deals with the pedagogical problems (supervision, training, educational management) of Estonian doctoral education in the context of international developments in the doctoral education field.

Similar to the changes in Estonian society since regaining the independent statehood in 1991, the Estonian higher education system, including the doctoral level, has undergone several reforms that align it more with the Anglo-American system. The problems of research education (on master's or doctoral level) in Estonia have been somewhat unique compared to the "old democratic" countries in Europe, but at the same time Estonia shares the goal of developing its national economy with the whole European Union.

In the Estonian context, the purpose of doctoral studies is defined in the Universities' Act (Ülikooliseadus, 1995) as "study 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". This definition presents a common understanding of the aims of doctoral education: to prepare doctoral candidates to be high level professionals in the field of (higher) education and research but also for R&D in different sectors of the economy. To achieve proposed aims, new challenges for Estonian doctoral education lie mainly in cooperation within and between research communities as well on national and international level to support interdisciplinary approaches and develop research cultures, including education of new researcher generation.

# I. LITERATURE REVIEW

## I.1. New approaches to doctoral education: academic and political

Before the current century, doctoral education has been understudied by academic scholars. The last decade of the 20<sup>th</sup> century brought changes in the interest of dealing with matters of graduate education on the sides of both academic and national governments. Gumport (1998) noted increased interest in how doctoral education “works” when:

“scholars of higher education have begun to do case studies and ethnographies of local practices on campuses to shed further light on how administrators, faculty and students perceive and behave within their organizational circumstances, including the extent to which the academic department truly does function as a home for *advanced study or research training*.”<sup>2</sup>

A number of cross-national surveys were conducted, and a variety of national practices of doctoral education were studied and results collected. In the US, the Carnegie Initiative conducted a comprehensive five year long study with forty-four universities into national doctoral education, which concluded that doctoral candidates’ *supervision* should be a collective responsibility in which they are *apprenticed by several mentors* (Walker et al., 2008, p. 91). In Australia, an inter-university investigation determined the principles and methods of good supervision, splitting supervision in collaboration with the doctoral candidate into “*hands on*” and “*hands off*” supervision (Sinclair, 2004, pp. 6–7). ‘Hands on’ characterizes research in laboratories where supervisors involve Ph.D. candidates in their research project, whereas ‘hands off’ typifies researchers from humanities and social sciences who have been traditionally working individually (Sinclair).

International networks of scientists in the field of education have analysed doctoral education and examined the problems and potential good practices associated with the process from their experiences in conducting workshops with doctoral candidates and their supervisors. The main conclusions of these studies that postgraduate research as experienced by Ph.D. candidates and doctoral supervision as perceived by supervisors are both relatively *isolated activities* (Wisker et al., 2007) and need active support from the *research community* (Leshem, 2007). Wisker et al. (2004) demonstrate the importance of promoting doctoral candidates’ *meta-learning* as a tool to reach *meta-cognition*: the ability to do independent research and to contribute to the creation of knowledge.

Although the *concepts of supervision* (Lee, 2007, 2008; Pearson & Kayrooz, 2004) have been studied to understand how Ph.D. candidates are

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<sup>2</sup> Author’s italics (A. Kärner).

supervised the theory of *supervision pedagogy* has been expanded insufficiently to date as Australian researchers Pearson and Kayrooz (2004) have stated. In Australia, although the topic is treated quite broadly, there is little evidence that supervision of doctoral candidates is based on the theories of supervision pedagogy. Supervision has been treated either as a guide presenting the accumulated experience of supervision (cf. Delamont et al., 2001; Phillips & Pugh, 2000; Rudestam & Newton, 1992; Wisker, 2005) or as case of descriptions (cf. Leshem, 2007; Lee, 2008; Zuber-Skerritt & Roche, 2004). Academics, on the basis of experience, have published manuals guiding Ph.D. candidates through the process of a doctoral project, from hypothesis to results' presentation (cf. Bolker, 1998; Cryer, 2000; Davis & Parker, 1997; Dunleavy, 2003; Murray, 2002; Rugg & Petre, 2004; Trafford & Leshem, 2008; Wisker, 2001).

Examining doctoral education through the doctoral candidates' perspective enables researchers to see the 'pros and cons' of the system. 'Candidate perspective' research in the US (Golde & Dore, 2001) and Germany (Reinhardt, 2006) show that many doctoral candidates do not clearly understand what doctoral study entails, and for those who do participate, the training does not always meet their expectations.

In the European context, many doctoral study frameworks are influenced by EU policies of science and higher education. The European Universities Association's (EUA) 'Doctoral Programmes for the European Knowledge Society' project discussed in 2004–2005 the adaptation of outcomes and the content of doctoral studies to meet the needs of modern society. The Bologna Seminar at Salzburg (EUA, 2005a) made ten conclusive recommendations which the project would review in depth. Europe's need, as stated by the European Commission, to increase the number of researchers and research related careers, means that doctoral training related programmes can be seen as the cornerstone in reaching such a goal (EUA, 2005b). The experiences of the 48 European universities selected to participate in the EUA project in doctoral training and supervision were collected and analysed. Special attention was paid to the mutual responsibilities of supervisors, doctoral candidates and the institution and stressed the use of resources, which would involve integration between scientific fields and co-operation between supervisors from different fields (EUA, 2005b). The EUA Report (2007) presented a number of recommendations concerning: minimum standards for supervisory requirements and the regulations of supervision; the involvement of more than one supervisor in supervising a Ph.D. candidate; the training of supervisors; written guidelines for the cooperation of the candidate and supervisor and assessment procedures of the progress of Ph.D. candidates. The Report stressed an important development in doctoral education considering it the first phase of a young researcher's career (EUA, 2007). The Bologna Process also directs further developments of doctoral education in Europe emphasizing the research component of the third cycle as well as the acquisition of transferrable skills (EUA, 2007b, p. 17).

Nevertheless, universities are concerned about the policies of their national governments towards doctoral education. In response, The League of European

Research Universities stressed the importance of combining quality assurance of doctoral training with regular research assessments of research degree awarding institutions and not to accept overregulation of this cycle of higher education (LERU, 2007).

## **1.2. Perspectives of doctoral education in Estonia**

At the beginning of the 1990s after the collapse of communism, Professor of Economics Elvi Ulst (1991, p. 1472) admitted that science and education had, during the previous fifty years, contributed to the formation of *homo soveticus*. Educational science particularly had to suffer from this ideology. Also, the first one and a half decades after Independence, doctoral education in Estonia is mainly directed toward educating the new generation of academic scholars caused by the shortage of university academic staff with the Ph.D. degree.

Since 2003 all six Estonian public<sup>3</sup> universities<sup>4</sup> in collaboration with the Ministry of Higher Education and Research have conducted two projects about doctoral education in Estonia. “Development of a complex of measures for strengthening doctoral studies in Estonia” (2003–2004)<sup>5</sup> and “Assurance system for quality, effectiveness and sustainability of doctoral studies in Estonian universities” (2005–2008)<sup>6</sup> were designed to collect comprehensive data about how doctoral education had functioned from the beginning of the 1990s. The data of these two projects highlighted two critical facts concerning doctoral education pertaining to the development of Estonia’s economy and therefore Estonian society: first, the low completion rate of Ph.D. programs at Estonian universities and secondly, the demand for post-doctoral researchers, managers and developers by the academic sector, R&D in industry and public administration (Puura et al., 2004; Puura et al., 2007; 2008). As an outcome of these two collaborative projects, recommendations for the development of doctoral education were worked out for use by the universities and the government of Estonia. Among these recommendations were two essential characteristics: improved organization of doctoral programs and closer cooperation between contract research themes of the faculties and doctoral projects. The projects also noted the lack of in-depth analyses of the pedagogical aspects of Ph.D. supervision and their impact on the effectiveness and quality of doctoral education in the Estonian context.

Perspectives of doctoral education in Estonia have been focused mainly on the problems of financing and the allocation by scientific fields of state

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<sup>3</sup> Public university is a legal entity in public law (Universities’ Act, 1995).

<sup>4</sup> Tartu Ülikool (University of Tartu), Tallinna Ülikool (Tallinn University), Tallinna Tehnikaülikool (Tallinn University of Technology), Eesti Kunstiakadeemia (Estonian Academy of Arts), Eesti Muusika- ja Teatriakadeemia (Estonian Academy of Music and Theatre) and Eesti Maaülikool (Estonian University of Life Sciences).

<sup>5</sup> Funded by European Union Phare programme.

<sup>6</sup> Funded by the European Social Fund.

commissioned doctoral places (cf. Rajangu, 2004), the brain drain and the low level of competition for academic positions in universities (Saari, 1999) or the availability and value of study allowances for Ph.D. candidates (Paulus, 2004). Engelbrecht (2000), the president at the time of the Estonian Academy of Sciences, noted that a problem for Estonia as a small society is that decisions about financing of higher education and science may sometimes be based on the personal opinion of key individuals as opposed to rational analyses. Public discussions concluded that the Government funding of research and universities does not generally relate to society's expectations on the outcomes of these activities.

**In conclusion,** the results of the previously mentioned studies show that changes in doctoral education are desired equally by universities and national governments. The objectives of doctoral education are broader than in previous years to cover the demands for highly qualified R&D specialists, research experts and academic scholars. To meet society's expectations of the knowledge and skills levels of Ph.D. holders, structured doctoral programs (EUA, 2007a) are being developed by the universities. Research training has to offer a variety of workshops and lectures which are designed in relation to the real actual needs of the doctoral candidates. For universities improvement of supervisory practice to reduce the non-completion or late completion of doctoral studies by directing special attention towards the methods of supervision is the task of high importance. Supervision of Ph.D. candidates' should not be limited to just personal contacts between the supervisor and the candidate but involve other faculty members as advisors and experts in their field of expertise.

The current dissertation however, does not seek examine the significant role financing has as a catalyst for a change in doctoral education; as expressed by Walker et al. (2008, p. 32) "...money can induce temporary change but not necessarily improvement or lasting impact. Even more, funding can be seen not only as a condition for change but as its consequence."

## **2. AIMS OF THE DISSERTATION**

The current dissertation's primary goal is to study and explain the positive as well as the negative experiences of doctoral training and supervision in Estonia from the students' perspective (Ph.D. graduates and active students), complemented by those of supervisors and university leaders. On the basis of the research data obtained and compared with the corresponding data from literature, the dissertation seeks to find and describe possibilities of (1) widening the repertoire of skills for a successful research career within academia, public and economic sector; (2) furthering the understanding of doctoral education as a pedagogical activity in the research community; and (3) achieving better results in the completion rates in Estonian Ph.D. education.

The specific objectives of this dissertation are as follows:

1. To study the motives of Ph.D. graduates and doctoral candidates for obtaining the degree and how their experience of supervision influenced them during doctoral studies (Studies I, III);
2. To describe the expectations of society and the participants' perceptions about their doctoral education (II, III);
3. To study what impact the doctoral program and supporting/non-supporting research environments have on the success of implementing a doctoral project, and to analyze the experiences of doctoral graduates regarding supervisory situations and on supervision as a process (I, II, III)

### **3. DATA AND METHODOLOGY**

Studies constituting current dissertation belong to the field of higher education pedagogy. A combined methodology departing from the pragmatic approach advocated by Tashakkori and Teddlie (1998, p. 21), was applied to data collection and interpretation. Semi-structured interviews were used to collect data regarding the experiences of Ph.D. graduates in coping with cognitive and emotional problems in the doctoral study process. The method of analysis was inspired by phenomenology. In studying the phenomenon of supervision and doctoral training, the author focused on the participants and on the interpretations of their real life situations (Schutz, 1970) concerning their role and activity in the doctoral process.

Data triangulation as a method (Flick, 1988, p. 229) was used for studying the experiences of doctoral supervision and training from different persons who participated in the process of doctoral education. This data, along with the treatment of doctoral education in the corresponding literature, were used to investigate the educational resources and ways to make the process more successful and efficient.

#### **3.1. Participants**

Fifteen doctoral graduates from the University of Tartu were chosen as sample based their learning experience, perceived high motivation to complete their dissertation, and their abilities to reflect on their experiences. These participants were asked to recollect their personal experiences via an in-depth interview method. The underlying principle for using this sample of respondents was to represent the socio-demographic profile of Ph.D. graduates as broadly as possible. Their doctoral projects came from the following research fields: medicine, biomedicine, computer science, physics, sports science, geology, human geography, history, linguistics, social work, zoology, chemistry, botany, law, psychology.

The respondents differed with regard to: i) their previous educational experience (do they continue in the area of specialisation of their Bachelor's degree, do they continue their Master's level research topic or a closely-related topic, or have they chosen a new area of specialisation and a new research topic); ii) time elapsed i.e. the time span between the preceding studies); iii) experience of working individually or in a group (characteristic traditions of the research areas, the work and knowledge transfer culture); iv) full-time or part-time doctoral study (dedication to the doctoral project and its relations with every day life). There were eight male and seven female Ph.D.s involved. Their ages ranged from 26 to 50 years; eight respondents were under 30 years old, and seven were over 30 years. The respondents started their doctoral studies in 1990s and had obtained their PhD degree in the years 2002–2004, having spent from three to ten years preparing their dissertations.



### **3.2. Data collection and methods**

A semi-structured face-to-face interview method based on open questions (Wengraf, 2002, p. 162) which enable the respondents to elaborate their answers and avoid simple yes-no responses was used for personal in-depth interviews with Ph.D. graduates.

The questions had three main focuses: motivation and goals for starting doctoral studies; respondents' experiences with supervision; obstacles to, and opportunities for, joining doctoral studies. The aim was to understand how the motives to obtain Ph.D. degree and experiences of supervision may impact the successful completion of doctoral studies.

The first interviews took place in winter of 2002. The author had initially planned to do 13 interviews to be completed by spring of 2003. However, after conducting the in-depth analysis and explication of the conceptual framework, the author concluded that additional participants from other research disciplines with different educational experiences were needed in order to achieve her studies' goals. Therefore, two more interviews were conducted in winter of 2004. Reasons for the two-year time frame for completing the interviewing program included the small number of Ph.D. graduates in these years and the limited possibilities of finding sample representatives from different research fields were rather limited.

Approximal extension of the interview was 55–60 minutes, the shortest interview lasted 45 and the longest 90 minutes. Interviews were recorded and stored on minidisks; their transcriptions as Word format constitute total 153 pages.

Even though the experience of each doctoral graduate as previously Ph.D. student is as unique as the very personal achievement of gaining a Ph.D. (Trafford & Leshem, 2008), recurring patterns were found in the process of encoding and analyzing the interviews. First, an initial coding of the texts of interviews was created. When expressive concepts were discovered, open coding was created. Looking for concepts by axial coding (Coffey & Atkinson, 1996), some patterns between the concepts appeared through different views and experiences about doctoral study and supervision.

In tandem with the interviews of the Ph.D. graduates three personal interviews with the supervisors from the University of Tartu were conducted. Two supervisors represented humanities, and one, natural sciences. These interviews were used as a pilot to the focus group interviews with the supervisors from Estonian public universities.

To widen the range of data by incorporating different points of view, the triangulation of data was used by gathering data on variety of people (Denzin, 1970). For this purpose, four focus group interviews were conducted in spring of 2006. Two groups consisted of active Ph.D. candidates, and two other groups were formed from Ph.D. supervisors from Estonian public universities. The sample of seventeen Ph.D. candidates from all six Estonian public universities (see footnote 4) was divided into two groups according to the location of their

Pd.D.-granting universities: one group represented Ph.D. candidates from Tartu, and the other from Tallinn universities. The doctoral study experiences of the candidates ranged from one to four years and covered a wide variety of research domains, including materials science, chemistry and materials technology, musicology, art history, education, media and design, ecology, physics, medicine, forestry and agriculture. The sample of thirteen supervisors from five Estonian universities<sup>7</sup> represented the research areas of medicine, biosciences, science, agricultural, technical, social and educational sciences and the arts. This sample was also divided into two groups representing the Tartu and Tallinn universities, respectively. The supervisors' professional ranks ranged from associate to full professors, with five to twenty years experience in supervising a broad number of doctoral candidates.

The questionnaires for the focus group interviews were compiled in accordance with the data obtained from personal interviews with the Ph.D. graduates. The Ph.D. candidates' self-reflection in the context of their doctoral project's progress was encouraged during the group interviews. The problems arising in the process of doctoral study were discussed from the organizational and supervisory point of view. The questions asked of the supervisors concerned their expectations of the Ph.D. candidates, the supervisors' own motivation to advise students, and the academic environment's impact on the results of supervision. The interviews yielded enough qualitative data to analyze the problems of doctoral education from pedagogical perspectives, with a special focus set on training and supervision.

Supervision process was observed by the nature and level of the supervisor's partnership with the Ph.D. candidate; the student's expectations of the supervision and satisfaction with the supervision process. The supervisor and Ph.D. candidate's relationship in the doctoral project was assessed by the personal satisfaction from collaboration with supervisor and other faculty members involved into supervision process of the Ph.D. candidate. Supervision was classified by the styles as follows: supervisor as co-working partner or colleague; guarantor or expert of subject; emotional supporter or enthusiastic pusher; controller or critic. Horizontal relations between researchers in the team involving Ph.D. candidates were viewed as precondition for mentoring, which means the supervision as partnership with colleagues.

In order to get a "broad picture" and considering the university leaders' role in the organization of doctoral study rectors, vice-rectors and deans (48 persons) from the six public universities were involved in the study; the Delphi method was applied. This took place parallel to the group interviews. Linstone & Turoff (2002) suggest this technique for a small monitor team in order to design a questionnaire which is sent to a larger respondent group. After the questionnaire was returned by 20 respondents, the results were summarized and, based on these results a new questionnaire was developed for the respondent group. The respondent group had an opportunity to re-consider the original

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<sup>7</sup> Estonian Academy of Music and Theatre was not represented.

answers based upon the examination of the group response. The re-evaluations were returned by 11 respondents. The data obtained from university leaders were also compared with the supervisors' input, taking into account the fact that university leaders have also had experiences in supervising Ph.D. candidates.

The comparison of documented supervision practices and the descriptions of 'good practice' (cf. Literature review, pp. 11–12) were used as a combined methodology tool to illustrate how a phenomenon occurs under a variety of circumstances (Stake, 2000, p. 444). Documented doctoral curricula (Puura et al., 2004), codes of good practice in supervision (EUA, 2005b), the legislation of higher education and science in Estonia (cf. Universities' Act (Ülikooli-seadus, 1995), the Organization of Research and Development Act (R&D, 1997), the Procedure for accrediting university and applied higher education institution, their curricula and requirements to accreditation (HTM, 2003)) were all used for the analysis of the regulated environment where the interaction of doctoral candidates and the other participants in the process occurs.

## **4. OUTCOMES AND DISCUSSION**

Proceeding from the current research data, literature concerning doctoral supervision and regulations of research and doctoral education policy, the main research outcomes presented in this dissertation are the following:

1. The Estonian Ph.D. candidates' motives to complete their doctoral project are related to their orientation towards research and mainly to the prospect of an academic career. Good contact with the supervisor, who acts as an expert in either a specific or general field of research, positively influences the candidates' motivation and progress during their doctoral studies. The intellectual community of peers and other people related to the doctoral research provides added value to the research environment surrounding Ph.D. candidates.
2. There is a general lack of common understanding about the goals of doctoral education in the Estonian society. The universities need to develop doctoral programs and supervision practice that offer more professional socialization and a broadening of skills for doctoral candidates so that they can become highly qualified specialists both for research and higher education and for public sector and industry.
3. There is incongruity between the goals of doctoral education as defined in the Universities Act and the requirements for the doctoral dissertations as defined by the universities; the requirements for supervision and the doctoral training process are poorly defined or suffer from the lack of regulation, often due to varying practices in different research environments. For example, depending on that environment, some doctoral projects were completed in a well-organized research community, while others were completed by doctoral candidates who depended on traditional apprenticeship-type supervision with no or weak connections to a larger research community.

### **4.1. Efficiency of doctoral education from the perspective of Ph.D. candidates' motivation to obtain a doctoral degree**

The main motives to start a doctoral project are a candidate's profound interest in conducting research; self-realization; a possibility to develop and acquire new experience; to develop self-respect or to continue a family tradition (Kärner, 2004).

The interest in research appeared in two main ways: 1) during primary and secondary school years when teachers noted a student's special ability and gave additional assignments, for instance to study a (natural) phenomenon or solve problems of mathematics, chemistry etc.; 2) during the first cycle of a university education when respondents were involved in research as assistants. These early

experiences with more or less independent intellectual efforts raised self-confidence and motivation for higher achievements (Study I; Kärner et al., 2005). In some cases, an explicitly expressed desire to reach a top position in an academic sphere was an additional motive to obtain a Ph.D. degree (Study III; Kärner, 2008).

Good contact with the supervisor during different stages of doctoral project has a significant impact on the progress of the Ph.D. candidates (Study I: Kärner et al., 2005; Study III; Kärner, 2008). The supervisor may act as an expert in either a specific or general field of research. Supervisors' international networks and their abilities to involve their students in international research were revealed as additional factors which supported Ph.D. candidates in achieving their doctoral degree. However, data from the respondents indicated that international contacts, e.g. participation in conferences or working in a foreign university or library, etc., were not necessarily prerequisites for a doctoral study's success.

The existence of doctoral courses, which would broaden the degree seeker's horizons in their research field, would be useful, but for most respondents special doctoral courses were not an option. Another supportive factor, which the respondents felt could be improved, are the opportunities to discuss research problems with peers or other members of research group and to present research results to different audiences. To discuss and present his/her research results ought to be a prerequisite and one of the most important outlets to the researcher, although not experienced by the respondents as much as they could wish.

The importance of supervised teaching practice of students in order to obtain pedagogical experience in higher education was mentioned mainly by Ph.D. graduates of humanities and social sciences. In other cases, some graduates in the sciences reflected that their lecturing abilities were quite poor because of a lack of experience. This data suggests that supervision is also important in gaining teaching skills by Ph.D. candidates.

Despite these motivational factors and the high demand for the new generation of academic scholars in some fields, extended research periods for completing dissertations characterize doctoral studies in Estonian universities. On average, only 25% of doctoral candidates successfully obtain their doctorates within the five year period of 'funded' studies. If study period is extended to 8.5 years, the proportion of successful doctoral graduates rises to between 41% and 57% of those who commenced their studies (Study I; Puura et al., 2008).

A range of factors has variable negative impacts on the success of doctoral projects. Inadequate supervision or operating in isolation extraneous to either a research environment or an intellectual community leads to weakened performance and in many cases to a cessation of studies. A doctoral candidate and their supervisor also run the risk that their collaboration will not flourish for several inherently 'personal reasons'. These may be disparate background knowledge, differing world views, or incompatibility of personalities (Delamont

et al., 2001). The launching of a doctoral project, a complex intellectual journey, faces the risk of failure. A doctoral candidate requires intellectual courage to search for new knowledge, the ability to acknowledge mistakes and to start anew. The levels of risk are related to the availability of the research environment, the everyday and family circumstances of a candidate and their readiness and willingness to conduct lengthy research.

A further risk to candidate-supervisor relationship depends on the candidate's aim and the degree of awareness of the research topic. Candidates either aim to gain access to the 'academic highway' rapidly with a pre-prepared thesis or will start with the twin searches for a topic and the investigative methodologies. In addition to the conflicts that 'personal reasons' and different approaches may cause, there are other risk factors. For example, the success in performing an experiment, natural environmental conditions in field research and unexpected developments in the social environment may all affect a doctoral project. Universities should acknowledge these risks and manage them professionally (McWilliam et al., 2002).

The motivation of doctoral candidates to carry out research and to complete their doctoral project in a set time as a short term objective requires the support of the surrounding environment, the community. An intellectual community (Walker et al., 2008, p. 121) consists of peers and other people either related to the research topic of the student or possessing a wider outlook. The student in collaboration and in discussion with the community becomes intellectually more mature and, when facing intellectual barriers, can overcome them and thus establish knowledge. The intellectual community helps to reduce isolation, which may emerge in research and creation in general where a person acts on their own. The cooperation of the supervisor with the candidate should start immediately at the design stage of the doctoral project. At the launch of a doctoral project, the need is imperative to draw up an action plan (i.e., to map the landscape to be researched) in order to avoid becoming lost due to a lack of knowledge and understanding (Burbules, 1997). Without an action plan, the candidate will have either too many choices or no choices at all, which will inevitably result in a crisis of choice and identity. In conclusion, effective supervision develops from negotiated, mutually satisfactory arrangements made between the candidate and the supervisor.

Therefore, the training of doctoral students must take into account individual needs and the aims of research, but this should not be understood as individual research that stands completely alone and is separate from other doctoral students and researchers. This would limit the role of the professional research community (Leshem, 2007) to that of only controlling and assessing the results. The supervisor may have various roles in the research community, such as intellectual leader, hierarchical group leader or principal investigator, etc. A doctoral candidate has the premises to achieve "doctorateness" (Trafford, 2008), which entails such elements as explicit research questions, explicit research design, correct data collection, appropriate methodology and conceptual framework resulting in a contribution to knowledge, primarily in a

research community of practice. The community of practice defined by Wenger (1996) is a dynamic group of people sharing a common active interest and who interact in a way that facilitates learning from each other, but it does not take intentional responsibility for the development of the skills of the new comers. The research community of practice, consisting of highly qualified experts and specialists, can act as determined and innovative organization. The overarching characteristic of the research community, in doctoral education context, is that “the process of knowledge building is a fundamentally social enterprise” (Wenger, 1996, p. 3). In the case of a specific research community of practice, as stressed by Wisker et al. (2007, p. 306), the community involves working teams or groups in which individuals: 1) interact with one another, 2) are psychologically aware of each other, and 3) perceive and are perceived as being members of a team.

In the studies within the dissertation’s framework, the importance of horizontal relationships to support a Ph.D. student’s self-confidence as a specialist in their research field was stressed by some supervisors (Study II; Kärner et al., 2006; Kärner & Puura, 2008; Study III; Kärner et al., 2008). This data demonstrates the real importance of Ph.D. candidates’ involvement in the the research community’s activities.

There are a number of possibilities for enlarging the professional community surrounding a doctoral candidate. Participants at an international conference, with whom the doctoral candidate interacts and who could lead to new scientific contacts, are members of the professional community. Temporary study or research periods in universities abroad also create an international community within different (research) cultures, which in turn will develop the candidate’s ability to adapt to circumstances and to create new relationships in another environment. A strong motivating force is teaching students at Bachelor’s and Master’s levels. Teaching not only links the doctoral project to the skill of presenting the results but also involves the doctoral candidate as a member of the academic staff in the professional community.

Doctoral candidates also create their own intellectual environment by interacting and cooperating with their peers. In some cases, besides officially appointed supervisor they need to search for advisors among the specialists of their research topic or among the specialists in a particular field of a discipline (Study III; Kärner, 2008). The strong inner motivation of a doctoral candidate, expressed in the deep interest in their research and in purposeful activities, should motivate the supervisor to co-operate. At the same time, the activity of a doctoral candidate in shaping their research environment serves as a good basis for becoming the leader of a research group or some other line of development activity in a future career.

## **4.2. Meeting the expectations of society requires new approaches to the doctoral education**

When discussing the aims of doctoral education, and the methods of achieving them, the situation in Estonia should be taken in consideration. Estonia differs from the technologically developed countries (e.g. Finland, UK, and USA) where more than half of all Ph.D. graduates have to seek employment in the civil, industry or business sectors (Dill et al., 2006, p. 31; Haynes & Metcalfe, 2007, p. 13; Walker et al., 2008, p. 19). The implementation of the Bologna declaration and the Lisbon strategy directs to prepare new doctoral graduates for the employment outside higher education and research (Kehm, 2006, p. 74). At the same time, Estonia needs up to 1,300 Ph.D. awards over the next five years (Puura et al., 2007, p. 32) simply to meet the substitution and growth demand of the higher education sector (i.e. without accounting for the needs of industry and public administration).

Non-academic employment in Estonia of Ph.D. graduates will increase, first due to the demand for Ph.D.s outside academia to develop research-based economy, and secondly, to an increasing number of Ph.D. candidates doing their research as practitioner researches, as called by Jarvis (2000). Individuals working in schools, state institutions, media, industry etc. develop a doctoral project closely related to their professional activities. They also need a completely different type of supervision than the traditional doctoral candidate (Adler et al., 2000; Jarvis, 2000).

A small number of top level specialists with a Ph.D. degree are currently active in Estonian industry (Puura et al., 2007, p. 67), while over 80% of doctors engaged in R&D activities (Masso et al., 2007, p. 6) are employed in the higher education sector. However, Tiit et al. (2008) have shown the tendency to start their own entrepreneurship among younger generation of Ph.D. holders. According to research on the production of knowledge, the criteria for evaluating knowledge are multidimensional. Gibbons et al. (1994) noted that in addition to the peer review process, social acceptance has also its impact. These factors, however, also cause difficulties for the degree of cooperation between doctoral studies and industry, which the frequently disparate goals and outcomes of industrial R&D and academic research further complicate. Other problems integral with doctoral candidates from industry are the excessive time involved in the publication process of results and the academic supervisors' lack of experience in dealing with doctoral candidates from industry (Adler, 2000).

The discussions at Estonian universities (within the framework of the projects "Development of a complex of measures for strengthening doctoral studies in Estonia" (2003–2004) and "Assurance system for quality, effectiveness and sustainability of doctoral studies in Estonian universities" (2005–2008)) revealed that many stakeholders of the doctoral study process have only a surface understanding of the processes involved, based mainly on their own experiences in their research fields (Study II; Kärner & Puura, 2008). They have



little or weak interest in discussing the problems of doctoral education with colleagues from the other fields of research (Study III; Kärner et al., 2008). The results of the Ph.D students' survey (Kärner, 2004) and the interviews conducted in the frames of current dissertation showed that the three core groups involved in improving the doctoral process – university leaderships, supervisors and doctoral candidates – had pointedly different priorities. The university leadership bodies focus on improving the regulative and evaluative activities of the doctoral study process (besides financing matters). The supervisors consider that recruiting Ph.D. candidates who are highly motivated and better prepared for scientific research would not only offset high workloads and poor financing but also help to meet the higher efficiency requirements of doctoral studies. Ph.D. candidates, however, expect suitable research environments that involve perceptive guardian supervisors, and interactive research communities (Study II; Kärner et al., 2006; Kärner & Puura, 2008). One outcome of the present dissertation's research is the recommendation that 'round table' meetings, involving representatives of all the three core groups, should take place to create a common understanding of the problems and solutions to achieving the goals of doctoral education.

Although, according to the standards for doctoral thesis at Estonian universities, the international publication of research papers is required as a prerequisite for a doctorate there are few open academic discussions about the lengthy process prior to publication, encompassing not only the research process itself but also learning the methods, techniques, ethics of doing research. The shortage of this type of instruction and the mystification of the supervision process as a private endeavor (Pearson & Kayrooz, 2004, p. 100) are quite prevalent also in the Estonian context. A common assumption that research skills and key competences are a side-product of doing a doctoral research project seems to throw academics into confusion when a discussion about supervision pedagogy and research training is held. For example, there are descriptions of doctoral qualification from the UK where the creation of new knowledge is defined to come through advanced scholarship (Taylor, 2004, p. 248). In the UK, the shift towards research training is formalized to support the understanding of doctoral education as outcomes of learning research which concludes in a high quality doctoral dissertation. In Estonia, the normative acts regulating doctoral studies at university level place considerably higher emphasis on describing the quality requirements of the output (doctoral dissertation) than on the process and supervision. Nevertheless, the Procedure for accrediting university and applied higher education institution, their curricula and requirements to accreditation (HTM, 2003) does request that higher education institutions define the efficient criteria and methods of assessing the contribution by the academic staff. In universities, doctoral studies agreements among Ph.D. candidates, supervisors and the institution are being implemented to guarantee that the supervision works and that all involved in doctoral study fulfil their responsibility. Suspensions remain about the effect of these agreements, when viewed as pressure from 'above' as a result of the

faculty either disregarding or misunderstanding the use of mutual negotiations (Study II; Rutiku et al., 2007; Kärner & Puura, 2008).

Although traditional and non-traditional Ph.D. candidates need different approaches in supervision, the main goal of doctoral training is professional development. Entering the professional community, accepting its work culture and ethics, is as important for a doctoral candidate as in the case of any other profession. The supervisor plays a gate-keeping role (Lee, 2008) so that the supervisee has the opportunity to become a member of a professional community. In the formation of the identity of a researcher, there will be transformations on the personal level in connection with acquiring knowledge and skills that will lead to the achievement of a doctorate. The professional level entails the specific professional skills of the researcher but primarily the ethical convictions, the culture of functioning in a research team and the skills of presenting one's knowledge and results of research to different audiences (EUA, 2005b). Every identity needs constant development (Taylor 2008), and this principle does not support the understanding that the teamwork and management skills simply proceed from research activities.

The identity of a researcher is formed in the professional environment and is influenced by the traditions and culture of that environment (Sibbett & Thompson, 2008). As Bender (2006, p. 305) noted, the hidden curriculum embedded in the departmental culture is of enormous importance in the intellectual and professional formation of Ph.D. students. Although pedagogical skills are identified as being common to academic scholars, some academics consider pedagogical development unnecessary and prioritize excellent professional knowledge and research. At the same time, there are doctoral candidates who confess that they have a certain degree of incompetence in teaching students. Studies (II; Kärner & Puura, 2008 and III; Kärner, 2008) demonstrated that doctoral students as trainee teaching staff may limit themselves to copying the existing teaching tradition in their subject area, which they experienced as students in the first and second cycles of the university education, rather than actively improving and modifying their approaches via additional professional development and research.

### **4.3. Concepts of supervision and research training; Ph.D. candidates' experiences of supervision<sup>8</sup>**

The implementation of a doctoral project as a learning process involves the Ph.D. candidate and the supervisor as well as the other actors in the surrounding

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<sup>8</sup> When discussing supervision and research training in this section, Wenger's (1996; 1998) concept of learning organizations and the idea of threshold concepts (Meyer & Land, 2003; Trafford, 2008) together with literature references and studies about research supervision were used and applied to the research data gathered by the dissertation's author.

environment. The collaboration between the supervisor and candidate influences all those involved. Seeing something anew and overcoming certain barriers in order to change the mindset is necessary both for the doctoral candidate, as well the other researchers involved, who possess smaller or greater research skills.

In the studies carried out in this dissertation's framework, crucial factors appeared in the supervisory process in relationship to the expectations of the candidate developing their doctoral project: the competency of the supervisor to the topic of their candidate's doctoral project; the supervisors' time resources and the supervisors' inclination to share time with the candidate. In the study 'supervision resources' were defined as (Study III; Kärner, 2008):

- 1) Supportive of the Ph.D. candidate's progress: the supervisor has an elaborated topic in which they engage the candidate; the supervisor has only a few doctoral candidates; an additional benefit occurs if the supervisor does not have an administrative workload, which increases their time resource as a supervisor;
- 2) Complicated state of affairs for the Ph.D. candidate: the supervisor suggests a topic which has not been researched in the local context but there are not any topic specific experts available in the country; the supervisor's research topic is not close to the research domain of the candidate;
- 3) The independent mature candidate: the candidate only requests feedback from their supervisor(s) concerning their original research topic.

#### **4.3.1. Apprenticeship**

The study of Ph.D. graduates shows that doctoral candidates in Estonian universities have, before and after the first years of the new century, experienced mainly the apprenticeship style of supervision. Only occasionally were special courses were available for doctoral candidates, and many doctoral projects were frequently unrelated to the faculty's research topics (Study I; Kärner et al., 2005; Study II; Kärner & Puura, 2008; Study III; Kärner, 2008).

Apprenticeship is typically understood as advising and mentoring the Ph.D. candidate by a faculty member in a face to face manner (Walker et al., 2008, p. 91). Collins et al. (1991, p.2), for example, interpret apprenticeship as scaffolding, the support the master gives to his/her apprentices in carrying out a task. Damrosch (2006, p. 39) claimed also that apprenticeship tends to be a reproductive model of mentoring, which subtly reinforces social as well as intellectual conformity. The reliance of doctoral candidates on the authority of one individual, the supervisor, limits their opportunities of becoming multi-skilled. Also taboos and unwritten rules due to outdated hierarchical systems may hinder a Ph.D. candidate's constructive cooperation with other members of the faculty. These are circumstances that argue against the traditional master-apprentice style of supervision and for the co-involvement of the research community in doctoral training.

On the other hand, even the master-apprentice style learning and teaching may be considered a complex of social relationships (Wenger, 1998), as there are generally other people with whom both supervisor and student, singly or jointly, are involved in a social network of learning and research. Also Walker et al. (2008) admit that apprenticeship should be understood more broadly, as construction assignments and occasions that allow students to practice key tasks and move step by step toward independent practice.

Apprenticeship as support-giving to overcome barriers in thinking could be explained by the idea of Perkins (1999) of *troublesome knowledge* which is counter-intuitive, strange, or just *prima facie* wrong, and by the theory of *threshold concepts* (Meyer & Land, 2003). The process of doctoral studies, from the thresholds concepts' perspective contains a strain of liminality (Turner, 1969, p. 95) where existing knowledge, practices or conventions do not hold. Overcoming thresholds is, in general terms, a continuous process for a researcher (Meyer & Land, 2006, p. 25). The words of a supervisor interviewed by Kiley and Wisker (2008) illustrate the threshold concepts theory in practice: "In terms of 'helping students through conceptual thresholds' in my experience the student has identified a blockage, the nature of the blockage has been discovered through supervisory dialogue and the conceptual threshold has been crossed when a deeper and usually more conceptual understanding has been reached. These have been moments of 'insight' and connected to being able to identify the particular threshold concept that has enabled the making of new connections from what was previously a 'collection' thus removing the 'blockage'."

Trafford (2008) complemented the supervisor's role with the importance of assistance from others involved in the doctoral project. The latter should be instrumental in overcoming learning blockages and moving candidates through their respective liminal states. Trafford's view corresponds to the phenomena of the Zone of Proximal Development, described by Vygotsky (1978, p. 86) as *'the distance between the actual development level as determined by independent problem-solving and the level of potential development through problem-solving under adult<sup>9</sup> guidance or in collaboration with more capable peers.'* Vygotsky claimed that learning occurred in this zone which bridges the gap between what is known and what can be known.

In many European countries special structures for doctoral training and supervision were developed to encourage cooperation between supervisors and implement supervisory teams instead of sole supervisor. Graduate schools should be helpful to set up interdisciplinary research clusters as well as regional and international networks and to foster the co-operation with research institutes of different institutions. In Finland, for example, graduate schools provided the opportunity Ph.D. candidates' to work full-time on research in the contacts with researchers at home and abroad in creative and inspiring atmosphere (Oksanen et al., 2003, p. 45). In Estonia, in 2005/2006 academic year, nine more or less

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<sup>9</sup> In the context of doctoral study, "adult" is a supervisor or other faculty members.

multidisciplinary graduate schools covering main areas of doctoral training were established. By the opinion of Professor Jaanus Harro (2007) collaboration between different universities and other research institutions as also the interdisciplinary nature of doctoral training increased with the implementation of graduate schools.

Proceeding from theoretical treatments brought above and empirical data found in the framework of this dissertation, it may be concluded that doctoral candidates expect the supervisor or the supervisory team, as an established researchers in their subject area, to be interested in the Ph.D. candidate's research topic or at least in the close area to the topic, and to be able to follow the research intellectually in order to keep them 'on the right track'. To achieve the best results in the the supervisor-candidate collaboration, both parties would benefit from knowing the degree of guidance required by the doctoral candidate and which forms of collaboration are mutually suitable.

#### **4.3.2. Functional supervision**

The research results indicate that teachers who identify themselves as individuals who transmit knowledge to learners are supporters of surface learning (Wisker et al., 2004). From the perspective of supervision, such an approach can be interpreted as functional supervision (Lee 2008), which is limited to direct guidance, fixed assignments or responding to the questions of the doctoral candidate. In this type of supervision, the supervisor assists the candidate in solving the emerging problems but does not necessarily set new, provocative questions. Since doctoral candidates ask questions within the limits of their knowledge, the functional approach to supervision need not lead to a transformation, i.e. reaching a new level in the knowledge of the candidate and in their opinions on a specific topic.

As stated by Lee (2008, p. 276) quality assurance procedures put focus on the functional approach to supervision. The present study demonstrates that Ph.D. graduates, mainly from the natural sciences, also considered that the main goal of doctoral education was to publish articles in international peer reviewed journals. This means that (academic) writing skills are perceived as the best overall skill to obtain. Proceeding from the functional style of supervision, doctoral candidates mainly perceived their need for supervision in the form of supervisor's answers to their questions and feedback to their written works (Study III; Kärner, 2008; Kärner et al., 2008). The functional supervision consists of atomistic concepts (Brew, 2001) like techniques, problems and other separate elements linked together in a linear manner.

Study II (Kärner & Puura, 2008) indicated that the quality of Ph.D. candidates' publications may reflect, to a smaller or greater degree, the authorship of the supervisor and the working group involved, which may compensate candidate's lack of achieved knowledge or presentation skills. This lack in turn mirrors the sometimes low quality of doctoral training and supervision. These

deficiencies seem to stem from (1) the requirement to publish over the four year period at least three high quality peer reviewed articles for doctoral thesis, and (2) the impossibility, in circumstances of the high workload of supervisors and small or non-existent research groups, of achieving in a short time the knowledge, the skills and the publishable research results.

#### **4.3.3. From critical thinking to emancipation**

The development of critical thinking is relevant for the doctoral candidate in order to achieve the confidence and skills of independent reasoning. While finding support for one's arguments in scientific literature is easy; finding only supportive arguments does not facilitate discussion. A doctoral candidate needs to realize that arguments should not only serve to support the writer's view but also to counter opposing views (Lategan, 2007). Furthermore the views of respected researchers should be critically interpreted. Developing critical thinking may lead a doctoral candidate to constant inquiry, to the feeling of "fight or flight" (Lee, 2008). A doctoral candidate has to clarify their ideas in the research process and acquire the confidence for presenting their ideas and views. In the present study, one Ph.D. graduate indicated the development of critical thinking when admiring the supervisor's skill in asking questions that stimulated further thinking (Study III; Kärner, 2008, p.68).

Perkins (2006) suggested a constructivist approach to 'foreign' knowledge to engage learners in recognizing that there are alternative perspectives. There are examples in this study where Ph.D. candidates experienced being pushed into creative thinking by a professor who asked them to look at a certain problem from different perspectives. Playfulness releases thoughts from the limits of a narrow paradigm. Play is also liberating during the period of search when the candidate is not convinced whether they are on the right track. Winnicott (2005, p. 71) noted that a relaxed state that generates creative play is almost the only mode when a person can be freely creative. The play of thought requires interaction with peers and the environment suitable for debating which includes individuals (researchers) with different interests, knowledge and skills.

Brew (2001) suggested making a Ph.D. project a journey and therefore supervision as a facilitative process that includes mentoring of the candidate. The supervisor has a challenge to achieve the status of a mentor (Lee, 2007, p. 687), a reflective colleague to their mentee. The supervisor as a mentor also supports the candidates' development involving their personal and career goals, links them to the appropriate networks, offering both personal and professional support (Pearson & Kayrooz, 2004, p. 105). Walker et al. (2008, p. 91) postulate that effective mentors provide structured support for candidates' learning, in teaching the elements of being an expert researcher and scholar. The surrounding environment also plays a major role in demystifying a doctoral project. Narratives have their role in this process where the supervisor's reflections on, and transfer of, a personal experience to the student will help

overcome insecurity. The reflective supervisors are open to new ideas and constructive criticism related to their personal supervisory experiences; this openness in turn supports the relationship development with doctoral candidates (Pearson & Kayrooz, 2004). The opposite effect will be achieved by stigmatizing, i.e. by belittling a person who is acquiring some skills, or by negative tagging. Mentoring, supporting constructivism by the supervisor, will lead to the personal growth of the Ph.D. candidate and result in the candidate's becoming an expert researcher.

Elements of mentoring were found in the present study when the Ph.D. graduates acknowledged that their supervisors were caring and empathetic, and clearly described the relationship of the supervisee as a colleague as extremely positive (Study III; Kärner, 2008). Walker et al. (2008) mentioned the opportunity for students to have multiple mentors by actively seeking cooperation. This perspective on mentorship was noted in the present study when Ph.D. graduates related instances when they sought advice from academics other than their officially appointed supervisor.

#### **4.3.4. Supervision in the research community based on pedagogy of supervision**

By acknowledging doctoral study as achievement outcomes of learning research, supervisors and other advisors need, not only to establish the learning needs of their doctoral candidates through workshops, interviews, analyses and other forms of cooperation but also to provide training for the corresponding research strategies. This approach to doctoral study enables the supervisor to anticipate and avoid crises that may impact doctoral candidates especially at the start of a doctoral project when the candidate has not yet achieved self-confidence in their research work. This is characteristic of the phase of research where the "landscape" to be studied is not yet mapped and the researcher lacks clarity in which paths will lead to the goals. A stigmatic experience (Sibbett & Thompson, 2008) can occur when a student is forced to act independently during the project's design and initial phases, especially when the context is external to the research community's activities but the results of research are audited by the community (Lee, 2008). The success of a student is inhibited when either they are not accepted as a colleague in joint research or the research community's co-operation culture (or its absence) does not favour the development of the next generation of researchers. In the present dissertation, examples exist concerning experiences of Ph.D. candidates doing their doctoral project in isolation from other researchers. Also an example of a stigmatic experience was found in the instance of a formally appointed supervisor having an indifferent, even hostile attitude towards the Ph.D. candidate.

Viewing the doctoral study process, Trafford (2002; 2008) regard a conceptual framework as a threshold or gateway, the crossing of which will open a new vision of the research data for the doctoral candidate. In other

words, conceptualization is integral to achieve the doctoral level. Leshem and Trafford (2007) found in workshops with doctoral candidates that about one third of them struggled in visualizing concepts within a framework. The presentation of the research outcome will be descriptive at best without a conceptual framework or theory. Rudestam and Newton (1992) stated that generalizations are made on the basis of data obtained by observation and linked to a conceptual framework which in turn leads to explicating new research questions and the need for additional research. All of these activities require discussion and communication with the supervisor or, more widely, with the members of the professional community.

Interaction with a professional community requires a common language in order to be understood. The absence of language as a means of communication is one reason for the creation of a marginal state (Sibbett & Thompson, 2008). There is the need to master the meta-language of the research area and topic from the very beginning of doctoral studies (Wisker et al., 2004). There is also the need to indicate the role of the supervisor and the community of practice in this process. Any new knowledge causes the broadening of language use by the learner or researcher. Meyer and Land (2005) emphasize an extension of language might need to be acquired, for example, within a specific discipline, language community or community of practice.

Members of the research community can improve Ph.D. candidates' ability of meta-learning and thereby meta-cognition. Leshem and Trafford (2007, p. 99) regarded meta-learning as enabling the student to achieve the conceptualized research conclusions within their respective theoretical context and supporting meta-cognition, which is essentially thinking about thinking. Meta-learning, which essentially is deep learning, describes the critical, reflective, self-evaluative process of being aware of one's own learning needs, problems and achievements (Wisker et al., 2004, p. 474). Meta-cognition entails awareness of, and control over, one's thinking, enabling one-self to become aware of the barriers on the way to acquiring new knowledge and thus learning how to overcome them.

A number of academic scholars have shown interest in the problem of how to teach creative thinking on doctoral study level (cf. Lovitts, 2005; Trafford and Leshem, 2002; Wisker et al., 2004, 2007). Important innovations are increasingly in evidence (for example see above: improving meta-learning, use of multiple mentors etc.), but referring to Walker et al., (2008, p. 151), the process through which learners develop expertise as researchers calls out for more systematic study.

Acknowledging liminal phases in the process of studying, in the process of searching for or creating new knowledge, may provide a key for understanding the epistemological problems of the progress of doctoral candidates. However, ignoring the pedagogical problems involved in doctoral studies also remains an issue in Estonian universities (Study II; Kärner & Puura, 2008; Study III; Kärner, 2008, p. 70). Sibbett and Thompson (2008, p. 230) warn that dealing with this kind of 'taboo'-knowledge involves risk and discomfort, particularly



in organizational contexts. A conclusion may be drawn that research communities should act as innovative knowledge communities (Bereiter & Scardamalia, 1993), taking a collective responsibility for the competence and advancement of its individual members.

## 5. CONCLUSIONS

The original, peer reviewed publications that serve as the basis of this dissertation (Studies I, II and III) deal with the beliefs that the successful completion of a doctoral project is the result of the interrelationships between the candidate's self-motivation and their productive cooperation with their supervisors and research communities. By acknowledging doctoral study as learning research, supervisors and other members of research community establish the learning needs of their doctoral candidates and provide training for the corresponding research strategies. Collaboration in the research community is a significant factor in creating new knowledge and obtaining skills that are transferable into various R&D activities.

Taking into consideration that the efficiency of doctoral studies can be treated as the achievement of objectives on two counts: first, by meeting the requirements of academia and, secondly in producing a critical mass of highly qualified specialists necessary to develop a research based economy, the dissertation concludes that:

1. A common understanding between the core stakeholders groups involved in improving the doctoral studies process should be created in order to address the problems and solutions relevant to achieving the goals of a doctoral education.
2. Achieving the general aim of doctoral education, that of preparing highly qualified people for research, development or professional creative activity presupposes approaching the doctoral studies via a (new) paradigm which considers doctoral education as collaborative activity.
  - 2.1. Collaboration in research training to broaden the knowledge base spans many different disciplines;
  - 2.2. An increasing repertoire of skills is needed for a successful research career in different sectors;
  - 2.3. A critical mass of researchers willing to build a shared culture across the traditional disciplinary boundaries is necessary.
3. The implementation of supervision pedagogy through research guidance, supervision and mentorship would contribute to best practices among members of the research community.

Proceedings from these conclusions, this thesis suggests recommendations as follows. First, doctoral education would benefit from expanding the national and international communication networks of doctoral candidates as well as of the entire research community. Such expansion would in turn promote the dissemination and application of the ideas of supervision pedagogy. Secondly, by adopting the principles of pedagogy, supervisors would create a more favorable environment in which doctoral candidates could further their research.

The studies underlying the present thesis should be continued from the perspective of the supervisor and the activity of the research community in order to learn more about supervision-related barriers and to develop new

concepts of Ph.D. supervision. Follow-up studies involving additional problems of appropriate financing would elaborate new solutions for furthering the professional research communities and involving them in doctoral education.

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## SUMMARY IN ESTONIAN

### **Juhendamine ja teadustöö kooolitus professionaalses teadustöö kogukonnas. Uutest väljakutsetest Eesti doktoriõppes**

Käesolev dissertatsioon põhineb uurimustel, mis on avaldatud kolme eelretsenseeritud originaalpublikatsioonina ning on seotud teiste avaldatud artiklite ja konverentsiettekannetega (vt LIST OF ORIGINAL STUDIES, lk 6). Tekstis viidatakse uurimustele vastava Rooma numbriga.

Dissertatsiooni eesmärgiks oli uurida doktoriõppe (*doctoral education*) tulemuslikkuse seoseid doktorantide kooolituse (*training*) ja juhendamisega (*supervision*), käsitledes doktoriõpet kui teadustöö õppimist ja õpetamist doktoriprojekti tegemise käigus teadustöö keskkonnas. Töös on püstitatud järgmised ülesanded:

- 1) uurida doktorikraadi omandamise motiive ja juhendamise rolli motiivatsiooni püsimisel doktoriõppe käigus (I, II);
- 2) kirjeldada ühiskonna ootusi doktoriõppele ja doktoriõppe protsessis osalejate arusaamu doktoriõppe eesmärkidest (II, III);
- 3) uurida, kuidas doktoriõppe korraldus ja toetav või mittetoetav teadustöö keskkond on mõjutanud doktorantide edukust ning analüüsida doktorikraadi omandanute kogemusi juhendamissituatsioonide ja juhendamise kui protsessi kohta (I, II ja III).

Käesolevas käsitluses on jäetud kõrvale doktoriõppe finantseerimise ning doktorantide materiaalse toimetuleku problemaatika.

Uurimus on läbi viidud kombineeritud meetodiga. Fenomenoloogilise uurimise printsiipi on järgitud uuritava fenomeni vaatlemiseks ja analüüsimiseks sellega lähedalt seotud inimeste individuaalse elulise kogemuse kaudu (Schutz, 1970). Doktoriõppe keskkonna vaatlemisel on kasutatud doktoriõppe statistilisi materjale ning doktoriõpet reguleerivaid dokumente. Andmete triangulatsiooni kui fenomenist mitmekülgsema ülevaate saamise meetodit on kasutatud andmete kogumisel eri positsioonis doktoriõppega seotud indiviididelt (Flick, 1998; Denzin, 1970). Küsitletute valimid moodustati doktorikraadi omandanud endistest doktorantidest, aktiivsetest doktorantidest, doktorantide juhendajatest ning ülikoolide juhtidest, kes on seotud doktoriõppe korraldamisega.

Doktorikraadi omandanute valim koosnes 15 Tartu Ülikooli endisest doktorandist, kes alustasid doktoriõpinguid 1990ndatel aastatel ning omandasid doktorikraadi uue aastatuhande esimestel aastatel. Valim moodustati ülikooli doktorikraadi omandanud endiste doktorantide sotsiaal-demograafilist profiili arvestades, kaasates kaheksa meest ja seitse naist erinevatest teadusvaldkondadest ja erialadelt. Doktorikraadi omandanutega viidi läbi poolstruktureeritud intervjuud, mis salvestati ja transkribeeriti. 17 aktiivse doktorandiga Eesti kuue

ülikooli eri doktoriõppe valdkonnast ning 13 eri teadusvaldkonnas ja eri akadeemilise kogemusega juhendajaga Tartu ja Tallinna viiest ülikoolist viidi läbi neli fookusgrupiintervjuud. Doktoriõppe protsessi kolmanda osapoolena kaasati uuringusse viie ülikooli juhtkonnad (rektorid, prorektorid, dekaanid), kellega viidi läbi *Delphi* meetodil küsitlus.

Juhendamiskogemuse ja praktikate kirjelduste võrdlemine (EUA, 2005b) andis võimaluse saada ülevaade sellest, kuidas doktorantide juhendamine kui fenomen toimib erinevates tingimustes (Stake, 2000, p. 444). Doktoritööde nõuete ja doktoriõppekavade võrdlust (Puura jt, 2004) Eesti vastava seadusandlusega (vt näit Ülikooliseadus, 1995; Teadus- ja arendustöö korralduse seadus (R&D, 1997); Ülikooli ja rakenduskõrgkooli ning nende õppekavade akrediteerimise kord ja akrediteerimisel esitatavad nõuded (HTM, 2003)) on käesolevas töös kasutatud seadusandlikult reguleeritud doktoriõppe keskkonna analüüsimiseks, et selgitada tingimusi, milles toimub doktoriõppe osapoolte koostöö ja interaktsioon. Euroopa ülikoolide koostöödokumente ning Bologna protsessi doktoriõpet käsitlevaid materjale kasutati kui ühiskonna ootusi peegeldavat teavet.

Doktorikraadi omandamise motive ning motivatsiooni püsimist seoses juhendamisega (I ja III) on käsitletud doktorikraadi omandanute intervjuude ning doktorantide küsitluse andmete alusel. Doktoriõppesse astumise peamine motiiv on olnud soov tegeleda teadusliku uurimistööga. Doktorandid on pidanud oluliseks ka eneseteostust, võimalust areneda ja saada uusi kogemusi, saada enam respektierituks või jätkata perekondlikku traditsiooni (Kärner, 2004). Doktorikraadi omandanute puhul ilmneb varajane uurimishuvi, mida on ergutanud nende õpetajad alates põhikoolist, suunates huvidega ja andekat õpilast tegelema mõne probleemiga süvitsi. Koolist on leitud usk enda võimetesse ja soov jõuda ülikooli, mõnel puhul ka kindlam kavatsus saada teadlaseks.

Doktorandi motivatsiooni tegeleda doktoriprojektiga kuni selle valmimiseni ning kaitsta doktorikraad, toetavad peamiselt järgmised doktoriõppe organisatsiooni ning pedagoogilise suunamisega seotud tegurid: 1) koostöö juhendajaga, kes on tugev teadlane, soovitatavalt omab rahvusvahelisi kontakte ja vahendab neid ka doktorandile; 2) doktorikursuste- ja seminaride olemasolu, mis laiendavad doktorandi erialast silmaringi ning pakuvad võimalust esitada ning diskuteerida oma uurimistulemusi; 3) bakalaureuse- ja magistritaseme üliõpilaste õpetamine. Uuringust selgus, et ametliku juhendaja formaalse või ükskõikse suhtumise puhul doktorandi tegevusse on aidanud doktorandi enda aktiivne tegevus mitteametlike juhendajate kaasamisel, väljastpoolt ülikooli spetsialistidega konsulteerimisel, kaasdoktorantidega koostöö või, erandolukorras, uue juhendaja leidmine. Mitmel juhul jäi doktoriõpingute ajal puudu esinemiskogemuse omandamise võimalustest ja vähesest diskussioonist laiemas doktorantide ning kogenud teadlaste ringis, seega puudus piisav koostöö teadustöö kogukonnaga (*research community*). Oluline motivatsiooni tugevdav tegevus on olnud üliõpilaste õpetamine, mis, ühelt poolt, seob doktoriprojekti uuringud tulemuste esitamise oskusega ja, teiselt poolt, kaasab doktorandi õppejõuna professionaalsesse kogukonda (*professional community*). Õpetamis-

kogemust seoses doktoritööga pidasid vajalikuks eelkõige sotsiaal- ja humanitaarvaldkonna doktorid. Samal ajal iseloomustas tihedam personaalne kontakt juhendajaga loodusteaduste valdkonna doktorantide doktoriprojekti tegemist. Enamikul doktorikraadi omandanutest ei olnud nende doktoritööpingute ajal koduülikoolis spetsiaalseid doktoritasemel õppekursusi. Doktorid, kes osalesid doktorandina välisülikoolide õppetöös või juhendamisel, said positiivse kogemuse sellest, kuidas toimub doktorantide õpetamine. Uuringust ilmnes, et doktoritööpe edukaks lõpetamiseks on suurem eeldus neil doktorantidel, kes on doktoritööpingute ajal tihedalt seotud ülikooliga kas õppejõuna või teadurina töötades või täiskoormusega doktorandina oma doktoriprojekti tehes ning soovivad siduda ka oma tuleviku eelkõige akadeemilise karjääriga.

Dokoritööpe protsessis osalejate arusaamu doktoritööpe eesmärkidest ja vajadustest (II ja III) ning nende vastavust ühiskonna ootustele on uuringus selgitatud doktorikraadi omandanute intervjuude, juhendajate ja õppivate doktorantide grüpiintervjuude ning ülikoolide juhtkondade *Delphi*-küsitluse andmete alusel.

Kui teadmusühiskonnas on doktoritööpe väljund suunatud nii ülikoolidele kui ka mitteamakadeemilistele sektoritele (ministeeriumid, omavalitsused, tööstus- ja äriettevõtted), siis Eestis, on asendus- ja kasvunõudluse täitmiseks suurim doktorite vajadus akadeemilises sektoris ning tööstuses ja ettevõtluses on siiani valitsenud vähene huvi doktorikraadiga tippspetsialistide vastu (Puura jt, 2007). Doktoritööpe osapooled näevad selle arendusvajadusi ja -võimalusi erinevalt. Ülikoolide juhtkonnad pööravad tähelepanu eelkõige regulatiivsetele ja kontrollimehhanismidele. Juhendajad on huvitatud võimalikult paremate teadustöö kogemuste ja eeldustega doktorantide värbamisest ning stabiilsest teadustöö rahastamisest, mis annaks kindlustunde doktorantide uurimistöö tagamisel. Doktorandid on huvitatud teadustöö keskkonna toimimisest niisugusel moel, et nad oleksid kaasatud selle tegevusse, juhendajad aga oleksid uurimistöö partnerid, kolleegid ehk mentorid (*mentor* (Pearson & Kayrooz (2004), Lee (2007), Walker et al. (2008)).

Eesti ülikoolides on doktoritööpet reguleerivates dokumentides põhirõhk doktoridissertatsiooni kvaliteedinõuete määratlemisel. Doktoritööpet kui õppeprotsessi, milles toimub koostöö doktorantide, nende juhendajate ning teadustöö kogukonnaga, on seni vähe käsitletud.

Dokoritööpe korralduse ja teadustöö keskkonna mõju doktorantide edukusele ning doktorikraadi omandanute kogemusi juhendamissituatsioonide ja juhendamisprotsessi kohta (II ja III) on analüüsitud dissertatsiooni kaitsnud endiste doktorantide doktoritööpingute representatsioonide kaudu. Doktorandi ja juhendaja koostöö edukuses on juhendajapoolses tegevuses tähtsal kohal juhendaja teadustöö seotus doktoriprojekti teemaga, tema ajaressurss ning soov seda doktorandiga jagada. Samal ajal võtavad nii doktoriprojekti alustaja kui ka tema juhendaja riski, et koostöö ei laabu erinevatel põhjustel, olgu selleks segavalt suur erialaste teadmiste taseme või maailmavaateline erinevus kuni isiksuste sobimatuseni.

Kuna seni on puudulikult arendatud teadustöö juhendamise pedagoogika (*supervision pedagogy*) teooriat, leidub ka rahvusvahelisel tasandil vähe teoorial baseeruvaid doktorantide juhendamise praktika käsitusi ning vastavaid uurimusi. Doktorantide juhendamist on käsitletud peamiselt juhendamisalaseid kogemusi esitavate käsiraamatutena (vt näit Delamont et al., 2001; Rudestam & Newton, 1992), eksperimentide analüüsidenä või küsitluste tulemuste põhjal (näit Leshem, 2007; Lee, 2008; Sinclair, 2004). Käesolev uurimus sedastab, et doktorantide juhendamine on käesoleva aastatuhande algul Eestis toimunud veel peamiselt traditsioonilise õpipoisi (*apprenticeship*) mudelile toetudes ehk juhendaja ja doktorandi personaalses suhtlemises. Selle mudeli puuduseks peetakse isoleeritust professionaalsest kogukonnast. Teiselt poolt, ka õpipoisi stiilis õppimine ja õpetamine on käsitletav sotsiaalsete sidemete kompleksina (Wenger, 2007). Lee (2008) andmetel on enam levinud funktsionaalne juhendamine, mis kombineerub teiste stiilidega. Funktsionaalne juhendamine on instrumentaalne, piirdudes doktorandile konkreetsete ülesannete ja juhiste andmisega. Käesoleva dissertatsiooni aluseks olevate uurimuste tulemused viitavad funktsionaalsele juhendamisele eelkõige seoses doktoritöö tulemuste publitseerimisega. Funktsionaalsele juhendamisele võib provotseerida vajadus kiiresti publitseerida arvestataval rahvusvahelisel tasemel uurimistöö tulemusi ja saavutada arvestuslikult suurem doktoriõppe efektiivsus.

Doktorantide koolitus (*training*) peaks arvestama doktorandi individuaalseid vajadusi ja uurimistöö eesmäärke. Doktoritöö ei tuleks mõista kui individuaalselt toimuvat uurimistööd, millega tegeletakse täiesti omaette, eraldi teistest doktorantidest ja uurijatest, piirates kogukonna rolli vaid kontrollija ja tulemuste hindaja rolliga. Doktorantidel on ootus, et juhendaja kui oma eriala tugeval tasemel teadlane mõtleb temaga kaasa, aidates tal püsida n.ö. õigel teel. Seega juhendaja ja doktorandi koostöös on otstarbekas doktoriprojekti alustades selgitada mõlemale sobivad koostöö vormid ning juhendatava vajadus vähema või suurema suunamise järele. Doktoriprojekti tegemine arendab kriitilist mõtlemist ja juhendajal on siin doktorandi emantsipatsiooni toetav roll. Brew (2001), Pearson & Kayrooz (2004), Lee (2007) soovivad arendada juhendamist kui doktorandi uurimistööd soodustavat protsessi (*facilitative process*), milles juhendaja kui mentor toimib juhendatavale reflekteeriva kolleegina. Juhendaja kui mentor toetab doktorandi edenemist, kaasates teda koostöövõrgustikku, pakkudes tuge nii tema personaalses kui ka professionaalses arengus. Doktorandi sisenemisel professionaalsesse kogukonda näeb Lee (2008) juhendajal väravahoidmise (*gate keeping*) rolli.

Teadlase identiteedi kujunemine personaalsel tasandil toimub seoses doktori tasemel teadmiste ja oskuste saavutamise ja arendamisega. Professionaalne tasand sisaldab teadlase spetsiifilisi erialaseid oskusi, esmajoones aga eetilisi tõekspidamisi, teadustöö kollektiivis toimimise kultuuri ning oma teadmiste esitamise oskust erinevale auditooriumile (Doctoral programmes, 2005). Teadlase ja õppejõu identiteet kujuneb professionaalses keskkonnas ning on selle keskkonna tavade ja kultuuri poolt mõjutatud. Erinevate keskkondadega kokkupuude võib mõjutada uskumusi (*beliefs*) ning suunab uutele otsingutele. Iga identiteet vajab

pidevat ülesehitamist (Taylor, 2008), teadustöö oskustele lisaks on vajalik ka meeskonnatöö- ning juhtimisoskuste arendamine (II ja III).

Doktoriprojekti edukas lõpuleviimine on doktorandi tugeva sisemise motiveerituse ning juhendaja ja teadustöö kogukonnaga toimuva produktiivse koostöö tulemus. Lähtudes arusaamast, et doktoriõpe on teadustöö tegemine samaaegselt õppides teadustööd, on doktorantide juhendajate ja teiste teadustöö kogukonna liikmete ülesanne koolitada doktorante ja soodustada nende uurimistööd. Teadustöö kogukonna koostöö soodustab uue teadmuse loomist ning võimaldab doktorandil omandada oskusi, mis on kasutatavad erinevates teadus- ja arendusalastes tegevustes.

Võttes arvesse teadustöö võimete ja oskustega töötajate vajadust ühiskonna eri valdkondades ning doktoriõppe seniseid tulemusi, esitatakse käesolevas uurimuses järgmised järeldused.

1. Doktoriõppe parema tulemuslikkuse saavutamiseks on vajalik, et kõik doktoriõppega seotud osapooled saavutaksid ühise arusaama doktoriõppe eesmärkidest.
2. Pidades silmas, et doktoriõppe kaudu valmistatakse ette tippspetsialiste teadus- ja arendustööks ühiskonna eri sektorite jaoks, on oluline läheneda doktoriõppele läbi koostöö paradigma:
  - 2.1. uurimistöö alase koolituse koostöö toimub eri distsipliinide üleselt;
  - 2.2. doktorandid omandavad oskusi, mis võimaldavad teadus- ja arendustöö alast tegutsemist ühiskonna eri sektorites;
  - 2.3. ühise teadustöö kultuuriga teadlaste kriitilise massi kujundamine, mis ületaks traditsioonilised teadusvaldkondade piirid.
3. Juhendamise pedagoogika kui teoreetilise ja rakendusliku valdkonna arendamine võimaldaks levitada teadustöö juhendamise parimat kogemust teadustöö kogukonna liikmete hulgas.

## **PUBLICATIONS**

# CURRICULUM VITAE

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### Education and qualifications

1981 Diploma *cum laude* from the Faculty of Philology University of Tartu; qualification of Estonian philologist, teacher of Estonian language and literature  
2000 University of Tartu, Faculty of Social Sciences, master's examinations in Sociology of Education  
2005 International Summer-school for Ph.D. students in Granada, Spain  
2002-2009 Doctoral program in Education, Faculty of Education University of Tartu

### Professional Employment

1981–1985 Senior Librarian, University of Tartu Library  
1981–1984 Half-time Teacher, Department of Estonian Language University of Tartu  
1985–1991 Language Editor, University of Tartu Publishing House  
1992–1993 Senior Librarian, University of Tartu Library  
1993–1994 Language Editor, University of Tartu Rector's Office  
1995–2004 Head Specialist for Postgraduate Study, University of Tartu  
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### The main fields of interest

Organization of doctoral education and doctoral programs; comparative studies of the systems of doctoral education; practices of doctoral supervision; supervision pedagogy



### **Participation in professional organizations**

Member of the expert-council for the national curriculum; member of the committee of the program *Eduko* (development of educational research and teacher education, funded by the European Social Fund); member of the committee of national program “Value Development in the Estonian Society 2009–2013”

### **Publications and presentations**

7 publications, 3 presentations at international conferences

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### Hariduskäik

1976–1981 Tartu Riikliku Ülikooli filoloogiateaduskond, lõpetanud  
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2000 Tartu Ülikooli sotsiaalteaduskonnas sooritanud eksternina  
haridussotsioloogia magistrieksamid  
2002–2009 Tartu Ülikooli haridusteaduskonna doktorant  
2005 Doktorantide rahvusvaheline suvekool Granada Ülikoolis

### Teenistuskäik

1981–1985 Tartu Ülikooli Raamatukogu vanemraamatukoguhoidja  
1981–1984 Tartu Ülikooli filoloogiateaduskonna eesti keele kateedri  
õppeülesande täitja  
1985–1991 Tartu Ülikooli Kirjastuse vanemtoimetaja  
1992–1993 Tartu Ülikooli Raamatukogu vanemraamatukoguhoidja  
1993–1994 Tartu Ülikooli rektori kantselei vanemtoimetaja  
1995–2004 Tartu Ülikooli õppe- ja üliõpilasosakonna magistri- ja  
doktoriõppe peaspetsialist  
2005–2006 Tartu Ülikooli õppeosakonna doktoriõppe peaspetsialist  
2007– Tartu Ülikooli haridusteaduskonna haridusuuringute ja  
õppekavaarenduse keskuse juhataja, doktoriõppekava  
peaspetsialist.

### Teadus- ja arendustöö põhisuunad

Doktoriõppe korraldus ja doktoriõppekava arendamine, doktoriõppe süsteemide  
võrdlevad uuringud, doktorantide juhendamise praktikad ja doktorantide  
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### **Tegevus erialastes organisatsioonides**

Riikliku õppekava ekspertnõukogu liige, ESF programmi Eduko nõukoja liige, riikliku väärtusarenduse programmi nõukogu liige

### **Publikatsioonid ja esinemised**

Publikatsioonide üldarv 7, kolm ettekannet rahvusvahelistel konverentsidel

## DISSERTATIONES PEDAGOGICAE UNIVERSITATIS TARTUENSIS

1. **Карлен, 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 keeleimmersion Eesti muukeelse hariduse mudelitenä. 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.