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Rajamäki, July 2018

Iris Humala

ABSTRACT

In this dissertation, I explore the key elements that enable leaders to foster creativity in a virtual work environment; I thus contribute to the scientific discussion that increases our understanding of the links between leadership and creativity in virtual work. The research topic was investigated in four separate studies (1–4). The dissertation features a conceptual part and an empirical part, each of which consists of two studies. I used a qualitative research approach as the primary research methodology and combined several methods and the theoretical perspectives of both business-oriented and pedagogical research to understand the research topic more deeply and achieve more productive and reliable results.

In Study 1, I executed a descriptive, interpretative concept analysis that clarified the fundamental concepts of the research—virtual work, creativity, and leadership—and determined how they are connected to one another in the research literature. Study 1 provides a map of the central concepts and defines leadership that fosters creativity in virtual work. The results show that leaders who efficiently foster creativity in virtual work understand the complex, multidimensional, and multilevel essence of virtuality at work and the role of both virtual and face-to-face interaction in mutual collaboration in organizations and networks. This kind of leadership utilizes both leadership approaches to support inspiring interaction and collective creativity at work and understands the significance of interpersonal interaction in the virtual work context and ways to exploit it.

In Study 2, I applied myself to the philosophical underpinning of the study and explored the applicability of heterarchy as an ontological commitment to leadership for encouraging creativity in virtual work. The results show that a heterarchical ontological commitment is appropriate to leadership regarding creativity in virtual work. Heterarchy can help leaders comprehensively understand their roles in virtual networked work, develop supportive orchestration abilities, nurture co-workers' creativity, and develop the most appropriate organizational culture possible. The results of Study 2 indicate that the three focal leadership challenges around creativity—understanding virtuality as a networked context, developing a virtual leadership mindset, and leading meaningful work for progress—and the two heterarchical leadership attributes of distributed

authority to orchestrate work and supportive interdependent interaction are very strongly linked to one another.

In Study 3, I investigated (a) the experiences of the key people in a case start-up regarding the learning challenges in leadership and collaboration toward creativity in virtual work and the meanings attributed to those experiences and (b) the measures they see as necessary to meet those challenges. The study was a single in-depth case study in the early development phase of a start-up operating in a global sustainable engineering sector. Study 3 reveals that co-creative and assertive coaching leadership in a start-up advance the stimulation of creativity and improve business forecasting and decision making that can contribute to superior credibility among customers.

In Study 4, I developed a descriptive typology based on empirical data from a multiple-case study to identify and describe how leadership occurs in virtual work in various types of companies. Study 4 supports the conception of the present trend in leadership toward type B (the "collective mind"), especially in today's realities of globally operating networks and more technologically advanced contexts. The collective mind operates via a virtual mindset. Its characteristics include shared values, meaningful work, collective intelligence, conscious reflection, transparency, coaching, empowering leadership by example, effective multichannel interaction, and assertiveness.

Based on the research findings, I argue for a coaching and distributed leadership culture to help leaders inspire creativity in a virtual workforce. This culture means coaching people to flourish, supporting their professional growth, adopting distributed leadership by example, and encouraging collective creation. The main factors contributing to coaching and distributed leadership in virtual work are (a) adopting a virtual leadership mindset to support diverse knowledge management, (b) respecting collective intelligence to provide a seedbed for critical reflection and testing, and (c) developing social bonding skills, tools, and spaces to offer opportunities for learning and growth. A leader with a virtual mindset understands virtuality as a networked context realizes that leadership and the work setting are linked and that it is necessary to integrate the use of technology with the mindset for creativity, collaboration, and multimedia productivity. Respect for collective intelligence incorporates shared power and shared responsibility, paying attention to knowledge management, skillful recruitment and orientation, critical reflection and testing, focusing on people, and a climate of microinteraction. Moreover, leaders who care for their people and communicate with them actively and transparently through multiple channels while being visible in their cooperation with both employees and partners can better develop social bonds within the virtual work context and thus enhance creativity.

This dissertation strengthens the benefits from integral theoretical pluralism in the future development of leadership theory toward creativity in virtual work. The findings indicate that leaders who advocate humanistic values and so care for and empower people support their meaningfulness at work and professional growth and that leaders who foster collective creativity can contribute to the common good of society.

Keywords: leadership, virtual work, collective creativity, heterarchy, coaching and distributed leadership, virtual leadership mindset, collective intelligence, skills, tools, and spaces for social bonding

TIIVISTELMÄ

Tämä väitöskirjatutkimus tarkastelee keskeisiä elementtejä, jotka antavat johtajille mahdollisuuksia edistää luovuutta virtuaalisissa työympäristöissä. Tutkimus tuottaa kontribuutiota tieteelliseen keskusteluun lisäämällä ymmärrystä johtamisen ja luovuuden välisistä yhteyksistä virtuaalisessa työssä. Artikkeliväitöskirja koostuu neljästä osajulkaisusta (tutkimukset 1-4). Väitöskirja käsittää käsitteellisen ja empiirisen osan, joista kumpaankin kuuluu kaksi tutkimusta. Tutkimuksessa on sovellettu pääasiassa laadullisen tutkimuksen lähestymistapaa. Tutkimuksessa on lisäksi yhdistetty liiketoimintaan ja kasvatustieteelliseen tutkimukseen liittyviä teoreettisia näkökulmia tutkimusaiheen ymmärryksen sekä tulosten laadun ja luotettavuuden lisäämiseksi.

Tutkimuskirjallisuuden pohjalta toteutettu tutkimus 1 on kuvaileva, tulkitseva käsiteanalyysi, joka selkeytti väitöstutkimuksen keskeisiä käsitteitä—virtuaalista työtä, luovuutta ja johtajuutta—ja määritti niiden välisiä yhteyksiä. Tutkimus 1 tuotti keskeisistä käsitteistä koostuvan käsitekartan ja määritteli luovuutta edistävän johtamisen virtuaalisessa työssä. Sen tulokset osoittavat, että virtuaalisessa työssä tehokkaasti luovuutta edistävät johtajat ymmärtävät virtuaalisuuden monitahoisen, moniulotteisen ja monitasoisen olemuksen sekä virtuaalisen ja kasvokkaisen vuorovaikutuksen roolit organisaatioiden sisäisessä ja ulkoisessa yhteistyössä. Tämäntyyppinen johtajuus ammentaa tietämystä vuorovaikutusta ja yhteisöllistä luovuutta tukevista johtajuuden lähestymistavoista, ymmärtää ihmisten välisen vuorovaikutuksen merkityksen virtuaalisessa työssä ja tiedostaa keinoja vuorovaikutuksen hyödyntämiseen.

Tutkimus 2 paneutui väitöstutkimuksen filosofisiin perusteisiin ja tarkasteli, miten heterarkia ontologisena sitoumuksena soveltuu luovuutta edistävän johtamiseen virtuaalisessa työssä. Tulosten mukaan heterarkinen ontologinen sitoumus sopii luovuuteen liittyvän virtuaaliseen työhön. Heterarkia voi auttaa johtajia ymmärtämään paremmin ja kokonaisvaltaisesti oman roolinsa virtuaalisessa verkottuneessa työssä, kehittämään kannustavan orkestroinnin kykyjään, tukemaan työntekijöiden luovuutta sekä kehittämään toimivaa organisaatiokulttuuria. Kolme keskeistä luovuutta edistävää johtamisen haastetta—virtuaalisuuden ymmärtäminen verkottuneena kontekstina, virtuaalisen ajattelutavan kehittäminen ja kehittymistä korostavan merkityksellisen työn johtaminen—sekä kaksi heterarkiaan liittyvää johtamisen ominaisuutta—hajautettu

valta työn orkestroinnissa ja toisiaan tukeva keskinäinen vuorovaikutus ovat tulosten mukaan hyvin vahvasti yhteydessä toisiinsa.

Tutkimus 3 tarkasteli startup-yrityksessä (a) avainhenkilöiden kokemuksia virtuaalisen työn johtamisen haasteista, jotka liittyivät luovuutta edistävään johtamiseen ja yhteistyöhön sekä näihin kokemuksiin liittyneitä merkityksiä ja (b) tarpeellisia keinoja, joilla haastateltavien mielestä näihin haasteisiin vastataan. Tämä tapaustutkimus kohdistui yhteen kansainvälisellä kestävän kehityksen teknologia-alalla toimivaan alkuvaiheen startup-yritykseen. Tulosten perusteella startup-yrityksessä kollektiivista luovuutta tukeva, jämäkkä ja valmentava johtaminen luo mahdollisuuksia edistää luovuutta sekä parantaa liiketoiminnan ennakointia ja päätöksentekoa kohti yhä parempaa asiakasuskollisuutta.

Tutkimuksessa 4 kehitettiin monitapaustutkimuksessa kerättyyn empiiriseen aineistoon pohjautuva kuvaileva typologia, joka kuvasi johtamisen toteutumista virtuaalisessa työssä neljässä eri tyyppisessä yrityksessä. Tutkimus 4 tukee nykysuuntauksen mukaista, yhteisöllisyyttä korostavaa liiketoiminnan johtamiskäsitystä (tyyppi B) erityisesti nykyisissä globaalisti toimivissa verkostoissa ja edistyneissä teknologisissa toimintaympäristöissä. Yhteisöllisyyttä korostava johtajuus sisäistää virtuaalisen ajattelutavan. Tällaisen johtajuuden tyypillisiä piirteitä ovat yhteiset arvot, merkityksellinen työ, kollektiivinen älykkyys, asioiden tietoinen pohdinta, läpinäkyvyys, valmentava, esimerkkiä näyttävä ja mahdollisuuksia tarjoava johtaminen, tehokas monikanavainen vuorovaikutus sekä jämäkkyys.

Tutkimustulosten pohjalta tutkijana väitän valmentavan, hajautetun johtamiskulttuurin auttavan johtajia edistämään virtuaalista työtä tekevien ihmisten luovuutta. Tällaisessa johtamiskulttuurissa ihmisiä valmennetaan edistymään, heidän ammatillista kasvuaan tuetaan, johdetaan hajautetusti esimerkkiä antaen sekä rohkaistaan yhteisölliseen luovuuteen. Valmentavaan ja hajautettuun johtamiseen vaikuttavat keskeiset tekijät virtuaalisessa työssä ovat: (a) virtuaalisen ajattelutavan sisäistäminen tukemaan monimuotoista tiedolla johtamista, (b) kollektiivisen älykkyyden arvostaminen kriittisten pohdintojen ja kokeilujen kasvualustana, ja (c) sosiaalisia siteitä vahvistavien taitojen, työkalujen ja tilojen kehittäminen oppimista ja kasvua varten. Virtuaalisen ajattelutavan sisäistänyt johtaja käsittää virtuaalisuuden verkottuneena toimintaympäristönä. Hän ymmärtää johtamisen ja kontekstin välisen kytköksen sekä tiedostaa, että teknologian soveltaminen sekä luovuutta, yhteistyötä ja tuottavuutta multimedian hyödyntämisessä korostava näkemys on välttämätöntä yhdistää toisiinsa. Kollektiivisen älykkyyden arvostaminen kiinnittyy jaettuun valtaan ja vastuuseen sekä kiinnittää huomiota tiedolla johtamiseen, taitavaan rekrytointiin ja perehdytykseen, kriittiseen pohdintaan ja kokeilemiseen sekä keskittyy ihmisiin ja ihmisten keskinäisen

mikrovuorovaikutuksen ilmapiiriin. Johtajat, jotka pitävät huolta työntekijöistään, viestivät heidän kanssaan aktiivisesti ja monikanavaisesti ja tulevat näkyviksi työntekijöilleen ja yhteistyökumppaneilleen, ovat kyvykkäämpiä kehittämään sosiaalisia siteitä ja siten edistämään luovuutta virtuaalisessa työssä.

Tämä väitöstutkimus vahvistaa käsitystä teoreettisen pluralismin hyödyistä kehitettäessä tulevaisuudessa johtamisen teoriaa, joka edistää luovuutta virtuaalisessa työssä. Tutkimustulosten perusteella johtajat, jotka kannattavat humanistisia arvoja pitämällä huolta ihmisistä ja tarjoamalla heille uusia mahdollisuuksia, edistävät työnteon merkityksellisyyttä ja ammatillista kasvua, ja jotka vaalivat kollektiivista luovuutta, voivat edistää yhteistä hyvää koko yhteiskunnassa.

Avainsanat: johtajuus, virtuaalinen työ, yhteisöllinen luovuus, heterarkia, valmentava ja hajautettu johtaminen, virtuaalinen ajattelutapa, kollektiivinen älykkyys, sosiaalisten siteiden kehittämiseen liittyvät taidot, työkalut ja tilat

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LIST OF ORIGINAL PUBLICATIONS

This thesis is based on the following original publications, which are referred to in the text by the numerals 1–4.

1. Humala, I. (2014). Defining leadership that fosters creativity in virtual work: Descriptive interpretative concept analysis. *Journal of Professional and Vocational Education, 16*(3), 22–43.

2. Humala. I. (2016). Heterarchial ontological commitment for leaders to stimulate creativity among virtual workforce. *Nordic Journal of Business, 65*(2), 45–65.

3. Humala, I. A. (2015). Leadership toward creativity in virtual work in a start-up context. *Journal of Workplace Learning, 27*(6), 426–441.

4. Humala, I. (2017). Typology on leadership toward creativity in virtual work. *Interdisciplinary Journal of Information, Knowledge, and Management, 12*, 209–243.

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1 INTRODUCTION

1.1 Background and research environment

Flexible work and the changing nature of work in general are now reality for a growing number of employees. *The Future of Jobs* report published by the World Economic Forum (2016, p. 7) listed drivers of change such as mobile internet and cloud technology, advances in computing power and Big Data, new energy supplies and technologies, the Internet of Things, and crowdsourcing. In the coming years, advanced robotics, artificial intelligence, and advanced manufacturing and materials will evolve to change daily life and work (World Economic Forum, 2016, p. 7). Technological development creates challenges for employees and their leaders in ensuring that work is a channel through which people recognize their full potential and in recruiting, training, and managing talent. (World Economic Forum, 2016, p. 26).

"Virtual work" and "virtual workforces" refer to people working in dynamic multimedia, massive, and multiplayer social networks (Panteli, 2009) in different geographical locations, communicating both face-to-face and using information and communication technology (ICT) to manage business processes. "Virtuality" refers to a context in which companies work together in networks with customers, users of products and services, and interest groups. Besides the importance of ICT, virtuality, and mobility, today's business leaders face rapid change, complexity, and the need to enhance innovative solutions and productivity. They are confronted with continually emerging dynamics that involve relationships between people and open communities, ethics, and managing the work-life balance and leaders' human capital (Lane & Down, 2010).

Simultaneously, a strategic challenge is posed for a growing number of organizations to obtain creative insights for suitable solutions and enhance novel approaches. In virtual work in particular, it is crucial to find ways to use ICT effectively in leadership, organizational learning, collaboration, and how to combine individuals' creativity with the collective creativity of the group. This knowledge offers a broader ability to see things in new ways and energizes the maximum potential for change (e.g., Sawyer & DeZutter, 2009) and helps reveal the possible effects of ICT on leadership dynamics (Avolio, Sosik, Kahai, & Baker, 2014; Guo, Dilley, & Gonzales, 2016; Nemiro, 2004).

The speed of digital development makes this even more important, because new areas are becoming subject to automation, with machines complementing and augmenting human capabilities, and people need to adapt to use their creativity in new environments (Brynjolfsson & McAfee, 2014, p. 92).

Leadership is a social interaction process (e.g., Lord & Smith, 1999). Leadership actively encourages people to find new possibilities, achieve their potential, and reach targets (Searle & Hanrahan, 2011). Leadership also balances continuous change, strategic goals, renewal, and people's emotional and motivational processes. Facilitating communicative processes between people can be especially important in creative collaboration and empowering people (Poutanen, 2016, pp. 64–65). Empowerment has been defined as a psychological state manifested in the meaning of one's work, competence (in the sense of self-efficacy), self-determination (indicating perceptions of freedom to choose how to initiate and carry out tasks), and the impact of one's work (Spreitzer, 1995). Zhang and Bartol (2010) found that leaders' encouragement of creativity moderated the link between psychological empowerment and creative process engagement. In addition to leadership, management is necessary because it provides the necessary direction to see that tasks are carried out.

In light of the increasing complexity of global and digital working life, the World Economic Forum (2016) suggested the top ten skills required for a successful working life in 2020. Creativity ranks third on the list, after complex problem solving and critical thinking. These skills are followed by collaboration and leadership skills such as people management, emotional intelligence (EI), judgment and decision making, service orientation, negotiation, and cognitive flexibility. The developments identified by the forum challenge business leaders, educators, and governments to be proactive in up-skilling and retraining people (World Economic Forum, 2016).

Leading a virtual workforce creates specific demands for leaders to understand better both the creativity that occurs when technology and human creative processes interact (Gilson, Maynard, Jones Young, Vartiainen, & Hakonen, 2015) and human consciousness and interpersonal interactions (Panteli & Chiasson, 2008). Success reinforces personal and communal professional growth, productivity, and competitiveness. The growing complexity of problems challenges leaders to piggyback the enthusiasm and experience of different people for open interaction and collective creativity inside and outside organizational, geographical, and technological boundaries. Therefore, leadership experienced in collective creativity becomes necessary to maximize the benefits of new and improved ways of working and to produce creative outcomes (Anderson, Potočnik, & Zhou, 2014; Hargadon & Bechky, 2006). Meeting this challenge requires a new kind of leadership toward creativity in virtual work to add

value in value chains, despite the dynamic and complex nature of interactions between leaders and employees (Guo et al., 2016).

The focus of leadership toward creativity in virtual work is on energizing people and enabling their relationships to initiate development processes in organizations in the digital era. Developing collective creativity requires time (Uusikylä, 2012) and reflective commitment from different contributors (Lipman-Blumen & Leavitt, 2009), and virtuality creates a socially constructed context in which leadership fully integrates. In discussing leading toward creativity, scholars have emphasized issues such as focusing on people, the power of direction, motivating and facilitating employees' creativity, being responsible for decisions, and achieving meaningful progress toward excellence (Amabile & Kramer, 2011; Bass & Avolio, 1993; Derecskei, 2016). Based on research in management and leadership in virtual work, technology, trust, relationship building, diversity, and communication are significant factors in contributing to virtual work effectiveness (Panteli & Tucker, 2009; Quisenberry, 2011, p. 78). The challenges in virtual work are how to use the actors' collective knowledge and intuition for the common good and to exploit their creativity and learn from their experiences to produce innovative outcomes. In general, as Hatch and Cunliffe (2006, p. 212) note, the ability of leaders to effectively mobilize their influence within organizations depends on their knowledge of and relationship with the culture and their openness to and respect for the interpretive acts of others.

To date, leadership in virtual teams and understanding modern technology and using it in leadership have attracted the most attention from scholars. Research topics include issues such as distances between people, virtual co-presence, empowerment, participation, and supportiveness to bridge the gaps between people (Avolio et al., 2014; Jarvenpaa & Leidner, 1999; Zimmermann, Wit, & Gill, 2008). The combination of leadership and creativity has thus remained unexplored in research on virtual work. Moreover, studies focusing on the real-world applications of leadership toward creativity in virtual work are scarce (Guo et al., 2016). This dissertation concentrates on this research gap and addresses a new perspective: leadership that stimulates creativity in virtual work. The thesis contributes to the scientific discussion regarding better understanding the links between leadership and creativity in virtual work. It takes note of the processes that occur at multiple levels of virtual work and how leaders influence the underlying processes and dynamics that lead to organizational outcomes (Dinh et al., 2014). Appropriate ways to lead a virtual workforce help people to commit themselves to shared targets for creative, meaningful development and organizational learning and growth. Success enhances productivity, competitiveness, and both personal and communal professional growth. In addition, leadership toward creativity in virtual

work does not rest on any particular theoretical framework. This thesis contributes to academic and managerial discussions in leading a virtual workforce toward creativity by bringing forward both theoretical and practical implications to the debates.

Inspiring creativity in virtual collaborative work contexts questions hierarchical, authoritarian leadership (Houglum, 2012) and a task-focused attitude centered on following standard rules and regulations and mistakes and deviations from performance standards (e.g., Derue, Nahrgang, Wellman, & Humphrey, 2011). Traditional views on leadership typically regard organizations as equilibrium-seeking systems with knowable futures and focus on the leader's role in determining future desired states and directing organizational action to achieve those states (Plowman et al., 2007).

Hierarchical organizations focus on power, authority, and value control, which in practice means that leaders take on the role of planning, instructing their employees on what to do and how to do it, and carefully supervising them. A hierarchy can be effective for routine tasks but encounters difficulties in implementing an innovative, agile strategy and carrying out modernization functions, whereas new knowledge arises in creative collaboration (Adler, 2001). The task-oriented leadership style includes facilitating information acquisition and sharing in virtual communication settings and can enable the speedy development of solutions to problems (Zimmermann et al., 2008; Pinar, Zehir, Kitapçı, & Tanrıverdı, 2014). However, previous research has indicated that leaders who have a fixed mindset and focus on task-based factors are rational, normative, and less conducive of creativity (e.g., Karwowski, 2014).

Numerous scholars have conducted studies to identify the real nature of leadership. For instance, Seijts (2014) interviewed 31 senior leaders from different industries, sectors, and countries and concluded that good leaders follow a challenging and never-ending path of learning that requires keeping an open mind. This finding of good leaders as constantly open-minded learners relates to my values in leadership in general. On the other hand, different people can experience the same leadership style in various ways. Leadership is expressed differently in different cultures, and the history of leadership features several different approaches that have been well regarded in their time. Supported by my own work experience, context influences leadership; in virtual settings, especially in the fostering of creativity in a virtual workforce, some ways of leading people are more useful and relevant than others. For this thesis, changing business environments and contexts necessitates not having an interest in only one specific kind of leadership, but instead openly sensing the situations and circumstances valid at the time and familiarizing oneself with different types of leadership approaches to develop them to better suit each situation.

Especially in today's digital era, there are similarities in leaders' and teachers' work to support businesses and individuals to flourish and grow. Fostering creativity in virtual work constitutes a leadership problem that extends to cover business-oriented and pedagogical thinking. To tackle this issue requires multidisciplinary research that intends to address complex real-world problems and understand them more fully. By integrating my previous knowledge in business and business research with the educational approach to leadership, my aim in this thesis is to gain a broader understanding of leadership and collaboration in virtual work. This multidisciplinary approach aims at promoting the success of organizations in virtual work and the professional growth of a virtual workforce. It supplements Nokelainen and Ruohotie's (2009) growth-oriented atmosphere model with the factors contributing to professional growth in virtual work.

1.2 Objectives and scope

This dissertation contributes to scientific and managerial discussions seeking to increase our understanding of the links between leadership and creativity in virtual work. The idea for this dissertation originated from my work experiences, which piqued my interest in understanding how leaders could better inspire and utilize creativity in virtual work so that people would feel that their knowledge was appreciated and that they could use their full potential at work. This issue is also related to the question of how leaders can foster professional growth in a virtual workforce.

The dissertation's research question is, "What are the key elements that enable leaders to foster creativity in a virtual work context based on the research data?" To find the answers to this question, I divided the primary research task into separate studies. The investigation began with a conceptual analysis (Study 1) involving extensive familiarization with the related literature to answer the question, "How does one define leadership that fosters creativity in virtual work?" The concept analysis presented a map of the central concepts in leadership toward creativity in virtual work and a definition of that leadership. This effort revealed the need for empirical evidence to better understand leadership that stimulates creativity in virtual work. Next, I carried out an empirical single-case study at a partnership start-up company (Study 3) to address the question, "How are the learning challenges of leadership toward creativity in virtual work and the measures to meet them experienced in a start-up context?"

Studies 1 and 3 generated the basis for and interest in exploring in more detail the philosophical underpinning of leadership toward creativity in virtual work. Inspiring creativity in virtual work demands a leadership philosophy and a more integrative

ontology that support successful collaboration and positive outcomes (Drath et al., 2008). Therefore, I carried out an exploratory study positioning itself in leadership philosophy and the heterarchical ontological commitment of leadership toward creativity in virtual work (Study 2). I chose the heterarchical perspective rooted in complex adaptive systems (CAS) theory (Holland, 2006), despite its not having been previously applied to virtual work. Virtual work in networks does indeed resemble CAS, which have been characterized as open, evolutionary systems of interacting yet interdependent agents who have a common outlook and who can solve problems creatively (Uhl-Bien, Marion, & McKelvey, 2007). The heterarchical perspective regards an organization as a multi-layered entity with overlapping parts and institutional slack (Spelthann & Haunschild, 2011). Study 2 answered the question, "What is the relationship between leadership toward creativity in virtual work and the heterarchical ontology?"

After Studies 1–3 were completed, additional empirical evidence was necessary to solve the central research question. The next step was to execute a multiple-case study that answered the question, "How is leadership toward creativity made up in different types of companies in virtual work?" This fourth study generated a typology of four different types of businesses that define alternative trajectories in the transition toward leadership creativity in virtual work.

In this dissertation, I have reported the four separate studies published in four articles in the following order: first the two theoretical studies and then the two empirical studies. The theoretical studies mapped the central concepts and the philosophical underpinning of the research, while the empirical studies provided evidence about leading a virtual workforce toward creativity and increased my understanding of the issue under investigation.

1.3 The structure of the dissertation

The introductory chapter offers background information about the research subject and research environment and introduces the gap on which this investigation focuses. It discusses the objectives and scope of the research and presents the structure of the dissertation.

Chapter 2 provides a review of the philosophical basis of the research.

Chapter 3 covers the major theoretical approaches. The theoretical framework lays the foundation for the conceptual and empirical parts regarding leadership toward creativity in virtual work.

Chapter 4 deals with the methodological approach used in this research. It describes the methods of the study, data gathering, and data analysis.

Chapter 5 offers an overview of the four separate studies and introduces the main findings of each study.

Chapter 6 summarizes the findings of the four original studies.

Finally, Chapter 7 evaluates the research undertaken, discusses its theoretical and practical implications, and offers recommendations for future studies.

Extracts from the original interview data have been included as epigraphs to Chapters 2, 3, and 6.

2 PHILOSOPHICAL BASIS FOR THE RESEARCH

> *The leadership philosophy in a dispersed virtual work context is in its best sense of communality, it is a lot of collaboration. The more people ponder everyday practicalities together, the closer to practical dealings they get and can think how things could be done better. This practice creates prerequisites for easier working.* (Study 4, Business Manager, about 30 years old)

Even though virtual work contexts are not tangible, they are very much human realities. In studying human realities, there is no objective truth, which makes it necessary first to analyze the ontological preconceptions of the research and so avoid mechanizing people and positioning them as mere objects of investigation. Ontology aims to find out the nature of reality under investigation—the essential elements of reality and the relationships of those parts to each other—whereas epistemology is the branch of philosophy dedicated to understanding the nature of knowledge (Gray, 2014, p. 19; Siegel, 2014). Following Sandberg (2005), considering knowledge and truth to be relative to ontological and epistemological assumptions can help overcome the problem of mixed discourse and the issue of extreme relativism that can arise from the interpretive rejection of objective truth claims.

2.1 Ontological foundations

Virtual collaborative work contexts question the traditional leadership thinking related to hierarchical, authoritarian leadership. Hierarchical leadership has its roots in objectivist ontology and positivist epistemology, which hold that external reality operates apart from people's conceptions and beliefs about it (Houglum, 2012). The leadership thinking in this thesis rests on the heterarchical ontological commitment to leadership (Crumley, 2005; Humala, 2016) that is based on a nondualistic, subjectivist, and processual ontology. A nondualistic ontology underlines the interconnection between people's inner and outer worlds, while a subjectivist and processual ontology regards reality as a social construction and leadership as a continuous social flow (Crevani, Lindgren, & Packendorff, 2010). According to social constructionism as an ontological position, social actors continually construct social phenomena and their meanings (Parjanen, 2012, p. 41). As for the subjectivist point of view, people create

and experience realities in different ways due to the assumptions, beliefs, and perceptions that individuals and groups have (Hatch & Cunliffe, 2006, p. 12). Subjectivism is vital for a leader who stimulates a virtual workforce toward creativity to be subjectively aware of the different state of affairs in the virtual work context and know, understand, and handle them intelligently (Humala, 2016). In addition, leaders need to understand the relevance of a common language, discourse, and texts and place a heavy emphasis on their employees and those workers' views to inspire creativity among a virtual workforce (Hatch & Cunliffe, 2006, p. 14; Humala, 2016).

This research is based especially on the heterarchical ontological commitment to leadership (Humala, 2016; Spelthann & Haunschild, 2011). An ontological commitment in a knowledge-based system, like leadership in virtual work, is an agreement to use coherently and consistently the shared vocabulary defined by a common ontology (Gruber, 1995). Ontological commitment is a prerequisite for knowledge sharing and reuse, but there is no need to have an equivalent knowledge base term for every term in the ontology (Waterson & Preece, 1999). Heterarchy as an ontological commitment has been found useful in helping leaders deeply understand their role in virtual work and to stimulate interaction that releases the creativity in people (Humala, 2016).

Heterarchy represents an organizational form of distributed intelligence focusing on the collective good (Stark, 2009, pp. 19–27; Stephenson, 2009). In heterarchical organizations, power actively and legitimately fluctuates among team members with conditions to align their capabilities with changing situational demands (Aime, Humphrey, Scott, & Paul, 2014; Crumley, 2005). Aime et al. (2014) suggest that heterarchy offers a theoretical core in which to merge several theoretical discussions focusing on dynamic power relations within groups. Heterarchy offers the potentiality to identify ranked and unranked values, behaviors, and organizations as they shift in time, space, and cognitive frame, as well as in situations when old forms are suspended, but useful elements of them are preserved for creative new solutions (Crumley, 2005). Stephenson (2009) highlights virtual relationships between people that are invisible to a hierarchy but are essential for governing and sustainability. He argues that trusted, virtual strategic connections make partnership work and reveal a heterarchical organizational form. Moreover, heterarchies are CAS that intertwine many organizing principles and involve interdependent relations (Holland, 2006). The leadership thinking in this research reflects a complexity perspective on knowing. With the various social constructivist, interpretive, and post-structuralist approaches, this perspective shares the view that humans construct meaning through their social interactions (Kuhn, 2007). According to Kuhn's (2007) theory, the ontological explanation of complexity science is that "reality" is interconnected and dynamic, self-organizing, emergent, and

simultaneously singular and multiple. Kuhn (2007) adds that, although reality may be studied from various perspectives, the very act of study will affect the "reality" observed. In line with Spelthann and Haunschild (2011), from a heterarchy perspective the resulting complexity is a robust arrangement for embedded organizational creativity. Stark (2009, pp. 4–5) regards heterarchies as cognitive ecologies that facilitate reflexive cognition.

Leadership in heterarchy is considered to take a distributed, collective form that enables interaction, meaningful work, inspiration, and creativity (Crumley, 2005; Spelthann & Haunschild, 2011). In addition, distributed authority with extended organizational reflexivity and fine-grained coordination are essential for leadership to cope with complex interdependencies (Girard & Stark, 2002; Stark, 1999).

2.2 Epistemological foundations

Epistemology deals with the knowledge about "how" to study a phenomenon. In line with Sandberg (2005), epistemology refers primarily to the following three central questions for the researcher: (1) How can individuals achieve meaning and thereby knowledge about the reality, the actual environment, in which they live? (2) How is this knowledge constituted? (3) Under what conditions can the knowledge achieved be claimed to be true?

This research rests on an interpretivist epistemology which assumes that knowledge can be created and understood by the individuals who live and work in a culture or organization (Hatch & Cunliffe, 2006, pp. 12–15; Newton Suter, 2012, p. 351). Symbolic-interpretivists include in the definition of empirical reality forms of experience that lie outside the reach of the five senses, like emotion and intuition, and they study how people make and communicate meaning in each situation (Hatch & Cunliffe, 2006, pp. 15, 44). As leadership in heterarchy highlights stimulating interaction and facilitating reflexive cognition, it includes characteristics from the symbolic interpretive perspective of organization theory and from symbolic-interpretivist epistemology (Hatch & Cunliffe, 2006, p. 14). According to Hatch and Cunliffe (2006, p. 14), symbolic interpretation maintains that "organizations are continually constructed and reconstructed by their members through symbolically mediated interaction."

Symbolic-interpretivist epistemology is parallel with the pragmatic, humanistic theory of symbolic interactionism (Plummer, 2000) which originated in the sociological research by George Herbert Mead, Herbert Blumer, and the Chicago School during the first half of the twentieth century (Plummer, 2000). In the view of symbolic

interactionism, reality consists of social, developed interaction with others, knowledge is particular and produced through meaning and interpretation and recognized via coherence, and the model for human relationships is community (Hatch & Cunliffe, 2006, p. 56). According to Plummer (2000), most symbolic-interactionist sociologies focus on four interweaving themes: (1) the world of a human being is not only material and objective but also semiotic and symbolic; (2) lives, situations, and even societies are always and everywhere evolving, adjusting, and becoming; (3) interaction between people; and (4) symbolic-interpretivist sociology's distinct engagement with the empirical world.

Symbolic-interpretivists understand that meaning and knowledge originate through collective cognition, and they analyze various understandings of phenomena by studying the mutual negotiation of the meanings of symbols, artifacts, and language within the context of a particular culture (Houglum, 2012). In organizational settings, the fundamental reality can be described as a constant and increasingly rapid change that is difficult to deal with favorably (Owen & Dietz, 2012). As reported by Hatch and Cunliffe (2006, pp. 42–43), symbolic-interpretivists believe that organizational realities and the knowledge of how to manage them are socially produced as members interact, negotiate, and make sense of their experience. Frey and Sunwolf (2004), who applied a symbolic-interpretivist perspective to the study of groups, maintain that as group members interact, they engage in symbolic practices that are the specific forms of communication employed, such as humor, metaphors, rituals, and stories. From the symbolic-interpretivist perspective, the creation, exchange, and interpretation of symbols in a group have crucial consequences at the individual, relational, and collective levels (Frey & Sunwolf, 2004).

Because meaning is embedded in human interactions and in symbols and artifacts that people may interpret differently, it is vital to address multiple interpretations to constitute knowledge; in addition, the role of context influences how individuals who experience situations and events understand them (Hatch & Cunliffe, 2006, p. 44).

Symbolic-interpretivists want to commit themselves to be true to their personal experience and to honoring the accounts and explanations offered by others (Hatch & Cunliffe, 2006, p. 15). Because of subjectivity and contextuality, the findings of symbolic-interpretivists are only tentatively applied to other contexts (Frey & Sunwolf, 2004). Symbolic-interpretivist scholars also face other challenges, such as acquiring access to some of the real groups that they wish to study and the amount of time they need to collect enough data to make claims about symbol usage in groups and make sense of the data as a whole (Frey & Sunwolf, 2004). According to Hatch and Cunliffe (2006, p. 15), symbolic-interpretivists may use verisimilitude—the resonance of one's

own experience with the experiences of others—as the basis for claiming that they have contributed to understanding.

Next, the theoretical foundation of this thesis concerning leadership toward creativity in virtual work is discussed.

3 THEORETICAL FOUNDATION

Eventually, this all is that everyone wants to be in such an environment where you are taken care of. As a leader of a virtual workforce, you must be extremely interested in people. There is an enormous sense of pressure that every one of us leads people, and it goes even deeper than the surface. At the same time, one should enjoy leadership at some level—not only as a position but mainly because one enjoys dealing with people to raise and support them. That dimension should also be assessed in leadership somehow. (Study 4, CEO, about 40 years old)

3.1 Background

The theoretical framework of this dissertation rests on the literature examined during the research process. Because existing studies on leadership in virtual work contexts are not based on any specific theoretical framework, I have chosen the following as my theoretical underpinning: previous research on leadership in virtuality and virtual work, creativity, and collective creativity on the one hand, and central creativity-conducive leadership approaches like transformational leadership, emotional leadership, and complexity leadership on the other. Transformational, emotional, and complexity leadership as creativity-conducive leadership orientations have been regarded as appropriate theoretical approaches to study leadership toward creativity in virtual work (Humala, 2014; Uhl-Bien et al., 2007). All these approaches follow an interpretivist epistemology (Hatch & Cunliffe, 2006, pp. 12–15; Houglum, 2012) and a subjectivist and processual ontology by regarding reality as a social construction and leadership as a continuous social flow (Crevani et al., 2010). In addition, concept analysis (Humala, 2014, p. 39) supports "applying combinations of different leadership approaches" in leading a virtual workforce. The final reason for the chosen theoretical framework is to bring forward humanistic and educational approaches to leading a virtual workforce toward creativity.

3.2 Virtuality and virtual work

The concept of virtuality is related to work settings, which have changed from traditional face-to-face contexts to interaction environments where people use technology tools to share thoughts and information, and execute work (Makarius & Larson, 2017). Virtuality as a multidimensional concept refers to a holistic organizational setup whereby operations are organized and distributed at the level of the whole organization (Parjanen, 2012, pp. 73–74). Dixon and Panteli (2010, 1194) define virtuality as based on "'virtual continuities' that describes the continuities that emerged within the team as face-to-face and technology-mediated interactions worked in conjunction with one another to mitigate the perceived effects of boundaries." Echoing Gibson and Gibbs (2006) and Panteli and Chiasson (2008), virtual contexts are "unbounded and nonlinear with free movement, enabling flexibility, fluidity, creativity, and opportunities, which lead to improvements in the innovation process" (Humala, 2017, p. 212).

Virtuality is related to the real, the possible, and the actual (Linstead & Thanem, 2007). As Panteli and Chiasson (2008) put it, virtuality is not only about information technology but also part of a social network in which individual choices are believed to widen to numerous and new possibilities, unrestricted by local constraints (Panteli & Chiasson, 2008). Variations of virtuality exist both within organizations (e.g., virtual individual members and virtual teams) and beyond organizations (e.g., inter-organizational and online communities, local and global markets) (Panteli & Chiasson, 2008). Technological and social changes modify how we understand virtuality, its role in organizations, and its effect on future perspectives for businesses. In addition, cultural, geographical, and technical characteristics influence virtuality (Humala, 2014), and, at the micro-level, people of different ages understand virtuality differently.

Virtual work includes dynamic structural arrangements (Gibson & Gibbs, 2006; Zimmermann et al., 2008), and it actualizes in dynamic networks in complex contexts with multilevel patterns and social relations (Weil, 2009). According to Zohar 1997, p. 132), "virtuality as a work context can be described as a continuous dynamic bundle of processes consisting of circles of circles within circles; each circle or network consists of smaller networks or teams of people, and each network works together in a large network" (Humala 2016, 47). Virtual work, as this dissertation reveals, includes permanent, contemporary, intra- and inter-organizational, and nationally and globally dispersed work (Panteli, 2004, p. 28). It also incorporates hybrid work that combines face-to-face and virtual communication (Griffith, Sawyer, & Neale, 2003). In doing so,

"it involves specific remote work contexts and virtual teams, organizations and customers, and users and suppliers in networks" (Humala, 2017, p. 211).

Virtual teams are groups of geographically dispersed individuals who work together on a joint project or common task and primarily communicate with each other electronically (Jarvenpaa & Leidner, 1999). Research has indicated that trust is essential for enabling people to collaborate in virtual work contexts and found that a lack of face-to-face interaction decreases productivity in genuinely virtual teams (Panteli & Chiasson, 2008; Parjanen, 2012, p. 74). Through virtual co-creation it is possible to utilize previously unavailable expertise better and to arrive at innovative solutions (Panteli, 2009; Parjanen, 2012, p. 74).

Recently, "scholars have focused on factors affecting knowledge sharing and outcomes in virtual organizations" (Humala, 2017, p. 212). Chumg, Cooke, Fry, and Hung (2015) found that promoting social values based on mutuality, trust, and shared goals can improve employees' sense of well-being and knowledge-sharing via ICTs, improving the organization's competitive advantage as a consequence. As O'Leary, Wilson, and Metiu (2014) and Wilson, O'Leary, Metiu, and Jett (2008) have underlined, perceived proximity—a symbolic representation of geographically distant co-workers—mediates "the effects of communication and identification on relationship quality, reinforcing the hypothesis that critical aspects of distributed work are socially constructed and symbolically laden" (Humala, 2017, p. 212).

Besides diverse business skills, leadership and collaboration in virtual work require multiliteracies or new media literacy expertise that incorporates competencies to manage the mass of knowledge, prioritize essential information, and to adopt a positive mindset regarding exploring and participating in online networks (Guth & Helm, 2010). It also includes recognizing and using multiple discourses and media and understanding, analyzing, and interpreting their content (Blattner & Fiori, 2011). The term "multiliteracies" refers to the increase in the number of communication channels and the salience of cultural and linguistic diversity (The New London Group, 1996).

3.3 Creativity and collective creativity

This dissertation focuses on enhancing creativity, especially collective creativity, in organizational contexts and the contribution of leadership to creativity in virtual work. Here, "creativity is considered a joint course of action taken by everyone in an organization" (Humala, 2017, p. 212) and an essential competitive weapon that enables

an organization to create new ideas through the energy and commitment of its people (Amabile, 1998).

Creativity, the process of generating something novel and useful, relates to individuals, groups, organizations, and social networks, and is said to originate from personal predispositions toward creativity and a hospitable social context (Amabile, 1988; Csikszentmihalyi, 1999; Woodman, Sawyer, & Griffin, 1993). Building on Moeran (2015) and Penttilä and Hakala (2016), creativity can also be "understood as divergent thinking—devising alternative solutions to problems—that produces novel and useful outputs and demands discipline, skill, hard work, and patience" (Humala, 2017, p. 212).

Creativity research initially focused on individual creativity (Sawyer & DeZutter, 2009), with Guilford (1950) taking a pioneering role. According to Parjanen (2012, p. 47), an individual's "creative thinking means that an individual is able to see things from more than one perspective and is able to question the existing working models." Research on individual determinants of creativity has focused mainly on personality traits, positive affect, and cognitive heuristics (Klijn & Tomic, 2010). In componential theory, one of the most popular theories of creativity, Amabile (1983) emphasizes that individual creativity requires domain-relevant skills and expertise, creativity-related thinking, and task motivation—specifically, the intrinsic motivation to arise. In this dissertation, individual creativity refers to the creativity of the individuals in an organization. By generating creative ideas, employees provide new possibilities and solutions that benefit their organizations (Parjanen, 2012, p. 46).

In addition to individual creativity, studies in the 1980s increasingly stressed sociocultural and collective creativity (Amabile, 1983; Csikszentmihalyi, 1996; Sawyer & DeZutter, 2009), rooted in Vygotsky's (1978) sociocultural approach to human learning as a social process. Creativity requires the following three components: (1) domain-relevant skills and expertise, (2) creativity-related thinking relating to cognitive and personality processes that are conducive to novel thinking, and (3) task motivation, specifically intrinsic motivation (Amabile, 1983). Csikszentmihalyi (1996, p. 314) suggests that creativity is a social construct because it occurs in the interaction between a person's thoughts and a sociocultural context (Parjanen, 2012, p. 41). Meanwhile, Csikszentmihalyi (e.g., 1999) uses his "theory of flow and a system model of creativity to explain the creative process and to improve understanding of what leads to creative moments" (Humala, 2014, p. 30).

The second phase of creativity research showed how creativity is embedded in social groups and emerges from the collaboration and contribution of many individuals and how creative products emerge from collaborative networks (Parjanen, 2012, p. 55; Sawyer & DeZutter, 2009). Parjanen (2012, p. 61) summarizes the characteristics of

collective creativity found in the literature as follows: creativity that is shared by two or more people; an outcome is more than a sum of individual efforts; collaboration, dialogue, and common interest are important; and past knowledge, situated practice, and diversity are essential sources. Creativity in social groups refers to team-based work systems and developing group performance and innovative teams to foster creativity (Parjanen, 2012, pp. 48–50). Creativity in groups is influenced by the contributions of individual group members, by group composition, interaction, and processes, and by contextual elements (Klijn & Tomic, 2010; Parjanen, 2012, p. 48).

According to Woodman et al. (1993, p. 293), organizational creativity refers to "the creation of a valuable, useful new product, service, idea, procedure, or process by individuals working together in a complex social system." Organizational creativity is related to group creativity and the contextual influences on adopting innovative practices, products, and services to improve an organization's ability to remain competitive (Parjanen, 2012, pp. 42–43; Schepers & van den Berg, 2007). The challenge for organizations is to "design a context and strategy to maximize creative achievement at work while taking individual differences into account" (Klijn & Tomic, 2010, p. 333). As Klijn and Tomic (2010) note, most theories regarding organizational creativity come from social psychology. A relaxing environment, support for the organization's structural and leadership solutions, resources, skills, and a positive organization culture are all essential for organizational creativity (e.g., Martens, 2011). Amabile (1988) extended her theory to include teams and organizations. Organizational motivation to innovate, financing, time and personnel resources, and managerial practices like enabling challenging work and supervisory encouragement have been found to be essential components of a broader work environment that influences employee creativity (Amabile & Conti, 1999; Anderson et al., 2014). Later, Amabile and Kramer (2011) identified the power of progress as the top motivator of performance.

Recently, the social network perspective on creativity has emphasized that creativity is embedded in dynamic interactional relationships between people and their cultural and material realities (Poutanen, 2016, p. 17). Social network parameters influence creativity through social relationships, creativity-relevant cognitive processes such as the ability to see connections between seemingly different concepts, divergent and flexible thinking, and domain-relevant knowledge, which is an individual's knowledge of facts, circumstances, and issues surrounding a given problem or area, along with contextual characteristics (Amabile, 1983; Perry-Smith, 2006; Perry-Smith & Shalley, 2003). A moderate number of weak ties enhances creativity, and connections to a more heterogeneous set of direct contacts mediate the relationship between weak ties and

creativity (Perry-Smith, 2006; Perry-Smith & Shalley, 2003). On the other hand, being too central may constrain an individual's creativity (Perry-Smith & Shalley, 2003).

Virtual work contexts call specifically for sociocultural and collective creativity, and a social network perspective on creativity and various social resources and tools related to collaboration can promote creativity (Hämäläinen & Vähäsantanen, 2011; Sawyer & DeZutter, 2009). Hämäläinen and Vähäsantanen (2011 underline the need to integrate theoretical knowledge about creativity and collaborative learning with orchestration activities and bound to the learning context. The ability of people to transform the outside world and gain a sense of belonging to a community by finding creative solutions to everyday tasks and longer-term goals have been underlined as ways in which creativity is meaningful (Countlett, 2011, p. 240; Zhou & Shalley, 2008).

In generating collective creativity, the role of micro-level, momentary social interactions and processeshas been underlined in previous research (Hardagon & Bechky, 2006; Poutanen, 2016, p. 71). According to Hardagon and Bechky (2006), reflective reframing is the key contributor for collectively creative moments because it draws upon participants' prior experience and combines it in new ways. They see help seeking, giving support, reflective reframing, and reinforcing as ways to activate collective creativity in organizations.

Understanding how collective creativity emerges and how to combine it with individual creativity is crucial for organizations to achieve success in virtual work. According to Amabile (1998) and Drazin et al. (2008), online social interactions involving problem solving, creative cognition, and communication are especially important for achieving creativity. Critical issues for leaders seeking to inspire innovative collaboration online include understanding the creativity that occurs among people in organizations, combining individual creativity with collective creativity, person-job fit, and supporting continuity and trust between employees (Amabile, Conti, Coon, Lazenby, & Herron, 1996; Panteli & Chiasson, 2008; Sawyer & DeZutter, 2009). Hardagon and Bechky (2006, pp. 497–498) have reported that organizations seeking creative outcomes "should select and reward individuals who pursue collective achievements over individual ones" and managers might "even require routine interaction between project teams in order to foster the social interactions." Perceptions of an organizational work environment can influence the level of creativity in an organization (Amabile et al., 1996), even in virtual work contexts (Cortini & Scaratti, 2011).

3.4 Creativity-conducive leadership approaches

Leadership has been defined as a social interaction process of actively influencing, motivating, and inspiring people to discover new possibilities, achieve their potential, and reach goals (Humala, 2014; Searle & Hanrahan, 2011). The work of Amabile et al. (1996) and Amabile and Khaire (2008) shows that "leaders and managers can enhance their followers" intrinsic motivation and creativity, for example, by paying attention to work environments, encouraging collaboration, mapping the phases of creative work, and providing paths through bureaucracy and ways for passion at work" (Humala, 2014, 31). Additional ways to support creativity at work are exciting tasks, freedom, permission to fail, sufficient time, rewards, positive affect, minor successes, and constructive debate communities (Amabile, Barsade, Mueller, & Staw, 2005; Amabile & Kramer, 2011; Uusikylä, 2012, pp. 188–189). As to virtual work, "dominance, domain knowledge, downward norm setting, lack of shared understanding, time pressure, and technical difficulties" have been found to inhibit creative performance (Ocker, 2005, p. 22).

This section discusses transformational leadership, emotional leadership, and complexity leadership. These key creativity-conducive leadership approaches have been highlighted in previous research on virtuality and virtual work and theories of creativity and collective creativity (Humala, 2014) and have therefore been chosen as the essential creativity-conducive leadership approaches in this thesis. These approaches are connected: for example, transformational leadership involves elements of both emotional and complexity leadership (Humala, 2014). Creativity-conducive leadership focuses on encouraging people and enabling relationships, aiming to nurture individual and collective creativity inside an organization and outside organizational, geographical, and technological boundaries, despite the dynamic and complex nature of interactions between leaders and employees (Guo et al., 2016; Humala, 2017).

3.4.1 Transformational leadership

Transformational leadership is characterized by a clear vision and mission, inspiration, motivation, intellectual stimulation, and individualized consideration (Avolio & Bass, 1988; Avolio, Waldman, & Yammarino, 1991; Warrick, 2011). This type of leadership has been linked to employee creativity through, for instance, individual creative identity (Hu, Gu, & Chen, 2013). Further, it creates a context for more effective organizational and personal performance (Bass & Avolio, 1993). Wang and Zhu (2011) found that a

group's creative identity mediates the effect of group-level transformational leadership on individuals' creative identities. Contributing factors include establishing creative systems and values and an innovative and creative climate and shared creative norms and regulations within the group, as well as developing and training transformational leadership (Wang & Zhu, 2011). Mittal and Dhar (2015), who studied small- and medium-sized enterprises (SMEs) in India's IT industry, concluded that transformational leadership has a significant and positive relationship with creative self-efficacy (CSE), which is the belief that an individual can produce original outcomes. In addition, CSE mediates the relationship between transformational leadership and employee creativity (Mittal & Dhar, 2015).

Researchers have presented different views about the utility of transformational leadership in virtual work. Ruggieri, Boca, and Garro (2013) found that transformational leadership with a cognitive and metacognitive style is more satisfying than transactional leadership with a more participative style in online teamwork. Schultz (2010), Kahai, Huang, and Jestice (2012), and Eisenbeiß and Boerner (2013) regard transformational leadership as creativity-conducive in virtual work environments despite empirical findings that negatively link transformational leadership to employee creativity because of employee dependency.

However, some researchers have argued that the relationship between transformational leadership and creativity is not completely understood (Wang & Zhu, 2011). A study by Castro, Gomes, and de Sousa (2012) indicates that employees' creativity relates to transformational leadership and leaders' emotional intelligence (e.g., Coleman, Boyatzis, & McKee, 2004). Other combinations of leadership styles in virtual work have also been suggested, such as a combination of transformational and transactional leadership (Zayani, 2008) with visionary style (Whitford & Moss, 2009). In addition, a greater understanding of the roles of employees and organizational context in transformational leadership processes has been emphasized (Wang & Rode, 2010).

3.4.2 Emotional leadership

Emotions are essential to understanding social relations while leading and working, including in virtual environments. Psychologist and philosopher John Dewey states in his theory of experience that emotion reflects the underlying dynamics of the interaction between people (Alexander, 1987, p. 137). In line with Coleman (2001), emotional intelligence (EI) refers to one's ability for self-assertion, management of emotions, social awareness, and management of relationships to recognize and regulate emotions

in oneself and others. Frye, Bennett, and Caldwell (2006) and Quisenberry (2011, p. 9) describe EI as the emotional, affective, and social skill dimension of general intelligence, while Mayer and Salovey (1997) define it as one's ability to regulate emotions to promote emotional and intellectual growth. In addition, EI is linked to social intelligence (Coleman, 2006) and interpersonal intelligence (Gartner, 1983). According to Lewis (2010), social intelligence connects to the development of trust in leader-member relationships in virtual project teams. This connection indicates strong links between interpersonal relationship skills and developing positive trust relations and interactions in virtual environments.

The notion of emotional leadership has developed from EI (Bar-On, 2004; Coleman, 2001; Mayer & Salovey, 1997). The work of Boyatzis and Sala (2004) and Coleman et al. (2004, p. 6) shows that "in work-related contexts, emotional leadership is defined as one's EI-based ability to recognize, understand, and use emotional information about oneself and others in a way that leads to efficiency and excellent performance at work" (Humala, 2017, p. 214).

Castro et al. (2012) tied employee creativity to their leaders' EI. The concept analysis (Humala, 2014, p. 34) indicated that, through EI and emotional leadership, it is possible for leaders of a virtual workforce "to inspire people, which is especially important in situations where people are working in dispersed locations and at least partly via computer-mediated tools." Setting clear goals, objectives, and processes and allowing the group to execute strategies autonomously are ways for virtual team leaders to motivate team members (Quisenberry, 2011, pp. 169–170). Excellent interpersonal relationship skills enable active trust relations and interactions to develop in virtual work environments (Humala, 2014).

3.4.3 Complexity leadership

The virtual working process represents a self-organizing system with a non-linear organizational structure. Such a complex and dynamic work setting presents a challenge to leaders of virtual workers, who must navigate complicated situations. Owen and Diez (2012) have rightly stated that organizations' complexity grows and changes as the organizations themselves grow and change through time. Virtual interaction resembles CAS: open, evolutionary networks of communication and interdependent agents with a shared outlook who are capable of creative problem solving (Humala, 2014; Uhl-Bien et al., 2007). These circumstances make complexity leadership (Lichtenstein, Uhl-Bien,

Marion, Seers, & Orton, 2006; Uhl-Bien et al., 2007) one possible type of leadership in virtual work (Humala, 2014).

Complexity leadership is an integrative theoretical framework challenging traditional leadership theories in which the relationships among people are largely hierarchical. It regards mutual interaction as a complex interactive dynamic through which adaptive outcomes can emerge and views leadership as a function of interaction (Uhl-Bien et al., 2007). Complexity leadership considers leadership in CAS to emphasize interactions among heterogeneous agents and across agency networks. It is thus essential that leaders of virtual workforces understand the importance of virtual relationships between people and exploit those relationships to encourage positive outcomes (Zimmermann et al., 2008).

Complexity leadership highlights relationships and complex interactions between people. The complexity perspective offers a more multifaceted view of leadership toward creativity in virtual work than those offered by transformational and emotional leadership. Hazy's (2009) work shows that "it influences interpersonal interactions, and clarifies the purpose of each member of the organization" (Humala, 2017, p. 215). Leaders adopting a complexity leadership approach need to think through complex problems, engage groups in dynamic adaptive changes, encourage innovation, and manage emotions (Humala, 2017; Plowman et al., 2007). Moreover, scholars have underlined the role of complexity in multiple levels in organizations and networks to promote organizational creativity (Spelthann & Haunschild, 2011) and understanding how temporal complexity influences people and organizations (Plowman et al., 2007). Especially relevant for virtual interaction is Geerlof and Van Beckhoven's (2016) finding that both the ephemerality and the specificity of the organizational context influence organizations' potential for self-direction.

However, complexity leadership is neither easy nor rapid (Goldstein, Hazy, & Lichtenstein, 2010, p. 194). Large amounts of interactions between people create challenges for this type of leadership, and creating the conditions for the emergence of a new and undefined solution requires commitment from everyone in the value chain (Goldstein et al., 2010, p. 194). In virtual work contexts, the process may be even more challenging. It is vital for leaders to focus attention on flexible working cultures and environments for creative energy, workgroups, and conditions to handle complexity, diversity, and uncertainty (Houglum, 2012; Johannessen & Skålsvik, 2013). It is also essential to understand leadership as a group behavior that contains multiple relationships rather than the actions of one individual (Metcalf & Benn, 2013). Leaders in virtual work contexts may also train other people to assist them and move into leadership positions as required (e.g., Dotlich, Cairo, & Rhinesmith, 2008).

3.5 Theory synthesis

This section sums up the theoretical framework of this dissertation as described above. That framework comprises virtuality as a work context, characteristics of virtual co-creation and creativity, and collective creativity as issues for leadership in virtual work, as well as creativity-conducive leadership approaches, including transformational leadership, emotional leadership, and complexity leadership.

Based on the theoretical framework, virtuality is a novel organizational form that is actualized in dynamic networks in complex contexts with multilevel patterns and social relations. As virtual contexts are unbounded and nonlinear and feature free movement, they offer space for flexibility, creativity, and new opportunities. Creativity is embedded in meaningfulness and especially intrinsic motivation, dynamic interactional relationships between people—where micro-level interaction, such as different moments and events, are also noteworthy for creativity—and reflective reframing. In stimulating creativity, previous research emphasizes that leaders should hire the right people to the right positions, pay attention to the composition of groups, and create a social context and organizational culture that are perceived to be hospitable and encouraging. Further, fostering interaction together with divergent thinking and reflective reframing and meaningful work where people can learn and develop themselves are significant contributors to creativity. On the other hand, financing, time and personnel resources, discipline, hard work, and patience are issues that scholars have stressed as needed for creativity to emerge.

Especially through virtual co-creation, it is possible to utilize previously unavailable expertise better, which makes virtual co-creation notable for innovative solutions. Previous research has indicated that it is essential in virtual work to understand collective creativity as a process and social system providing divergent thinking and combine it with individual creativity. To advance knowledge sharing in virtual work and virtual co-creation, it is essential to nurture social values based on mutuality, trust, and shared goals through employees' sense of well-being. Moreover, perceived proximity and multiliteracies are significant contributors to virtual collaboration and in leading virtual work. Among the key creativity-conducive leadership approaches, transformational leadership typically incorporates a clear vision and mission, inspirational motivation, intellectual stimulation, and individualized consideration. Transformational leadership links to employee creativity through individual creative identity, CSE, and creative group identity and provides the context for more effective organizational and personal performance. However, there are some limitations; for instance, the roles of the employees and the entire organizational context in the

transformational leadership processes are not yet entirely understood. Emotional leadership uses EI to recognize and understand one's own and others' emotions and use them in ways that lead to efficient and high-quality performance at work. As emotions reflect the underlying dynamics of the interaction between people, through emotional leadership it is possible to inspire people, which is vital in leading a virtual workforce. Employees' creativity links up with leaders' EI, which is itself related to social and interpersonal intelligence. In virtual work contexts, interpersonal relationship skills enable active trust relations and interactions to develop. As to complexity leadership, it treats leadership as a process and function of interaction. It views leadership through the CAS lens, in which relationships among people are regarded as interactions among heterogeneous agents and across agency networks. In complexity leadership, leaders need to think through complex problems, encourage people to adapt to changes, create innovative solutions, manage emotions, and change leadership positions among the participants as required.

The theoretical foundation introduced above offers a view of distributed leadership based on the heterarchical ontological commitment to foster creativity in virtual work. Figure 1 brings together the theoretical understanding of creativity and co-creation as issues for leaders in virtual work and the major contribution to these issues from the creativity-connected leadership approaches examined in this research.

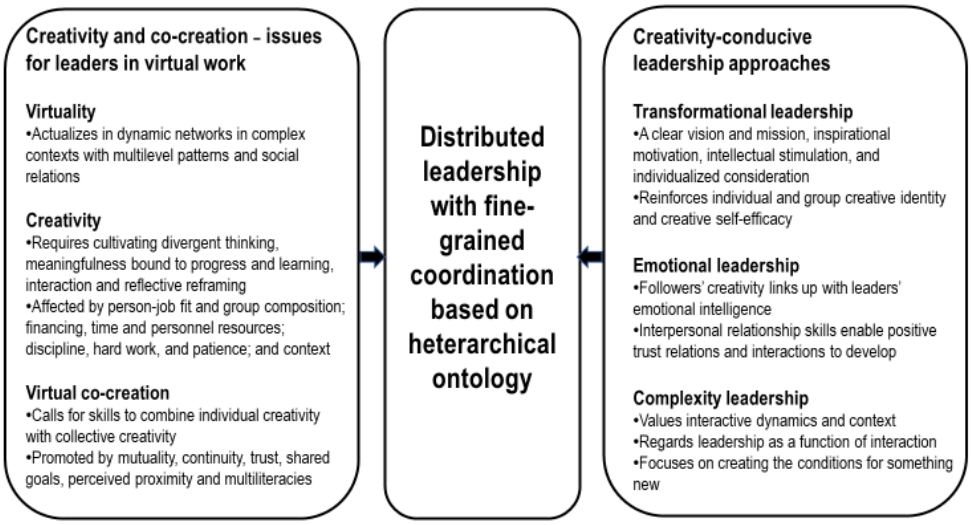

Figure 1. The theoretical understanding of leading a virtual workforce toward creativity

4 METHODOLOGICAL APPROACH

This chapter describes the methodological approaches, including data collection and data analysis, in the original studies and the dissertation as a whole. Detailed descriptions of the methodology are presented in the original studies.

4.1 Research methods

A heterarchical ontological commitment to leadership and a symbolic-interpretivist epistemology demand a qualitative research approach to better comprehend leadership toward creativity in virtual work. Qualitative research offers the means of capturing the views, perspectives, and social interactions of leaders and employees and the contextual conditions within which they work (Yin, 2011, pp. 7–8). Besides using the qualitative approach as the primary research methodology, this dissertation combined several methods and the perspectives of both business-oriented and pedagogical research to gain a more nuanced insight into the research topic and more reliable results (Patton, 2015, p. 674; Tracy, 2010).

Study 1 explored the connections between the concepts of virtual work, creativity, and leadership in the research literature and defined leadership that fosters creativity in virtual work (Humala, 2014). A descriptive, interpretative concept analysis (Takala & Lämsä, 2001), focusing on the definition of concepts, was applied as a research methodology to describe the concepts and their use and find out how concepts in the field have been deduced (Nuopponen, 2010). Study 2 debated whether heterarchy is applicable as the ontological commitment to leadership for stimulating creativity in virtual work and applied an explorative study as a research methodology to study a problem, explore what was occurring, and ask questions about it (Humala, 2016). The research interest in Study 2 was to interpret existing research and to understand deeply the information within it; this guided the choice of a document-based inquiry (Bowen, 2009) as the primary data-gathering method, using qualitative and quantitative analysis in the interpretative process.

Study 3 focused on a single-case start-up and investigated how its key people experienced the learning challenges arising from leading virtual workforces toward

creativity, the meanings they attributed to those experiences, and the measures they considered to meet those challenges (Humala, 2015). Study 4 focused on empirically exploring how leadership toward creativity occurred in virtual work and developed a descriptive typology to better identify leadership toward creativity in virtual work in different types of companies (Humala, 2017). A case study approach was applied in the empirical studies (3 and 4), because case studies are particularly appropriate for exploring perceptions, justifications, and rationales of social practices and contexts and the strategies that individual and collective actors develop (Haunshild & Eikhof, 2009). Yin (2014, p. 16) defines a case study as "an empirical inquiry that investigates a contemporary phenomenon (the 'case') in depth and within its real-world context." Study 3 was a single in-depth case study in a start-up company, while Study 4 was a multiple-case study that included firms of different sizes.

Finally, this summary approaches the research challenge of leading toward creativity in virtual work by using the results of the four original studies as data, by assessing the effects, and by drawing conclusions regarding the issue under investigation. Table 1 presents a general overview of the research aims, focus, and methodologies, and the data gathering and analysis methods of each original study.

Table 1. A general overview of the methodology of the original studies

Number of the study and its aim	Focus	Research methodology	Data gathering methods	Data analysis methods
Study 1: Enhance and understand the concept of leadership toward creativity in virtual work	Interpreting definitions of key and connected concepts and relating the concepts to one another	Descriptive, interpretative concept analysis	Searching definitions of the concepts of virtuality, creativity, and leadership and their associated concepts in the central research texts (journal articles, books, etc.) from recent years; a total 101 sources	Describing, interpreting, and forming a holistic idea of the concepts The understanding followed the principles of the hermeneutic cycle
Study 2: Debate the applicability of heterarchy as the ontological commitment to leadership toward creativity in virtual work	A situation or a problem, exploring what is occurring, and asking questions about it	An explorative study	Document-based inquiry of existing research texts on virtuality and virtual work, fostering creativity in virtual work contexts, and heterarchy as an ontological approach to leadership Interviews with five leaders	Qualitative analysis, supported by coding and counting Finding, selecting, appraising, and synthesizing viewpoints, contexts, and positions in research documents
Study 3: Understand better how the key people in a start-up experience the learning challenges of leadership that foster creativity in virtual work and the measures to meet them	Experiences and the meanings participants assign to them	A single in-depth case study in a partnership start-up	Interviews with the six key people in the start-up Telephone conversations, a seminar presentation, presentation materials, and news about the case company offered additional data	Qualitative analysis The complexity leadership approach was used as a supplemental data analysis method to interpret the data; it focused on interaction and collaboration among the principal people
Study 4: Develop a descriptive typology to identify and describe how leadership in virtual work is made up of different types of companies based on empirical data	Analyzing what, how, and why leadership toward creativity in virtual work occurred in the case companies	A multiple-case study	21 interviews with leaders and employees at 5 companies Presentation materials and news about the case companies supplemented the interview data	Qualitative analysis An interpretivist approach and abductive analysis were applied

The following subsection provides more detailed information about the data gathering and analysis procedures employed in the original studies.

4.2 Data gathering and analysis

Study 1, a descriptive, interpretative concept analysis (Takala & Lämsä, 2001), was carried out from February 2013 through May 2014. The data consisted of definitions of the concepts of virtuality, creativity, and leadership. It was acquired by database searches and the snowball method, which in qualitative research advances in line with references until saturation is reached. The data comprised 101 research texts and was coherent and reliable regarding the research problem. The essential criteria in the choice of research materials were the objective of Study 1—to define leadership that fosters creativity in virtual work—and the way the research topic was outlined. In other words, those research papers were selected for the concept analysis, which included definitions of the critical concepts of virtuality, creativity, and leadership that increased understanding of those concepts and their mutual connections. I critically selected the concepts as subjects of interpretation by the theoretical perspective, the quality of the references used, and the references (Takala & Lämsä, 2001). Table 2 summarizes the information about the data gathering in Study 1.

Table 2. Summary of the data gathering in Study 1

Study	Data gathered	Search methods	Selection criteria for data	Themes arising during the data gathering
Study 1: A descriptive, interpretative concept analysis	The concepts of virtuality, creativity, and leadership; the definitions and the meanings included in the concepts and the definitions .	- Searching through Finnish and international education, business economics, and information sciences databases, e.g., EBSCO, Elektra, SAGE Journals Online, Emerald, Science Direct, and PsycINFO - Database searches continued by using snowballing technique that advanced according to references until saturation is reached	- Texts including the definitions of the fundamental concepts outlined in ways that increase understanding of those concepts and their mutual connections - The quality of the references in the scientific texts	Complexity occurred in 15%, emotionality in 26%, and transformational leadership in 11% of the 101 documents studied

The material was analyzed and synthesized using descriptive, interpretative concept analysis as a research method that aimed to find the meanings related to the concepts of virtuality, creativity, and leadership, reveal their multiplicity, and broaden the understanding of those concepts (Takala & Lämsä, 2001). The issues of interpretation were the definitions of the concepts in other writers' and theorists' texts. My understanding followed the principles of the hermeneutic cycle and using critical reflection to interpret, describe, and clarify the meanings related to those key concepts. It is contextuality that defines the meaning in descriptive, interpretative concept analysis (Takala & Lämsä, 2001). In my analysis, therefore, it was essential to understand the phenomenon at issue from the history, current practices, and the immediate concepts by comparing them to one another. Exploring new concepts and the development of their meanings requires knowledge about the connections between the concept and institutional practices. According to Takala and Lämsä (2001), the formation of meanings is a process in which the text, the interpretation, and the interpreter are centrally interdependent, with the interpreter's everyday observations also guiding the analytical process. However, in descriptive, interpretative concept analysis, the significance of the theoretical approach is approximate but not strictly binding; in any case, the interpreter's observations and the theory are in a continually reciprocal interplay (Takala & Lämsä, 2001). The analysis produced a visual concept map with the connections among concepts. The concept map is an interpretation of meanings to be connected to the scientific discussion of leadership that stimulates creativity in virtual work. Besides the concept analysis, the visualization of the connections between the concepts helped me to understand the whole of the meanings better and formulate the definition for leadership that fosters creativity in virtual work for further elaboration in research and in business. In addition, Takala and Lämsä (2001) underlined that the concepts, the interpretations of their meanings, and the interpretative potential of the interpreters undergo continual change.

Study 2, an explorative document-based inquiry, was conducted from October 2014 through April 2016. The themes of the semi-structured interviews in Study 2 are listed in Appendix 1. My research interest was to interpret the existing research texts on virtuality and virtual work, fostering creativity in virtual work contexts, and heterarchy as an ontological approach to leadership, and to understand the information in those texts. The texts had been recorded without my intervention, in printed, electronic, or other forms, mostly within the last ten years. To bring the perspectives of business actors to the document analysis, I interviewed 5 such leaders in June 2013 and November 2014; they ranged between 30 and 60 years of age. Two were female and three male; three worked in Finland, one in Estonia, and one in both countries. They

represented service and technology fields of networked businesses and had between 5 and 25 years of relevant work experience. I recorded and transcribed the interviews. Table 3 provides additional information about the data gathering in Study 2.

Table 3. Additional information about the data gathering in Study 2

Study	Data gathered	Search methods	Selection criteria for data
Study 2: A document-based inquiry	- Research texts on virtuality and virtual work, fostering creativity in virtual work contexts, and the heterarchical ontological approach to leadership - Face-to-face interviews with six business actors to obtain perspectives from business practices	- Searches of Finnish and international education, business economics, and information sciences databases carried out in Study 1 - Snowballing technique used as a complement to database searches	- Paying attention to the processes that occur at multiple levels of virtual work and how leaders influence the underlying processes and dynamics that lead to organizational outcomes (Dinh et al., 2014) - Finding business actors of different ages, genders, and work experience in service and technology fields of networked business

First, a document-based inquiry was used to identify the focal challenges for leadership toward creativity in virtual work and the central attributes of heterarchy in leadership. The understanding developed through appraising viewpoints, contexts, and positions in the research documents (Lankshear & Knobel, 2004, pp. 54–55). The document-based inquiry focused primarily on content. Other essential subjects included authenticity and usefulness, the original purpose of the documents, the context within which they were produced, and the intended audience (Bowen, 2009; Tracy, 2010). The document-based inquiry treated the research documents as dynamic expert discourses that provide valuable data for the study (Prior, 2011; Wilson, 2013). In addition, six expert interviews, which were analyzed manually, brought empirical evidence to the document analysis to help identify the focal challenges for leadership that inspire creativity among virtual workforces. The central attributes of the heterarchical ontological approach to leadership were developed with the help of data from the documents. Second, the focal leadership challenges and the attributes of heterarchical ontology were contrasted with one another in an interpretative process. A qualitative analysis supported by coding and counting was used to determine the primary groups of relations between the focal challenges (Spelthann & Haunschild, 2011). The characteristics of each challenge for leading a virtual workforce toward creativity and each central attribute of heterarchy in leadership were thoroughly outlined, and the

relationships between the leadership challenges and the attributes of heterarchy in leadership were interrelated, compared, and tagged with color-coded labels. Then, the analysis focused on the strong relations between the leadership challenges and the attributes of heterarchy in leadership. Adding up the number of color-coded ties helped to find the strongest ties between the leadership challenges and the attributes of heterarchy in leadership. The same data was examined from both business-oriented and pedagogical perspectives to reduce distortion during data analysis (Patton, 2015, p. 674).

Study 3, a partnership case study, aimed to understand better how the key people in a start-up experience the learning challenges of leadership toward creativity in virtual work and the measures undertaken to meet those challenges. In start-ups, leadership and collaboration can be especially problematic for the success of the business (Flyvbjerg, 2007). The study was a single in-depth case study in a start-up. The aim was to hear the full stories of the interviewees and maximize the utility of information from a single representative case. The case start-up operates in a global sustainable engineering business and was recommended to the researcher by the Federation of Finnish Technology Industries. It was founded in early 2013 and is owned by five networked partners working in different areas of Finland. Through cooperation with local partners and the global network, the company offers advanced technology solutions for manufacturing, technology, and assembly, all based on customer needs. Its strategy includes providing added value by minimizing process time, reducing working capital for supply chains, and executing projects rapidly. During the data gathering, the start-up was seeking customers and initiating trading.

Semi-structured face-to-face interviews with the six male principals in the start-up—five partners and one strategic legal advisor—provided the data for this study. Appendix 2 presents the themes of the semi-structured interviews from Study 3. The interviews were carried out from September through November 2013, resulting in 144 pages of interview transcripts. All the interviewees had experience in different fields of national and global technology business as managing directors, crew chiefs, and counselors. Telephone conversations, a seminar presentation, presentation materials, and news about the case company offered supplementary data.

Atlas.ti, a software program for qualitative data analysis and research, was exploited in the analysis of Study 3 to carry out the open coding and code family stages. The analysis clustered the code families, both manually and using Atlas.ti, into learning themes. Finally, the qualitative data analysis further refined the learning themes into four main learning challenges in leadership to foster creativity in virtual work in the case start-up and into the primary leadership measures used to meet the four main learning challenges. The complexity leadership approach supplemented the interpretation of the

data by considering the interaction and collaboration among the key players (Lane & Down, 2010).

Study 4 was a multiple-case study that used a descriptive fourfold typology as a framework for analyzing responses to leadership toward creativity in virtual workforces in the case companies (Humala, 2017). The concepts and associated terms located in the four cells or quadrants of a typology constitute the cell types. According to Collier, LaPorte, and Seawright (2012, p. 228), cell types are "in relation to the overarching concept", and "the categories that establish the row and column variables provide the defining attributes of each cell type." In a descriptive typology, the dimensions and cell types help identify and describe the phenomenon under analysis. The overarching concept measured by the typology was leadership toward creativity in virtual work (Humala, 2017).

The goal was to find case companies of different sizes operating in part across national borders. Companies operating in the ICT sector were most interested in participating in this study because they regarded leadership that fosters creativity and supports successful collaboration in virtual work as important for their businesses (Humala, 2017). In many ways, the ICT industry has been a pioneer in virtual work by using ICT tools in collaboration and inspiring virtual workforces to achieve creativity. Half of the case companies operated primarily globally, and many participants had previous experience in global business and virtual work. Therefore, "the chosen case companies can be regarded as representative in this study as they align well with the main types of company profiles that exist in virtual contexts," regardless of the field of industry (Humala, 2017, p. 219).

The data for Study 4 was gathered through 21 semi-structured interviews from April through June 2016: the participants were five female and ten male leaders and four female and two male employees between 20 and 60 years of age working at five companies in Finland. Two case companies were start-ups, the third was an SME, the fourth a large company, and the fifth a one-person business advising enterprise. The following people were interviewed: one key person in the first start-up, the CEO and two employees in the second start-up, the CEO and eight other people in leadership positions at the SME, three people in leadership positions and four employees at the large company, and the owner-manager of the fifth enterprise. The interview instrument used in Study 4 is presented in Appendix 3. One person was interviewed through Skype, while the others were face-to-face interviews, totaling 474 pages of interview transcripts. Presentation materials and news about the case companies supplemented the interview data. A basic qualitative research approach and an interpretivist approach were applied in the data analysis. The data was coded with the help of Atlas.ti. To bring polyphony

to the analysis, the subjective experiences and viewpoints of the interviewed people in leadership and employee positions working in the same case companies were examined in parallel. Therefore, an abductive form of analysis (Brinkmann, 2014) was employed as a supplemental data analysis form that provides a typology to guide practitioners in situations and highlight behavior and practices to avoid in the future (Staw, 2016). Abduction is a mode of inference in which explanations are sought for anomalous or surprising phenomena, which is primarily needed to understand the processes of discovery (Paavola, 2004). Abductive reasoning aims to find an overall pattern into which all evidence and clues fit, and it particularly requires taking into account various clues and constraints relevant to one's subject area (Paavola, 2004).

In Study 4 (Humala, 2017), the first of the case start-ups was a multinational company founded in 2011 and employing 12 people. With its headquarters in the Netherlands and its research department in Finland, it operates in the global advanced ICT industry, especially in Asia, and uses virtuality in its professional internal and external communications. The other start-up, founded in 2014, employs three to four people; it operates virtually in the software industry in Finland and cooperates with Vietnamese organizations. The third case company, the Finnish SME, was founded over 100 years ago. Its 130 employees work in the ICT service sector at different locations in Finland. It uses virtual tools in various ways to enhance transparency in business. The fourth company was founded over 30 years ago. It offers real-time automated financial management solutions at several locations in Finland and employs more than 300 people. The SME and the large case company operate mainly in Finland. The one-person business advising enterprise uses virtual tools to cooperate with its remote customers and partners in Finland. Its owner has work experience in leadership positions and as an entrepreneur in other fields of business and thus was able to offer different perspectives on the issue under study.

The analysis proceeded in three phases: 1) forming a rough outline of the typology, 2) identifying each of the company types in the typology in more detail, and 3) determining the final typology (Humala, 2017). Two critical theoretical lenses, creativity-conducive leadership and heterarchical leadership, guided the location in which creativity-related and heterarchy-related data were placed in the typology and to generate a typology of four modes of leadership with ontological commitment. The theoretical approaches also served as tools to detect the unnoticeable in everyday life, such as beliefs and hidden power structures (Brinkmann, 2012, p. 18). Two dimensions of the leadership focus were analyzed: leadership inspiring creativity among a virtual workforce and leadership with a task-based mindset. In addition, two dimensions of the ontological commitment to leadership were analyzed: heterarchical integrative leadership and

hierarchical authoritarian leadership. These four dimensions formed the rows and columns of the typology.

First, the typology was outlined with criteria based on the explorative Study 2 (Humala, 2016), which identified focal relations between challenges in leading a virtual workforce toward creativity and a heterarchical ontology to leadership. Next, the creativity- and heterarchy-related themes were chosen from the coded and grouped data and placed at the appropriate corners of the typology. Those themes that did not relate to creativity and heterarchy were selected for the other corners of the typology. The four types of companies were then analyzed and described systematically to offer detailed information about leadership and how it appears to both leaders and employees in each company type (i.e., what, how, and why different characteristics are related to leadership toward creativity in virtual work). An abductive form of analysis helped me to reread the themes and the original data from the interviews and analyze the themes again to ensure that the themes were accurately located in the typology. This stage of analysis also focused on how humans' experiences, interactions, virtual tools, and material objects are taken into consideration when leading a virtual workforce in different types of companies (Brinkmann, 2012). The final typology was determined by combining the key issues in the identification phase with each of the four company types in the typology. In line with current theoretical understanding, the key issues in each company type are categorized as one of three critical aspects of business: leadership, communication, and learning and growth (Humala, 2017). These aspects uncover key issues that leaders who want to nurture creativity among virtual workforces must consider, reveal how different features are related to one another, and identify the consequences of those features and interrelations (cf. Dewey, 1938, p. 512).

Different interpretations of the case studies were acquired through writing reports to the case start-up (Study 3) and the SME and the bigger case company (Study 4) about the initial study findings immediately after the interviews. The reports enabled reflexive elaboration of the analyses, together with participants in research seminars and conferences and journal paper submissions. Additionally, the researcher's experience in management praxis and theory, carrying out conversational explorations, and interest in linking education and business knowledge empowered data gathering and analysis in the case studies. The interaction between data interpretation and theoretical analysis influenced the outcomes of both case studies (Diefenbach, 2009).

The next section provides an overview of the four original studies and introduces their main findings.

5 AN OVERVIEW OF THE STUDIES

This dissertation includes two parts: a conceptual part and an empirical part, each consisting of two studies. The detailed results of this dissertation have been published in four journal articles (Studies 1–4) that are presented at the end of the thesis. The four original publications combine to create a continuum to answer the central research question, "What are the key elements that enable leaders to foster creativity in a virtual work context based on the research data?" and to contribute to the scientific discussion that increases our understanding of the links between leadership and creativity in virtual work (Table 4). Studies 1 and 2 specify the theoretical contribution to answering the research problem and lay the foundation for the two empirical articles. Studies 3 and 4 consist of one single-case study in a partnership start-up company (Study 3) and one multiple-case study in five case companies (Study 4). Studies 3 and 4 help address the scarcity of empirical studies on leadership that stimulates a virtual workforce toward creativity in companies of different sizes, increasing our understanding of the issue under research. Next, the results of each study are briefly summarized.

Table 4. The contribution of the four single studies to the central research question

Study	Research question	Contribution
Study 1: "*Defining leadership that fosters creativity in virtual work: Descriptive interpretative concept analysis.*"	How does one define leadership that fosters creativity in virtual work?	Provides a map of the central concepts and defines leadership that fosters creativity in virtual work
Study 2: "Heterarchial ontological commitment for leaders to stimulate creativity among a virtual workforce."	What is the relationship between leadership toward creativity in virtual work and a heterarchical ontology?	Provides the philosophical underpinning of the study; reveals the central relations between leadership toward creativity and the heterarchy perspective
Study 3: "Leadership toward creativity in virtual work in a start-up context."	How are the learning challenges of leadership toward creativity in virtual work and the measures undertaken to meet them experienced in a start-up context?	Provides empirical evidence in a start-up context about combining leadership and creativity within virtual work research
Study 4: "Typology on leadership toward creativity in virtual work."	How is leadership toward creativity made up in different types of companies in virtual work?	Generates a descriptive fourfold typology based on empirical evidence on leadership toward creativity in various kinds of businesses in virtual work.

5.1 Study 1: Defining leadership that fosters creativity in virtual work: Descriptive interpretative concept analysis

This study addresses the first research question: "How does one define leadership that fosters creativity in virtual work?" The purpose of this study was to define leadership that promotes creativity in virtual work through a descriptive interpretative concept analysis (Takala & Lämsä, 2001) and an inductive epistemological approach. From the dissertation perspective, this definition was lacking in the research literature. The descriptive interpretative concept analysis clarified the fundamental concepts of the research—virtual work, creativity, and leadership—revealed how they are connected to one another in the research literature and offered a definition of leadership that fosters creativity in virtual work.

The evidence of this analysis consisted of definitions of key and related concepts, interpretations of the concepts, and construction of the concept map showing the connections and correlations between the concepts (Humala, 2014).

Based on the descriptive concept analysis, effective leadership that fosters creativity in virtual work includes:

- understanding that virtuality at work is complex, multidimensional, and multilevel, and that people work in organizations and networks using both virtual and face-to-face interaction
- utilizing a combination of leadership approaches to support inspiring interaction and collective creativity at work
- understanding the significance of virtual spaces and relations between different people in virtual work and ways to exploit them in interaction (Humala, 2014).

The descriptive, interpretative concept analysis revealed that transformational, emotional, and complexity leadership approaches were found to be particularly appropriate for promoting collaborative creativity in virtual work settings. Transformational leadership mainly presents elements of both emotional and complexity leadership, but studies on leadership in virtual work settings have not yet rested on any theoretical framework. The findings suggested that effective leadership toward creativity in virtual work requires a broad understanding of virtuality, creativity, and interpersonal interactions between people. The results indicated that understanding the complexity of virtual work thoroughly, along with interpersonal interactions, and using them appropriately can produce valuable solutions for co-creative practices and lead to successful innovations and solutions toward sustainable organizations. This finding echoes the complex challenges in leadership for sustainability (Metcalf & Benn, 2013) and managing the microinteraction climate in systemic leadership (Hardagon &

Bechky, 2006). Moreover, Study 1 indicated that "the future development of leadership theory for fostering creativity in virtual work can benefit from integral theoretical pluralism" (Humala, 2014, p. 39).

The concept analysis contributed a conceptual basis to continue the research both theoretically and empirically to verify and complement the connections and correlations and explore the appropriateness of related types of leadership for leading a virtual workforce toward creativity. However, the concept map was based only on accurate data, regardless of the managerial and contextual understanding of the researcher. In addition, the influence of power relations that can affect leading a virtual workforce toward creativity was not analyzed, because its significance did not come up explicitly in the texts chosen for this concept analysis.

5.2 Study 2: Heterarchial ontological commitment for leaders to stimulate creativity among a virtual workforce

Study 2 aimed at debating the applicability of heterarchy as the ontological commitment to leadership for encouraging creativity in virtual work. Heterarchy has its roots in CAS theory, and it relates to the lateral coordination of organizational diversity (Crumley, 1995). It had not previously been applied to virtual work. The focus of attention was on the second research question of the dissertation: "What is the relationship between leadership toward creativity in virtual work and the heterarchical ontology?" With the help of the data from the document-based inquiry and interviews, the study identified the focal relations between the challenges in leading a virtual workforce toward creativity and the heterarchical ontology in leadership.

The findings of Study 2 demonstrated that the heterarchical ontological commitment is appropriate to leadership toward creativity in virtual work. By using the heterarchical ontological commitment, leaders can understand their role in virtual networked work in greater depth, orchestrate collaboration more successfully, foster co-workers' creativity, and encourage a regenerative organizational culture. The study also indicated that complexity, which develops with more nodes and interpersonal interactions, calls for leadership based on heterarchical ontology. The analysis revealed that it is particularly important for leaders inspiring a virtual workforce toward creativity to perceive virtuality as a networked work setting and to apply distributed authority to orchestrate work. In particular, "the three focal leadership challenges toward creativity—understanding virtuality as a networked context, developing virtual leadership mind-set, and leading meaningful work for progress—and the two attributes of heterarchy in

relation to leadership—distributed authority to orchestrate work and supportive interdependent interaction" are linked together (Humala, 2016, p.58).

Study 2 added to the limited research on leadership toward creativity in virtual work and applied the heterarchy perspective to virtual work. It connected the two different academic streams of leadership of virtual work toward creativity and the heterarchical commitment to leadership. Hence, the study advances the future development of leadership theory toward creativity in virtual work. Further, because this study blended business-oriented and pedagogical leadership perspectives, it can broaden the understanding of empowering people and utilizing their ideas in leading a virtual workforce toward creativity.

The results indicated that further studies of the complexity and the microinteractions in virtual work, i.e. the roles of events, moments, and leadership behaviors and invisible aspects of leaders' work like sensitivity and the ability to listen, could help in understanding how to better inspire creativity in virtual settings and foster reflectivity and critical thinking. These findings support Hardagon and Bechky's (2006) notion of reflective reframing as the core of the creatively collective moment. This study also highlighted the deeper future notion of tagging to help label important themes in virtual work and to encourage people to join in those themes. The findings raised the challenge of exploring the significance of power and different power positions in leading a virtual workforce toward creativity and making those areas visible when leading people remotely while suggesting the use of various methodologies to find answers to those questions.

5.3 Study 3: Leadership toward creativity in virtual work in a start-up context

This case study in a start-up addressed the third research question, "How are the learning challenges of leadership toward creativity in virtual work, and the measures to meet them, experienced in a start-up?" The qualitative single in-depth study provided empirical evidence in a partnership start-up setting about combining leadership and creativity within virtual work research. In a partnership start-up company, two or more partners form a corporate alliance to create common value (Osborn & Marion, 2009). The Finnish case start-up was in an early development phase operating in a global sustainable engineering business. However, the key people in this start-up had broad previous experience in business life. The data was gathered through interviews with key people that captured their perspectives and experiences.

Study 3 first construed ten learning themes in leadership and then refined them into four main learning challenges in leadership. Based on the analysis, the most significant learning challenges for a partnership start-up are (1) collaboration in a business team, (2) orchestration and leadership, (3) collaboration with customers, and (4) project management. The data analysis also revealed the critical leadership actions needed to meet the primary learning challenges. The primary measure for leaders to meet the first challenge was encouraging collective creation, critical reflection, and assertiveness. Assertiveness, efficient and flexible interaction, and multiliteracies are essential for leaders to address the problems of orchestration and leadership, create shared values with clients, and have a consistent course of action to help them collaborate with customers. Finally, excellent management skills and systems are necessary for managing projects successfully.

Study 3 demonstrated that leadership that encourages using virtuality and ICT creatively from a company's early stages and takes advantage of multiliteracies and critical reflection could help both people and businesses flourish in the digital economy. Virtuality and ICT provide a seedbed to critical thought and testing, which are both essential for collective creativity to proceed. These issues help create new shared values for start-ups that are coping with complex challenges and for all partners to learn how to run a start-up. The findings of Study 3 "suggested the importance of a co-creative and assertive coaching leadership style and working culture utilizing critical reflection" in a start-up (Humala, 2015, p. 436). Additionally, this kind of leadership can improve business forecasting and decision making and bring about superior credibility among customers. The results indicated that coaching supports the learning of people and entire organizations, strategic and commercial development, and the best ways of doing business with interest groups (Humala, 2015).

Study 3 highlighted the significance of a shared vision, leadership as a function of interaction, and listening to people and respecting them in stimulating creativity in a start-up context. Based on the findings, multiliteracies and lobbying are effective methods for key people to manage social and physical distances in virtual work. This output added to the scholarly debate by offering views on how ICT influences the adoption of virtual leadership tools and processes (Avolio et al., 2014). In addition, the study showed that the integration of business and pedagogical knowledge could help in perceiving leadership and collaboration in virtual work more broadly.

5.4 Study 4: Typology on leadership toward creativity in virtual work

The fourth study sought to answer the research question, "How is leadership toward creativity made up in different types of companies in virtual work?" The multiple-case study aimed to develop a descriptive typology based on empirical data to identify and describe how leadership occurs in virtual work in various types of companies. The study helped alleviate the scarcity of empirical studies on leadership that stimulates a virtual workforce toward creativity (Guo et al., 2016). It provided empirical evidence for applying the heterarchical perspective on virtual work and understanding the connections between stimulating creativity and heterarchy in better leading a virtual workforce. This study empirically explored how leadership toward creativity occurred in virtual work in various companies and used the primary theoretical lenses of creativity-conducive leadership and heterarchical leadership as the basis to generate a typology.

A multiple qualitative case study was designed, and an interpretivist approach was applied in the data analysis, supplemented by an abductive form of analysis. The data was collected by interviewing 21 people who were leaders and employees in four companies in the ICT sector and one business advisory company. Based on the interview data, the study produced a descriptive typology of different company types. The typology was outlined by analyzing the common aspects of what, how, and why leadership toward creativity occurred in virtual work in the case companies. Four different types of companies were analyzed in detail to identify the composition of and name each company type: type A ("nascent launch pad"), type B ("collective mind"), type C ("command center"), and type D ("leaky boat"). On the vertical axis of the typology, leadership nurturing creativity in a virtual workforce increases upward, and leadership with a task-based attitude increases downward. On the horizontal axis, heterarchical integrative leadership increases to the right, while hierarchical leadership increases to the left.

The descriptive typology strengthens the view that in the global networked business environment and with advancements in technology, the trend in leadership is toward type B, the collective mind. Type B operates via a virtual mindset. Its characteristics include shared values, meaningful work, collective intelligence, conscious reflection, transparency, coaching, empowering leadership by example, effective multichannel interaction, and assertiveness. The findings make clear that "leaders who are genuinely interested both in people, and their development, and collaboration with individuals, as well as in the technologies, can inspire collective creativity and promote the common good in society" (Humala, 2017, p. 234). Further, both functional virtual and physical

spaces are crucial for genuine mutual interaction and collective creativity to evolve in virtual work. To improve the quality of virtual communication, leaders must communicate and interact with people. This demand, which is also suggested by the heterarchical perspective, requires leaders to develop the horizontal capability of people so as to consciously develop their thinking. This kind of leadership reinforces sustainability for both people and business.

The typology enriches the theoretical understanding of leadership inspiring creativity in virtual work by specifying different courses in the transition toward that kind of leadership. It helps scholars analyze "dimensions that influence leadership toward creativity in virtual work and better understand and conceptualize the conditions and relationships in leadership that are related to each other" (Humala, 2017, p. 234). It can also be helpful for the classification of companies and leaders. The findings empirically support applying the heterarchy perspective to inspire creativity among a virtual workforce. With the help of the typology, practitioners can better realize how leadership, communication and interaction, and learning and growth are closely tied in virtual contexts. They all also need to be developed to support creative interaction and improve productivity and competitiveness. The typology can also assist leaders and managers evaluate their job performance and establish appropriate performance assessment indicators for leaders and employees in virtual work.

The study suggested that future scholars focus on other fields, industries, networks, the role(s) of material objects and employees in fostering creativity, on theory development, and on conducting longitudinal studies.

The following chapter summarizes the findings of the four studies.

6 SYNTHESIS OF THE FINDINGS OF THE STUDIES

When a leader of a virtual workforce truly believes in an organization's vision and perceives her work to be meaningful, she can act in her own way, value others' contribution, and let them work in their way. The better the staff knows about the business, the easier it is to act. Decisions without reason don't work in virtual work by any means. You need mechanisms for pressing the gas pedal and every so often to brake and stop. Those include checkpoints and lessons learned and a sufficiency of communication and documentation to understand and write down the targets, to learn from the successes and failures, and to decrease personnel risks. (Study 4, Leader, about 40 years old)

6.1 Synthesis of the results

This thesis has explored the key elements that enable leaders to foster creativity in a virtual work context based on the research data and contributes to the scientific discussion that increases our understanding of the links between leadership and creativity in virtual work. Based on the original Studies 1–4, I summarize the findings of this dissertation in Figure 2.

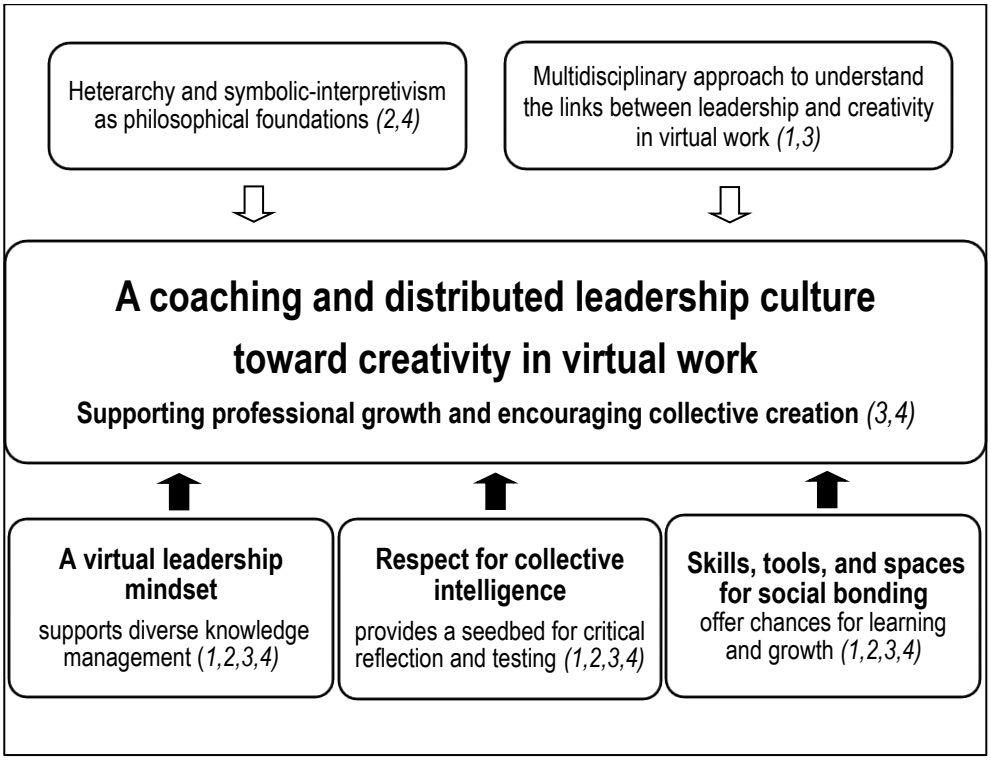

Figure 2. Leadership toward creativity in virtual work with its three essential elements (the numbers in brackets refer to the original studies (1–4) that support the findings at issue)

A critically and reflectively retrospective view of the conclusions of the four studies brings out the comprehension that to inspire collective creativity among a virtual workforce for business and societies, leaders should adopt a coaching and distributed leadership approach in virtual work (Figure 2). That means coaching people to flourish and supporting their professional growth, distributing leadership and responsibilities by example and encouraging co-creation, and managing the microinteraction climate. The findings demonstrate that promoting creativity in virtual work requires entire companies and organizations to shift toward a coaching and distributed leadership culture. The results highlight the following key elements in the leadership culture that most efficiently foster creativity in virtual work and contribute to the professional growth of leaders in virtual work:

- adopting a virtual leadership mindset to support diverse knowledge management
- showing respect for collective intelligence to provide a seedbed for critical reflection and testing

- developing skills, tools, and spaces for social bonding to offer chances for learning and growth

The next paragraphs discuss the leadership culture and the roles of each essential element in detail.

6.2 A coaching and distributed leadership culture in virtual work

Based on the empirical evidence from the case studies (Studies 3 and 4), I argue that it would be far-sighted for organizational leaders to update their leadership approaches toward a coaching and distributed leadership culture so as to foster a virtual workforce toward creativity. The introductory section made clear that leadership and creativity have so far remained separate in virtual work research, and empirical knowledge about leadership toward creativity in virtual work is scarce. This dissertation contributes to filling this research gap by highlighting coaching and distributed leadership to foster a virtual workforce toward creativity.

Leaders encourage co-creation when they can coach people to flourish, create mutual trust, support individuals' professional growth, apply distributed authority to orchestrate work, manage the microinteraction climate among human beings, and lead by example. The results support the previously highlighted demands for future leaders to develop the potential and promote the best in every individual (e.g., Rodriguez & Rodriguez, 2015). In addition, the findings of this dissertation are in line with the views of Stein, Wanstreet, Slagle, Trinko, and Lutz (2013) that continual coaching and feedback in an online community reinforce the power of learner-led discussions and foster problem solving and collaborative learning.

Coaching and empowering leadership with sharing experiences and participatory learning across role boundaries can also enhance mutual coaching, in which each participant acts as both coach and trainee, and generate a leadership culture that values listening and learning. This kind of coaching culture can be extended to cover primary partners, customers, and other players. It is vital to understand that organizations work in virtual networked environments together with their customers and user communities (Studies 1, 2, and 4), linking both customers and customers' customers to business development (Study 3). The findings also support earlier research on leadership for growth that highlights the importance of the coaching skills of leaders to develop a team capable of operating at the same high level that ideally does not directly involve day-to-day business operations (Freeman & Siegfried, 2015). Because this kind of leadership enables power, responsibility, and commitment to arise from the community, it

resembles emergent (Chamakiotis, 2014, p. 296) or ad hoc leadership (Hara, Shachaf, & Stoerger, 2009). Both emergent and ad hoc leadership enable temporary leadership opportunities for people, which is also suggested by the complexity leadership approach (Dotlich et al., 2008). It is also critical for leaders to know their people and their expertise, skills, passions, and interests over their role limits and to support their people to utilize those traits for empowerment in the digital era. The leaders interviewed in the case studies indicated that coaching and assertive leadership toward collective creation generates opportunities to improve the well-being and effectiveness of employees, enhances customer service and stability, and reflects better business forecasting, decision making, and profitability.

The essential elements that were found to have the most influence over coaching and a distributed leadership culture and to contribute to the professional growth of leaders in virtual work are adopting a virtual mindset, showing respect for collective intelligence, and developing skills, tools, and spaces for virtual communication.

6.2.1 Adopting a virtual leadership mindset

Study 2 revealed that developing a virtual leadership mindset is one of the focal challenges for leading a virtual workforce toward creativity to support knowledge management in diverse virtual work settings. This finding was supported by Studies 1, 3, and 4. Mindsets are implicit theories or assumptions that people hold about the plasticity of their abilities (Keating & Heslin, 2015). In this research, a virtual mindset means understanding virtuality as part of a social and conceptual network that allows collaborative interaction between people based on mutual trust and responsibility, and uncovering what is unseen and unheard and understanding its nature. A virtual leadership mindset means that leaders can sense, experience, and share the virtual context with other people. These requirements demand EI, sensitivity, and transparency from leaders, skills that help them understand the interlinear hints from their people, encounter bad business news constructively, and better orchestrate collaborative work. These results support the significance of the latent mind (Perry, 2011) for collective creativity to develop: to uncover what is unseen and understand its nature so as not to hinder creative problem solving.

Leaders who adopt a virtual leadership mindset understand virtuality and creativity comprehensively as a networked context to support collaborative work toward new solutions and deal with overarching problems and changing circumstances. A leader who has a virtual mindset realizes that leadership and context are intertwined (Osborn,

Uhl-Bien, & Milosevic, 2014). Therefore, it is necessary to integrate the use of technology with the mindset for creativity, collaboration, and multimedia productivity with a sharp ear and actively and assertively. A virtual leadership mindset relates to a growth-based mindset and environment, where human development is valued and people can thrive (Dweck, 2012, p. 141).

The findings show that assertiveness—clear, shared targets and rules; a consistent and fair course of action and processes; and consistent leadership profiles toward different players—is a fundamental attribute in a virtual leadership mindset. Supported by heterarchy, combining different organizing principles can help to achieve both structural support and performance to foster creativity in virtual work.

6.2.2 Respect for collective intelligence

Promoting creativity in leading a virtual workforce is related to leaders' respect for people, valuing interaction with and collaboration of individuals, and enhancing collective intelligence in a trusted environment. In a sense, virtual contexts enable leaders to work with their collaborators to create courses of action that suit the prevailing circumstances and let collective intelligence lead the organization toward success. In addition, developing cultures of collective intelligence generates broader social foresight and reflexivity so that organizations can match science and technology and respond to the near-term future context (Jakonen & Kamppinen, 2015). This interpretation signifies shared power and shared responsibility in virtual work, echoing the notion of shared leadership "as a dynamic, interactive influence process among individuals in groups" (Pearce & Conger, 2003). Collective intelligence requires horizontal interaction among people, which challenges leaders to pay attention to knowledge management, such as by encouraging their people to bring forward multiple perspectives and developing and revising their integrative thinking (Kallio, 2011). The findings of this dissertation have augmented existing knowledge and underlined skillful recruiting and orientation of suitable new leaders and employees to enhance creativity and make virtual work successful.

Respect for collective intelligence together with virtuality and ICT offer a seedbed for critical reflection and testing. The findings of empirical Studies 3 and 4 strengthened the impression about a working culture that utilizes conscious and critical reflection in inspiring creativity among a virtual workforce. This kind of working culture is also related to the mindset of a coaching culture, which emphasizes that inquiring together

(Hawkins, 2012, p. 22) and an open, helpful, and communal way of working together can generate better responses to new challenges.

As the virtual experiences of relationships and encounters play a significant role in virtual work, inspiring a virtual workforce toward creativity requires focusing on people and the microinteraction climate or grassroots dynamics (Phelps, 2013, p. 288). This kind of leadership also demands fine-grained human skills and relational competence (Hardagon & Bechky, 2006), meaningful shared objectives and values, and hence supportive orchestration abilities to enable individuals to reveal their thoughts and feelings and use conscious, unhurried times at work for reflection (Spelthann & Haunschild, 2011). This outlook supports the systemic view of leadership (Johannessen & Skålsvik, 2013) and recent discussions on meaningful work as an ongoing search for meaning, which calls for measuring the dimensions of meaningful work with each other (Lips-Wiersma & Wright, 2012).

6.2.3 Developing skills, tools, and spaces for social bonding

In virtual work, a lot is going on that cannot be seen (Hickman & Sorenson, 2014, p. 2). Therefore, the role of material objects like technology and digital communication tools is critical in mutual interaction and requires attention in leading a virtual workforce and removing factors that inhibit creativity. Indeed, virtuality and ICT provide chances for learning and growth for everyone at every turn. Through stimulating open conversation, interaction, and listening to one another, leaders enable people to express their voices and generate creativity in virtual work. This situation makes appropriate skills, tools, and spaces vital for social bonding in virtual work contexts, both inside the organization and with customers and other stakeholders. Leaders who care for their people and communicate actively and amicably with them through multiple channels and are visible to their employees and partners in cooperation can better develop social bonds to enhance creativity within the virtual work environment. On the basis of the results, remote employees appreciate leaders who regularly meet with them face-to-face and use modern functioning communication tools and spaces such as social media to discuss and reflect on issues together. Studies 3 and 4 underlined that multichannel communication and active transparent communication are effective ways to manage social and physical distances, stimulate discourse, and orchestrate creative interaction in virtual work. These results are linked with those of Bordi, Okkonen, Mäkiniemi, and Heikkilä-Tammi (2018), who concluded that social factors like organizational and team-level practices influence communication-related well-being in the digital work

environment. Study 4 empirically supported the notion that collective creativity in virtual work requires both virtual and physical interaction in appropriate spaces and caring for one another. Further, both Studies 3 and 4 highlighted the relevance of unlearning old courses of action and the creative utilization of virtuality and ICT to help collective creativity in virtual work to emerge. This type of leadership refers to a joint effort among individuals and a new practice of communication that can lead to a more productive business (Ziek & Smulowitz, 2014).

The next chapter evaluates the research and presents its theoretical and practical implications.

7 IMPLICATIONS

7.1 Evaluation of the research

Evaluation of the research requires focusing on each of its phases: planning, data collection, data analysis, and interpretation. During the entire research process, I have tried to cast the study as a process in which the phrasing of the research question and the choices have varied. The final wording of the research question, "What are the key elements that enable leaders to foster creativity in a virtual work context based on the research data?" took shape after the latest empirical study and during the summary writing process. The research question highlights leaders as the primary target group of this research. Setting leaders as a target group is significant because one of my fundamental motives in carrying out this dissertation is to contribute to managerial discussions that can increase our understanding about the links between leadership and creativity in virtual work. Moreover, concentrating in this thesis on the key elements to foster creativity in a virtual work context is realistic enough, given the research data collected. I have also described the research process and its phases openly, justified the research problem, and explained the ontological, epistemological, theoretical, and methodological choices I have made. I have defended the decisions on drawing understanding from previous research literature and collecting empirical data in each separate study. Data and interpretation have gone together throughout the process.

The research project formally started with a literature review in 2012, although there had already been periods of active reading and reporting concerning the same general theme as this research in the preceding couple of years. The literature review and data analysis continued toward the end of the research project in 2018. The research problem was initially defined in spring 2012. The research process was not straightforward but meandered widely by approaching the whole complex cluster of issues from different perspectives to find a justified understanding of the interest. The alternative of concentrating on learning instead of leadership was considered, and the option of focusing on learning business know-how in Massive Open Online Courses (MOOCs) was studied. This detour started to direct the research toward a cul-de-sac but eventually strengthened to bring its focus back to the starting point—toward leadership that fosters creativity in virtual work.

Concerning methodological choices, selecting the basic qualitative research design as the research method in the third study was in no way straightforward. Instead, both the phenomenographic approach and the constructivist grounded theory approach were thoroughly investigated before the final choice was made. In the first phase, because the primary goal was thought to be increasing holistic understanding, discovering possible principles concerning creativity fostering leadership, and specifying the outputs of such leadership in virtual work, the phenomenographic approach was explored (Marton & Booth, 1997). Next, the constructivist grounded theory was deeply considered, because the aim of the research changed direction to derive new theoretical insights from the data. Constructivist grounded theory lies in the interpretive tradition, prioritizes the phenomena under study, and sees both data and analysis as being created from shared experiences and relationships with participants (Charmaz, 2006, p. 130). In the constructivist approach, researchers need to interpret how and sometimes why participants construct meanings and actions in specific situations. The theory depends on the researcher's view, and any analysis is contextualized in time, place, and culture (Charmaz, 2006, p. 130; Mills, Bonner, & Francis, 2006). The final choice was the basic qualitative research approach (Merriam, 2009), because the aim of the third study crystallized into understanding better how the key people in the case study experienced the learning challenges of leadership that foster creativity in virtual work and the measures undertaken to meet them.

I conducted the research process, including data gathering, data analyses, and reporting, individually. Additional resources helped in language editing and partly in transcribing the data. However, I presented and discussed the progress and the results of the original studies several times in research seminars and with my supervisors as well as in review processes for scientific journals throughout the research process. The outcomes were also presented at two international research conferences in 2014 and 2017 and two national research conferences in 2016 and 2017.

7.1.1 Ethical considerations

Research ethics call for highlighting the interest and starting assumptions of the research and the researcher. Conducting research on leadership toward creativity in virtual work originates from my previous experiences, both as an employee and a leader, in virtual dispersed work and my interest in how to help people flourish at work and in business. It is also worthwhile to provide a new understanding of a modern phenomenon that has not been studied before, i.e., linking creativity and leadership in virtual work. My

background helped me to understand the issue under research and its basis but could also have influenced the way I interpreted the data. However, in agreement with the chosen ontological and epistemological approaches, the researcher is one actor inside the issue under study and explores it from her own perspective. Moreover, this dissertation represents multidisciplinary research that links educational and business research approaches. During the entire research process, I have strived for the realization of these approaches, both in carrying out research and in reporting the findings.

Ethical questions are present during the entire qualitative research process. Each person who was interested in participating in the empirical studies was contacted personally and informed about the research and her role in it. Dialogic and discussion-style interviews enabled an open and pleasant atmosphere for mutual interaction and allowed the researcher to monitor the emotional states of the interviewees. The confidentiality and anonymity of the respondents and their work organizations were guaranteed. Each participating organization was offered the opportunity to comment on the summary made from the interviews of their organization and the journal manuscripts. Ultimately, the start-up case company in Study 3, and the bigger company, the SME, and one start-up company in Study 4 commented on the outcomes. Ethical decisions have been based on the particularities of each context, mutual interaction with others, and sharing the research (Tracy, 2010).

7.1.2 Reliability and validity

In the qualitative paradigm, validity and reliability can be conceptualized as trustworthiness, rigor, and quality (Golafshani, 2003). Validity that is appropriate to the epistemological and ontological assumptions of the interpretive tradition can be redefined as the extent to which the research findings appropriately reflect the properties of the social setting investigated to achieve correct interpretations (Sandberg, 2005; Walther, Sochacka, & Kellam, 2013). The condition for validity in scientific knowledge is to analyze the underlying substance of the phenomenon to be studied, i.e., present and justify the core ontological assumptions and positioning in the field of science. This picture is of importance in research like this endeavor when the research aims to study a new phenomenon or a more established phenomenon from a novel point of view. Because replicability is not realistic in complex social systems and the qualitative, interpretive research tradition, reliability can then be understood as the procedure to achieve correct interpretations and to mitigate the effect of random

influences on the research process (Sandberg, 2005; Walther et al., 2013). In general, Tracy (2010) has suggested eight critical markers of quality in qualitative research: worthy topic, rich rigor, sincerity, credibility, resonance, significant contribution, ethics, and meaningful coherence. The combination of markers of quality depends on the researcher, context, academic affiliation, and project.

Sandberg (2005, p. 52) describes a truth achieved within interpretive approaches as "an ongoing and open process of knowledge claims correcting each other." Instead of using positivist criteria to justify knowledge produced within interpretive approaches, he proposes validity as communicative, pragmatic, and transgressive validity and reliability as interpretive awareness as the most appropriate criteria (Sandberg, 2005). Communicative validity explains the co-construction of knowledge in the social context of investigation and within the research community (Walther et al., 2013); it focuses on the coherence of interpretations with the empirical material investigated (Sandberg, 2005). Pragmatic validity examines the extent to which theories and concepts are consistent with empirical reality (Walther et al., 2013) and corrects discrepancies between what the research participants say they do and what they actually do (Sandberg, 2005). Transgressive validity helps researchers become aware of their taken-for-granted frameworks and corrects possible contradictions (Sandberg, 2005). As to reliability, maintaining interpretive awareness means that the researcher acknowledges and explicitly deals with her subjectivity in making interpretations (Sandberg, 2005). Other strategies for reliability include communicative validation, validation of the interview situation, authenticity, an honest discussion of the limitation of the chosen approach, sufficient explanation of the methodology, method triangulation, and attempts to validate findings (Golafshani, 2003; Haunschild & Eikhof, 2009). Additionally, the provision of research process details, a thorough analysis, and the clear presentation of results helped to strengthen reliability.

This thesis examines validity from the perspectives of communicative validity, pragmatic validity, and transgressive validity. The evaluation criteria and the strategies that satisfy those criteria are explored in each aspect. Table 5 presents the evaluation of validity and reliability.

Table 5. The evaluation of validity and reliability of the research

Subject of evaluation	Evaluation criteria	Strategies to satisfy the criteria
Communicative validity	**The coherence of the interpretations** (Sandberg, 2005)	- Transparent and clear accounts and reflections of the research process were carried out from the foundations through methodological choices, data analysis, and reporting of findings - Semi-structured audio-recorded interviews and open-ended questions enabled the gathering of abundant data and checking the original data and emerging themes -The interpretations were made by ongoing engagement with the data, iteratively relating the parts to the whole, and continuously testing their stability -Verbatim extracts from the data were included in the study reports to assist the reader in making judgments about the coherence of interpretations
	Construction of knowledge socially within the relevant communication community (Walther et al., 2013)	-Argumentative discourses within the research community were ongoing throughout the research process, such as presenting papers at conferences and seminars and in review processes for scientific journals - Participants were invited to comment on the research findings and the manuscripts
Pragmatic validity	**Quality, quantity, and time frame of the data** (Diefenbach, 2009)	-References to multiple theoretical approaches and other studies -Collection of enough data from different sources and different people relating to the same issues in different periods -Efforts were made to find appropriate case contexts for the goals of the thesis
	Discrepancies between what the participants say they do and what they do (Sandberg, 2005)	-To avoid biased data, all interview statements were treated as equally important, participants were observed during the interviews, and follow-up questions were asked of them to embed their comments; data from the documents and interviews were compared with each other - The interpretations were validated in the subsequent studies
	Transferability: i.e. how the concepts and knowledge claims withstand exposure to the reality investigated (Walther et al., 2013)	-Plentiful evidence of leadership and creativity in virtual work contexts deeply anchored to interaction, including the notions of both leaders and employees, facilitates the evaluation of the conclusions and their transferability to other virtual dispersed work contexts - Explanatory power of results that can also be utilized for future theory development
Transgressive validity	**Contradictions in interpretations** (Sandberg, 2005)	-Interpretations were consciously interrupted from time to time, and transcripts reread from different angles -Methods were critically reflected upon to search for contradictions and ensure sufficient depth and relevance of data analysis, e.g., an abductive form of analysis
Reliability	**Interpretative awareness:** how the researcher acknowledges and explicitly deals with her subjectivity (Sandberg, 2005)	-During the entire research process, the researcher strived to be aware of her prior subjective values, biases, inclinations, and experiences of leadership in virtual work and carefully checked that the interpretations were based on the participants' actual views - A reflective research journal was kept to document challenges, issues, and decisions so as to maintain cohesion -The researcher's background was openly brought forward to the reader
	Triangulation: using multiple sources of data and various methods	- Multiple sources were employed in data collection in different phases of the research: written documents and interviews with female and male voluntary leaders and employees at various companies - Various qualitative methodological approaches were applied and supported by quantitative analysis to a lesser extent to produce more comprehensive findings

Regarding the limitations of this research, the data in this qualitative study was collected by one researcher. Since I as researcher take full responsibility for all choices made, data collection, and the systematics of the analysis throughout the research process, I have addressed these matters in the above evaluation of the validity and reliability of the research.

The theoretical framework of this dissertation does not involve highly specific theoretical choices because there is as yet no fixed theoretical framework on leadership in virtual work contexts. However, the theoretical framework based on the literature review offers a groundwork for continuing theoretical discussion and theory formulation about leadership toward creativity in virtual work. Moreover, at the beginning of my doctoral studies and based on my practical experience, my interest focused more on the practice-based needs to conceptualize creativity-conducive leadership in virtual work that differs from traditional hierarchic leadership and that ensures daily business be done properly and on time in complex virtual work contexts with little or no face-to-face interaction. In other words, besides the complexity in virtual contexts, my initial view on leadership that stimulates creativity in virtual work was more directed to individual-based leadership thinking of the kind typically represented by transformational leadership. However, over the course of my doctoral studies, along with the heterarchical ontological commitment to leadership, my understanding of the creativity-conducive leadership in virtual work has become deeper and more collective. In any case, my practice-oriented mindset has mediated the more normative contribution of this thesis than its theoretical aspects.

The empirical data was collected almost entirely in Finland, except for two participants in Estonia in Study 2 and two participants in Study 4 who were originally from Southeast Asia but were working in Finland. However, half of the case companies operated globally, and several participants were experienced in global business. Finland, with 5.5 million inhabitants, is an example of an open economy that depends on world trade, with ICT integrated into the society. Both the society's and the country's digital operational environments are being reformed to improve the functionality and flexibility of current practices. This situation makes virtual work in Finland comparable to the rest of the world and facilitates the transferability of the findings to other virtual dispersed global work contexts, especially in service industries. Further, the extensive documentary data from previous research literature is supplemented by the geographical limitations of the empirical evidence.

Each of the original studies included shortcomings, some of which could be focused on and explored more in later studies to validate the findings. The concept analysis in Study 1 brought out other related types of leadership toward creativity, like servant

leadership and the visionary leadership style. Similarly, it highlighted power relations that might influence leadership toward creativity but were not analyzed in that study, because their significance did not come up explicitly in the texts chosen for the concept analysis. These issues were noted in subsequent studies to check for their relevance to the research problem. The explorative Study 2 called for more empirical evidence from multiple cases and different fields of operation in the future to be able to extend the study's findings and to develop a theoretical foundation for leadership toward creativity in virtual work. The empirical data related to dispersed organizations and online interaction remained particularly modest in Study 2. Additionally, it showed the need to acquire more empirical evidence and a richer theoretical understanding regarding the notion of physical, social, and virtual distances and relations between people and how to exploit them. Ultimately, Study 3 and especially Study 4 offered more empirical evidence about the issue under study. However, Study 3 consisted of a single start-up case operating in a global sustainable engineering business, where the principal respondents made comparatively little use of virtuality and ICT, partly because the start-up was in an early development phase. Since all the interviewed principal people had several layers of prior knowledge in global business, and creativity can be conceptualized as a built-in element in start-ups, the case and its findings could justifiably pave the way for future empirical studies. To supplement the interview data, Study 4 included interviews with both female and male people of different ages at five companies. Even so, the case companies in Study 4 represented the ICT and ICT service sectors in Finland, because the case companies in the ICT field were interested in the research topic and willing to invest their time in the research project. However, the two case start-ups in Study 4 complemented the data received from the single partnership start-up in Study 3.

7.2 Theoretical implications

7.2.1 Multidisciplinary approach to understanding the links between leadership and creativity in virtual work

This dissertation relates to several organizational processes, such as collective creation (Sawyer & DeZutter, 2009), collaborative learning and knowledge creation, individuals' contribution to the organizations' knowledge (cf. Hämäläinen & Vähäsantanen, 2011; Scardamalia & Bereiter, 2006), and the leadership processes that foster creative

interaction and collaboration in virtual work. Based on the research data, this research mainly concerns leaders of people who work in abstract task-intensive occupations such as managerial, professional, and technical occupations that involve more cognitively complex tasks that have a high degree of uncertainty (Autor, 2015; Autor, Levy, & Murnane, 2003).

The thesis adds to the scholarly debate by integrating different academic streams in studying leadership toward creativity in virtual work. Based on the heterarchical ontological commitment to leadership, this research combined virtuality and virtual work, creativity and collective creativity, and creativity-conducive leadership approaches containing the following principal approaches: transformational leadership, emotional leadership, and complexity leadership. The research strengthens the benefits of integral theoretical pluralism in the future development of leadership theory toward creativity in virtual work. Moreover, integrating business-oriented and pedagogical leadership perspectives in this research broadens the understanding of empowering people and taking advantage of their ideas in leading a virtual workforce toward creativity. This integration supports Geerlof and Van Beckhoven's (2016) views regarding applying multiple styles of leadership depending on the context and having the audacity to go beyond conventional and widely accepted behaviors in leading the transformation of an organization from a traditional toward a self-organizing organization.

7.2.2 Professional development of leaders in virtual work

Based on the results of this research, leaders who advocate humanistic values to care for and empower people support their professional growth and meaningfulness at work, foster collective creativity, and generate common good in the society. However, leading a virtual workforce toward creativity is not an easy task and may even be a chore to some leaders. Various skill requirements for leaders create the demand to craft ways to support leaders in their professional development and growth (cf. Hämäläinen & Vähäsantanen, 2011). The empirical results suggest the need for leaders to support their managers (Study 4) and reveal the benefits for leaders and managers from mutual coaching and collegial support (Studies 3 and 4). Support from superiors and reflective sessions together with colleagues and members from professional networks face-to-face and on social media are two effective ways to maintain leaders' and managers' enthusiasm, creativity, and well-being. Leaders may also utilize skills developed in hobbies like sports teams or musical bands in leading a virtual workforce toward creativity. The results support Adams and Gaster's (2014) claim that it is essential for

leaders to approach their development from the inside out and make structural changes from the bottom up.

In addition, experienced leadership toward creativity in virtual work offers opportunities to take advantage of interpersonal interactions and thus enhance the development of the learning environments. The findings highlight the significance of participatory learning across role boundaries in authentic duties in the digital age. Authentic tasks in virtual work awaken individuals' intrinsic motivation and engage them in working together and developing dialogic know-how.

Furthermore, virtual work challenges organizations, leaders, and employees to continually consider such issues as how individuals' skills and resources can stretch to work collectively toward creativity and novelties. Significant concerns include how and where to find the time and space to enable concentration on certain assignments, how to avoid the common fallacy phenomenon, and how to readjust after unexpected breakdowns. The results of this dissertation indicate that a virtual workforce may be able to work collectively only occasionally to ensure continuous development of resources; meanwhile, the work may be organized in a new way. These circumstances can also mean finding new business models. Organizations can also apply various leadership and employment solutions, because they and their employees differ from one another. These kinds of considerations strengthen the fundamental role of conscious reflection in virtual work both inside organizations among leaders, managers, and employees and in cooperation with partners. Conscious reflection helps both people and firms to navigate the virtual business context as successfully as possible. Further, distributed leadership and changing roles in virtual networked work are crucial and highlighted by heterarchy. These courses of action can enable human beings to recover after intensive and exhausting work periods and rediscover their intrinsic motivation and creativity (Humala, 2017).

7.3 Practical implications

Based on the results, inspiring people and activating their energy, passion, and performance toward creativity in virtual work requires leaders who work in the middle of groups, are genuinely interested in people and their development, and take ample advantage of technologies. As virtual work is becoming more common, the realization of the practitioners' ontological commitment can contribute to a more collaborative and committed virtual workforce and creative and innovative outputs. The results suggest that the heterarchical ontological commitment to leadership can "create prerequisites to use ICT tools to raise the present working culture to the next level focusing on changing

courses of action" and "continuous receiving and giving of feedback to achieve common goals" (Humala, 2016, p. 60). In the new working culture, leadership is coaching and dispersed, people and their interactions are in focus, and the role of technology is to create suitable means for creative interaction.

Table 6 presents an overview of how a coaching and dispersed leadership culture toward creativity can be implemented in different types of case companies studied in this dissertation. The table can help practitioners apply the research findings in practice. It was created by applying at the general level the ideas from soft systems methodology (SSM), which is a systems approach that attempts to understand the fuzzy world of complex organizations and conceive actions to improve the present (Checkland & Poulter, 2006). Table 6 pieces together the structured leadership situations in each company type studied in this thesis, feasible and desirable changes in each company type, and a set of actions for them to improve leadership toward creativity in virtual work. The structured situations of the case companies are based on the analysis in Studies 3 and 4, and they are named as the company types in the typology generated in Study 4: nascent launch pad, collective mind, command center, and leaky boat. Nascent launch pad symbolizes a company type in which leaders aim to reinforce the creativity of a virtual workforce by implementing a hierarchical leadership. A collective mind company has restructured its organization and leadership toward heterarchical integrative leadership while nurturing creativity in a virtual workforce. The command center represents a traditional company type with a hierarchical leadership mode. In a leaky boat company, it is typical that the business objective and leadership culture are perceived as confusing. A leaky boat company is not included in Table 6 because no such case company was involved in Study 4.

Table 6. An overview of implementing a coaching and distributed leadership culture toward creativity in different types of case companies studied in this research

Company type	The structured leadership situation based on the research	Feasible and desirable changes to leadership	Set of actions to improve leadership toward creativity in virtual work
A new start-up company	Nascent launch pad	Implementing a virtual leadership mindset and assertive and coherent organizing principles	Increasing openness in communication and interaction; recruiting the right professionals and developing their knowledge
A start-up with previous experience	Collective mind	Strengthening the role of common vision, collective intelligence, and employee empowerment in leadership	Highlighting the common vision and values; developing tools for mutual communication and participatory learning
An expansive SME	Collective mind	Sustaining cohesion in leadership during the expansion; breaking out of the burdens of history	Putting leadership toward creativity into practice all over the company and updating the skill requirements in virtual work from time to time
A more conventional and growing company	Command center	Updating the working and leadership culture for the digital era	Increasing distributed decision making and transparency; valuing people and their ideas and supporting interaction

For practitioners, the findings highlight the importance of coaching, collective leadership, working culture, and assertiveness and reflectivity for learning and growth and to minimize mistakes in virtual work. Companies and organizations can use virtuality to build a reflective organization, such as by developing multichannel interaction, sharing structured business analysis through ICT, lobbying before decision making, and organizing sessions for reflection as regularly and informally as necessary by using social media tools. Based on the findings, virtual work creates additional demands for leaders to stabilize the daily work by stepping back from complex and changing situations and organizing conscious reflection sessions to manage those situations together. Leaders can also tag essential themes in virtual work and encourage people to join those themes. In addition, new ways of working and leading require unlearning old courses of action. For instance, open discussions about the relations between an organization's history and its future strategic aims can release individuals' curiosity and creativity to shape innovative solutions. The findings also underline the importance of a shared objective and integrating customers and suppliers to commit them everyone toward that common target. The results help practitioners understand

the strong mutual links between leadership, communication and interaction, and learning and growth in virtual contexts; they all need to be developed to encourage creative interaction and improve productivity and competitiveness. Practitioners can also utilize the typology generated in Study 4 in evaluating their work performance and in developing appropriate performance assessment indicators for leaders and employees in virtual work.

The results also have implications for the development of leadership training and coaching and working tools and spaces. The findings indicate that besides being coaches themselves, leaders in practical virtual work need extra support from their own superiors or colleagues to better understand what is unseen in virtual work, retain control over the situation, and foster their own creativity and assertiveness. In virtual work in general, it is essential to specify skill requirements for leaders and employees and to hire the right people for the right positions. To succeed in leading a virtual workforce toward creativity, leaders must pay attention to the recruitment and orientation of their people. Additionally, executive education on coaching and dispersed leadership and skills to orchestrate distributed work needs more attention. Improvement of EI and listening skills in face-to-face and virtual interaction, professional utilization of modern virtual tools, and development of flexible activity-based offices and new mobile and remote ways of working contribute human capital and sustainability in people and business. Particularly in networks of organizations, these issues should be on the agenda as early as possible in the planning phase.

7.4 Recommendations for further research

Creativity is an enormous challenge for everyone; it touches all disciplines in society. To encourage creativity in virtual work, future scholars should explore a deeper and more concrete level in this field of study to find out how to adopt a virtual leadership mindset, respect for collective intelligence, and develop skills, tools, and spaces for social bonding in practice and how practical operative work looks when these key issues are addressed well. Researchers can also focus on the role and importance of the invisible aspects of leaders' work, like the role of events and moments, as well as sensitivity, the ability to listen, and giving space to different views. The ways and tools to take advantage of physical, social, and virtual distances and relationships between people demand more research efforts. Additional empirical evidence and theoretical understanding of these issues can lead to a better understanding of the virtual context and foster reflectivity, critical thinking, and creativity. In addition, knowledge management in virtual work in general calls for future research.

The understanding of leading a virtual workforce toward creativity would be broadened by future empirical studies conducted by several researchers in other fields of industry, in several geographical locations, or using multiple cases, focusing on particular types of companies such as start-ups. Exploring how to use virtuality in the orchestration of networks and longitudinal studies would also be warmly welcomed.

To be able to lead different kinds of people, leaders need to know them well as individuals. One leadership style does not suit everyone, which is also true in virtual work. Because individual people have not been the focus of this research, future studies could focus on leading different individuals in virtual work. For instance, new insights could be found by exploring the links between leading a virtual workforce toward creativity and Kirton's adaptive-innovative (KAI) theory, which suggests that all individuals are creative to a greater or lesser extent and in different ways within their cognitive styles (Kirton, 2003, p. 309). Future scholars could concentrate on developing proper incentives and compensations for people in virtual work. Additionally, research on tools and methods that help foresee individuals' emotional severe baggage in time to avoid frustration, a sense of alienation, demotivation, or burnout in virtual work would be very valuable. Researchers interested in inquiring mindsets may be interested in studying the various virtual work mindsets of different individuals.

Future researchers are strongly recommended to study the outcomes of the coaching and dispersed leadership suggested in this research. Understanding better the outcomes of leadership toward creativity in virtual work is crucial for developing organizations and organizational cultures in practice and optimizing human and other resources for sustainable business and development. Additional empirical and theoretical evidence on leadership toward creativity in virtual work and its outcomes could also fill in the knowledge gaps to construct a theory about leadership toward creativity in virtual work and to establish options for ideological pluralism. For instance, the links between coaching and a shared leadership approach toward creativity in virtual work and sustainable leadership (e.g., Avery & Bergsteiner, 2011) could offer a fruitful path for future researchers.

This research also gives reasons to suggest future studies that use different methodologies in linking leadership and creativity to the reviews about virtual work. For instance, poststructuralist research could offer opportunities to wander through data by writing educative narratives, making observations, and including affect that can be understood as an experience of influence, intensity, and impact (Wetherell, 2012, p. 3). Additionally, collecting, analyzing, and interpreting data through social media could enable an exploration of individuals' mental processes and greater consciousness of the

significance of invisible issues in leading virtual workforces toward creativity and illuminating them.

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APPENDICES

Appendix 1

STUDY 2: THEMES OF THE SEMI-STRUCTURED INTERVIEWS

1. Background information about the interviewee's current job and career history and the values and beliefs of the work organization

2. Collaborative dispersed work, virtual work, virtual communication tools as well as creativity and dynamism in virtual work – special characteristics, priorities, challenges

3. Leadership in virtual work in general – special characteristics, priorities, challenges

4. Nature of leadership that stimulates creativity among virtual workforce – special characteristics, priorities, challenges

5. Meanings of leadership toward creativity and dynamism in virtual work and its influences and outcomes

6. Possible other relevant issues

Appendix 2

STUDY 3: THEMES OF THE SEMI-STRUCTURED INTERVIEWS

1. Background information about the interviewee, his/her work organization and the reasons he/she has joint the case partnership startup

2. The interviewee's understanding of the aims and business opportunities of the case startup and his/her experiences of the business so far

3. Experiences of mutual interaction, team dynamics and the ways and tools for collaboration

- The roles of the key persons
- Experiences of the physical distances
- Experiences of the exploitation of different expertise
- Factors that promote interaction and team dynamics
- Challenging factors in interaction and team dynamics

4. Collaboration in the startup with its customers, and tools for customer interaction

- Factors that promote collaboration with customers
- Challenging issues in collaboration with customers

5. Leadership in the partnership startup and the ways and tools for interaction among key persons

- Ways how leadership arises and develops
- Essential factors in leading virtual collaboration in the partnership startup
- Challenges in leadership
- Needs to develop leadership in virtual work

6. Ways how creativity is connected to virtual collaboration and leadership and how it can be utilized

7. Possible other relevant issues

Appendix 3

STUDY 4: INTERVIEW INSTRUMENT

1. Background information about the interviewee and the case company
    - The interviewee's role(s) at work, duties, work history in brief
    - Description of the company/work organization, its values, visions and aims

2. Experiences of leadership toward creativity by leaders and employees
    - How would you describe leadership in virtual work in your company currently? What kind of leadership task do you consider it? How do you experience it?
    - How do you describe good leadership in virtual work? In which kinds of situations does it arise? How do you experience and feel it? How does it differ from good leadership in general?
    - How do you describe leadership toward creativity in virtual work? What are the main characteristics in such leadership? Where, when and in which kinds of situations does this kind of leadership arise and how? Which personal characteristics of leaders are significant in inspiring creativity among a virtual workforce?
    - How can an individual become a source for creativity and energy for others in virtual work?

3. Contextual and organizational issues influencing creativity and its use in virtual work
    - e.g., organization structure and processes; work culture, communication, interaction; resources allocated to leadership, and virtual and physical settings and tools

3. Outcomes generated by leadership that foster creativity in virtual work
    - How is leadership toward creativity reflected in leaders/employees/business partners/customers in your company?
    - What kinds of outcomes have you noticed? How? To whom?
    - Which outcomes do you see the most significant? How? Why?

4. Possible other relevant issues

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2. Humala. I. (2016). Heterarchial ontological commitment for leaders to stimulate creativity among virtual workforce. *Nordic Journal of Business, 65*(2), 45–65, http://njb.fi/wp-content/uploads/2016/09/Humala.pdf

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