Doctoral student engagement

The dynamic interplay between students and scholarly communities

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Supervisors: *Assistant Professor, Research director*
                 Kirsi Pyhältö
                 University of Helsinki

                 Professor
                 Kirsti Lonka
                 University of Helsinki

                 Professor
                 Kai Hakkarainen
                 University of Turku

Pre-examiners: *Professor*
                 Gina Wisker
                 University of Brighton, United Kingdom

                 Adjunct Professor
                 Taru Feldt
                 University of Jyväskylä

                 Custos: *Professor*
                              Kirsti Lonka
                              University of Helsinki

                 Opponent: *Professor*
                              Mary Ann Danowitz
                              North Carolina State University,
                              United States

University of Helsinki
Faculty of Behavioural Sciences
Department of Teacher Education
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Jenna Vekkaila

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Abstract

This dissertation study explored students' engagement in the doctoral process and factors associated with it. Doctoral students' experiences of engagement were investigated in three studies, while the associated factors were analysed in a further two. The dissertation used a mixed-methods approach; accordingly, the data were collected through interviews and surveys, and were analysed by combining qualitative and quantitative methods.

Study I investigated the key learning experiences that the students perceived to be either inspiring or challenging in their doctoral process. Altogether 19 natural sciences doctoral students were interviewed. The majority of the key learning experiences identified by the students were positive. Most of the experiences were related to the students' participation in the scholarly community, developing as a scholar, and developing specific research competencies. The students situated such experiences typically in various scholarly activities including research work, courses, and academic meetings.

Study II focused on analysing students' engagement by exploring the main experiences and sources, as well as the qualitatively different forms of engagement in the doctoral process. Altogether 21 behavioural sciences doctoral students were interviewed. The students described their engagement in terms of experiences of dedication, efficiency, and sometimes absorption. They typically emphasised their sense of competence and relatedness as the main sources of engagement. In the students' descriptions three qualitatively different forms of engagement in doctoral work were also identified: an adaptive form of engagement, an agentic form of engagement, and a work-life inspired form of engagement. Further, there was variation among the students in terms of what forms of engagement they emphasised in different phases of their doctoral studies.

Study III focused on students' disengagement by exploring the main experiences and sources of disengagement from the doctoral process. Also, the students' perceptions of the dynamic interplay between themselves and their environments with respect to disengaging experiences were explored by analysing the perceived misfits between the students and their environments. Altogether 16 behavioural sciences doctoral students were interviewed. The students described their disengagement in terms of experiences of inefficacy, cynicism, and sometimes exhaustion. They typically emphasised their struggles and conflicts within the scholarly community as the main source of disengagement. The students typically attributed their disengagement to the perceived misfit between themselves and their environments, and in particular often associated the problem with the scholarly community rather than themselves.

Study IV focused on the collective fit between doctoral students and their environments that had contributed to their engagement. Altogether 1 184 doctoral students and 431 supervisors from different disciplines participated in the surveys. The collective fit was explored at the faculty level in terms of similarities and differences in the students' and supervisors' perceptions of the main resources and challenges with respect to the doctoral process. The relation between the perceived fit and the doctoral students' satisfaction with their study process and supervision was explored. The results showed that either a fit, a partial fit, or a misfit existed between the students' and supervisors' perceptions in the different faculties. A relation was also found between the collective fit and students' satisfaction with their overall study process and supervisory support.

This dissertation contributes to the literature on doctoral student engagement by breaking down the complexity of engagement; it does this by identifying the qualitatively different experiences, sources, and forms of engagement. Moreover, the study reveals the nature of engagement at the interface of study and work by shedding light on the dual role of doctoral students as both students and professional researchers. Further, the results provide a new understanding of the perceived student–

learning environment fit as a primary determinant of doctoral student engagement. The results encourage viewing doctoral student engagement as a complex, multidimensional phenomenon supported by the constructive interplay between doctoral students and their learning environments that fosters students' meaningful participation and a sense of belonging in their scholarly communities.

Jenna Vekkaila

Tohtoriopiskelijan väitöskirjaprosessiin kiinnittyminen
Vuorovaikutus opiskelijan ja tiedeyhteisön välillä

Tiivistelmä

Tässä väitöskirjassa tutkittiin tohtoriopiskelijoiden väitöskirjaprosessiin kiinnittymistä ja tekijöitä, jotka yhdistettiin kiinnittymiseen. Tohtoriopiskelijoiden kokemuksia väitöskirjaprosessiin kiinnittymisestä käsiteltiin kolmessa osatutkimuksessa, kun taas kiinnittymiseen yhdistettyjä tekijöitä tarkasteltiin kahdessa osatutkimuksessa. Aineisto kerättiin sekä haastatteluin että kyselylomakkein. Analyysissä yhdistettiin laadullisia ja määrällisiä menetelmiä.

Osatutkimuksessa I tutkittiin tohtoriopiskelijoiden inspiroivia ja haastavia väitöskirjaprosessin avainoppimiskokemuksia. Haastatteluaineisto kerättiin 19 luonnontieteiden tohtoriopiskelijalta. Suurin osa tohtoriopiskelijoiden avainoppimiskokemuksista oli positiivisia. Kokemukset liittyivät pääosin tiedeyhteisöön osallistumiseen sekä tutkijana kehittymiseen ja tutkimusosaamisen karttumiseen. Opiskelijat sijoittivat avainoppimiskokemuksensa tapahtuvaksi tyypillisesti erilaisissa tieteellisissä käytännöissä kuten tutkimustyön, jatko-opintokurssien ja tieteellisten tapaamisten aikana.

Osatutkimuksessa II syvennyttiin tarkemmin tohtoriopiskelijoiden väitöskirjaprosessiin kiinnittymiseen analysoimalla erilaisia kiinnittäviä kokemuksia ja niiden lähteitä. Tutkimuksessa analysoitiin myös laadullisesti erilaisia kiinnittymisen muotoja. Haastatteluaineisto kerättiin 21 käyttäytymistieteiden tohtoriopiskelijalta. Opiskelijoiden kiinnittyminen ilmeni omistautumisen ja pystyvyyden kokemuksina sekä joskus myös uppoutumisen kokemuksina. Opiskelijat kuvasivat usein vahvistuneita osaamisen ja kuulumisen kokemuksia kiinnittymisensä lähteiksi. Opiskelijoiden kuvauksista tunnistettiin myös kolme laadullisesti erilaista väitöskirjaprosessiin kiinnittymisen muotoa: mukautumista heijastava kiinnittymisen muoto, toimijuutta heijastava kiinnittymisen muoto ja työelämän inspiroima kiinnittymisen muoto. Eri vaiheissa väitöskirjaprosessiaan olevat opiskelijat painottivat eri tavoin laadullisesti erilaisia kiinnittymisen muotoja.

Osatutkimuksessa III keskityttiin tarkemmin tohtoriopiskelijoiden väitöskirjaprosessista etääntymiseen analysoimalla erilaisia etäännyttäviä kokemuksia ja niiden lähteitä. Tutkimuksessa analysoitiin myös koettua dynaamista vuorovaikutusta tarkastelemalla opiskelijoiden kokemaa vastaamattomuutta heidän ja ympäristöjensä välillä etääntymiskokemuksissa. Haastatteluaineisto kerättiin 16 käyttäytymistieteiden tohtoriopiskelijalta. Opiskelijoiden etääntyminen ilmeni riittämättömyyden ja kyynisyyden kokemuksina sekä joskus myös uupumisena. Opiskelijat kuvasivat etääntymisensä keskeiseksi lähteeksi kohtaamansa hankaluudet ja konfliktit tiedeyhteisön sisällä. Opiskelijat tyypillisesti näkivät etääntymisensä aiheutuneen vastaamattomuudesta heidän ja ympäristöjensä välillä. Opiskelijat yhdistivät etääntymisen johtuvan pikemmin heidän tiedeyhteisöstään kuin heistä itsestään.

Osatutkimuksessa IV syvennyttiin tohtoriopiskelijoiden väitöskirjaprosessiin kiinnittymiseen vaikuttavaan kollektiiviseen vastaavuuteen opiskelijoiden ja heidän ympäristöjensä välillä. Kyselyaineisto kerättiin eri tieteenaloilta 1 184 tohtoriopiskelijalta ja 431 ohjaajalta. Kollektiivista vastaavuutta tutkittiin tiedekuntatasolla analysoimalla opiskelijoiden ja ohjaajien väitöskirjaprosessin resursseja ja haasteita koskevien käsitysten yhdenmukaisuutta ja eroavaisuutta. Tutkimuksessa analysoitiin myös yhteyttä havaitun vastaavuuden ja opiskelijan väitöskirjaprosessia ja ohjausta kohtaan raportoiman tyytyväisyyden välillä. Tulokset osoittivat että, eri tiedekunnissa opiskelijoiden ja ohjaajien käsityksien välillä oli joko vastaavuus, osittainen vastaavuus tai vastaamattomuus. Kollektiivisen vastaavuuden ja opiskelijan väitöskirjaprosessia ja ohjauksessa saamaansa tukea kohtaan raportoiman tyytyväisyyden välillä havaittiin yhteys.

Neljän osatutkimuksen tulokset avasivat uusia näkökulmia tohtoriopiskelijoiden väitöskirjaprosessiin kiinnittymiseen tuomalla esille laadullisesti erilaisia kiinnittymisen kokemuksia, lähteitä ja muotoja. Tämä väitöskirjatutkimus toi myös uutta tietoa tohtoriopiskelijoiden kiinnittymisen luonteesta opiskelun ja työn rajapinnoilla valaisemalla opiskelijoiden kaksoisroolia sekä opiskelijoina että

tutkijoina. Tulokset tuottivat lisäksi uutta ymmärrystä koetusta opiskelija–oppimisympäristö vastaavuudesta keskeisenä tekijänä tohtoriopiskelijoiden väitöskirjaprosessiin kiinnittymisessä. Tutkimustulokset kannustavat näkemään tohtoriopiskelijoiden väitöskirjaprosessiin kiinnittymisen monitahoisena ilmiönä, jota tukee rakentava, mielekkäitä osallisuuden ja tiedeyhteisöön kuulumisen kokemuksia edistävä vuorovaikutus tohtoriopiskelijoiden ja heidän oppimisympäristöjensä välillä.

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At home in Kellokoski, January 2014.

List of original publications

This doctoral dissertation is based on the following original publications, which are referred to in the text by their Roman numerals (*Studies I–IV*):

I Vekkaila, J., Pyhältö, K., Hakkarainen, K., Keskinen, J., & Lonka, K. (2012). Doctoral students' key learning experiences in the natural sciences. *International Journal for Researcher Development, 3*(2), 154–183.

II Vekkaila, J., Pyhältö, K., & Lonka, K. (2013). Focusing on doctoral students' experiences of engagement in thesis work. *Frontline Learning Research, 1*(2), 10–32.

III Vekkaila, J., Pyhältö, K., & Lonka, K. (2013). Experiences of disengagement – A study of doctoral students in the behavioral sciences. *International Journal of Doctoral Studies, 8*, 61–81.

IV Pyhältö, K., Vekkaila, J., & Keskinen, J. (2012). Exploring the fit between doctoral students' and supervisors' perceptions of resources and challenges vis-à-vis the doctoral journey. *International Journal of Doctoral Studies, 7*, 395–414.

Contents

Original articles

1 Introduction

The aim of doctoral education is to train accomplished researchers and create new knowledge through conducting high-quality research. Doctoral studies are about learning in terms of research work and becoming an acknowledged researcher in a scholarly community (e.g., Brew, Boud, & Namgung, 2011; Pyhältö, Num-menmaa, Soini, Stubb, & Lonka, 2012a; Turner & McAlpine, 2011; Walker, Golde, Jones, Conklin Bueschel, & Hutchings, 2008). This challenges students intellectually, emotionally, and socially. Conducting doctoral research requires students to work at the edge of their competencies and tolerate their own incompleteness. These challenges can, however, be a significant part of a meaningful doctoral process and a candidate's engagement in it. They can help students to surpass themselves (e.g., Bereiter & Scardamalia, 1993) and inspire them to learn and earn the degree. Challenges are in fact necessary for the creation of new knowledge and developing future researchers; without challenges, doctoral students cannot exceed their existing boundaries.

Doctoral students are academically highly competent and successful based on their educational backgrounds. They are typically highly motivated to carry out doctoral studies since they have applied to doctoral education programmes, passed the selection process, and launched their own research projects. However, for many the challenges of the doctoral process seem to consist of a series of negative experiences and insurmountable obstacles. Doctoral students are often found to experience hopelessness, exhaustion, distress, and being overwhelmed during their studies (e.g., Brauer et al., 2003; Hyun, Quinn, Madon, & Lustig, 2006; Kurtz-Costes, Helmke, & Ülkü-Steiner, 2006; Toews, Lockyer, Dobson, & Brownell, 1993; Toews et al., 1997).

Doctoral students may even question their persistence and decide to leave their studies. Various studies have found remarkably high attrition rates among doctoral students varying from 30% to 50% (Gardner, 2007, 2008; Golde, 2000, 2005; Lovitts, 2001; McAlpine & Norton, 2006; Nicholls, 2007) with differences evident across contexts and countries. Some sources indicate that attrition rates may be even higher (e.g., Lovitts & Nelson, 2000; Nettles & Millet, 2006). In addition, it is not rare for many doctoral students to leave during their first year (e.g., Jairam & Kahl Jr., 2012), and those students who persist will spend often more time to earn their degree than anticipated (e.g., Walker et al., 2008; Wao & On-wuegbuzie, 2011).

This raises the question of how to foster students' engagement in the doctoral process. Previous studies on doctoral experience provided information about factors associated with the quality of the doctoral experience as well as students' persistence and time-to-the-doctorate including socialisation into the academic community, faculty support, and supervision, as well as students' personal attributes such as motivation (e.g., Appel & Dahlgren, 2003; Gardner, 2007, 2008; Golde, 2010; Lahenius, 2013; Protivnak & Foss, 2009; Sakurai, Pyhältö, & Lindblom-

Ylänne, 2012; Spaulding & Rockinson-Szapkiw, 2012; Wao & Onwuegbuzie, 2011). However, little is known about doctoral student engagement.

While it has been suggested that, when focusing on student learning in higher education, experiences of engagement and disengagement should be given attention (e.g., Case, 2007, 2008; Mann, 2001), at present an increasing body of literature only on engagement among undergraduate students exists (e.g., Bresó, Schaufeli, & Salanova, 2011; Carini, Kuh, & Klein, 2006; Krause & Coates, 2008; Lonka & Ketonen, 2012; Ouweneel, Le Blanc, & Schaufeli, 2011; Salanova, Schaufeli, Martínez, & Bresó, 2010; Schaufeli, Martínez, Pinto, Salanova, & Bakker, 2002a). Moreover, while the need for developing more engaging learning environments for doctoral students is acknowledged (e.g., Golde, 2005; Lovitts, 2001; Pontius & Harper, 2006), current studies do not tell us enough about how the interplay between student and environment produces engagement (e.g., Fredricks, Blumenfeld, & Paris, 2004). Accordingly, there is a need to gain a better understanding of the key ingredients of an engaging or a disengaging doctoral experience and what contributes to such an experience. This study aims to fill the gap in the doctoral education literature by exploring the nature of doctoral student engagement and factors associated with the doctoral experience.

1.1   Student's learning during the doctoral process

Learning has been suggested as a core element of doctoral studies (e.g., Austin & McDaniels, 2006; Pyhältö et al., 2012a; Stubb, 2012; Turner & McAlpine, 2011; Walker et al., 2008). For instance, McAlpine and Norton (2006) proposed that doctoral education should be organised as an integrative and systemic learning process, the student experience of learning situated at its core. From this perspective doctoral studies are about learning to become a researcher, learning about research, and learning to create new knowledge, as well as learning about the practices of a scholarly community and ways to participate in them. In this dissertation, doctoral students' engagement is explored within the general frameworks of sociocultural and socio-constructivist views of learning (Lave & Wenger, 1991; Salomon & Perkins, 1998; Vygotsky, 1978).

Learning itself is always active knowledge construction, that is, a process of selection and interpretation (e.g., Resnick, 1991; Salomon & Perkins, 1998; Vygotsky, 1978). This means that doctoral students actively construct their understanding. Hence, doctoral studies involve learning about research and how to conduct research (e.g., Delamont & Atkinson, 2001; Saunders, 2009; Stevens-Long, Schapiro, & McClintok, 2012; Wu, Griffiths, Wisker, Waller, & Illes, 2001), including domain-specific as well as generic knowledge and skills (e.g., Häikiö, Lindblom-Ylänne, Lonka, & Pyhältö, 2013). Doctoral students construct their understanding on the basis of their prior knowledge, experiences, expectations, and beliefs, which they have developed, for instance, during their undergraduate studies. Students' previous experiences contribute to their ways of understanding research and their skills related to it. This, in turn, influences how they engage in the process of researching and carrying out research, as well as their ways of learning when conducting doctoral research. For instance, while conducting their research

projects, doctoral students undergo changes in their understanding of research, which further develops their prior knowledge (e.g., Kiley, 2009; Wisker & Robinson, 2009). Some doctoral students face significant difficulties in developing domain-specific competencies and mastering generic competencies (Pyhältö, Toom, Stubb, & Lonka, 2012b). Doctoral students have reported, for instance, suffering from a lack of self-regulated learning skills and low self-confidence, and from problems with constructing a theoretical framework as well as with selecting research questions and methods (e.g., Delamont & Atkinson, 2001; Li & Seale, 2007; Pyhältö et al., 2012b; Wisker, Robinson, Trafford, Creighton, & Warnes, 2003; Wu et al., 2001). Such difficulties were likely to evolve because students' prior experiences of research gained during undergraduate studies were insufficient or even contradicted the experiences of their doctoral studies (e.g., Delamont & Atkinson, 2001).

However, doctoral students' learning is not only about constructing an understanding of research and mastering the related skills and knowledge; it is also about developing one's identity as a scholar (e.g., Baker & Lattuca, 2010; Green, 2005; McAlpine & Amundsen, 2008; McAlpine, Jazvac-Martek, & Hopwood, 2009), that is, the perceptions of oneself as a professional agent (e.g., Pyhältö et al., 2012a). For instance, the transition to doctoral studies involved multiple shifts in students' thinking about themselves in regard to their roles within their study lives and their lives outside academia (Tobbell, O'Donnell, & Zammit, 2010). Through the study process doctoral students also balanced between the roles of student and professional researcher (Baker & Pifer, 2011; Jazvac-Martek, 2009; Sweitzer, 2009), imagined their futures and sought what sort of scholar they would become (McAlpine, Amundsen, & Jazvac-Martek, 2010), and gained experiences of themselves as active agents (McAlpine & Amundsen, 2009; Pyhältö & Keskinen, 2012). Hence, doctoral studies involve developing an understanding of what it means to be a researcher and an on-going construction of self-images of oneself in relation to a prior understanding. This also entails finding enthusiasm and passion for particular questions that give meaning and purpose to one's research (Austin & McDaniels, 2006).

Doctoral students' learning is also dependent on the object of their activity. Most postgraduate studies are related to conducting doctoral thesis research. Thus, the object of doctoral students' activity is mostly concerned with conducting research and creating new knowledge. Research work is an innovative process during which new knowledge is created on the basis of current knowledge that enriches or significantly transforms it (e.g., Hakkarainen, Palonen, Paavola, & Lehtinen, 2004). For instance, it has been suggested that the central aim of the doctoral thesis is for a student to bring to light something creative and to make an original contribution to knowledge (e.g., Lovitts, 2005). Hence, students' learning during their doctoral studies is conditional based on what they do, that is, through conducting their doctoral research work and the knowledge creation that takes place during the study process. Accordingly, doctoral students construct their understanding of research and themselves as researchers in relation to the object of their activity.

However, it has been found that doctoral students perceive their primary objects of activity, that is, doctoral research, differently. Students' personal objects

and reasons for undertaking a doctorate and, hence, the personal meaning given to the doctoral project, may vary (Stubb, Pyhältö, & Lonka, 2012a). For instance, Meyer, Shanahan, and Laugksch (2005) proposed that doctoral students may have intrinsic, extrinsic, or strategic reasons for their doctorate and they are likely to organise their research activities accordingly. This indicates that in their doctoral projects students may focus on a learning process and developing academic expertise or on other ends such as acquiring qualifications and proving one's expertise (e.g., Hoskins & Goldberg, 2005). For instance, in their research work doctoral students place emphasis on the process, the end product, or both (Stubb et al., 2012a). While the students often perceived their research as "a personal learning process", they also understood it as a "job to do", "making a contribution", as well as "obtaining qualifications and gaining accomplishments" for their professional careers (Stubb, Pyhältö, & Lonka, 2012b). The latter—that is, placing the emphasis on professional experiences—has been found to be typical for domains where students aim at professional development, appreciate applicable knowledge, and have a stronger practical emphasis rather than scientific ambition, such as in medicine or law (e.g., Lonka & Lindblom-Ylänne, 1996; Mäkinen, Olkinuora, & Lonka, 2004).

   Doctoral students do not construct their understanding of research and themselves as a researcher in a vacuum; it always takes place in a certain context. Accordingly, learning is a context- and culture-dependent participatory process of active knowledge construction that is mediated by the interaction between the person and the environment (Lave & Wenger, 1991; Salomon & Perkins, 1998; Vygotsky, 1978; Wertsch, 1991). This involves changes both in the relationship between the students and their learning environment, as well as in the shared object of the activity (e.g., Hakkarainen et al., 2004; Lave & Wenger, 1991; Rogoff, 2003). Therefore, individual and social processes are mutually interconnected rather than defined separately from one another (Lave & Wenger, 1991; Rogoff, 2003). This means that doctoral students' learning takes place in a constant interplay in which personal efforts and communal processes are intertwined. Such learning is considered as an active participatory process within a specific cultural context and its practices.

1.2   The scholarly community as a learning environment

Doctoral students' learning is highly embedded in the social interactions of the scholarly community. Accordingly, this community forms the primary learning environment for doctoral students (Austin, 2002; Gardner, 2007; McAlpine & Amundsen, 2008; Pyhältö, Stubb, & Lonka, 2009; Stubb, 2012). The scholarly community itself is, however, a systemic, nested entity involving various layers ranging from the wider disciplinary and organisational levels to supervisory relationships that have their unique cultures, languages, and habits (e.g., McAlpine & Norton, 2006; Pyhältö et al., 2012a; Stubb, 2012; Tinto, 1993). Accordingly, there are either distinct, complementary, or partially overlapping layers that affect one another providing various arenas for students' participation. This complexity is also reflected in doctoral students' experiences of their scholarly communities. Students perceive their scholarly community in unique and complex ways, and

these experiences are influenced by many communities ranging from the abstract to the more concrete and include those within the discipline, institution, department, advisor, and even laboratory (Stubb, 2012; White & Nonnamaker, 2008).

While the forms of the communities may be diverse, the primary scholarly community for doctoral students is typically formed around those persons and groups with whom they are actively collaborating and conducting research. Various *communities of practice* (Lave & Wenger, 1991) have been shown to provide the closest learning arenas for doctoral students (e.g., Green, 2006; Kasworm & Bowles, 2010; Pyhältö et al., 2012a; Shacham & Od-Cohen, 2009). *Academic communities of practice* can be built from formal or informal research groups and seminars, as well as from peer and study groups, within or across departmental and university boundaries (Boud & Lee, 2005; Hasrati, 2005; Lahenius, 2012; Shacham & Od-Cohen, 2009; Wisker, Robinson, & Shacham, 2007). These communities base their work on shared values and interests, research materials and instruments, and a mutual sense of commitment to membership, solving problems jointly, and contribution to the discipline (e.g., Kasworm & Bowles, 2010; Lahenius, 2012; Wisker et al., 2007). Moreover, students are often involved in multiple disciplinary communities that rely upon and integrate the resources, theories, methods, and expertise of researchers from various disciplines (e.g., Boden, Borrego, & Newswander, 2011; Holley, 2010). It follows that, instead of speaking of a single scholarly community, *multiple scholarly communities* provide the learning environments for doctoral students.

At its best, doctoral students' learning can be seen as deepening processes of participation in scholarly communities. The journey from a doctoral student to a scholar is traditionally referred to as a socialisation process, through which a novice student acquires the knowledge, skills, values, and habits of an academic department and eventually becomes an effective member of it (e.g., Gardner, 2007, 2008; Gardner & Mendoza, 2010; Golde, 1998, 2000, 2005; Weidman & Stein, 2003). Building upon this, Golde (1998) argued that socialisation includes adaptation both into the role of doctoral student and into the profession. Such a learning process is often referred to as *legitimate peripheral participation* (Lave & Wenger, 1991), during which students' participation increases gradually being at first peripheral, but then evolving from the edge of the community towards its centre as students become increasingly involved in gradually more demanding activities and the practices of their communities, and develop a sense of ownership of their doctoral research and their identity as researchers. For instance, doctoral students have described their development as a scholar as taking place through interactions with the members of their scholarly communities and while being involved in their various practices (e.g., Gardner, 2007; Gardner & Barnes, 2007; Holley, 2009; McAlpine & Amundsen, 2009; McAlpine et al., 2009; Jazvac-Martek, 2009; Stevens-Long et al., 2012). Learning is typically supported by formal or informal interaction and guidance is often provided by more experienced individuals (e.g., Lave & Wenger, 1991; Rogoff, 2003). Ideally, in the interaction advanced researchers scaffold doctoral students' learning by elaborating their practices, work habits, and ways of thinking while working together in the authentic practices (Austin, 2009; Hasrati, 2005).

It has been suggested that socialisation is a two-way process (e.g., McDaniels, 2010). This means that doctoral students are not only adapting into their scholarly communities, but they can actively modify their environments, and direct and redirect their own activity and learning with their choices, prior experiences, and ideas. Students may modify their environment, for instance, by their competencies developed during their undergraduate studies, selection of a research problem and methods, finding their own research direction, or creating new collaborative arenas. In this sense, doctoral students can be considered active agents in terms of their doctoral process and their scholarly communities (Hakkarainen et al., 2013b; Hopwood, 2010; McAlpine & Amundsen, 2009; Pyhältö & Keskinen, 2012). This entails choosing and modifying the primary arenas of the participation and the intensity of the participation (e.g., Pyhältö & Keskinen, 2012; Pyhältö et al., 2012a), as well as the skills, norms, and values associated with them (e.g., Holley, 2009). In some communities student participation may be more peripheral or infrequent and, in others, more active and central. In addition, each community may place varying degrees of importance on the participation of students at different stages of the doctoral process (White & Nonnamaker, 2008) and, hence, they may participate in them differently. For instance, participation in a department and interaction with an advisor may be quite influential for students when they apply to join a doctoral programme. Later in the doctoral process students may participate more intensively in seminars as well as research and peer groups since these may represent the communities in which they share common interests. Accordingly, students' involvement in terms of how agentic (Reeve & Tseng, 2011) they experience themselves in their doctoral process may also vary depending on the activity at hand.

The various scholarly communities involve a variety of practices, that is, the socially created ways in which academics think, interact, and are involved in their day-to-day work (McAlpine & Åkerlind, 2010). Take, for example, supervision, academic writing, and the established ways of conducting research. These practices are mediated through students' perceptions and prior experiences evolved during their previous studies, and in their family and professional work lives. At the beginning of the doctoral process students may rely more on prior perceptions when interpreting scholarly practices and, then, gradually learn about the cultural knowledge and expectations and find their own ways of participating.

The practices may vary from those which are quite routine related to supporting knowledge creation to more fluid and innovative practices which foster the solving of emergent and novel problems (e.g., Hakkarainen, Hytönen, Makkonen, Seitamaa-Hakkarainen, & White, 2013a; Hakkarainen et al., 2013b). The practices mediate and direct doctoral students' and advanced researchers' activities in research work. Hence, learning about the practices and how to participate in them is essential in terms of knowledge creation and becoming a researcher. In addition, practices are not static in nature; instead, they are constantly and more or less intentionally evolving and reforming (Lave & Wenger, 1991) in the interplay between students and communities.

However, these practices have their own cultural roots, and, hence, they reflect academic traditions and conventions—that is, the values, norms, and beliefs of a certain research domain (e.g., Holley, 2009, 2010; Neumann, 2001; Neumann,

Parry, & Becher, 2002; Smeby, 1996; Stubb, 2012; Ylijoki, 2000). Such cultural knowledge is often tacit and partially unconscious (e.g., Gerholm, 1990; Holley, 2010; Parry, 1998). Thus, learning and teaching academic writing is challenging (Aitchison & Lee, 2006; Caffarella & Barnett, 2000; Lonka, 2003). Accordingly, different academic domains may organise their research work through different and more or less implicit practices.

1.2.1 Disciplinary practices

The various scholarly practices can be understood through different disciplinary communities which have their own epistemological premises. A disciplinary community has been traditionally defined as "a body of knowledge with a reasonably logical taxonomy, a specialised vocabulary, an accepted body of theory, systematic research strategy, and techniques for replication and validation" (Donald, 2002). In addition to organising bodies of knowledge and defining the nature of academic work, disciplinary communities provide institutional homes for academics (Golde, 2010) and define work relationships between them (Austin, 2002). Such communities are also known as academic tribes that are characterised by unique academic cultures and practices (Becher, 1989). Therefore, the workings of various disciplinary communities influence how different scholarly communities are realised into practices such as research and collaboration.

In some disciplinary communities research is carried out as individualised work. This is quite typical in the humanities or social sciences—that is, in so-called "*soft*" or "*ill-defined*" domains—that are characterised by a relatively loose theoretical structure and target of interest as well as unspecific strategies of inquiry (Alexander, 1992; Biglan, 1973a, 1973b; Lonka, Joram, & Bryson, 1996). In such domains researchers often define and are involved in their own individual projects. Research is often conducted in libraries, archives, and field settings (Lovitts, 2001). Moreover, the form in which the thesis is reported can alter. For instance, in the humanities researchers tend to favour books and monographs (e.g., Golde, 2010). The individualistic research structure often promotes the idea of independent thinkers; however, it can also entail separation (Chiang, 2003). Hence, doctoral students may have fewer possibilities for making contact with others. However, some students in these fields may also work in research groups (e.g., Austin, 2010), such as those found typically in archaeology. In the individualistic disciplinary communities students typically select the advisors whom they want to supervise their research. Supervision is a more hands-off practice: it is often the students who contact their advisors whenever they need guidance, and the students' research is not necessarily linked closely to the supervisors' research (e.g., Chiang, 2003; Golde, 2010).

Communities that carry out group-based and collaborative practices have been called *innovative knowledge communities* (e.g., Hakkarainen et al., 2004). The characteristics of the practices here are that they are organised around shared objects—that is, complex problems—and its members' collective efforts are focused on the objects, which, in turn, are likely to enhance knowledge and associated practices (Hakkarainen et al., 2004). In a research group this would mean supervisors',

other advanced researchers', and doctoral students' collaboration and joint efforts focus on shared research problems, theories, and methods in order to create new knowledge and transform the group's practices. While such practices are increasing in the humanities and social sciences, they have a longer history in the physical and natural sciences. These domains represent the so-called "*hard*" or "*well-defined*" domains where typically consensus about the specific paradigm, explored phenomenon, and appropriate methodology between researchers exists (Alexander, 1992; Biglan, 1973a, 1973b; Lonka et al., 1996). Solving complex problems through laboratory or field research often requires intensive collaboration (Becher, 1989; Cumming, 2009a, 2009b; Delamont & Atkinson, 2001; Pole, Sprokkereef, Burgess, & Lakin, 1997) and expertise that is distributed among the various researchers. This is especially typical in "Big Science", which is known for large-scale research projects with large staffs and various research instruments (e.g., Furner, 2003). In the natural and physical sciences students' thesis research is typically part of research projects in which the research objectives are often defined by senior researchers directing less experienced researchers and students. Doctoral students often present their thesis in the form of co-authored articles that they have written together with their supervisors and other members of the research group (e.g., Golde, 2010).

Ideally, group-based research practices make it possible for doctoral students to have close and constant interaction with supervisors, other advanced researchers, and peers (Austin, 2010; Chiang, 2003; Delamont & Atkinson, 2001; Lovitts, 2001). Students may have already participated in the research group during their undergraduate years and they are often directly recruited to research projects by their supervisors (Cumming, 2009a, 2009b). In these domains supervision is often rooted in the organisation of research itself (e.g., Delamont & Atkinson, 2001; Chiang, 2003; Cumming, 2009a, 2009b; Pole et al., 1997). Hence, supervision typically takes place in everyday research activities—that is, in actual research settings in the field or laboratory, group meetings, or even in informal discussions during coffee breaks.

Both in the individualised and collective research practices, the signature pedagogy of doctoral training has been the implicit apprenticeship either in the student–supervisor dyad or in a research group (e.g., Austin, 2009; Dysthe, Samara, & Westrheim, 2006; Löfström & Pyhältö, 2012; Olson & Clark, 2009). This entails all implicit activities of learning while working and participating in authentic practices (e.g., Lave & Wenger, 1991), such as in creating and advancing knowledge either through individual or collective practices which are related to conducting research and doctoral education. While group-based apprenticeship tends to be more typical in the physical and natural sciences, not all doctoral students in these domains work in research groups. Moreover, there is an emerging tendency in the social sciences and humanities towards more collective supervisory practices. For instance, in psychology collective supervision and co-authority with supervisors is quite common. In addition, it has been argued that there are some differences in doctoral students' characteristics between domains. Science students are often younger, full-time, and supported by scholarships whereas humanities and social

sciences students are more often part-time, mid-career, and may have other professions outside academia (Leonard, Becker, & Coate, 2005).

Although there are disciplinary differences (Becher, 1989; Biglan, 1973a, 1973b), it has also been suggested that academic disciplines should not be viewed as monolithic entities (e.g., Donald, 2002; Holley, 2010; Weidman, 2010). Disciplinary differences are never sharp and there are always exceptions. Variations can be found not only between disciplines but also within a discipline (Weidman, 2010) and, hence, extensive, oversimplifying generalisations cannot be made. For instance, it is suggested that doctoral education is influenced not only by the disciplinary premises, but also by the organisational culture and practices of a specific scholarly community (Stubb, 2012; Weidman, 2010). Building upon this, the varying experiences of doctoral students' scholarly communities have been shown to be related to the work conditions of the scholarly community (Stubb, Pyhältö, & Lonka, 2011). Similarly, it is also suggested that variation in doctoral students' attrition rates between departments within a discipline can be explained by different social practices such as the integration possibilities provided by departments (Lovitts, 2001).

Furthermore, Golde (2010) reminds us that disciplinary perspectives may become disciplinary blinders. Innovativeness is built on risk taking, exploring bold ideas, and working at the edge of one's competence (Hakkarainen et al., 2004). Relying solely on the accepted wisdoms found in a discipline, however, may prevent breaking existing knowledge boundaries, transforming practices, and creating novel ideas. In fact, much of the most important, path-breaking intellectual work going on today occurs in these borderlands between fields (Walker et al., 2008).

Doctoral students' active involvement in the various practices of their scholarly communities is likely to contribute to their learning in terms of knowledge creation and becoming a scholar. However, students' active involvement in the scholarly practices cannot be taken for granted. The practices provide various arenas for participation. At the same time, students can participate in them in different ways. Students' participation in scholarly practices may form cycles of positive and negative experiences that either engage or disengage a doctoral student. The various ways in which students engage in or disengage from their doctoral process in turn either promote or hinder their learning to create knowledge and become a scholar, respectively. Accordingly, active involvement in a scholarly community is a key determinant of a student's engagement in the doctoral process. Therefore, it is essential to understand what leads to engagement in or potential disengagement of students from various learning opportunities and practices that their learning environments provide.

1.3 Student engagement in the doctoral process

Producing a doctoral thesis can be seen in terms of both academic work and studying. Doctoral students take their first steps as professional researchers by carrying out independent research and by teaching undergraduates, both of which are considered academic work embedded in a scholarly community (e.g., Brew et al., 2011; Golde, 1998; Pyhältö et al., 2012a; Stubb, 2012; Turner & McAlpine, 2011).

However, to learn how to carry out their research and write up their theses, doctoral students take various courses and, in this sense, fit into the role of students (e.g., Brew et al., 2011; Golde, 1998; Pyhältö et al., 2012a; Stubb, 2012). Accordingly, to better understand doctoral student engagement this dissertation draws from research both on work engagement[1] (e.g., Schaufeli et al., 2002a; Schaufeli, Salanova, González-Romá, & Bakker, 2002b) and on study engagement[2] (e.g., Appleton, Christenson, Kim, & Reschly, 2006; Fredricks et al., 2004; Reeve, Jang, Carrell, Jeon, & Barch, 2004).

Engagement refers to a student's active involvement (e.g., Fredricks et al., 2004; Reeve et al., 2004) in various learning opportunities and practices provided by learning environments. This entails a meaningful and constructive relationship between a doctoral student and his thesis work. Engagement is characterised by *vigour*, *dedication*, and *absorption* (Hakanen, Bakker, & Schaufeli, 2006; Schaufeli, Bakker, & Salanova, 2006; Schaufeli et al., 2002b). A doctoral student who feels *vigorous* when working on his doctoral project experiences high levels of drive, a willingness to invest time and effort in his work, and persistence even when confronted with challenges and difficulties. This simultaneously involves both a positive self-efficacy and being efficient in his actions. *Dedication*, in turn, refers to a doctoral student's strong psychological involvement in learning opportunities and practices combined with a sense of significance, enthusiasm, inspiration, pride, and challenge. *Absorption*, however, refers specifically to a doctoral student's total concentration and immersion in his research and studies characterised by the feeling of time passing quickly and difficulty detaching himself from his work.

Absorption comes close to the flow experience. During such a captivating experience, an individual is deeply immersed in a challenging activity that is intrinsically enjoyable (Csikszentmihalyi, 1990). This entails the experience that the required skills and the challenge set by the learning task are both very high and in balance (Inkinen et al., 2013). Thus, a doctoral student experiencing flow is likely to perceive the challenge of conducting a doctoral project to be very high while his competence to meet the challenge is very high as well. Accordingly, engagement

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[1] It is acknowledged that there is an extensive body of literature on work engagement involving different conceptualisations and perspectives on engagement, such as extra-role behaviour, personal initiative, job involvement, organisational commitment, job satisfaction, positive affectivity, flow, and workaholism (e.g., Bakker & Leiter, 2010; Schaufeli & Bakker, 2010). Moreover, there exist various views on whether engagement and disengagement represent independent or related constructs: some consider them as each other's antipode (e.g., Maslach, Schaufeli, & Leiter, 2001), others understand them as distinct constructs (e.g., Schaufeli & Bakker, 2004; Schaufeli, Salanova, González-Romá, & Bakker, 2002b), and others more specifically approach them through distinct continua (Demerouti, Mostert, & Bakker, 2010; González-Romá, Schaufeli, Bakker, & Lloret, 2006; Mäkikangas, Feldt, Kinnunen, & Tolvanen, 2012). These perspectives are investigated primarily in various work and occupational contexts (e.g., Schaufeli & Bakker, 2010).

[2] On the other hand, there are also different conceptualisations related to study engagement, such as student engagement, school engagement, classroom engagement, and academic engagement (e.g., Appleton, Christenson, Kim, & Reschly, 2006; Archambault, Janosz, Fallu, & Pagani, 2009; Fredricks et al., 2004; Reeve, Jang, Carrell, Jeon, & Barch, 2004; Reeve & Tseng, 2011; Zyngier, 2008). These perspectives are investigated primarily in compulsory education contexts (e.g., Fredricks et al., 2004).

focuses on human strengths, fulfilling, and flourishing experiences as well as optimal functioning. In this sense, engagement draws from the traditions of positive psychology (e.g., Schaufeli & Bakker, 2010; Seligman & Csikszentmihalyi, 2000).

Moreover, engaged students often experience internal regulation of their involvement in study activities (e.g., Reeve et al., 2004). Accordingly, an engaged doctoral student is more likely to experience being in charge of and having ownership over the doctoral project such as by having an active role in defining and steering it. Engaged persons are also efficient in dealing with the demands of their work (Schaufeli et al., 2002a, 2002b). Moreover, students may express their engagement in varying ways, for instance, through their thoughts, feelings, and behaviours (Fredricks et al., 2004). It may range, for example, from experiencing positive emotions and satisfaction to active participation and the efforts doctoral students put into their research work. This indicates that engagement entails doctoral students' commitment, concentration, and effortful activities as well as meaningful and enthusiastic involvement in their research, studies, and other activities and practices included in the doctoral process.

Previous research among undergraduate students suggested that engagement in one's study process contributes to academic performance and outcomes (Bresó et al., 2011; Carini et al., 2006; Salanova et al., 2010; Schaufeli et al., 2002a) and study persistence (Kuh, Cruce, Shoup, Kinzie, & Gonyea, 2008). Similarly, the various ways students are engaged in their doctoral process are likely to promote the quality of their learning and development as scholars, as well as enhancing their progress and persistence in their studies. For instance, doctoral students who were actively involved in their training attained good quality professional development and relationships within their scholarly communities (e.g., Gardner & Barnes, 2007). In addition, engaged doctoral students are likely to experience their doctoral studies as being meaningful and bring their full potential to their research and studies. Virtanen and Pyhältö (2012), for instance, found that doctoral students who were engaged in their studies felt effective and satisfied with their thesis work, and remained determined when they encountered challenges.

Moreover, the process of earning a doctorate is in many ways a highly intensive time in the students' lives. The various positive and challenging experiences that continuously working at the edge of one's competencies and surpassing oneself generates are likely to contribute to students' well-being. There is evidence indicating that undergraduate students' engagement in studying is related to their well-being (e.g., Bresó et al., 2011; Ouweneel et al., 2011). The term *pedagogical well-being* has been used to describe the cyclic and entwined relationship between learning and well-being (Pyhältö, Soini, & Pietarinen, 2010; Soini, Pyhältö, & Pietarinen, 2011). In the context of doctoral education, this means that the way students' learning process—that is, the cycle of positive and negative learning experiences—evolves in their everyday activities and the practices related to their doctoral research and studies may enhance their inspiration and engagement, and, hence may foster their well-being while earning the doctorate. For instance, there is evidence indicating that students' learning experiences affect their well-being during their research (Morris et al., 2010; Morris & Wisker, 2011). In particular, a recent study showed that some doctoral students' well-being was maintained and

strengthened by their varying positive and challenging doctoral experiences (Haynes et al., 2012). It follows that doctoral students' engagement in their doctoral process may also be a catalyst for their further well-being.

However, doctoral students' engagement in learning opportunities and practices cannot be taken as universal. For instance, students may be quite motivated but not actively engaged in their studies (e.g., Appleton et al., 2006). There is evidence suggesting that the doctoral process does not always work out perfectly. For instance, many students who run up against failures and delays associated with the successful completion of their dissertations experience hopelessness, exhaustion, and stress as well as struggles with thoughts of whether to continue their studies or not (e.g., Hyun et al., 2006; Lovitts, 2001; Mewburn, 2011; Nutov & Hassan, 2011; Pyhältö et al., 2009; Spaulding & Rockinson-Szapkiw, 2012; Stubb et al., 2011; Toews et al., 1997; Vassil & Solvak, 2012). Sometimes students become disengaged from their doctoral process.

1.4 Student disengagement from the doctoral process

The doctoral process may include various phases during which students' involvement in their research, studies, and the other practices of their learning environment may vary significantly. There are likely to be times when students may become less committed or even half-hearted in regard to their doctoral process. It is possible that such students are likely to suffer from disengagement. Disengagement refers to a student's passivity and withdrawal (e.g., Archambault, Janosz, Fallu, & Pagani, 2009; Fredricks et al., 2004; Reeve et al., 2004; Zyngier, 2008) from various learning opportunities and practices provided by their learning environments. This entails perceiving the relationship between a doctoral student and his thesis work as dysfunctional, perceiving one's work as meaningless, and experiencing alienation from one's work. Disengagement is characterised by *low energy*, *reduced involvement*, and *experiences of inefficacy* (e.g., Maslach & Leiter, 2008; Schaufeli et al., 2002b). *Low energy* refers to doctoral students' feelings of strain and exhaustion resulting from experiencing their research work, studies, and participation in other scholarly practices as overly demanding. On the other hand, lacking interest in the doctoral process and a feeling that earning a doctoral degree has lost its meaning are typical for doctoral students with *reduced involvement*. *Inefficacy*, in turn, is characterised by a student's sense of being incompetent and having diminished self-efficacy beliefs as a researcher. It follows that disengagement is likely to impede doctoral students from bringing their full potential to learning about research and becoming a scholar.

In addition, as opposed to engaged students, students suffering from disengagement may lose their internal locus of control and allow external factors to regulate their study activities (e.g., Reeve et al., 2004). This includes experiences of not being in charge of the doctoral project and perceiving oneself as a passive observer in the project while it is defined, directed, and owned by someone else such as a research group or a supervisor. A disengaged person also distances himself from his work and experiences negative emotions toward the work in general (e.g., Demerouti, Bakker, Nachreiner, & Schaufeli, 2001; Schaufeli et al., 2002b).

Students may be expressing such passivity and negative emotions in terms of being apathetic, distracted, or even burdened (Reeve et al., 2004) in relation to their doctoral process. This indicates that disengaged doctoral students are likely to become alienated from their research, studies, and other activities and practices, as well as withdraw from opportunities for learning.

Previous studies among undergraduate students indicated that students' passivity or a dysfunctional approach to learning is likely to reduce their academic performance (e.g., Carini et al., 2006; Lonka et al., 2008). Similarly, disengagement is likely to inhibit the quality of doctoral students' learning in terms of research and becoming a scholar. In addition, research on doctoral student attrition has indicated that students who dropped out of their training felt less satisfied and efficient, as well as unable to meet the challenges that they faced in their studies (e.g., Golde, 1998, 2000, 2005; Lovitts, 2001). Therefore, it is likely that disengaged doctoral students may feel that they are incompetent and give up easily in the face of challenges. Moreover, disengaged students may also be at risk of abandoning their doctoral studies. For instance, recent research showed an association between students' experiences of stress, anxiety, and exhaustion, as well as a lack of interest in and consideration of interrupting their doctoral studies (Pyhältö et al., 2012b).

Although doctoral studies always include some levels of frustration and anxiety, it is possible that long-term negative experiences are likely to lead to burdening and reducing students' well-being. For instance, in a recent study among graduate students (including mostly doctoral students) almost half of all respondents reported having had an emotional or stress-related problem that affected their well-being during their study process (Hyun et al., 2006). At its worst, experiences of disengagement may even develop into burnout (e.g., Maslach, Schaufeli, & Leiter, 2001). On the other hand, doctoral students' well-being may also be endangered by an imbalance between their work and personal lives (Morris et al., 2010; Morris & Wisker, 2011).

Summary of doctoral student engagement and disengagement. Table 1 summarises the typical aspects of doctoral students' experiences of engagement in and disengagement from their doctoral process. While engagement refers to students' active, constructive, and meaningful relationship to the learning opportunities and practices that their learning environments provide, disengagement, in turn, refers to students' passive, dysfunctional, alienating, and meaningless connections to them. However, absence of disengagement cannot be understood as a sign of engagement or vice versa (e.g., Schaufeli et al., 2002b).

Table 1. The typical aspects of engaging and disengaging doctoral experiences.

Engaged doctoral students	Disengaged doctoral students
• Active involvement and participation in doctoral research, studies, and other activities and practices	• Passivity and withdrawal in regard to doctoral research, studies, and other activities and practices
• Vigorous: sense of efficiency and self-efficacy	• Sense of inefficacy and insufficiency
• Dedication and commitment to the doctoral process	• Lack of commitment to and distancing from the doctoral process
• Absorption	• Alienation
• Enthusiastic and inspired	• Low energy, exhausted, and burdened
• Meaningfulness and satisfaction	• Half-hearted and apathetic
• Persistent when facing challenges	• Giving up easily when facing challenges
• Internal regulation of learning	• External regulation of learning

Doctoral students' engagement in and disengagement from learning opportunities and practices are affected by several factors. For instance, previous research on doctoral experience indicates that students' satisfaction with and involvement and persistence in their studies were affected by their motivation, personal life responsibilities, and time resources, as well as supportive supervision and feedback, encouraging academic climate, and open discussion within scholarly communities (e.g., Gardner, 2007; Hoskins & Goldberg, 2005; Jairam & Kahl Jr., 2012; Nettles & Millet, 2006; Paglis, Green, & Bauer, 2006; Protivnak & Foss, 2009; Spaulding & Rockinson-Szapkiw, 2012). Accordingly, engagement and disengagement do not occur in isolation. Moreover, factors contributing to them cannot be reduced solely to individual reasons or environmental attributes.

1.5 The dynamic interplay between doctoral students and their learning environments

There is a constant and dynamic interplay between the learner and learning environment (e.g., Lindblom-Ylänne & Lonka, 2000) in which engagement is constructed (e.g., Fredricks et al., 2004; Leiter & Bakker, 2010). This includes the notion that doctoral students' experiences of engagement are constantly reconstructed in the student–environment interaction. Such an interaction entails the students' prior learning experiences, beliefs, goals, and the practices and culture of the learning environment. Doctoral students' perceptions, participation, and other practices are mediated by their prior experiences and knowledge which has developed as a result of their undergraduate studies, other professional careers, or personal lives. The culture and practices of the learning environment, in turn, affect doctoral students' thinking and actions. Accordingly, the complex doctoral student–learning environment interrelation mediates students' engagement in the doctoral process. Moreover, the dynamics contribute both to whether a student engages or not (e.g., Fredricks et al., 2004; Leiter & Bakker, 2010) and the ways in which he engages in the doctoral process.

The dynamic interplay between doctoral students and their learning environments that contributes to students' engagement can be explored in terms of the *person–environment fit*. *Fit* refers to the congruence between individuals and their environment, and, accordingly, *misfit* refers to a lack of congruence (Cable & Edwards, 2004; Eccles et al., 1993; Edwards, 2007; Edwards, Cable, Williamson, Schurer Lambert, & Shipp, 2006; Edwards, Caplan, & Harrison, 1998; Gilbreath, Kim, & Nichols, 2011; Kristof, 1996; Schmitt, Oswald, Friede, Imus, & Merritt, 2008). There is some evidence indicating that a perceived fit between doctoral students and their scholarly communities in terms of promoting students' experiences of being competent, having autonomy, and making a contribution influenced students' satisfaction with and persistence in their doctoral studies (e.g., Golde, 2005; Holley, 2009; Hoskins & Goldberg, 2005; Mason, 2012). For instance, doctoral programmes that provided suitable environments for students' possibilities for intellectual development, and for feelings of having increased self-efficacy, an internal locus of control, and academic freedom as a researcher, as well as chances to make a difference through their doctoral project, have been associated with making the most of doctoral education, positive emotions related to the research project, and satisfaction with the doctoral process (Appel & Dahlgren, 2003; Hopwood, 2010; Lahenius, 2013; McAlpine & Amundsen, 2009; Virtanen & Pyhältö, 2012).

Moreover, previous research into the doctoral experience also suggests that a perceived fit contributed to the ways in which students perceived themselves within scholarly communities and their belonging to them (e.g., Sweitzer, 2009), which, in turn, affected their engagement in the doctoral process. For instance, Pyhältö et al. (2009) found that doctoral students' experiences of membership in their scholarly communities were divergent. In their study, more than half of the students perceived themselves as members of the scholarly community, while about one third of the students experienced themselves as outsiders and the rest of the students had an incoherent perception about their role in the scholarly community. Building upon this, further studies by Pyhältö and Keskinen (2012) and Stubb et al. (2011) showed that students more often experienced their scholarly communities not as empowering but as a burden and viewed themselves as a passive object within the scholarly community rather than an active agent within them. Accordingly, a fit between students and scholarly communities, as well as a sense of belonging in a community, is never self-evident and automatically constructed. Often, in contrast to students' expectations of collaborative research, they experience loneliness and social isolation that are likely to result in negative experiences and even in disengagement.

In earlier research doctoral students' experience of belonging in their scholarly communities is recognised as a central ingredient of students' satisfaction, the quality of the doctoral experience, and persistence in the process (e.g., Ali & Kohun, 2006, 2007; Deem & Brehony 2000; Golde, 2005; Sakurai et al., 2012). For instance, Lovitts' (2001) research indicated that students who completed their doctoral studies thought they were more integrated into their academic community and their advisors were more personally interested in them than those students who did not complete their studies. Similarly, a study by Hoskins and Goldberg (2005)

among current and former doctoral students revealed that if students experienced positive relationships with faculty and peers, as well as feeling that their expectations were met and the focus of doctoral programme was in line with their goals, they did not question their persistence in their studies. Building upon this, Holley's (2009) research suggested that doctoral students who felt they belonged in their academic community and persisted in achieving their degrees were more likely to work in environments that were congruent with their individual beliefs and values. Working against one's values is suggested as a risk factor for increasing negative experiences and reducing well-being at work (Maslach & Goldberg, 1998). Moreover, it appears that feelings of belonging in a scholarly community are more likely to support doctoral students' engagement. For instance, doctoral students who were satisfied with their learning environment reported the lowest levels of stress, exhaustion, and anxiety as well as less lack of interest in their studies (Pyhältö et al., 2009).

On the other hand, Golde (2005) showed that doctoral students who interrupted their studies pointed to several experienced mismatches between their goals and expectations and the norms and practices of the discipline and department as central reasons for attrition. Such mismatches were found between research practices and students' strengths, departments' and students' expectations, students and advisors, research faculty life and personal goals, uncertain career prospects and the aim of becoming a scholar, as well as students experiencing social isolation. Similarly, Lovitts (2001) found that students who did not complete their doctoral studies attributed their attrition to a lack of integration, feelings of isolation, and unsupportive relationships with faculty and their advisor. Moreover, it appears that factors such as being a perceived misfit in interactions within a scholarly community or with a supervisor and experiencing a lack of belonging in a scholarly community are likely to promote doctoral students' experiences of disengagement. For instance, doctoral students who perceived their scholarly communities or their own roles within them negatively experienced more negative emotions, exhaustion, and anxiety as well as lower interest towards their studies than those who perceived their communities or their roles within them positively (Pyhältö & Keskinen, 2012; Pyhältö et al., 2009; Stubb et al., 2011). Furthermore, students who perceived their communities negatively or experienced problems in their relationship with their supervisor considered interrupting their doctoral studies more often than students who perceived their community positively or had a satisfying relationship with their supervisor (Sakurai et al., 2012; Stubb et al., 2011).

Previous studies on the doctoral experience suggest that the dynamic interplay between doctoral students and their learning environments that promotes the students' sense of *belonging, competence, autonomy* (Deci & Ryan, 2000, 2002, 2008; Ryan & Deci, 2000), and *contribution* (Eccles, 2008) is likely to increase their engagement in the doctoral process. In turn, lacking these traits is likely to reduce doctoral students' engagement. Deci and Ryan (2002) have proposed that the experiences of belonging, competence, and autonomy are the prerequisites for individuals' personally meaningful actions and experiences (see the Self-Determination Theory). The sense of belonging refers to both feeling connected to other individuals and to one's own community, and being integral to and accepted by others

(Deci & Ryan, 2002). This entails a sense of being a part of a scholarly community and being a valued and acknowledged member of it. The sense of competence, in turn, focuses on feeling effective and confident in one's on-going actions within the social environment and experiencing opportunities to express and exercise one's capacities (Deci & Ryan, 2002). This refers to a sense of being a capable and efficient doctoral student and researcher. When individuals are autonomous, they feel as if they are the source of their own actions and behaviour even when those actions are influenced by outside forces (Deci & Ryan, 2002). That is, their actions are based on their own personal interests and values. A doctoral student experiencing autonomy feels that he is the source of his own actions in his doctoral project and that he has ownership over it. Furthermore, it is important to feel a sense of contribution when acting in a personally meaningful way (Eccles, 2008). This entails the experience that a doctoral student can make a difference to the academic field or to society through his doctoral project. Thus, the experiences of belonging, competence, autonomy, and contribution appear necessary in order to promote doctoral students' engagement (e.g., Mason, 2012; Virtanen & Pyhältö, 2012).

1.5.1 Dynamics concerning the demands of and resources for doctoral studies

One way to break down the complexity of factors contributing to doctoral student engagement is to explore the fit between students and their environments within the framework of the *job demands–resources (JD-R) model*, which focuses on the demands that are set by work and the resources that the environment may provide for meeting those demands (e.g., Bakker, Demerouti, De Boer, & Schaufeli, 2003; Demerouti et al., 2001; Schaufeli & Bakker, 2004). While demands and resources may vary in different environments, in general they refer to those physical, psychological, social, or organisational aspects of work (Bakker & Demerouti, 2007; Demerouti et al., 2001; Schaufeli & Bakker, 2004) that are likely to promote engagement in the dynamic interplay between doctoral students and their learning environments.

In the doctoral process the demands are often related to students' complex and novel learning challenges—that is, learning how to work on research problems, conduct research and creating new knowledge, becoming a scholar, and learning how to participate in various scholarly communities and their practices. The demands of the doctoral process may also entail coping with high workloads or time pressures and balancing different academic responsibilities with personal life commitments. These demands are not automatically negative; they may be experienced as inspiring challenges if a learning environment enables sufficient resources to meet them. Such resources for doctoral students can be control over their own work, the possibility to develop competencies and make a contribution to the field through their research, as well as supervision, feedback, and support from the other members of their scholarly communities. Together with job resources personal resources also influence engagement (Xanthopoulou, Bakker, Demerouti, & Schaufeli, 2007, 2009). Doctoral students' personal resources may include a strong sense of self-efficacy and self-esteem and optimism. The resources may also be important in their own right (e.g., Bakker & Demerouti, 2007; Demerouti et al.,

2001; Schaufeli & Bakker, 2004). For instance, resources may enhance doctoral students' engagement by promoting their experiences of being a competent, autonomous, and contributing member of a scholarly community.

There is evidence that high resources may result in engagement (Hakanen et al., 2006; Hakanen, Perhoniemi, & Toppinen-Tanner, 2008; Schaufeli & Bakker, 2004) particularly when demands are high (Bakker & Demerouti, 2007; Bakker, Hakanen, Demerouti, & Xanthopoulou, 2007; Hakanen, Bakker, & Demerouti, 2005). Such conditions may also form the basis for doctoral students' flow experiences. Earlier studies suggest that the availability of resources and overcoming challenges are likely to be central determinants for a student's involvement and the earning of a doctorate (e.g., Appel & Dahlgren, 2003; Protivnak & Foss, 2009; Pyhältö et al., 2012b). Martinsuo and Turkulainen (2011), for instance, showed that doctoral students' personal commitment and support from supervisors and peers contributed to the students' progress in their studies. It follows that students who receive needed resources from their scholarly communities and have adequate personal resources are likely to perceive a good fit between themselves and their learning environments. The perceived fit, in turn, is likely to promote students' engagement in their doctoral process.

However, there is some evidence suggesting that doctoral students and scholarly communities do not necessarily have similar perceptions about the resources and challenges that contribute to the doctoral process. Faculty, for instance, may emphasise student characteristics as core determinants of successful studying, whereas doctoral students may emphasise the scholarly community (Lovitts, 2001). In addition, previous studies indicate that there are some differences between various disciplinary communities in terms of resources provided to doctoral students (e.g., Gardner, 2007; Golde, 2005; Pyhältö et al., 2009). For instance, Chiang (2003) found that doctoral students thought that chemistry departments provided them with more satisfying and better doctoral education than students in education departments especially in terms of the academic culture, supervision, and research facilities for students.

Problems and tensions are likely to emerge then if appropriate resources are not available in scholarly communities for students to meet the novel learning challenges and breaking down of current boundaries as is required by the doctoral process. Accordingly, the demands may turn into job stressors in cases when the needed resources are not provided (e.g., Hakanen et al., 2006). Furthermore, previous research has suggested that a lack of resources may create the grounds for disengagement (Demerouti et al., 2001). For instance, students quite often experienced exhaustion as well as being overwhelmed and under stress during their doctoral process (e.g., Hyun et al., 2006; Toews et al., 1993, 1997; Pyhältö et al., 2009; Stubb et al., 2011), which might be related to, for instance, a poor academic atmosphere and an insufficient amount of feedback (Pyhältö et al., 2009). This suggests that a lack of resources from scholarly communities may promote students' perceptions of a misfit between themselves and their learning environments. Furthermore, the perceived misfit is likely to reduce students' engagement in the doctoral process.

Summary of the dynamic interplay between doctoral students and their environments. The results of previous research on engagement and doctoral education indicate that an engaging learning environment is likely to involve a fit (e.g., Edwards, 2007; Edwards et al., 2006; Kristof, 1996) between doctoral students and their environments in terms of:

- Promoting students' experiences of belonging, competence, autonomy (Deci & Ryan, 2000, 2002, 2008; Ryan & Deci, 2000), and contribution (Eccles, 2008), especially involving a fit in terms of experienced belonging (e.g., Golde, 2005; Hoskins & Goldberg, 2005; Lovitts, 2001; Pyhältö et al., 2009; Stubb et al., 2011);
- Providing adequate resources (e.g., Hakanen et al., 2006, 2008; Schaufeli & Bakker, 2004); and/or
- Entailing a balance between the demands of the work and the resources (e.g., Bakker & Demerouti, 2007; Bakker et al., 2007; Hakanen et al., 2005) that the learning environments provide and which students possess.

However, the fit between doctoral students and their scholarly communities is not a static state, but instead constantly evolving in everyday student–community interactions. Accordingly, both communities and students themselves can affect the quality of a fit, and, hence, students' engagement that is constructed as a part of the interplay. Moreover, for each doctoral student the dynamic interplay that forms between him and the scholarly community is a unique doctoral pathway and, hence, engagement is likely to vary between doctoral students.

Furthermore, engagement is constructed in a dynamic, multifaceted interplay that extends the boundaries of scholarly communities. This dynamic includes the entirety of doctoral students' lives: personal and family lives, scholarly communities, as well as other possible professional careers. For instance, students constantly balanced their doctoral projects with responsibilities from their family lives and professional jobs outside academia, which either were experienced as encouragements or burdens and, hence, influenced the quality of their doctoral experience (e.g., Appel & Dahlgren, 2003; Gardner, 2007; Jairam & Kahl Jr., 2012; Kasworm & Bowles, 2010; Protivnak & Foss, 2009). In addition, the larger framework and society need to also be taken into account (e.g., Välimaa, 1998; Ylijoki, 2000), since doctoral education is affected by the local cultures as well as national, societal, and international contexts (McAlpine & Åkerlind, 2010).

1.6   Summary of the theoretical framework

Figure 1 presents the theoretical framework of the dynamics of doctoral students' engagement in the doctoral process. Engagement in the doctoral process is mediated by the reciprocal relationship between students and their learning environments. The various scholarly communities—that is, disciplines, universities, departments, research and peer groups—and supervisory relationships provide the primary learning environments for doctoral students. These environments with their cultures, norms, and practices do not alone affect students' participation and involvement. Students bring their prior experiences, understanding of various prac-

tices, expectations, goals, beliefs, and personal resources to the interplay and through them participate in various ways in scholarly practices. This, in turn, shapes the communities and practices.

Students' involvement in various activities, practices, and other learning opportunities provided by their scholarly communities are likely to form cycles of positive and negative experiences that either engage or disengage a doctoral student. For instance, conducting doctoral research and attending courses may promote a student's experiences of dedication, vigour, and absorption, and urge a student to work at the upper limits of his competencies. Such engaging doctoral experiences are likely to occur if there is a perceived fit between students and their learning environments in terms of promoting students' experiences of belonging, competence, autonomy, and contribution. Also, the availability of needed resources in the learning environment is likely to enable a perceived fit, which, in turn, may enhance students' engagement.

On the other hand, if the demands of working at the edge of one's competencies become too high, a doctoral student does not have the necessary competencies, and the learning environment lacks the necessary resources, a perceived misfit may occur that is likely to result in experiences of inefficacy, cynicism, and exhaustion. Such disengaging doctoral experiences are also likely to arise if the interplay between students and learning environments does not promote students' experiences of belonging, competence, autonomy, and contribution.

Accordingly, the quality of the dynamic interplay between the learner and learning environment (e.g., Lindblom-Ylänne & Lonka, 2000) not only contributes to whether students engage in the doctoral process, but also to the ways in which they engage in the process. Moreover, the various ways in which students engage, in turn, either promote or hinder their learning in terms of knowledge creation and becoming a researcher.

However, doctoral student engagement is not only constructed in the reciprocal interplay between students and their scholarly communities; instead, the dynamics that also involve their personal and family lives, and other possible professional careers outside academia contribute to it. These environments may also either provide resources that support the students to meet the complex challenges of earning their doctorates or compete with their academic goals.
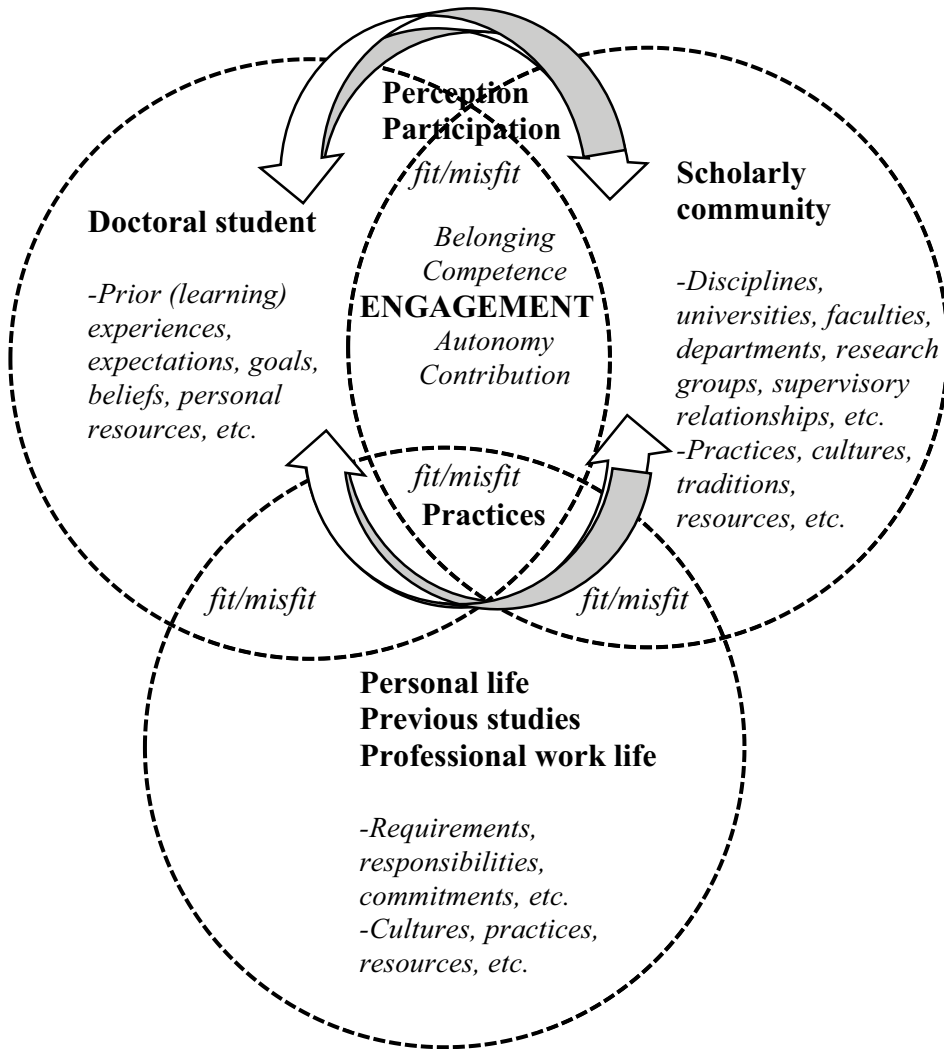
Figure 1. The dynamics of doctoral student's engagement in the doctoral process[3].

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[3] Figure 1 does not aim to reduce doctoral student engagement into individual and environmental components; rather, the aim is to visualise the nested, ongoing, reciprocal, and mutually constituted process and the interrelated aspects of the dynamics between students and their environments in which engagement in a doctoral process is embedded.

2   The aim of the study

The overall aim of this study was to understand what engages or disengages doctoral students from the doctoral process. This dissertation also aimed to explore the perceived dynamic interplay between doctoral students and their environments in which students' engagement and disengagement were embedded. The following research questions were addressed:

1) What are the key learning experiences in the doctoral process?
2) How did students experience engagement and disengagement from the doctoral process?
3) What contributes to students' engagement and disengagement from the doctoral process?

To approach the overall aim, specific research questions for each of the separate sub-analysis were addressed. Doctoral students' key learning experiences and engagement and disengagement from the doctoral process were explored in three studies. Factors contributing to doctoral students' engagement and disengagement were analysed in two studies.

Study I investigated the key learning experiences that natural sciences students perceived to either inspire or challenge them in their doctoral process. *Study II* focused more closely on analysing behavioural sciences students' engagement by exploring the main experiences and sources of engagement, and qualitatively different forms of engagement in the doctoral process. *Study III* took a more in-depth look at behavioural sciences students' disengagement by exploring the main experiences and sources of disengagement from the doctoral process. In addition, students' perceptions of the dynamic interplay between themselves and their environments with respect to disengaging experiences were explored by analysing the perceived misfit between the students and their primary environments. *Study IV* focused on the dynamic interplay between doctoral students and environments that contributed to students' engagement. The dynamics were explored at the faculty level across various domains in terms of the collective fit between the students' and supervisors' perceptions of the main resources for and challenges of the doctoral process. Moreover, the relationship between the perceived fit and the doctoral students' satisfaction with their overall study process and supervisory support was explored.

3   Doctoral education in Finland

In Finland, there are 16 universities which all have the right to award doctoral degrees. The general aim of a doctoral degree is that a doctoral student develops a profound understanding of research and high-quality research skills, and creates new knowledge (Finland's Council of State's regulation of university degrees 794/2004). Finnish doctoral education has undergone major changes in recent decades in terms of its organisation as well as the number of doctoral students and awarded doctoral degrees. The Bologna process's third cycle has followed a more structured doctoral education. Recently, changes in the operational environments of Finnish universities have also launched a development process in doctoral education (for more information, see Niemi et al., 2011). In 2012 altogether 18 687 doctoral students (of which 9 843 were women and 8 844 were men) were registered in Finnish universities (SVT). In 2012 a total of 1 655 doctoral students graduated from Finnish universities (SVT). The Finnish Ministry of Education's goal for doctoral graduates is 1 600 per year (OPM: Koulutus ja Tutkimus: Kehittämissuunnitelma vuosina 2003–2008, 2007–2012).

In Finland, students come to doctoral education through various routes. Some begin with their doctoral studies immediately after earning their master's degree or even before that (for instance, in the natural sciences and medicine it is typical that students begin their doctoral research already during their master's studies). Others launch their doctoral studies after having professional careers outside academia. Students need to apply for doctoral education. However, after receiving permission for the doctoral studies, the license has been valid for life until recently. Hence, some may continue as enrolled doctoral students even though they may not be actively conducting their research and thesis studies.

A significant portion of doctoral education involves conducting the research for the thesis. The doctoral degree involves a thesis, course work, and seminars as well as a public defence of the thesis. The research project is launched at the very beginning of the doctoral studies. There is no extensive separate course work; instead, seminars and course work are complimentary and designed to support the research project. In fact, depending on the discipline, from 40 to 80 European Credit Transfer and Accumulation System (ECTS) credits worth of postgraduate studies course work are included in doctoral studies and are usually individually constructed and based on personal study plans that typically include international conferences and some methodological studies.

Students can conduct doctoral studies full-time or part-time. The general target duration for full-time studies for the doctorate is four years. However, the completion time for the doctorate is often longer than this. A recent survey showed that the average time for completing the degree is about six to seven years (Sainio, 2010). There are, however, some differences across academic domains. For instance, according to a recent survey, natural sciences students earn a doctoral degree typically within four years, whereas in behavioural sciences earning a doctor-

ate often takes from seven to ten or more years (Pyhältö, Stubb, & Tuomainen, 2011b).

Doctoral education is publicly funded and free for students. However, students do not automatically get funding for launching their doctoral project and conducting their studies. They also have to come up with their cost-of-living expenses. There are a number of different ways to fund studies (Hiltunen & Pasanen, 2006; International Postgraduate Student Mirror, 2006; Pyhältö et al., 2011b; Sainio, 2010). Personal grants that students apply for through private foundations have been a common way of financing doctoral studies. In addition, appointment to a four-year doctoral school position funded by the Ministry of Education has been a significant and secure source of funding. Other typical funding sources are university posts, project funding from the Academy of Finland and universities, or wages earned by working outside universities.

The doctoral thesis can be done either in the form of a monograph or as a series of articles including a summary (Finland's Council of State's regulation of university degrees 794/2004). The former consists of three to five (depending on the discipline) articles published in peer-reviewed international journals and a summary that includes an introduction and a discussion bringing together the separate articles. The articles are often co-authored with the advisor(s) and supervisor(s) as well as other researchers. In natural sciences the most frequent type of thesis is a series of articles (International Postgraduate Student Mirror, 2006; Pyhältö et al., 2011b). In the behavioural sciences, a series of articles has also become the dominant form of thesis in recent years (Pyhältö et al., 2011b). However, there is variation among the domains within the behavioural sciences in terms of the primary form of the doctoral dissertation. For instance, the series of articles form is more dominant in psychology, while monographs are more often carried out in the field of educational science. In most cases, the students' mother tongue is Finnish or Swedish, but the articles and summary are typically written in English.

The student has at least one advisor (a full professor in the field where the thesis is being done) and one supervisor (International Postgraduate Student Mirror, 2006). They may also be the same person. In addition, the use of supervisory boards has become more popular in recent years (International Postgraduate Student Mirror, 2006). Doctoral students who pursue monographs often engage in seminars, and supervision is based on supervisor–student dyads rather than on work in research groups. Research groups, instead, typically consist of several doctoral students, postdoctoral researchers, and professors who focus on collectively solving shared research problems and publications related to the supervisor's research projects.

The evaluation process of a doctoral thesis consists of four stages. First, the doctoral student gives the thesis manuscript to the advisor(s) and supervisor(s). After they have accepted the manuscript, the Faculty Council will name the pre-reviewers (usually full professors from other national or international universities) to examine the thesis. Then, two or three pre-reviewers review the manuscript (they have about three months to review it), and the doctoral student revises it based on their comments. The Faculty Council then decides whether the student will be given permission to defend the thesis publicly and names the opponent for the de-

fence. At this stage, the thesis is printed and published with an ISBN number and sent to the opponent. Copies of the published thesis are made available to members of the relevant faculty and to others prior to the defence (International Postgraduate Student Mirror, 2006). After the public defence, the opponent decides whether he will recommend its ratification. Finally, the Faculty Council decides whether to award the doctoral degree.

4   Methods

This doctoral dissertation study was carried out using mixed methods (e.g., Creswell & Plano Clark, 2007; Johnson & Onwuegbuzie, 2004; Johnson, Onwuegbuzie, & Turner, 2007) to explore the dynamics of students' engagement in the doctoral process. Accordingly, both qualitative and quantitative methods were applied in the data collection and analysis. This study draws on a pragmatist view, which considers the selection of methods as a way to answer the research questions in the optimum and best possible way (Creswell & Plano Clark, 2007; Johnson et al., 2007). Therefore, the research questions in this study determined the specific methodological and procedural choices made (e.g., Creswell & Plano Clark, 2007; Johnson & Onwuegbuzie, 2004; Teddlie & Tashakkori, 2003).

4.1 Participants

Participants of this dissertation study included doctoral students from the natural and behavioural sciences, and doctoral students and supervisors from all 11 faculties of the University of Helsinki. In *Studies I*, *II*, and *III,* the natural and behavioural sciences, in particular, were chosen on the grounds that the former represents a domain that traditionally carries out group-based work and the latter represents a domain typically characterised by individualised work. Furthermore, the natural sciences are less frequently investigated in the doctoral education literature.

Participation was voluntary and the participants were not compensated for their time. The participants had the possibility to withdraw from the study at any phase of the research process. In this dissertation information on the participants is given as much as possible without compromising their anonymity.

Study I. The participants were 19 natural sciences doctoral students (women: 10, 53%; men: 9, 47%; mean age 27 years varying from a little over 20 to 35 years). This was the typical age and gender distribution of doctoral students in the research community at the time of data collection. Most of the participants were pursuing their dissertations full-time. The form of their thesis was a series of articles. The participants were at different phases of their doctoral process. They were all from the same internationally, highly acknowledged top-level interdisciplinary research community in the field of natural sciences at a large research-intensive Finnish university.

Study II. The participants were 21 behavioural sciences doctoral students (women: 17, 81%; men: 4, 19%) majoring typically in educational sciences. This was the typical gender distribution for doctoral students in the research community at the time of data collection. Of the participants, 11 were full-time doctoral students and 10 were pursuing their PhDs part-time. Seven participants were conducting their thesis in the form of a series of articles and six were pursuing it in the form of a monograph. Eight participants were unsure of the form their theses would take. The participants were at different phases of their doctoral process. They were all from the same internationally, well-established research community in the do-

main of behavioural sciences operating at a large research-intensive Finnish university.

In *Studies I* and *II*, participants were chosen from research-intensive groups in order to capture the experiences of engagement from students involved in communities which have a well-structured doctoral education and high academic achievements.

Study III. The participants were 16 behavioural sciences doctoral students (women: 11, 69%; men: 5, 31%; mean age 45 years varying from a little over 30 years to over 70 years) majoring in educational sciences, psychology, cognitive science, or speech sciences. This was the typical age and gender distribution of doctoral students in the faculty at the time of data collection. The participants were selected from a follow-up register of doctoral students who were contacted by their faculty because their doctoral processes were prolonged. These participants were chosen because they were considered as belonging to a group where disengaging experiences among students would be reported more frequently. The annual postgraduate study follow-up register contained registered doctoral students whose admission to postgraduate studies had exceeded seven years from the end of the preceding academic year and whose doctoral studies remained unfinished (Decision of the vice-chancellor 234/2006, 6/2011). Eight of the participants were pursuing their PhDs part-time and three were full-time doctoral students. Five participants had done their doctoral studies with varying emphasis on both full-time and part-time. Of all the participants, seven were pursuing their theses in the form of a monograph and six in the form of a series of articles. Three participants were unsure of the form their theses would take. The participants were at different phases of their doctoral process.

Study IV. The participants were 1 184 doctoral students (women: 770, 66%; men: 383, 34%; age mode: 30–34 years varying from under 25 years to over 50 years) and 431 supervisors (women: 166, 40%; men: 252, 60%; age mode: 50–54 years varying from under 25 years to over 65 years) from all 11 faculties of the University of Helsinki including Agriculture and Forestry, Arts, Behavioural Sciences, Biological and Environmental Sciences, Law, Medicine, Pharmacy, Science, Social Sciences, Theology, and Veterinary Medicine. Both doctoral students and supervisors were chosen in order to explore students' perceptions and those of the environment—that is, supervisors' perceptions—as well as the fit between them.

The response rate among doctoral students was 28%. Of all doctoral students, 65% were working on their PhDs full-time and 35% part-time. Of all students, 60% were doing their thesis in the form of a series of articles and 36% in the form of a monograph. Of all students, 4% reported that they did not know in which form they would write their theses. Appendix 1 shows the specific situation in each domain.

The response rate among supervisors was 29%. Of all supervisors, 62% were working as professors or research directors, 36% were employed as university lecturers or university researchers, and 2% were university instructors or postdoctoral researchers. Of all supervisors, 50% had been supervising doctoral students for more than 11 years (mean, 13 years). Appendix 2 shows the specific situation in each domain.

The sample of the doctoral students and the supervisors represented the whole population quite well in terms of gender distribution and sufficiently in terms of the age distribution. It appeared that the students from the Behavioural Sciences, Science, Pharmacy, and Theology who completed the survey were slightly younger than the average age (see Appendices 1 and 3). Moreover, in terms of full-time and part-time studies, the sample of doctoral students represented Finnish doctoral students from all domains quite well in relation to a larger national study (Hiltunen & Pasanen, 2006) and an international study (International Postgraduate Student Mirror, 2006). However, there were some differences in the working conditions. In general, in the national and international studies as well as in *Study IV,* most doctoral students reported that they were working alone; in the sample from *Study IV* fewer students reported working alone and more were working in groups than in the national and international studies.

In addition, the supervisors from Arts, Medicine, Pharmacy, and Social Sciences who completed the survey appeared to be slightly older than the average, whereas supervisors from Science appeared to be slightly younger than the average (see Appendix 2 and the University of Helsinki Annual Report, 2011). Although on average research staff at the University of Helsinki were employed as university lecturers or university researchers (see the University of Helsinki Annual Report, 2011) and typically the supervisors who completed the survey were working as professors or research directors (see Appendix 2), the sample of the supervisors represented the whole population well in terms of status distribution since professors and research directors are typically the primary supervisors of doctoral students.

4.2 Materials

In this study both interviews and surveys were conducted in order to capture data on doctoral students' engagement in and disengagement from the doctoral process and the factors associated with them.

Interview Studies I, II, and III. To capture a variety of engaging and disengaging experiences from doctoral students themselves, the data were collected by conducting semi-structured interviews (e.g., Kvale, 1996, 2007) between 2007 and 2010. The interview attempted to give space for the participants' voices and to understand their experiences (e.g., Kvale, 2007) of engagement in and disengagement from the doctoral process. It allowed the design of flexible procedures (Kvale, 1996) for exploring the doctoral students' experiences.

In *Studies I* and *III* the same interview procedure was applied (see Appendix 4). The interviews in *Study I* were conducted in spring 2009 and in *Study III* in spring and summer 2010. The interviews were designed to capture students' experiences of the significant critical events and turning points (e.g., Tripp, 1993, 1994; Woods, 1993) including the positive, inspiring experiences and the negative, challenging experiences from their doctoral process. A visualisation-based interview (e.g., Reavey, 2011; Rose, 2007) was applied to promote student reflection on the events and points. The interviews also included background information ques-

tions. Both in *Studies I* and *III* an average interview lasted 1 hour and 45 minutes (ranging from 50 minutes to 2.5 hours).

In *Study II* the interview data were collected in 2007–2008. The interview was designed to investigate the doctoral students' experiences of their doctoral process and how they saw themselves in it (see Appendix 5). The interviews also included background information questions. The interviews focused on retrospective recall of previous experiences of the doctoral process and on the present situation. Each interview lasted approximately 1 hour (ranging from 30 minutes to almost 3 hours).

In *Studies I*, *II*, and *III* the interview questions and procedures were formulated by the entire research group. The interviews were also piloted in two phases before the collection of data used in the analyses. All of the interviews were recorded and took place in locations chosen by the participants, these being either a peaceful space at the university or at their workplaces. The interviews were transcribed by trained research assistants[4].

Survey Study IV. To capture a range of perceptions from a large number of both doctoral students and supervisors in a structured manner allowing for further comparison, the data were collected by e-mail through two doctoral student (see Doctoral student survey, 2011) and supervisor (see Supervisor survey, 2011) online surveys in March 2011. The doctoral student survey was sent to all registered doctoral students and the supervisor survey was sent to all designated principal investigators[5] at the University of Helsinki. Both the doctoral student and the supervisor surveys consisted of Likert-type statements and open-ended questions focusing on three themes: (1) the thesis process, (2) supervision, and (3) doctoral studies, as well as background questions. The doctoral student and supervisor surveys were developed based on previous research on doctoral training[6]. The surveys were also piloted before the actual data collection.

In *Study IV* the doctoral students and supervisors were asked to name the main resources for and challenges of the doctoral process. Their perceptions were explored by two open-ended questions (see Doctoral student survey, 2011; Supervisor survey, 2011). Moreover, students' overall satisfaction with their doctoral education was measured with one item (see Doctoral student survey, 2011) and their satisfaction with supervisory support was measured through six Likert-scale items (Pyhältö et al., 2009) that together formed a scale (see Appendix 6).

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[4] In the results, quotations from the participants' interviews are provided. In order to protect the anonymity and identity of the participants, departments, and faculties, all interviewed participants were given codes that are used in every interview quotation. All potentially identifying information such as names, locations, dates, and specific research topics, were masked in the text. The quotations were translated from Finnish to English.

[5] For information (in Finnish) about the principal investigators at the University of Helsinki, see http://notes.helsinki.fi/halvi/hallinto/Rehtorin.nsf/dc887e3b5230caa0c225685400395d44/78b6368c c8a41a2ac22575e000450160?OpenDocument.

[6] The surveys included adapted items from the Early Careers of Doctorate Holders survey (Haapakorpi, A., 2008), the International Postgraduate Students Mirror survey (Högskoleverket, 2006; Dill, D. D. et al., 2006), PhD, the Changing Academic Profession survey (Aarrevaara, T. & Pekkola, E., 2010), and the PhD Experience questionnaire developed by Pyhältö, K. and Lonka, K. (2006).

4.3 Analyses

In this study both qualitative and quantitative analysis procedures were applied in order to explore the dynamics of students' engagement in the doctoral process.

4.3.1 Interview Studies I, II, and III

The interview data were qualitatively content analysed (e.g., Patton, 1990) by relying on an abductive strategy (e.g., Coffey & Atkinson, 1996; Haig, 2005; Levin-Rozalis, 2004; Morgan, 2007). This strategy was based on the chosen methodological framework (e.g., Morgan, 2007) and aimed at maintaining a continuous connection between participants' perceptions and prior theoretical understandings (Coffey & Atkinson, 1996). Furthermore, it was thought to yield an optimum understanding of the phenomenon (Coffey & Atkinson, 1996; Haig, 2005; Levin-Rozalis, 2004; Morgan, 2007)—that is, doctoral student engagement and disengagement and factors associated with them. Therefore, in the abductive inferences, both data-grounded analyses (e.g., Harry, Sturges, & Klingner, 2005; Mills, Bonner, & Francis, 2006) and theory-guided analyses (e.g., Patton, 1990) were combined. Theory-guided analyses relied on prior knowledge and research on engagement (e.g., Appleton et al., 2006; Demerouti et al., 2001; Fredricks et al., 2004; Reeve et al., 2004; Schaufeli et al., 2002a, 2002b) and person–environment fit (e.g., Edwards et al., 2006; Kristof, 1996; Pyhältö, Pietarinen, & Salmela-Aro, 2011a), as well as on Deci's and Ryan's (2000, 2002, 2008) and Eccles's (2008) work. In each phase of the analysis, the observed data and prior knowledge were repeatedly assessed in relation to each other as data was categorised.

Study I. To gain an understanding of the significant key learning experiences during the doctoral process, the analysis focused on exploring critical events and turning points (e.g., Tripp, 1993, 1994; Woods, 1993) as identified by the students themselves. The analysis process included four phases that are visualised in Figure 2.

Figure 2. A visualisation of the analysis process in *Study I*.

First, all of the text segments in which the participants referred to the critical events and turning points were coded into the same hermeneutic *key learning experiences* category. In the second phase, in order to understand the personal meanings given to the experiences by the participants, the key learning experiences were coded into four mutually exclusive, qualitatively different categories: (1) *participation in the scholarly community*, (2) *development as a scholar*, (3) *developing specific research competencies*, and (4) *balancing between doctoral research and other institutional tasks*. In the third phase, in order to identify the activities in which the experiences were embedded, the key learning experiences were categorised according to the primary contexts of the experiences as follows: (1) *research work*, (2) *PhD studies,* (3) *academic meetings*, (4) *supervision*, (5) *publishing*, (6) *academic assignments*, and (7) *personal activities*. Finally, to understand how the experiences contributed to the doctoral process, all of the key learning experiences were coded into two mutually exclusive categories: (1) *promoting key learning experiences* and (2) *hindering key learning experiences*.

   Study II. The analysis focused on identifying the doctoral students' engaging experiences. The analysis process included two phases. A visualisation of the first phase of analysis is provided in Figure 3.

Figure 3. A visualisation of the first analysis phase in *Study II*.

In the first phase, all of the text segments in which the participants made reference to *engaging experiences* in terms of their doctoral process were coded into the same hermeneutic category. Subsequently, to understand what the participants experienced—that is, the different qualities of doctoral student engagement—the engaging experiences were coded into three mutually exclusive main categories: (1) *dedication*, (2) *efficiency*, and (3) *absorption*. At the end of the first phase, in order to identify the causes for engagement as described by the participants, the three main experiences of engagement were coded into four basic categories according to the primary sources of engagement: (1) *competence*, (2) *relatedness*, (3) *autonomy*, and (4) *contribution*.

In the second phase, to identify different forms of engagement, the analysis focused on exploring similarities and differences in the main experiences and sources of engagement in each individual participant's interview description and across all participants' descriptions. As a result, three qualitatively different categories were identified: *adaptive form of engagement*, *agentic form of engagement*, and *work-life inspired form of engagement*. The various forms of engagement were also studied in relation to the phase of the participants' doctoral studies.

Study III. The analysis aimed to identify the doctoral students' disengaging experiences. The analysis included four phases that are visualised in Figure 4.

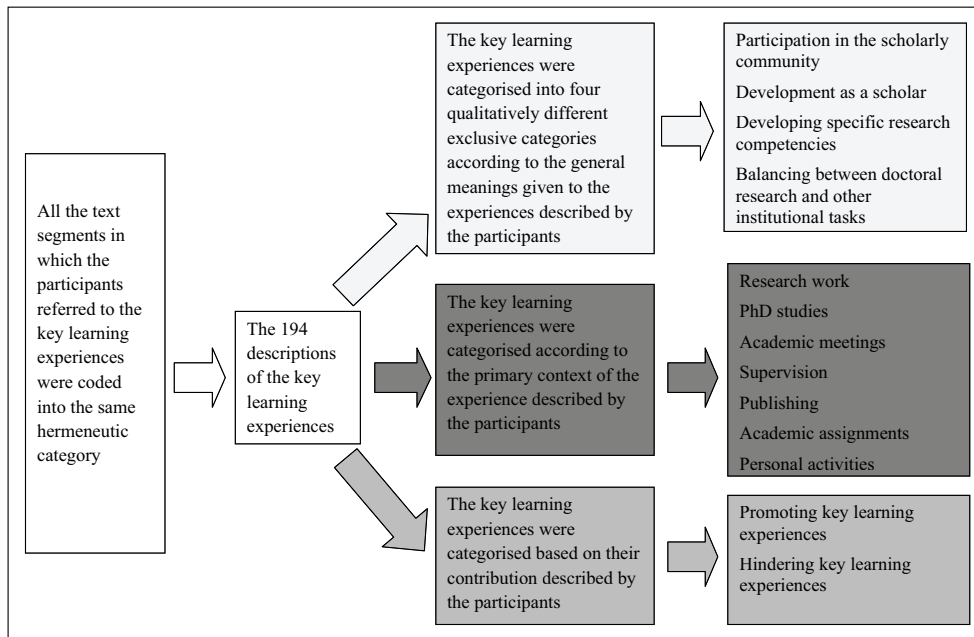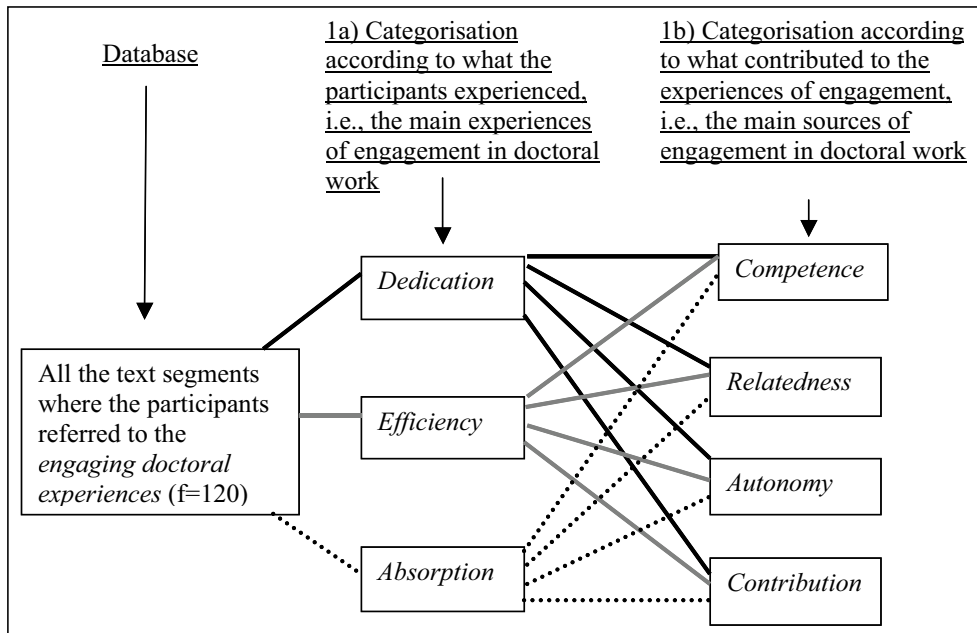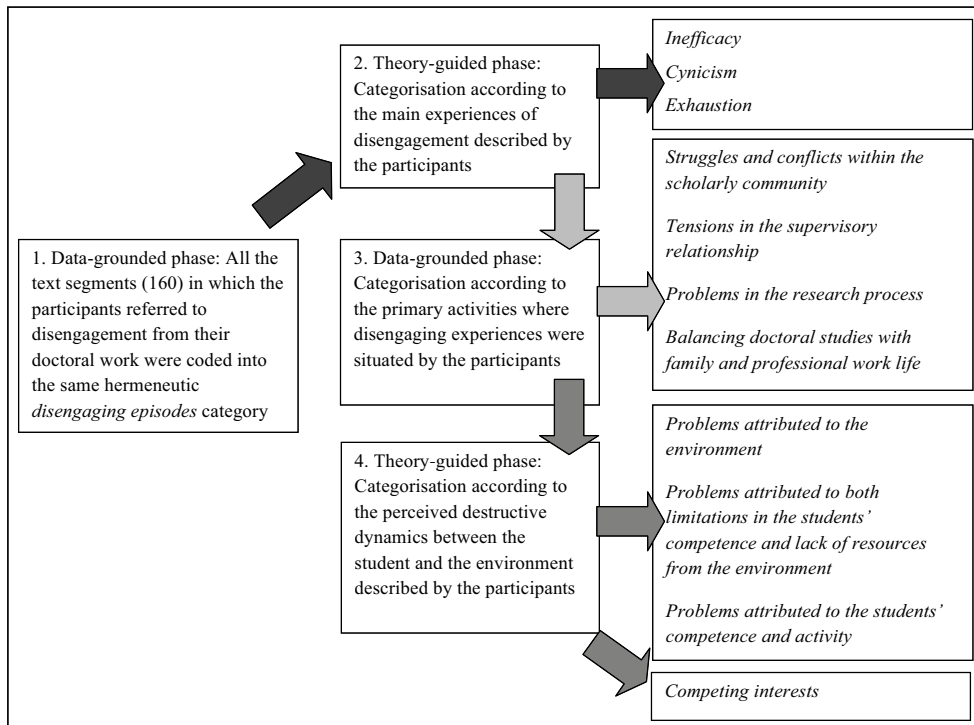**Figure 4**. A visualisation of the analysis process in *Study III*.

First, all of the text segments in which the participants referred to disengagement from their doctoral process were coded into the same hermeneutic *disengaging episodes* category. In the second phase, in order to understand what the participants experienced—that is, the different qualities of disengagement—three mutually exclusive main categories were formulated from the disengaging episodes: (1) *inefficacy*, (2) *cynicism*, and (3) *exhaustion*. In the third phase, to identify the causes for disengagement as described by the participants, the three main experiences of disengagement were coded into basic categories according to the primary sources and activities of disengagement: (1) *struggles and conflicts within the scholarly community*, (2) *tensions in the supervisory relationship*, (3) *problems in the research process*, and (4) *balancing doctoral studies with family and professional work life*. Finally, to understand the participants' perceptions of the destructive dynamics between themselves and their environment in the disengaging episodes, the activities related to those disengaging experiences were coded into subcategories according to the perceived misfit between the students and the activities: (1) *problems attributed to the environment*, (2) *problems attributed to both limitations in the students' competence and lack of resources from the environment*, and (3) *problems attributed to the students' competence and activity*. In addition, (4) *competing interests* from the students' family or professional work lives were described.

In *Studies I*, *II*, and *III*, the categories derived from the analyses were assessed by the research group at the end of each phase of analysis in order to enhance the

trustworthiness and credibility of the analyses and results (e.g., Miles & Huberman 1994). The categories resulting from the analyses were quantified by recording the number of times (frequency) the text segments assigned in each of the categories appeared in the data. In *Study II* the relationship between the main experiences and sources of engagement was analysed with cross-tabulation and χ^2 tests.

4.3.2 Survey Study IV

In order to gain an understanding of the dynamics contributing to doctoral student engagement, this analysis was aimed at exploring the collective fit between the doctoral students' and supervisors' perceptions of the main resources for and challenges of the doctoral process in different faculties. To investigate the collective fit and the relationship between the fit and the doctoral experience, both qualitative and quantitative procedures were combined in the analysis. In the first phase of analysis, which is visualised in Figure 5, the answers to the open-ended questions regarding the main resources for and challenges of the doctoral process were qualitatively cpontent analysed (e.g., Patton, 1990) using abductive reasoning (e.g., Coffey & Atkinson, 1996; Morgan, 2007).
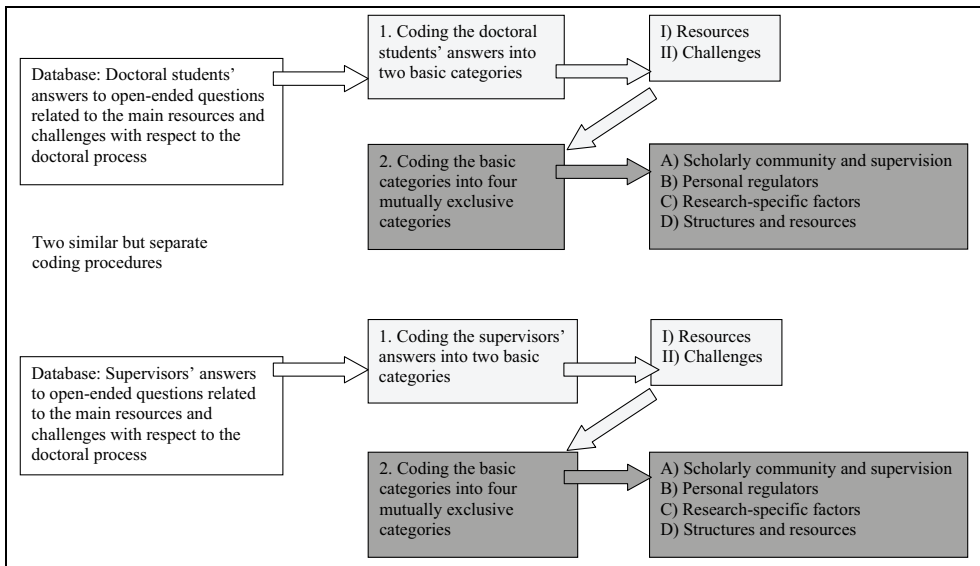
Figure 5. A visualisation of the first phase of qualitative analysis in *Study IV*.

First, the doctoral students' and supervisors' answers were separately coded into two basic categories: (1) *resources* and (2) *challenges*. Secondly, the two sets of basic categories were separately analysed using a grounded strategy (e.g., Harry et al., 2005; Mills et al., 2006) to construct corresponding categories for further comparison of the doctoral students' and supervisors' perceptions. As a result, the resources and challenges were coded into the following four mutually exclusive categories: (1) *scholarly community and supervision*, (2) *personal regulators*, (3) *research-specific factors,* and (4) *structures and resources*. Next, the faculties were

assigned to one of three categories according to the degree of fit between the doc-
toral students' and supervisors' perceptions: (1) *fit*, (2) *partial fit*, and (3) *misfit*.
The categories were supported by cross-tabulations and χ^2 tests. Finally, the stu-
dents in the fit, partial fit, and misfit categories were compared with each other in
terms of overall satisfaction with their doctoral education and satisfaction with
supervisory support using ANOVA. In order to improve the validity and reliability
of the analysis and results, the categories derived from the content analysis were
assessed by the research group at the end of each phase of analysis (e.g., Miles &
Huberman, 1994).

4.4 Summary of the methods

To achieve the research aim and provide answers to the research questions from
different angles and in the best possible manner (e.g., Creswell & Plano Clark,
2007; Johnson & Onwuegbuzie, 2004; Johnson et al., 2007), in this dissertation
study, the investigation of the dynamics of doctoral student engagement drew upon
both the perspectives of doctoral students and supervisors from different domains
and combined both qualitative and quantitative methods. Accordingly, this study
was carried out by collecting data through interviews and surveys, and analysing
the data using qualitative, abductive content analyses and statistical procedures. An
overview of the research aims, participants, methods, and procedures used in each
of the separate sub-analysis are presented in Table 2.

Table 2. Overview of the study methods and procedures.

Study	General aim	Participants	Method	Instrument	Analysis
Study I	To explore students' key learning experiences during their doctoral process	19 natural sciences doctoral students	Interview	- An interview examining the critical events and turning points during the doctoral process (see Appendix 4)	- Qualitative, abductive content analysis - Quantification of qualitative data
Study II	To explore students' engagement in their doctoral process	21 behavioural sciences doctoral students	Interview	- An interview examining the students' experiences of their doctoral process and themselves in the process (see Appendix 5)	- Qualitative, abductive content analysis - Quantification of qualitative data - Cross-tabulation and χ^2 tests
Study III	To explore students' disengagement from their doctoral process and the dynamics that contributed to their disengagement	16 behavioural sciences doctoral students	Interview	- An interview examining the critical events and turning points during the doctoral process (see Appendix 4)	- Qualitative, abductive content analysis - Quantification of qualitative data
Study IV	To explore the collective fit between doctoral students' and supervisors' perceptions of the main resources for and challenges of the doctoral process	1 184 doctoral students and 431 supervisors from all 11 faculties of the University of Helsinki	Surveys	- Open-ended questions about the main resources for and challenges of the doctoral process (see Doctoral student survey, 2011; Supervisor survey, 2011) - An item measuring overall satisfaction with doctoral education (see Doctoral student survey, 2011) - A scale measuring satisfaction with supervisory support (see Appendix 6)	- Qualitative, abductive content analysis of the answers to open-ended questions - Quantification of qualitative data - Assigning the faculties to one of the three categories: fit, partial fit, or misfit - Cross-tabulation and χ^2 tests - ANOVA

5   Results

In the following, the most vital results of the four studies are presented. The results are described in more detailed in the original journal articles.

5.1   Doctoral students' experiences of engagement and disengagement

Doctoral students' inspiring and challenging key learning experiences and engagement in and disengagement from their doctoral process were analysed in *Studies I, II*, and *III*.

5.1.1   Interview study of key learning experiences (Study I)

Natural sciences doctoral students' most critical inspiring and challenging key learning experiences that either enhanced or inhibited their doctoral process were explored in *Study I*. The results suggested that the students' key learning experiences were varied and were situated in various contexts. Although there was some variation, the students emphasised the *positive* and *inspiring key learning experiences* (84%) that encouraged them to proceed with their research work, the overall process of earning their doctorates, and develop as researchers (see Appendix 7). The students described most of the inspiring experiences in terms of their *participation in the scholarly community* (30%) consisting of various layers comprised of both the students' own research groups and international researchers. They described significant and exciting experiences connected with becoming a member of and engaging in dialogue with their own community and the larger international field. In addition, the students highlighted *developing specific research competencies* (26%) and *development as a scholar* (23%) as inspiring learning experiences that encouraged them to proceed. They described, for instance, their stronger involvement in scientific problem solving and knowledge creation, as well as their strengthened self-efficacy beliefs and competence as a researcher.

Moreover, the doctoral students typically situated their inspiring key learning experiences in various scholarly practices including *research work*, *PhD studies*, and *academic meetings*. For instance, one of the students described an inspiring experience in terms of participation in the scholarly community by describing getting to know fellow researchers:

> *For the first time, I was in one of those researcher meetings. It was a very exciting event. For the first time, I had an opportunity to meet and chat with fellow researchers. It was exciting to see how the science world works in these kinds of matters. There I also got to know other researchers and their research work. It was really interesting and valuable to see them, and fun to actually be involved.* (N13)

However, the students' doctoral process also included highly challenging and confusing experiences. Altogether, 16% of the key learning experiences were perceived by the students as *negative* and *hindering* their research and the overall pro-

cess of earning their doctorates (see Appendix 7). When the students identified such experiences, they typically described problems in their *development as a scholar* (6%), such as losing ownership in terms of their doctoral research and in their *participation in the scholarly community* (5%), such as experiences of being alone or poor treatment in their supervisory relationship as sources of worry, frustration, insecurity, and disturbances in progressing in their research. For instance, one of the students shared a challenging experience in terms of development as a scholar by describing losing control of one's own research:

> *Well, I presented this idea in our meeting ... and I got the feeling that it was being grabbed by others. So that it wouldn't be my project, I got the feeling that this is mine, but someone else is going to take it and conduct it . . . It was quite frustrating feeling that my projects were running away from me. This really worries me ...* (N1)

The results from *Study I* demonstrated how the natural sciences students' doctoral process included inspiring and engaging as well as highly challenging and disengaging experiences.

5.1.2 Interview study of engaging doctoral experiences (Study II)

The anatomy of students' engagement in their doctoral process was explored more closely in *Study II*. In this study the behavioural sciences doctoral students described various engaging experiences. The students emphasised their experiences of *dedication* (53%) and a sense of *efficiency* (40%) in their doctoral work (see Appendix 8). For instance, they often expressed their doctoral work and training as personally meaningful and entailing extremely positive emotions, and described their strong devotion and interest in their research. They also perceived themselves as having strengthened self-efficacy beliefs as researchers and as willing to make energetic efforts in their doctoral work. The doctoral students rarely described experiences of *absorption* (7%) such as being fully immersed in their research work or writing their theses.

For instance, one of the students described an engaging doctoral experience in terms of dedication by expressing the strong interest in and enjoyment of research work:

> *I think that finding and learning new knowledge is fun. My supervisor says that I should not read anymore, but when new research is published, I have to read it. I suppose I like it when I gain new insights and understanding about my research theme. These are really the best experiences in this work.* (Bs15)

The students associated their engagement with various sources (see Appendix 8). However, they emphasised their increased sense of *competence* (39%) and sense of *relatedness* (37%) as the main sources of their engagement ($\chi^2 = 13.42$, df = 6, p = .037). The students, for instance, described learning to become a researcher and development of their academic skills and knowledge in relation to their engagement. They also reported their participation in the scholarly community, a sense of

belonging in it, and having dialogues with their supervisors and other researchers as promoting their engagement. In this vein, one student said:

> *Usually I become inspired by our seminars and discussions. The first thing that comes to my mind is Professor H's ways of stating concepts. He somehow makes theories clearer and adds new perspectives. I have also participated in a group where we have discussed the doctoral theses of other advanced doctoral students and through those discussions I have had many new ideas … I get the feeling that it is wonderful that I am able to do this and it is amazing to be here, that this work is really fun.* (Bs1)

Moreover, further investigation indicated that the students' descriptions included three qualitatively different forms of engagement in the doctoral process (see Table 3). In each form the dynamics between the students and their scholarly communities, as well as the source of inspiration in their doctoral work, were expressed differently by the students. While in the students' descriptions at least two of the forms were typically present, only one of them was emphasised.

The first of them was labelled *adaptive form of engagement*, where the students emphasised their experiences of dedication and efficiency through a unidirectional relation between themselves and their scholarly community—that is, adjusting to their own community—which provided the arena for acquiring knowledge. The students expressed adapting and conforming to the current conditions, and acquiring the knowledge and skills that were valued in the scholarly community as the most significant source of inspiration in their doctoral work. This form of engagement was more often described by students who were at the beginning of their doctoral process. One student put it thusly:

> *Overall this graduate school has been rewarding because it was a new experience to create the research plan; but, at the same time I could see what others had done and from others' work I got some hints … I made notes and out of that mess I gradually came up with a logical vision and started to lay out my research plan.* (Bs19)

When describing the *agentic form of engagement*, the students emphasised their experiences of dedication and efficiency through a dialogical and reformulated relationship between themselves and their scholarly community including both their own research groups and the larger, international field. The students highlighted the creation of new knowledge—for instance, redefining one's own research—as the most important source of inspiration in doctoral work. This form of engagement was more often described by students who were either halfway through or at the end of their doctoral process. For example, one of the students said:

> *The most rewarding for me are the moments when I can share my thinking with others … For instance, I have those experiences where there were interesting discussions and I could present my point of view and we can develop some insights … I have found pleasure in those encounters in the field, or with*

my supervisor, when she can follow my ideas and clarify them, or through some e-mail conversations with a colleague. Of course, these experiences require that I must also write something and then share it with others. (Bs16)

In the *work-life inspired form of engagement* the students emphasised the influence of their professional work lives outside academia on their experiences of dedication to the doctoral work. The students' own scholarly community provided the arena for acquiring theoretical knowledge and research skills that extended their understanding of their research questions which evolved from their work-life contexts. The students emphasised applying their new knowledge and skills in order to solve practical problems and contribute to the work life outside academia as a significant source of inspiration in their doctoral work. This was described by students at all phases of the doctoral process. As one student said:

These were those moments of insight. I really understand my [professional] work now in a more profound way and can combine concepts that I have not previously realised as related. I find answers to those questions from practical problems that I have seen in my own work … and I have gained a lot from the graduate school seminars where there have been discussions of these ideas … Now, for instance, I can read a doctoral thesis and then I can gain some new insights into my own data and concepts, and through those concepts I can better understand my data … (Bs4)

Table 3. Qualitatively different forms of engagement (based on the person-oriented analysis of the participants' engaging doctoral experiences).

Qualitatively different forms of engagement	*Adaptive*	*Agentic*	*Work-life inspired*
What kind of dynamic exists between the doctoral students and their scholarly community	*Dedication* and *efficiency* through a unidirectional relation where the scholarly community provides the arena for the students to adjust and acquire knowledge	*Dedication* and *efficiency* through a dialogical relationship between the students and the scholarly community where both the students and the community reform	*Dedication* through a three-directional relationship where the scholarly community provides the arena for the students to acquire knowledge and to answer questions that have evolved from their work life outside academia
The source of inspiration in doctoral work	*Dedication* and *efficiency* through conforming to the current conditions and acquiring the knowledge and skills valued in the scholarly community	*Dedication* and *efficiency* through creating new knowledge in relation to the scholarly community's theoretical framework, being able to work on their own terms, and develop their own points of view	*Dedication* through applying the scholarly community's theoretical knowledge and research skills in order to solve practical problems and contribute to the work life outside academia

The results from *Study II* extended the understanding of doctoral student engagement that the results from *Study I* provided (in terms of positive and inspiring key learning experiences) by shedding light on varying experiences and sources, and the qualitatively different forms of engagement in the doctoral process.

5.1.3 Interview study of disengaging doctoral experiences (Study III)

The anatomy of students' disengagement from their doctoral process was analysed more closely in *Study III*. Disengaging experiences were explored among the behavioural sciences doctoral students who were selected for a study follow-up by their faculty because their doctoral studies were prolonged. The doctoral students described various disengaging experiences (see Appendix 9). The students emphasised their experienced *inefficacy* (44%) as novice researchers and *cynicism* (42%) with regard to their doctoral process. For instance, they often had diminished beliefs in their abilities and competence to conduct their thesis research, and they expressed apathy and disinterest towards their doctoral studies and their progress in them. They also described difficulties in finding any meaning in producing their doctoral theses and thought their doctoral work lacked any significance. The doctoral students seldom described experiences of *exhaustion* (14%) such as being totally overstrained or becoming depressed.

For instance, one of the students described a disengaging doctoral experience in terms of inefficacy by expressing his diminished self-efficacy beliefs as a researcher:

The other advisor was there in the seminar but the attitude was like "Well, this is nonsense again" and for me this situation formed an impediment ... I felt lousy and very incompetent in what I was doing. I was uncertain about my work ... Then, somehow this work just drifted away, I did not know how to proceed, and felt like this was not going to work out. (B8)

The students associated their disengagement with various sources (see Appendix 9). However, they emphasised the experienced *struggles and conflicts within the scholarly community* (43%) as being the most significant source of their disengagement from the doctoral process. They claimed that dealing with the inconsistent requirements of the national and international research communities, problematic interactions with other researchers, and an oppressive academic atmosphere fed their disengaging experiences. One of the students described the situation thusly:

I had the first thoughts of starting this work and then I felt that I got devastating treatment from the department. I felt that the attitude was "You are from yesteryear, we won't invest in you" ... Then, I was very down, I thought that this thesis was not going to work out. (B2)

Moreover, the students sometimes highlighted experiences of *balancing doctoral studies with family and professional work life* (26%) as another important source of their disengagement. They often associated the demands of full-time work outside academia, family responsibilities, and competing interests from rival careers or personal lives with their disengagement from their doctoral work. One student commented on his balancing act between doctoral studies and other professional full-time work in this manner:

Here at this point I tried, but was not able to conduct the research work at all, besides on a few weekends. As I worked long hours in my full-time work, I was usually tired and this took all my energy. I felt all the time that I should work and do more in a day than I was able to; I tried to do my best. (B8)

The results from *Study III* extended the understanding of doctoral student disengagement that the results from *Study I* provided (in terms of negative and hindering key learning experiences) by revealing a variation in the main experiences and sources of disengagement from the doctoral process.

5.2 The perceived dynamic interplay between the students and their environments

The perceived dynamic interplay between the doctoral students and their environments that was associated with engaging and disengaging doctoral experiences was explored in *Studies III* and *IV*.

5.2.1 Qualitative analysis of misfit (Study III)

The perceived destructive dynamics between the doctoral students and their environments contributing to students' disengagement from their doctoral process were explored in *Study III*. The results suggested that typically the behavioural sciences students with prolonged doctoral studies associated their disengaging doctoral experiences with the *perceived misfit between themselves and their environments* (91%). They rarely associated their disengaging experiences with *competing interests* from other more attractive possibilities from their family lives or other professional careers outside academia (9%).

Moreover, variation was noted in the perceived misfit (see Figure 6). The students emphasised their disengagement as a result of *the problematic environment* (52%) that did not provide experiences of belonging, sufficient support, control over one's own research work, or other resources.
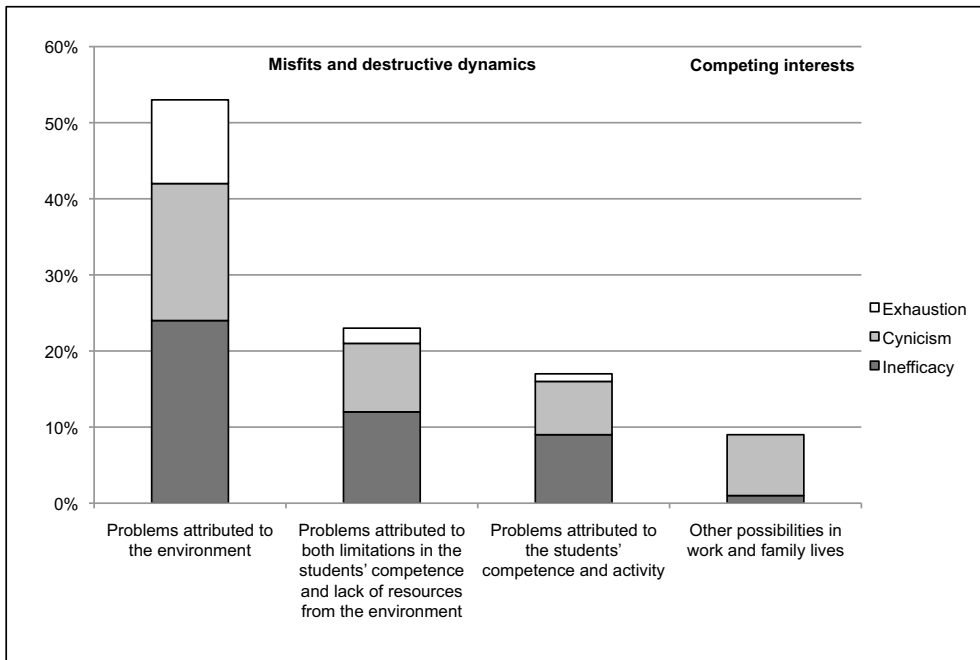
Figure 6. The main experiences of disengagement and the perceived misfit between the doctoral students and their environments and the experienced competing interests (percentages refer to all disengaging episodes described by the participants).

Further investigation revealed that when the students described the perceived misfit related to their environments they typically expressed that their scholarly community had a great deal of control over their doctoral process, while leaving them without support and completely alone to find the right way to proceed with their studies and the research process. The students felt they did not belong to the scholarly community as their efforts to become community members had been rejected and felt that they could not make any sense of the practices and rules of the com-

munity. Thus, they had become cynical and felt they were ineffective in the way they did their research. One of the students talked about this in the following way:

> *This is not any competition, instead it is systematic disparagement ... The atmosphere is quite hostile ... For instance, one professor from another field came to tell me that there is no sense to my work, that my approach was wrong ... and I have been alone and astonished by how anyone can say something so inappropriate and in such a crushing way to a beginner, to a doctoral student ...* (B12)

The results from *Study III* shed light on the perceived misfit and destructive dynamic interplay between the doctoral students and their environments with which the students associated their disengagement. Thus far, this dissertation study has been looking only at the experiences of natural and behavioural sciences doctoral students.

5.2.2 Survey study and analysis of fit (Study IV)

The perceived dynamics between doctoral students and their environments that contributed to students' engagement were explored in *Study IV*. The collective fit between the doctoral students' and supervisors' perceptions of the main resources for and challenges of the doctoral process was analysed at the faculty level across several domains. While the results indicated that in general the doctoral students and the supervisors identified rather similar kinds of resources and challenges, they emphasised them differently (see Appendices 10 and 11). The students highlighted *scholarly community and supervision* (43%), including a constructive supervisory relationship and working in a research group, as a central resource in the doctoral process. The supervisors, instead, emphasised *structures and resources* (39%), such as financial security, appropriate organisation of the doctoral training, and sufficient time to pursue a doctoral degree, as the main prerequisite for doctoral training. Both the students (59%) and supervisors (66%) most often perceived a lack of structures and resources as the main challenge that hindered the doctoral process. However, the results suggested that both the emphasis on the resources for ($\chi^2 = 76.611$, df = 3, p = .000) and the challenges of ($\chi^2 = 53.996$, df = 3, p = .000) the doctoral process differed between the students and the supervisors.

The results indicated a variation in how the students and supervisors from different faculties perceived the main resources and challenges. In the faculties of Behavioural Sciences, Law, Pharmacy, and Science there was a *fit*—that is, a shared understanding—between the students' and supervisors' perceptions of the main resources and challenges.

Moreover, in the faculties of Agriculture and Forestry, Arts, Theology, and Veterinary Medicine a *partial fit* existed between the students' and supervisors' perceptions of the main resources and challenges. They typically had similar perceptions of the core challenges in the doctoral process, but understood the resources differently. The students more often emphasised the scholarly community and supervision, whereas the supervisors underlined structures and resources as the core resource in the doctoral process.

However, in the faculties of Biological and Environmental Sciences, Medicine, and Social Sciences a *misfit* was found between the students' and supervisors' perceptions of the main resources and challenges. For the core resource the students typically emphasised the scholarly community and supervision, whereas the supervisors perceived structures and resources as the most important asset. In addition, the supervisors emphasised a lack of structures and resources, as well as personal regulators, as the primary impediments. The students, on the other hand, not only perceived a lack of structures and resources, but also a lack of scholarly community and supervision as the significant challenges.

Furthermore, the results suggested that there was a relationship between the perceived fit and the doctoral students' satisfaction with their overall study process and supervision in the different faculties. Table 4 shows that the students in faculties where either a fit or a partial fit existed between theirs and the supervisors' perceptions of the main resources for and challenges of the doctoral process reported that they were more satisfied with their doctoral education and supervisory support than the students from misfit faculties, where the students and the supervisors had differing perceptions.

Table 4. Differences in satisfaction with doctoral education and supervisory support between doctoral students from different faculties measured by ANOVA.

The scale 1–5	Fit M (SD)	Partial fit M (SD)	Misfit M (SD)	Significance
Satisfaction with doctoral education	3.5 (0.9)	3.4 (1.0)	3.3 (1.0)	F = 3.975, df = 2, p = .019
Satisfaction with supervisory support	3.6 (0.9)	3.6 (1.0)	3.4 (1.0)	F = 4.533, df = 2, p = .011

The results from *Study IV* revealed the perceived dynamic interplay between the doctoral students and the environments by demonstrating how the perceived collective fit between the students' and supervisors' perceptions of the main resources for and challenges of the doctoral process across several domains varied. The results also showed how the perceived fit was related to the students' engaging doctoral experiences in terms of satisfaction with their overall education and supervisory support.

5.3 Summary of the results

The aim of this dissertation study was to explore the dynamics of doctoral students' engagement in the doctoral process. The most important findings of this study were as follows:

1) Doctoral students' engagement in and disengagement from the doctoral process varied in terms of the quality of the experiences, sources, and forms.
   • The students emphasised the significance of *positive and inspiring key learning experiences* that were mostly related to their *participation in*

the scholarly community, *development as a scholar,* and *developing specific research competencies*. Such experiences were typically situated in various scholarly activities including *research work*, *PhD studies*, and *academic meetings*.

- The students described their engagement in terms of the experiences of *dedication*, *efficiency*, and sometimes *absorption*. The strengthened senses of *competence* and *relatedness* were typically emphasised as the main sources for engagement in the doctoral process. In the students' descriptions three qualitatively different forms of engagement in doctoral work—that is, *adaptive engagement*, *agentic engagement*, and *work-life inspired engagement*—were identified. Also, there was variation among the students in terms of what forms of engagement they emphasised in different phases of their doctoral studies.

- The students described their disengagement in terms of experiences of *inefficacy*, *cynicism*, and occasionally *exhaustion*. Typically the experienced *struggles and conflicts within the scholarly community* were emphasised as the main source for disengagement from the doctoral process.

2) Variation was found in the perceived dynamic interplay between the doctoral students and their environments contributing to engaging and disengaging doctoral experiences.
   - The students typically attributed their disengagement to the perceived *misfit between themselves and their environments*. The problem was often associated with the environment, in particular with *a controlling or alienating scholarly community*, which did not provide the needed resources.

   - *A fit*, *a partial fit*, and *a misfit* were identified between the doctoral students' and supervisors' perceptions of the main resources for and challenges of the doctoral process in different domains. A relationship was found between the perceived collective fit and the doctoral students' satisfaction with their overall study process and supervisory support.

6   Discussion

6.1   Theoretical reflections and implications

What constitutes an engaging doctoral experience has rarely been explored in the doctoral education literature. Hence, this study provided a better understanding of the dynamics of students' engagement in the doctoral process. The results of the present study extended our prior knowledge of doctoral student engagement by showing qualitative differences in engaging experiences typically characterised by dedication and a sense of efficiency. Here, experiences of absorption were very seldom reported. Also, the findings advanced understanding of doctoral student disengagement by shedding light on the qualitative differences in disengaging experiences that involved mainly a sense of inefficacy and cynicism. Here, experiences of exhaustion were rarely described. The various experiences of engagement and disengagement were in line with previous findings from work engagement research carried out in other work-life contexts and among undergraduate students (e.g., Bresó et al., 2011; Hakanen et al., 2006; Krause & Coates, 2008; Ouweneel et al., 2011; Salanova et al., 2010; Schaufeli & Bakker, 2004; Schaufeli et al., 2002a, 2002b, 2006).

However, the present findings further clarified the understanding of qualitatively different experiences of engagement and disengagement, and their meanings in the doctoral process. In particular, the results suggested that the main characteristics of engagement were positive self-efficacy beliefs as a researcher and perceiving one's doctoral project as meaningful and positively. In turn, the findings indicated that low perceptions of oneself as a researcher, negative feelings about the research, and perceiving one's doctoral project as meaningless characterised disengagement. It has been suggested that a long-term intensive involvement in one's work may lead to burnout (e.g., Bakker & Leiter, 2010; George, 2010; Mäkikangas et al., 2012). However, such connections were not found in the data presented here.

The results showed how the quality of engaging and disengaging doctoral experiences varied in the different activities and contexts at hand. For instance, conducting a doctoral research project was often associated with the doctoral students' experiences of efficiency, whereas meaningful social interactions within a scholarly community were typically described in relation to their dedication to earning the degree. On the other hand, problematic social interactions were often described together with experiences of inefficacy and cynicism, whereas combining doctoral studies with the commitments of another profession or family life was typically associated with experiences of cynicism and sometimes exhaustion. Moreover, the findings suggest that a doctoral student may experience engagement in their doctoral work in certain contexts, for instance, through inspiring collaboration and dialogue with other members of the research group. However, he may also suffer disengaging doctoral experiences in some other contexts, for example, when placed in the middle of departmental conflicts or facing problems in their research work. This resonates with previous studies on engagement suggesting that different study and work contexts may form the basis for different kinds of engagement (e.g., Fre-

dricks et al., 2004; Pyhältö et al., 2011a). Accordingly, the results extend our understanding and current knowledge of doctoral student engagement by indicating that engagement is not a singular entity; rather, it is a multidimensional construct and its quality varies depending on the context. Furthermore, it appeared that the contexts of doctoral student engagement vary, for instance, from one's own local research group and international collaborative arenas to carrying out research and attending courses.

Also, qualitatively different forms of engagement, including adaptive engagement, agentic engagement, and work-life inspired engagement, were identified. Prior to this research, there have not been any findings of qualitatively different forms of engagement in the literature concerning study and work engagement among university students. Hence, this study has contributed to the literature on engagement by revealing the nature of engagement at the interfaces of studying and working by shedding light on the dual role of doctoral students as both students and professional researchers. The results here also support Reeve's and Tseng's (2011) recent research suggesting that agentic engagement should be considered as one of the dimensions of engagement.

It is possible that the varying forms of engagement reflect the different meanings of doctoral work that were given by the participants (e.g., Hoskins & Goldberg, 2005; Meyer et al., 2005; Stubb et al., 2012a, 2012b). For instance, to some extent the results resembled the different perceptions of doctoral research found by Stubb et al. (2012b): 1) "a personal learning process", 2) a "job to do", 3) "making a contribution", and 4) "obtaining qualifications and gaining accomplishments". The first category and the agentic and work-life inspired forms of engagement overlap with one other since in all of them the significance of exploring something that was defined in one's own terms or was personally interesting were emphasised by the participants. In turn, the second category and the adaptive form of engagement resemble each other, because, for both of these, the participants highlighted doctoral research as an activity in which they follow the traditions and practices of the scholarly community or its use in fulfilling the community's requirements for a doctorate. In addition, in the third category, answering interesting questions that made a difference was viewed as meaningful to the doctoral students, and, hence, has similarities with work-life inspired engagement. However, in work-life inspired engagement, the contribution focused mainly on professional contexts outside academia, whereas in the third category, the contribution focused both on the discipline and society. Moreover, the fourth category of "accomplishment" not only included demonstrating one's excellent performance, but also the creation of new knowledge and, therefore, has similarities with the agentic form of engagement. However, gaining merit and status were also emphasised in this particular category, but were not expressed by the participants in relation to agentic engagement. Hence, it may be that the sources of inspiration in doctoral work at least partially reflect the students' motives, goals, and aspirations related to their doctorates.

Furthermore, the meaning of doctoral research given by the students and their goals for earning the doctorate may affect what kind of scholarly identity (e.g., Pyhältö et al., 2012a) the students construct (e.g., a professionally oriented one) and also their engagement in the doctoral process. For example, if students per-

ceive the meaning of doctoral work to be obtaining qualifications for work life outside the university and construct their identity through their professional careers, it may, at best, provide resources for earning the doctorate. However, tensions may evolve if an imbalance between a professional identity and identity as a researcher arises. The imbalance may occur if the student does not perceive his doctorate as a means of learning to become a researcher as such and the scholarly community, in turn, do not support the student's other professional goals. On the other hand, it may also be possible that professional work–lives outside academia do not always support doctoral students' academic goals and the pursuit of their doctorates. At worst, such tensions may lead to alienation and disengagement from the doctoral process if they become destructive. Hence, it may be that experiences that enable students to make a meaningful connection between their aspirations and thesis research projects are likely to promote their engagement in their doctoral process, whereas experiences that do not enable such a meaningful connection may reduce their engagement.

Moreover, the findings demonstrated how those students at the beginning of their doctoral process reported the nature of their engagement as more adaptive, while those students halfway through or at the end of their doctoral process described their engagement as increasingly agentic in nature. Still other students at various phases in their doctoral studies reported work-life inspiration. A reason for this may be that developing an active agency and participation in scholarly communities are highly challenging and they increase gradually over time as students progress in the thesis and research process (e.g., Hakkarainen et al., 2013b; Hopwood, 2010; Pyhältö & Keskinen, 2012; Pyhältö et al., 2009). This suggests that the form of student engagement may vary in different phases of the doctoral process.

In addition, the results showed variation in the sources of engaging and disengaging doctoral experiences. Engagement in the doctoral process, especially experiences of dedication and efficiency, were associated mainly with the doctoral students' experiences of belonging and competence, and sometimes with autonomy and contribution. This is consistent with previous findings indicating that students' and workers' internal motivation and optimal functioning, as well as doctoral students' engagement in their study process, were enhanced when their experiences of relatedness, competence, autonomy (Deci & Ryan, 2000, 2002, 2008; Fredricks et al., 2004; Mason, 2012; Niemic & Ryan, 2009; Ryan & Deci, 2000; Virtanen & Pyhältö, 2012), and contribution (Eccles, 2008; Virtanen & Pyhältö, 2012) were promoted. However, in the present results experiences of belonging and competence were emphasised. This may reflect the development of engagement during the doctoral process. It may be that in the early phases of the doctoral process students' engagement is strengthened by their experiences of developing competencies required by complex knowledge creation and problem solving as well as by being a part of a scholarly community. Then, when students perceive themselves as competent and acknowledged members, experiences of having autonomy and making contributions may become more salient.

Interestingly, problems in the research itself were rarely perceived as the main source for disengaging doctoral experiences; rather, the students associated such

experiences, especially experiences of inefficacy and becoming cynical, mainly with the struggles and conflicts experienced within the scholarly community. Traditionally the supervisory relationship is often identified as one of the main determinants of doctoral student satisfaction or distress (e.g., Jairam & Kahl, Jr., 2012; Lahenius, 2013; Sakurai et al., 2012). Based on the results here, however, it might be that the larger scholarly community, including the faculties, departments, and international arenas, provided greater variety of more or less familiar practices, which may have evoked varying doctoral experiences including inefficacy and cynicism. Hence, the results provided new insights by uncovering the importance of multiple scholarly communities in doctoral student engagement. This is in agreement with doctoral education literature proposing that a scholarly community should be considered a systemic, nested entity (e.g., McAlpine & Norton, 2006; Pyhältö et al., 2012a; Stubb, 2012). Moreover, disengaging doctoral experiences, especially becoming cynical, were occasionally associated with balancing doctoral studies with competing interests from another career or family life. This may be because pursuing a PhD is a long-term process where the goal is distant. Hence, students may need short-term goals that other pathways may provide.

The findings of positive and negative relationships with a scholarly community as significant sources of engaging or disengaging doctoral experiences are in line with previous research. These studies stress the importance of students' feelings of belonging and meaningful participation in a scholarly community as key factors affecting their positive experiences, well-being, and satisfaction with and persistence in doctoral studies (Ali & Kohun, 2006; Deem & Brehony, 2000; Gardner, 2007; Golde, 2000, 2005; Hoskins & Goldberg, 2005; Lovitts, 2001; Pyhältö et al., 2009; Stubb et al., 2011). However, the results also provided new insights into doctoral student engagement by breaking down the complexity of engagement through identifying its different sources and demonstrating how the students' experiences of belonging (or not belonging) appeared to be the primary determinants of doctoral student engagement or lack thereof.

The most intelligent and gifted doctoral students are traditionally considered more likely to persist and earn their degrees (e.g., Gardner, 2009; Lovitts, 2001). One might, therefore, expect that experiencing a sense of belonging would not be as important. The results here, however, demonstrated how the relational aspects— that is, experiencing meaningful relationships and belonging in a scholarly community—mattered in doctoral student engagement. In fact, the term relational agency was created to refer to the capacity of a person to work with others in order to better respond to complex problems (Edwards, 2005). In research work this may include working with others to expand the "object of activity"—that is, research problems—recognising others' resources and expertise, as well as negotiating and aligning the use of the resources as doctoral students and other researchers work together to create new knowledge (e.g., Pyhältö & Keskinen, 2012). Based on the present findings, it may be that such relational aspects also have importance in engagement in extremely challenging doctoral research projects.

Furthermore, the results showed that engaging doctoral experiences were typically associated with a perceived fit between the students and their environments including experiencing constructive interactions and a sense of belonging in the

scholarly community. Disengaging doctoral experiences, in turn, were often associated with a perceived misfit between the students and their environments characterised by experiencing dysfunctional interactions as well as lacking support from and a sense of belonging in the scholarly community. This is in accordance with engagement studies in work-related settings and among undergraduate students indicating that a perceived fit between the person and the environment promotes positive work- and study-related experiences and work drive, whereas a perceived misfit, in turn, increases the risk of negative experiences and even burnout (e.g., Gilbreath et al., 2011; Hakanen et al., 2006; Pyhältö et al., 2011a; Schmitt et al., 2008). The results also confirm research on doctoral student persistence suggesting that the perceived fit between doctoral students and their institutions, departments, and supervisors is the central factor supporting persistence, and that a perceived misfit between them is likely to result in attrition (e.g., Golde, 2005; Holley, 2009; Hoskins & Goldberg, 2005; Lovitts, 2001). This provided new insight into doctoral student engagement by implying that the experienced fit between students and their learning environments that promotes students' experiences of belonging and meaningful participation in a scholarly community is likely to enhance students' engagement in the doctoral process.

Accordingly, the results developed our understanding of the dynamics of doctoral students engagement further by showing how the quality of the perceived student–learning environment fit was the central ingredient of engaging and disengaging doctoral experiences. The results here extended our understanding of doctoral student engagement as a reciprocal process. In this dissertation an attempt is made to build a theoretical perspective that considers doctoral student engagement as a complex, mutually constituted learning process that is mediated by the dynamic interplay between the students and their environments. This perspective resonates with study and work engagement research suggesting that engagement should be considered as embedded in the dynamic interplay between individuals and their study or work environments (e.g., Fredricks et al., 2004; Leiter & Bakker, 2010).

Traditionally in the person–environment fit framework a fit is considered an individual construct (e.g., Cable & Edwards, 2004; Edwards et al., 1998, 2006; Gilbreath et al., 2011; Kristof, 1996; Schmitt et al., 2008)—that is, referring to an individual's perceptions of the fit between himself and the environment. The findings from the present study demonstrated that a collective fit between the doctoral students' and supervisors' perceptions existed in different faculties. Even though the mutual aspects of the relationship were not explored at the student–supervisor dyad level, the fit and its different qualities were found at the collective level. This may be a result of the doctoral students and supervisors sharing the same faculty environment and, furthermore, by working within it, they had formed similar perceptions. Accordingly, the results here provided a new understanding of the person–environment fit framework and encourage consideration of the fit as a collective construct as well.

Moreover, the findings of the present study showed how the shared understanding of the central resources for and challenges of the doctoral process between the students and supervisors at the faculty level produced the perceived collective

fit between them. Also, a relationship was found between the perceived collective fit and engaging doctoral experiences in terms of the experienced satisfaction with the overall study process and supervisory support. On the other hand, the results demonstrate how the perceived problems primarily attributed to the environment, especially to an overly controlling or alienating scholarly community, entailing experiencing a lack of support, participation possibilities, control of one's research, and other resources formed the grounds for a perceived misfit between the doctoral students and their environments. A perceived misfit, in turn, was associated with disengaging doctoral experiences. This is in line with previous studies on person–environment fit suggesting that a perceived fit is influenced by several factors involving, for instance, a congruence between various demands, resources, abilities, and the needs of an individual and an environment (e.g., Edwards et al., 1998; Gilbreath et al., 2011; Kristof, 1996). The findings also resonate with previous studies on engagement and job demands–resources showing that high resources are likely to support engagement (e.g., Hakanen et al., 2006, 2008; Schaufeli & Bakker, 2004), whereas a lack of resources may form the grounds for disengagement (Demerouti et al., 2001). Accordingly, the findings further clarified the mechanism and meaning of different factors associated with the perceived fit between students and their environments in terms of engagement in the doctoral process.

Additionally, the results provide a new understanding of different disciplinary communities vis-à-vis the doctoral student–learning environment fit. It has been suggested that traditional disciplinary differences affect the interplay between doctoral students and their scholarly community (e.g., Austin, 2010; Becher, 1989; Chiang, 2003; Gardner, 2007; Golde, 2010). The results here showed how the perceived collective fit was found both in faculties representing so-called "*hard*" domains and "*soft*" domains. Similarly, the perceived partial collective fit and misfit were also found in both of these domains. A reason for this may be that the environment's work conditions and unique practices, for instance, supervision and interaction, were more likely to contribute to the similarities and differences between students' and supervisors' understanding rather than any disciplinary differences. Although far-reaching conclusions cannot be made based on these results, this may indicate that the quality of the collective fit might not be affected by traditional disciplinary differences alone.

Furthermore, the results support prior research suggesting that, while there appear to be disciplinary trends vis-à-vis supervision and social practices, disciplines are not uniform entities (e.g., Holley, 2010; Lovitts, 2001; Stubb et al., 2011; Weidman, 2010). For instance, the behavioural sciences are often described as relying on individualised or independent work. Yet, the findings here showed a shared understanding among doctoral students and supervisors regarding the resources and challenges included in doctoral studies in behavioural sciences faculty. On the other hand, the results demonstrated how this domain formed the context for not only engaging but also disengaging doctoral experiences. This indicates that within a discipline subgroups with their own cultures may exist, which are also likely to affect doctoral experiences.

Overall, the results of this dissertation study suggest that the integration of study engagement research (e.g., Appleton et al., 2006; Fredricks et al., 2004;

Reeve et al., 2004) and work engagement research (e.g., Hakanen et al., 2006; Schaufeli et al., 2002a, 2002b, 2006) appeared to be well suited for exploring engaging and disengaging doctoral experiences. They complemented each other and together allowed for the construction of a new theoretical framework for engagement in a learning process that takes place at the interface of study and work. Moreover, the results here implied that the person–environment fit framework (e.g., Cable & Edwards, 2004; Edwards, 2007; Edwards et al., 1998, 2006; Kristof, 1996) provided a functional approach for exploring the perceived dynamic interplay between doctoral students and their environments contributing to students' engagement in the doctoral process. Also, analysing the experienced fit by focusing on fulfilment through the experience of belonging, competence, autonomy (Deci & Ryan, 2000, 2002, 2008; Ryan & Deci, 2000), and contribution (Eccles, 2008), as well as on the demands and resources (e.g., Bakker & Demerouti, 2007; Demerouti et al., 2001; Schaufeli & Bakker, 2004), appeared to be productive in shedding light on the mechanism regulating the doctoral student–learning environment fit.

Although the various engaging and disengaging doctoral experiences, their sources, different forms, and the perceived doctoral student–learning environment fit have been discussed separately here, it is acknowledged that they are highly intertwined and mutually constituted. The findings of this study provided new insights into students' engagement in the doctoral process and aid in the further development of current engagement theories. These results can be considered a valuable addition to current knowledge in the field of higher education and, in particular, doctoral education.

6.2 Methodological reflections

6.2.1 General reflections

In this study mixed methods were employed in order to integrate different kinds of data and analytical procedures to better answer the research questions and gain a more in-depth understanding of the divergent aspects (e.g., Creswell & Plano Clark, 2007; Johnson & Onwuegbuzie, 2004; Johnson et al., 2007) of students' engagement in the doctoral process. Thus, this study built upon a pragmatist view (Creswell & Plano Clark, 2007; Johnson & Onwuegbuzie, 2004; Johnson et al., 2007). The interview data enabled the participants to reflect on their doctoral process as well as bring out their own voices and experiences of engagement and disengagement, and of the dynamics in which such experiences were embedded. On the other hand, the use of surveys made it possible to explore the collective fit at the faculty level, and also provided generalizable findings. Moreover, combining both qualitative and quantitative analyses provided a better understanding of doctoral students' engagement by making possible multifaceted analyses of different aspects of engaging and disengaging doctoral experiences and the factors associated with them. The methods used in this study complemented each other. Methodological triangulation was used to improve the validity and credibility of the study (see Patton, 1990).

The quality of mixed methods research can be assessed in terms of the *inference quality* and *inference transferability*, of which the former includes two im-

portant aspects: *design quality* and *interpretive rigour* (Teddlie & Tashakkori, 2003). The design validity of this study is strengthened by exploring engaging and disengaging doctoral experiences in three studies and the factors associated with such experiences in two studies. However, the present study relied mainly on students' experiences, and, hence, it is possible that engagement in the doctoral process is also influenced by some other aspects in the complex student–learning environment interplay that were not brought to light through the students' perceptions. The perceived dynamic interplay was, however, also investigated by analysing the collective fit between the doctoral students' and supervisors' perceptions at the faculty level. This can be considered as strengthening the design validity of the present study.

The design validity of this study is limited by its cross-sectional nature. The interviews and surveys were conducted once under certain situations and at specific points in time. Engagement is, however, a phenomenon that changes over time and with different environments (e.g., Demerouti et al., 2001). Hence, when interpreting the results it must be borne in mind that engaging and disengaging doctoral experiences and the student–learning environment fit are likely to change during the doctoral process from one environment and situation to another. However, in this study, the experiences of students at different phases of their doctoral studies were collected. Thus, it may be that a general view of engagement during different phases of doctoral studies was captured. These experiences can be seen as important since they represent prior experiences that guide doctoral students' further actions and learning. The aim of this study was to gain a better understanding of a variety of engaging and disengaging doctoral experiences from different aspects instead of developmental changes in individual experiences over time. In a sense, this study provides a starting point—that is, snapshots of the phenomenon of students' engagement in the doctoral process.

The interpretive rigour of this study is strengthened by the chosen abductive data analysis strategy that made it possible to obtain a continuous connection between empirical observations and theories (e.g., Coffey & Atkinson, 1996; Haig, 2005; Levin-Rozalis, 2004; Morgan, 2007). In the abductive inferences continuous and active searching and checking of the data and theories for the reasons why interpretations should be or should not be trusted were employed, which, in turn, were likely to ensure the validity of the findings (see Kvale, 2007; Miles & Huberman, 1994). Also, different theories were triangulated in this study. The sociocultural and socio-constructivist views of learning and work and study engagement research were brought together in order to gain a better understanding of doctoral students' engagement. Drawing both upon study and work engagement research allowed for the construction of a new empirical operationalisation to explore engagement at the boundaries of studying and working. At the same time, integration of the two perspectives on analysing doctoral students' engagement was a challenge since they have typically been used separately—study engagement is primarily used in compulsory education contexts and work engagement is primarily used in occupational contexts. The chosen analytical strategy and theory triangulation appeared to be appropriate for providing answers to research questions and an understanding that was consistent with known theories and also served to develop

the theories further. In addition, all of the analyses were validated in research group discussions and in university pedagogy trainings for supervisors from different domains.

In regard to the inference transferability, the data were collected from certain doctoral student groups and from doctoral students and supervisors from one university in Finland. Hence, generalising the results to other universities and to other countries should be done with caution. However, this study provides an understanding of doctoral student engagement by relying on the experiences of doctoral students from various domains and phases of their doctoral process and from supervisors from different domains. In addition, the chosen design allowed for the exploration of engaging and disengaging doctoral experiences embedded in a variety of practices within academia. Hence, these findings have transferability for further studies in the field of doctoral student engagement research. These aspects can be considered as strengthening the inference transferability of the present study.

Lastly, the term *pragmatic validity* has been used specifically in reference to qualitative research designed to assess the significance and applicability of the study for both academic and wider purposes (Kvale, 1995). The theoretical reflections and implications of this doctoral dissertation study were discussed earlier in Section 6.1 and the practical (e.g., educational) implications are discussed in Section 6.3.

6.2.2 Sub-analysis specific reflections

Interview Studies I, II, and III. To encourage the sharing of personal experiences in *Studies I* and *III* the interviews were conducted by the author and in *Study II* by another member of the research group, both of whom were doctoral students at the time of the interviews. However, a retrospective approach involves some challenges (Cox & Hassard, 2007). The participants were interviewed only once and the interviews focused on the doctoral process as a whole. The doctoral students' experiences are always situated in time, context, and their overall life situations, which are often challenging to recall and sum up in one go. The retrospection was likely to cause a generalisation of experiences. It is also possible that the participants' prevailing emotions and experiences at the interviews affected their descriptions (see Kvale, 2007). In order to better support the participants' retrospective recall of their subjective experiences, a visualisation-based interview (e.g., Reavey, 2011; Rose, 2007) was applied in *Studies I* and *III*, and each interview began with the student visualising his own doctoral process and identifying the most critical episodes within the visualisation. Using the retrospective approach and semi-structured interviews also have their advantages (Cox & Hassard, 2007; Kvale, 2007). The retrospection and process-oriented design ensured that the participants recalled only significant experiences and events.

The strength of the qualitative, abductive content analytical procedure (e.g., Morgan, 2007; Patton, 1990) was the integration of both data-grounded analysis (e.g., Harry et al., 2005; Mills et al., 2006) and theory-guided analysis (e.g., Patton, 1990). However, in *Studies I* and *III* categorisation of the interview data into mutu-

ally exclusive categories may have given an oversimplified picture of doctoral students' engagement and disengagement. However, the analyses were done in a diverse and multiphase manner in which various categories were compared and synthesized with each other and hence, the overall analyses provided a rich understanding of engaging and disengaging doctoral experiences. Moreover, the interview and analyses in *Studies I* and *III* appeared to be quite reliable. In *Study I* the participants from the top-level natural sciences research community mostly identified inspiring experiences. In *Study III*, in turn, the participants with prolonged doctoral studies identified more disengaging than engaging experiences (Vekkaila, Pyhältö, & Lonka, 2013). In *Study II* the mutually exclusive categorisation resulting from the experience-oriented analysis was completed by a person-oriented analysis in which each participant's engaging doctoral experiences were grouped together and interpreted within the larger interview context. In *Studies I*, *II,* and *III* the results were synthesized and abstracted from (and across) individual participants.

Although in Finland the licence for doctoral studies has been valid for life, the results from *Studies I* and *II* suggest that the phase or duration of doctoral studies appeared not to affect the experiences reported, even though some variations in emphasis was observed among students at different phases of study. In turn, in *Study III*, the starting point was to collect experiences from students whose doctoral processes had been prolonged.

The trustworthiness and credibility of qualitative research can be established by relying on the lens of the researchers themselves, the participants, individuals external to the study, or all of the above (e.g., Creswell & Miller, 2000; Lincoln & Guba, 1985; Miles & Huberman, 1994). In *Studies I*, *II*, and *III* the lenses of the researcher and external individuals were employed. In regard to lens of the researcher, the trustworthiness and credibility checks of the qualitative research were addressed by employing a sound rationale and transparent inference processes (e.g., Lincoln & Guba, 1985; Marshall & Rossman, 1995; Miles & Huberman, 1994) by providing rich descriptions of the decision steps included in the data analyses and the overall research process (e.g., Creswell & Miller, 2000; Kvale, 2007).

The lenses of external individuals were applied in two ways to assess trustworthiness, credibility, and consistency. First of all, the criteria for analysing and categorising the interview data were critically evaluated and discussed among the members of the research group. Also, in *Study II* an independent parallel analysis was employed (e.g., Appleton, 1995). The agreement between the two classifiers regarding the independent parallel analysis of 30% (f = 36) of the text segments in relation to the main experiences of engagement was 94% and in relation to the sources of engagement was 97%. Interrater reliability measured with Cohen's kappa (κ) (Cohen, 1960) in regard to the main experiences of engagement was 0.91 and in regard to the sources of engagement was 0.95, indicating almost complete agreement.

Secondly, the communicative validity (e.g., Kvale, 1995, 2007) and the ecological validity (e.g., Bryman, 2004; Creswell, 2003) of the results were tested in discourses within the scholarly community with doctoral students and supervisors in seminars and trainings, conference audiences, and by the reviewers of the article

manuscripts related to each of the separate sub-analysis. In particular, the results of *Study III* were tested during the faculty's researcher training committee's meeting that focused solely on postgraduate studies. During the meeting the findings were reflected on by the committee members after the results had been presented by the author.

Survey Study IV. The response rates were rather low: the response rate among supervisors was 29% and among doctoral students 28%. However, the representativeness of the samples in terms of gender and age distribution and different disciplines can be considered as one of the strengths of the study. Previous studies (e.g., Cook, Heath, & Thompson, 2000; Krosnick, 1999) have shown that sample representativeness is a much more important criterion for evaluating the validity of a study than response rate. The moderate response rate among the students is likely due to the Finnish doctoral education system itself: it allows students to be enrolled for life even though in practice students may have abandoned their doctoral studies entirely. Full-time students were overrepresented in the sample, which indicates that those who were actively pursuing their studies were more likely to have completed the survey.

Certain challenges are involved in using self-report questionnaires including a reliance on retrospective generalisations (e.g., Krosnick, 1999). However, in this study the content of the measures were determined by relying on earlier validated instruments and theoretically informed considerations. Also, data were collected from both doctoral students and supervisors, and both structured and open-ended responses were used to analyse the perceived collective fit.

Categorising the answers to the open-ended questions into mutually exclusive categories may have given a somewhat oversimplified picture of the doctoral students' and supervisors' perceptions of the resources for and challenges of the doctoral process. However, the answers were in general rather short descriptions and, therefore, did not allow for a more diverse analysis. The qualitative content analysis procedure (e.g., Patton, 1990), however, made it possible to compare the answers with the item measuring satisfaction with doctoral education and the scale measuring supervisory support that provided a deeper understanding of the fit between the students and their environments and its relationship to engaging doctoral experiences.

Investigating the fit by analysing the similarities and differences in doctoral students' and supervisors' perceptions at the collective faculty level represents a strength of this study. While it is possible that other aspects of the scholarly environment may have affected students' engagement, supervision appeared to be well suited to provide information and understanding of the fit. Moreover, the scale measuring supervisory support proved to be reliable (Cronbach's Alpha, .90, indicating a good internal consistency for the scale). However, engagement was measured by exploring the doctoral students' satisfaction with different aspects of their doctoral process. Measuring aspects of engagement other than experienced satisfaction would have provided a more coherent view of engagement in doctoral studies. However, focusing on students' satisfaction appeared to be sufficient to provide an understanding of the relationship between the perceived collective fit and engaging doctoral experiences.

Moreover, the results were cross validated by analysing the categories quantitatively after the two-phase qualitative content analysis. This provided an opportunity for triangulation, which has been used to improve the validity and reliability of the findings (Patton, 1990). In addition, the criteria for the qualitative content analysis and categorising the data were critically evaluated and discussed among the members of the research group. Faculties were also set as comparative cases to further promote the validity of the findings (Yin, 1994). Moreover, the communicative validity (e.g., Kvale, 1995, 2007) and the ecological validity (e.g., Bryman, 2004; Creswell, 2003) of the findings were tested and verified on faculty visits in which the researchers and faculty members together reflected on the results.

6.3 Educational implications

The results of this dissertation study suggested that students' engagement in the doctoral process might be fostered by focusing on enhancing the constructive interplay between students and their learning environments which promotes students' meaningful participation and the sense of belonging. Thus, the findings imply that doctoral student engagement can be constructed in the interplay between doctoral students and their scholarly community. Accordingly, the results of this study indicated that the focus of developmental objectives should be educational and pedagogical in nature. Creation of more engaging learning environments requires becoming aware of various scholarly practices as central contexts in which student engagement is constructed. However, taking the pedagogical nature of scholarly practices such as research work as objects of elaboration is not always easy. For instance, it has been proposed that the pedagogical aspect of doctoral education practices has largely remained invisible, unscrutinized, and unquestioned (Johnson, Lee, & Green, 2000). This is a collective task that requires shared meaning-making and negotiations between doctoral students and supervisors and other members of scholarly communities at all levels of academia.

At the same time, there may be both individual and contextual variations. Based on the findings here, doctoral student engagement is a multifaceted phenomenon. For instance, it is one matter to support student engagement through the experience of dedication to earning the doctorate and another through the experience of being an efficient researcher or being absorbed in research activities. Experiences related to dedication focus on the positive perceptions of the doctoral process itself. Experiences related to efficiency, in turn, reflect doctoral students' positive perceptions of themselves as capable researchers, whereas absorption is likely to entail students' full concentration on their study or research activities for certain periods of time. Similarly, helping students to cope with a sense of being an inefficient researcher differs from helping them to cope with experiences related to becoming cynical or exhausted in terms of earning the doctorate. Experiencing inefficacy entails doctoral students' negative perceptions of themselves as researchers. Becoming cynical, in turn, is characterised by student apathy and alienation in relation to their doctoral projects, whereas becoming exhausted reflects a lack of energy to pursue the PhD. This implies that the means to support doctoral student

engagement and ways of addressing disengagement also need to be individually constructed.

Moreover, doctoral students, supervisors, and other members of the scholarly community face variation in relation to difficult times. There are also the reciprocal, continuously evolving relationships between students and their environments in which engagement is constructed. It follows that both doctoral students and the scholarly community need to be constantly adjusting. Although there is no single best set of practices that work in all settings, there are underlying general processes that can be identified from all of them (Walker et al., 2008). Accordingly, the ways of supporting doctoral student engagement need to be diverse. Some of the ways to support engagement in light of the results here are discussed below.

The results indicate that by paying attention to the fit between doctoral students and their environments the quality of the dynamic interplay between them can be enhanced, which, in turn, is likely to foster student engagement. Enhancing the fit could be taken as a starting point for ensuring the quality of the interplay as early as during the recruitment process. For instance, faculty or department members and supervisors can include interviews as part of the recruitment procedure. During the interviews the members of the scholarly community and the potential doctoral student could elaborate on their perceptions of doctoral work, as well as the related demands, resources, expectations, working styles, and goals associated with earning the doctorate. In addition, recruitment could also include orientation periods for students considering doctoral studies (e.g., Pontius & Harper, 2006). For instance, while doing their master's thesis or doctoral research plan, students could participate in a research group's collective practices as observers, which would make them more peripheral group members. To some extent, such practices are already being implemented, for instance, in the natural and medical sciences.

On the other hand, students can also be active in identifying and constructing a fit between themselves and their environment. For instance, Spaulding and Rockinson-Szapkiw (2012) propose that in doctoral education both academic match and social–personal match between doctoral students and their scholarly communities are important. They suggest that there are certain aspects that individuals who are considering doctoral studies and students who have already launched their doctoral projects should elaborate on in order to enhance the match between themselves and their scholarly communities. They recommend that students should choose a doctoral programme that meets their unique needs and consider the social and integration practices of the education programme, the dynamics of the scholarly community's interaction, as well as faculty members' personalities and communication styles in addition to their expertise and experience. Students could focus on such aspects either during interviews or orientation periods.

Moreover, a better fit can be constructed by facilitating shared meaning-making among doctoral students and supervisors regarding the resources for and challenges of the doctoral process, as well as their perceptions of doctoral research work. In practice, this can be supported, for instance, by encouraging supervisors and students to reveal and elaborate their perceptions in supervisory discussions. A tool for elaborations could be a personal study plan (e.g., Lahenius, 2013). Such elaborations may support supervisors and students to construct a shared under-

standing of the focus of supervision. For instance, in a problematic situation this may help both students and supervisors to identify what the challenges are as well as how to deal and cope with them. In a recent study Lahenius (2013) found that doctoral students should have been given more support and guidance in the early phases of their studies. Hence, supervisory discussions on the resources and challenges and the perceptions of research are important especially at the beginning of the doctoral process when supervisory relationships are formed and students plan and get started with their doctoral projects. Golde (1998), for instance, showed that one of the main reasons for doctoral students leaving their studies during the first year was a mismatch between the students and their supervisors including dissimilar working styles and expectations. One of the ways to promote a better fit between the student and their supervisors may be orientation periods at the beginning of doctoral studies that were mentioned before. Such periods could enable doctoral students and supervisors to find the best possible shared understanding in the supervisory relationship. During the process there could be checkpoints at which times students and supervisors could clarify their perceptions and update their shared understandings.

Elaborating on the resources and challenges included in the doctoral process in supervisory or research group discussions may also enable students' absorption experiences. The doctoral students rarely described experiences of absorption in their doctoral work. A reason for this may be that the experiences of absorption remain an unidentified or unused resource for supporting students' engagement in their doctoral process. Absorption resembles the flow experience (Csikszentmihalyi, 1990); hence, the emergence of such an intrinsically enjoyable experience can be fostered by optimising the balance between the challenges of learning tasks and students experiencing competence (e.g., Inkinen et al., 2013). The balance may be reached by providing doctoral students with the resources they need, such as supervision, constructive feedback of their learning and development as a researcher, peer support, and control over their own research. Then, when doctoral students experience a balance between available resources and the unique challenges set by the doctoral research and intensively work at the edge of their competencies they would be more likely to experience absorption.

In particular, the results of this study implied that one of the ways of supporting the fit and constructive interplay between doctoral students and their scholarly communities is to focus on students' experiences of belonging, being competent and autonomous, as well as making contributions in the everyday academic interactions taking place in the various and overlapping levels and subgroups of scholarly communities. One way of supporting this is to foster doctoral students' integration into their scholarly community. Hence, strategies promoting the active participation and active agency of students in terms of their doctoral process need to be enhanced (e.g., Pyhältö & Keskinen, 2012). Both students and their scholarly communities must, therefore, further clarify the meaning of participation in collective scholarly practices in terms of student engagement. In addition, doctoral students' regular and active participation in collaborative academic practices could be facilitated both in more formal meetings or courses at the departmental level and more informally in the practices of the students' closest academic communities.

For instance, supervisors and other more advanced researchers could encourage their doctoral students to participate in various everyday practices such as group meetings, seminars, and conferences, as well as facilitate dialogues between novice and advanced researchers. It is important here that new doctoral students are welcomed and guided in how to join the community—that is, they are introduced gradually to its practices—while more advanced students are guided to become more intensively involved both in their own communities and the larger international field.

Ideally, such guided participatory activities could also enable doctoral students to experience themselves as an autonomous researcher and as making a contribution through their doctoral research, which, in turn, is likely to support student engagement in doctoral work. To enhance the idea that doctoral research will make a difference, it is important to elaborate the extent to which it is possible to make contributions through doctoral research projects. Supervisors, other doctoral educators, and doctoral students also need to discuss what the contribution could be: for instance, whether it could be a theoretical and research-related contribution or a practical and societal-level contribution. To support a sense of autonomy, in turn, it is necessary to actively identify and negotiate the locus of control of doctoral projects and guide students to become autonomous. One way of doing this would be to gradually enable them to become increasingly more responsible for their own learning, doctoral research, and participation in the scholarly community.

At the same time supporting the constructive interplay fosters the creation of new knowledge by encouraging not only doctoral students but also other members of a scholarly community to surpass themselves in dialogues and shared problem solving. As Walker et al. (2008) proposed such intellectual communities are not simply happier places to work; they are also more efficient in knowledge creation than their dysfunctional counterparts. In this sense the signature pedagogy of doctoral education could be seen as a collective responsibility and reciprocal learning between doctoral students and various members of their scholarly communities (Walker et al., 2008) including supervisors, other advanced researchers, and fellow students. Then, it follows that supervision should also be considered as a collective matter of the entire environment and knowledge creation practices within which doctoral research activities and studies are realised (e.g., Green, 2005; Hakkarainen et al., 2013a).

Doctoral students themselves could also actively search for interaction arenas that provide them with the meaningful experiences of belonging, competence, autonomy, and contribution. An example of a practice that is shown to promote students' engagement is a learning community formed around certain academic activities (Zhao & Kuh, 2004). In doctoral education such academic activities could entail, for instance, doctoral students' active involvement in research or peer groups' collective practices that would support their participation in research collaboration, dialogues, shared projects, academic writing, and co-authoring (e.g., Boud & Lee, 2005; Hakkarainen et al., 2013a; Lonka, 2003). The practices could be designed to involve active and collaborative learning techniques and to provide interaction opportunities, social support, and academic challenges for students (Bresó et al., 2011; Overall, Deane, & Peterson, 2011; Umbach & Wawrzynski, 2005). More-

over, it has been proposed that an engaging and active learning environment should be based on diagnosing and activating current understanding and knowledge, fostering the learning process and reflective thinking, and assessing change and giving feedback (Lonka & Ketonen, 2012). These practices may function as the basis for doctoral students to strengthen their personal interests and positive self-efficacy beliefs (Bresó et al., 2011; Lonka & Ketonen, 2012; Overall et al., 2011), as well as to develop their awareness of others' expertise and resources, and further their relational agency in terms of research work (e.g., Pyhältö & Keskinen, 2012).

Peer groups, for instance, could provide an arena for creating a safe and open atmosphere among fellow students, which, in turn, may promote the emergence of meaningful and inspiring experiences. However, students may not recognise peer interaction as a key arena for learning and constructing engagement. Therefore, students' participation in peer and other learning communities and their collective practices could be guided, at least during the early phases, so that more advanced peers or other advanced researchers could provide feedback and support learning and participatory activities. At its best, participation in such practices supports students' experiences of belonging in a scholarly community and engagement in the doctoral process, as well as their optimal functioning and well-being.

However, while participation is likely to enable the experience of belonging, it does not guarantee it. In the field of doctoral education students' lack of belonging has been recognised as a major problem, which can be seen in terms of dissatisfaction with the learning experience and attrition (Deem & Brehony, 2000; Golde, 2005; Hoskins & Goldberg, 2005; Lovitts, 2001). Accordingly, it has been suggested that by focusing on enhancing students' experience of belonging the quality of their learning process and persistence in doctoral studies could be supported (e.g., Ali & Kohun, 2006, 2007). For instance, in a recent national follow-up evaluation of Finnish doctoral education it is recommended that practices enabling each doctoral student to truly be a member of a research community should be developed (Niemi et al., 2011). Hence, there should also be some explicit options for students to deal with any experience of isolation that they may encounter. In regard to this, Ali and Kohun (2007), for instance, suggest that by providing administrative support, as well as including the possibility for structured advisor selection and face-to-face communication, doctoral students' sense of belonging could be fostered.

Furthermore, doctoral students may need support in interpreting the scholarly world along with its expectations and requirements. Thus, when starting doctoral education students can be seen as stepping into a new world including more or less implicit and unconscious cultural knowledge—that is, traditions, requirements, practices, and language (e.g., Gerholm, 1990; Holley, 2009). Hence, it is the responsibility of more experienced academics, such as supervisors and senior members of research groups, to share their ways of interpreting the scholarly world and coping with possible academic tension and conflicts. Similarly, students may also need support in order to constantly balance between doctoral studies, family life, and other possible careers. Since managing multiple responsibilities on a daily basis is one feature of academic work (Austin, 2010; Brew et al., 2011), one possible way to construct a balance between the various commitments could be shar-

ing experiences related to workable practices and how to cope with the various, sometimes even competing, demands. Peer group meetings, supervision, or workshops, for instance, could include opportunities for discussing and sharing experiences among groups of more advanced researchers and novices. In addition, combining various responsibilities requires resiliency both from the scholarly community and the students.

Since there is variation among students in regard to their backgrounds, responsibilities, and goals that may affect the ways in which they engage in the doctoral process, the trend toward increased differentiation or specialisation has recently been discussed in doctoral education. For instance, professional doctoral education has been further developed (e.g., Boud & Tennant, 2006; Bourner, Bowden, & Laing, 2001) and discussions have also included suggestions for emphasising the goal of conducting full-time doctoral studies (e.g., Niemi et al., 2011). However, in addition to considering various specialisation possibilities, it is also important to consider how to develop such learning environments that foster doctoral student engagement despite their backgrounds and whether they conduct their studies full-time or part-time no matter what their professional orientation might be. One starting point for doctoral studies could be constructing such an optimal fit between a student and his scholarly environment so that they can together elaborate and commit to shared goals and work in line with them. This should be done in a manner that acknowledges the fact that nowadays research is increasingly carried out in complex applied contexts (e.g., Green, 2009) and the doctoral degree is a route to many destinations and diverse career paths (e.g., Walker et al., 2008).

Designing more engaging learning environments for today's doctoral students is also an investment for future academics and other knowledge workers. Doctoral students' experiences of engagement and disengagement may have long-lasting effects. For instance, Stubb et al. (2012a) demonstrated a relationship between doctoral students' perceptions of their thesis projects, engagement, and well-being. Their results showed that participants who perceived their doctoral research as a process reported less stress, exhaustion, anxiety, and lack of interest than students who emphasised the end product or both the process and product. Furthermore, those students who reported process-related meaning had less frequently considered interrupting their studies than others. In addition, among undergraduate students there is evidence that students' optimistic and pessimistic strategies and task-focused and task-avoidance behaviours during their university years were related to their work engagement and burnout during their early careers (Salmela-Aro, Tolvanen, & Nurmi, 2009). Similarly, students' experiences of engagement during their doctoral process may function as the basis for their engagement and well-being, and act as a buffer from disengagement after earning the doctorate whether their careers are going to be inside academia or in other professional fields in business, industry, or government. Engaged doctoral students may become inspired academics or other knowledge workers who turn challenges into strengths in order to flourish as researchers or other professionals and who, in turn, help the next generation.

Overall, awareness of the possibilities and challenges related to student engagement is necessary for understanding how students themselves can best prepare

for their doctoral process and how supervisors and other doctoral educators can best support the construction of engagement. For doctoral education to be successful, it needs to employ a variety of strategies for promoting doctoral student engagement.

6.4 Future research

This study extended our understanding of students' engagement in the doctoral process, and, hence, it can be used as the basis for further research in various domains, universities, and countries. However, many questions remain unanswered, and, given the results here, we are aware of several new questions involving both engaging doctoral experiences and factors contributing to the experience.

The results of the present study suggest that a closer look at the relationships between doctoral students' qualitatively different forms of engagement, the meanings of doctoral research given by the students, and identity construction are needed. Furthermore, it would be important to analyse and identify what kinds of mechanisms regulate these possible relationships. This would, in turn, enable us to better understand the learning process from a doctoral student to a scholar. In future research, it would also be beneficial to explore different qualities of engaging and disengaging experiences more closely. For instance, the disengaging doctoral experience could be investigated in greater depth alongside identifying whether disengagement includes qualitatively different forms such as that found for engaging experiences. Such an understanding could reveal more of the mechanism regulating doctoral student disengagement.

Further longitudinal studies are needed to explore the development of and changes in engagement (e.g., Demerouti et al., 2001) among doctoral students. This may provide a better understanding of, for instance, whether students engage in their doctoral work in different ways during the different phases of the doctoral process. A longitudinal design might also shed light on whether the adaptive form of engagement develops towards a more agentic form during the doctoral process. Particularly interesting would be to focus on what triggers changes in students' ways of engaging in doctoral work throughout the process, so that students themselves, supervisors, and other doctoral educators could be better informed, and so that learning environments could be better designed to support engagement. In addition, such design could also provide a better understanding of how changes in the student–environment interplay might affect students' engagement in the doctoral process.

The field of engagement research has required greater understanding of how the interplay between students and their environment produces engagement (e.g., Fredricks et al., 2004). While this dissertation study extends our understanding, in future studies a wider perspective should be applied to explore the doctoral student–learning environment interplay. For instance, focusing on the collective fit between doctoral students and their environments and on the factors regulating it would be a valuable addition to our existing understanding. In this study, the fit between doctoral students' and supervisors' perceptions was analysed at the collective faculty level; however, in future research, combining perceptions of each stu-

dent–supervisor dyad and using multilevel modelling would also provide a new and interesting perspective in the analysis of the student–learning environment fit.

Moreover, it would be significant to analyse experiences and perceptions of different agents in relation to one another—for instance, those of students, supervisors, and other scholarly community members—in terms of doctoral student engagement. This could be done, for example, by analysing the relational aspects of engagement—that is, doctoral students' meaningful participation and sense of belonging in a scholarly community. In addition, another possibility for exploring the notion of a collective fit could be analysing it in terms of scholarly identity and engagement. Then, it would be significant to ask what are the perceptions of scholarly identity and goals for earning a doctorate held by the faculty, department members, and supervisors and whether they fit with those held by the students; furthermore, it would interesting to determine whether there is a relationship between the perceived fit and students' engagement in the doctoral process.

In addition, it would be important to focus further research on the disciplinary nuances in the interplay between doctoral students and their learning environment and on the various qualities and forms of engagement and disengagement embedded within them. These aspects would extend our understanding of the extent to which disciplinary trends affect engagement in the doctoral process.

Furthermore, the focus could also be on how students construct their engagement in the doctoral process in the nested wholeness of their lives including their family and personal lives, other possible careers, doctoral projects, and scholarly communities. Exploring the dynamics from multiple perspectives would, in turn, serve the purpose of better understanding the preconditions for increasingly engaging learning environments.

To better understand the context-dependent nature of doctoral student engagement further research should not only focus on perceptions but also on observing doctoral students', their supervisors', and other researchers' actual activities as they occur in natural settings. For instance, it would be interesting to explore how doctoral students' involvement in different scholarly activities and contexts contributes to their ways of engaging in their doctoral process and also how their engagement is realised in the various practices. Similarly, it would be interesting to focus on how supervisors and other scholarly community members support doctoral students' engagement and how this support is realised in the various scholarly practices and interactions. This understanding would be a valuable addition to the current knowledge of the dynamics of doctoral student engagement and to the development of pedagogical practices.

Whether the focus of future research is on the aspects presented here or on some other ideas related to doctoral student engagement, it needs to be borne in mind that priority should be placed on research questions that advance both theoretical understanding and educational practice. In addition, when exploring doctoral education, it is important to consider it as a systemic nested entity in which doctoral student engagement is embedded in complex ways. At its best, doctoral education should be an on-going developmental process (e.g., Walker et al., 2008) which fosters existing best practices that support doctoral student engagement and in which the creation of new processes are based on insights provided by the latest

research. Inspired and competent researchers are likely to produce high-quality research. Hence, by promoting doctoral student engagement we also contribute to the quality of the academy and the knowledge base.

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Appendix 1: Doctoral students in *Study IV*

Faculty	N	Gender (%)		Age (mode)	Full-time (%)	Part-time (%)	Group status (%)			Form of thesis (%)	
		Women	Men				alone	group	both	monograph	article
Biological and Environmental Sciences	111	74	26	30–34	69	31	18	56	26	1	93
Veterinary Medicine	47	87	13	30–34	75	25	24	40	36	2	94
Pharmacy	30	79	21	25–29	70	30	14	36	50	7	90
Arts	239	72	28	30–34	65	35	91	1	8	83	14
Behavioural Sciences	98	83	17	30–34	68	32	54	16	30	29	66
Medicine	141	70	30	30–34	67	33	18	50	32	1	96
Agriculture and Forestry	118	70	30	30–34	62	38	42	30	28	6	86
Science	157	42	58	25–29	64	36	40	23	37	7	81
Law	42	50	50	30–34	64	36	95	-	5	90	10
Theology	59	52	48	30–34	63	37	72	7	21	93	7
Social Sciences	137	66	34	30–34	57	43	82	2	16	66	41
Total	1 184	66	34	30–34	65	35	54	22	24	36	60

Note. Distribution of doctoral students' gender, age, full-time and part-time studies, group status, and form of the doctoral thesis in each faculty.

Appendix 2: Supervisors in *Study IV*

Faculty	N	Gender (%)		Age (mode)	Status (%)			Years of supervising (mean)	Average number of doctoral students
		Women	Men		1*	2*	3*		
Biological and Environmental Sciences	34	33	67	40–44	44	53	3	12	3.6
Veterinary Medicine	17	71	29	45–49	71	29	-	14	5.8
Pharmacy	13	39	61	55–59	39	46	15	10	3.8
Arts	66	41	59	60–64	65	32	3	12	6.8
Behavioural Sciences	33	63	37	45–49	53	44	3	11	6.2
Medicine	68	45	55	65 or older	61	36	3	17	4.3
Agriculture and Forestry	41	46	54	50–54	49	49	2	13	4.5
Science	51	16	84	40–44	72	28	-	14	4.3
Law	16	13	87	45–49	80	20	-	14	8.1
Theology	15	36	64	50–54	73	20	7	12	7.6
Social Sciences	53	46	54	60–64	72	28	-	13	6.7
Total	431	40	60	50–54	62	36	2	13	5.4

Note. Distribution of supervisors' gender, age, status, years of supervising, and average number of doctoral students in each faculty. *Status: 1) Professor or research director, 2) university lecturer or university researcher, and 3) university instructor or postdoctoral researcher.

Appendix 3: Statistics (2011) on doctoral students at the University of Helsinki

Faculty	N	Women (%)	Men (%)	Age (mean/mode)
Biological and Environmental Sciences	427	66	34	35/30
Veterinary Medicine	106	81	19	36/32
Pharmacy	112	71	29	35/30
Arts	852	65	35	42/34
Behavioural Sciences	463	74	26	44/35
Medicine	657	73	27	38/33
Agriculture and Forestry	409	61	39	39/32
Science	626	41	59	35/30
Law	228	45	55	41/31
Theology	262	50	50	42/35
Social Sciences	654	58	42	40/34
Total	4 796	61	39	39/32

Note. Gender and age distribution among doctoral students in different faculties at the University of Helsinki according to the University of Helsinki Annual Report (2011) and university statistics.

Appendix 4: Critical events and turning points during the doctoral process inter-view

What is your field /discipline or subject?

How many years have you been a doctoral student?

How old are you?

Are you writing a monograph or a series of articles?

Are you doing your doctoral studies and research full-time or part-time?

What is the topic of your doctoral thesis/What is your research about?

What is the phase of your doctoral studies?

Instructions to the participant:

In this interview we will examine your doctoral process and its different critical events or turning points. Please visualise your doctoral research and study process. This visualisation can be some kind of a line, a map, or a spiral and so on, in terms of how you see it. This visualisation will work as a support for your memory. It is thought that with the help of a visualisation one can reflect on critical and significant events and points that cannot be so easily verbalised. Now think about the whole process, the whole path of your doctoral research and studies. How would it look on this paper? Visualise it on the paper in the way you see it. Think about what kinds of key events or turning points your process includes? Mark those clearly on the visualisation, and mark the year there, too. Let's go event by event, let's see what happened in each event and which other persons or groups have had some role in those events. Choose one event where you would like to start.

- Tell me what happened in that event? *Tell me everything you remember related to this event.*

Elaborative questions (when needed):

- Where did this happen? When this did happen? Mark the year.
- Why do you think this happened? What do you think are the reasons behind this?
- What did you think in this situation?
- What did you do?
- What happened then? Did this have some effect on you? If it did, how did it affect you?
- Were there some persons or groups who had a role in the event, had some effect on your process?
- Tell me more about this person/these persons. Who are they? What kind of effect did they have on this event? What were their roles?

- Background information of the other persons (age, profession, and workplace), how the participant and the person met, and connections between the identified persons/groups.

- Do you feel like you have forgotten something or is there still anything you would like to add?
- Is there some person or persons who have not come out in this interview but who have had some role in your doctoral research or who had some effect on your research life? Who is he/she? What role/effect did he/she have, and can they be attached to some event or phase?
- How is your research funded?
- Are there any questions that you would have wished to be asked about? If yes, would you like to answer them?
- Is there something you would like to ask about this interview or the research project?

Appendix 5: Doctoral student interview

Discipline or subject:

Been a PhD student since:

I'm doing a monograph/collection of articles:

I'm female/male:

I'm doing my thesis full-time/part-time:

Phase of my study:

1. How did you become a PhD student?

    -   What is the topic of your PhD work? How did you come up with this topic? Does it relate to the work of others in your group?

2. What motivates you to do your PhD research?

3. Describe in your own words, how has your PhD process gone so far?

4. Describe some situation, event or episode from your PhD studies that has really influenced your own thoughts about doing PhD research or something else related to that. What happened? Why? What did you think of and how did you feel?

5. At the moment, do you have some question/challenge that you are wondering about? If so, what? Why?

6. What is the most enjoyable thing about postgraduate studies? What is the hardest?

7. Describe a situation that gave you inspiration. What happened? Why do you think it happened? What did you do, think, and feel? Describe a situation in your PhD process that was in some way negative. What happened? Why do you think it happened? What did you do, think, and feel?

8. What kind of supervision have you gotten during your PhD process? What kind of supervision would you hope for?

9. Do you get support for your work from somewhere else? What kind of support? Would you need something more?

10. Describe a situation in your PhD process where you felt that your supervisor especially succeeded. What happened and why was that situation meaningful to you?

11. What kind of role do other researchers and PhD students have in your process?

12. In your opinion, how should postgraduate education be developed?

13. What kind of advice would you give to a student who is considering PhD studies? Why?

14. Is there still something you would like to share?

15. What would you have wished to be asked about?

Appendix 6: Satisfaction with supervisory support scale in *Study IV*

The scale	Items included	α	Mean (SD)
Satisfaction with supervisory support	*"I receive encouragement and personal attention from my supervisors"*	.90	3.5 (1)
	"I feel that my supervisors are interested in my opinions"		
	"I feel appreciated by my supervisors"		
	"I often receive constructive criticism of my skills and expertise"		
	"I can openly discuss any problems related to my doctoral education with my supervisors"		
	"I feel that I am treated with respect"		

Note. Six Likert-scale items from the PhD Experience questionnaire (Pyhältö et al., 2009) included in satisfaction with supervisory support scale based on a principal component analysis (Method: Varimax), Cronbach's Alpha (α), mean, and standard deviation (1 = fully disagree, 5 = fully agree).

**Appendix 7**: The key learning experiences in *Study I*

The key learning experiences	Participation in the scholarly community f / %	Development as a scholar f / %	Developing specific research competencies f / %	Balancing between doctoral research and other institutional tasks f / %	Total f / %
Promoting	58 30%	45 23%	51 26%	9 5%	163 84%
Hindering	10 5%	12 6%	5 3%	4 2%	31 16%
Total f / %	68 35%	57 29%	56 29%	13 7%	194 100%

Appendix 8: The main experiences and sources of engagement in *Study II*

The main experiences The main sources	Dedication f / %	Efficiency f / %	Absorption f / %	Total f / %
Competence	19 16%	24 20%	4 3%	47 39%
Relatedness	22 18%	20 16%	3 3%	45 37%
Autonomy	12 10%	2 2%	1 1%	15 13%
Contribution	11 9%	2 2%	- -	13 11%
Total f / %	64 53%	48 40%	8 7%	120 100%

Appendix 9: The main experiences and sources of disengagement in *Study III*

The main experiences The main sources	Inefficacy f / %	Cynicism f / %	Exhaustion f / %	Total f / %
Struggles and conflicts within the scholarly community	33 21%	29 18%	7 4%	69 43%
Balancing doctoral studies with family and professional work life	4 2%	28 18%	9 6%	41 26%
Tensions in the supervisory relation-ship	18 11%	7 5%	6 3%	31 19%
Problems in the research process	16 10%	2 1%	1 1%	19 12%
Total f / %	71 44%	66 42%	23 14%	160 100%

Appendix 10: Resources for the doctoral process in *Study IV*
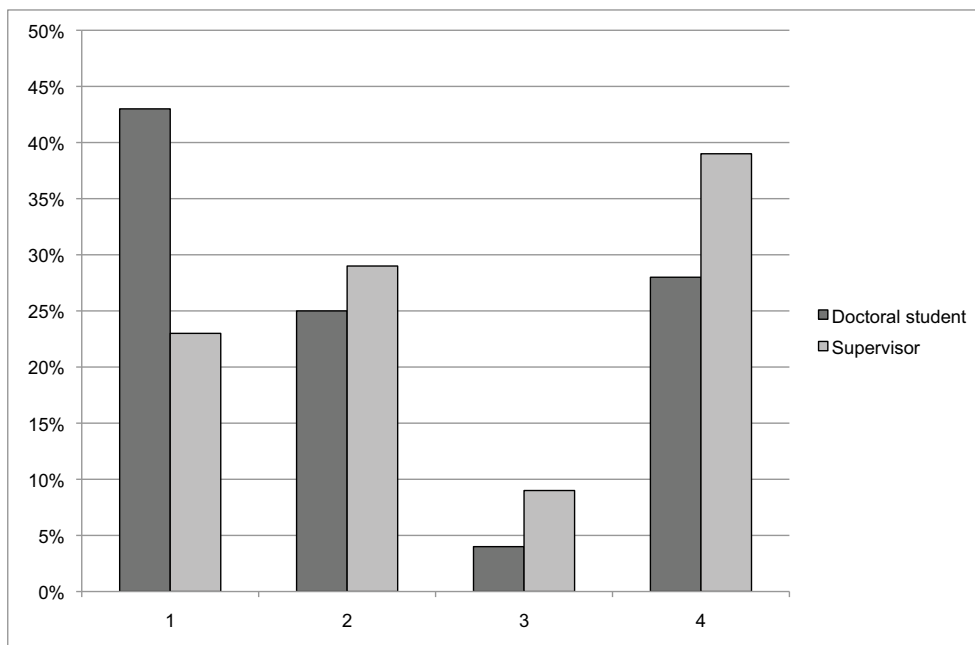
1 = Scholarly community and supervision, 2 = Personal regulators, 3 = Research-specific factors, and
4 = Structures and resources.

Appendix 11: Challenges of the doctoral process in *Study IV*

1 = Scholarly community and supervision, 2 = Personal regulators, 3 = Research-specific factors, and
4 = Structures and resources.