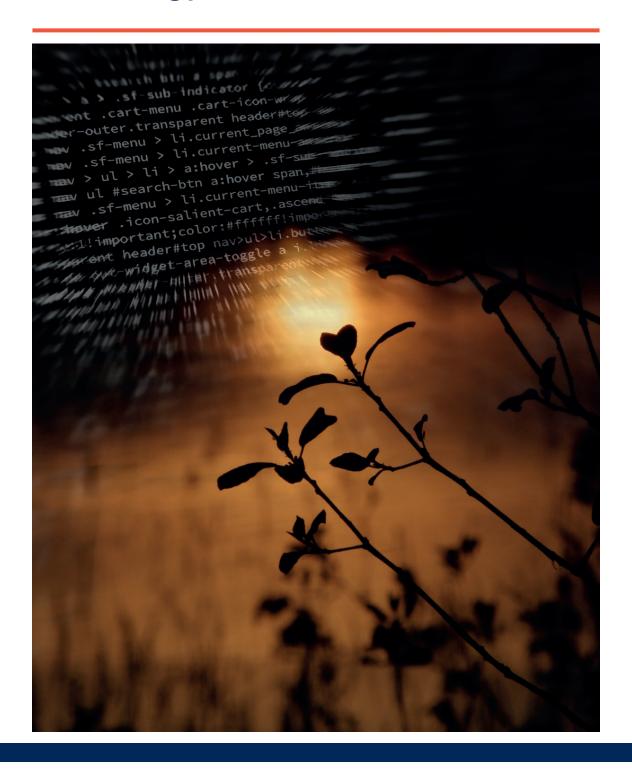
Soila Lemmetty

"Self-learning is present every day - in fact, it's my job"

Self-Directed Workplace Learning in Technology-Based Work



JYU DISSERTATIONS 243

Soila Lemmetty

"Self-learning is present every day - in fact, it's my job"

Self-Directed Workplace Learning in Technology-Based Work

Esitetään Jyväskylän yliopiston kasvatustieteiden ja psykologian tiedekunnan suostumuksella julkisesti tarkastettavaksi Agoran auditoriossa 2 syyskuun 4. päivänä 2020 kello 12.

Academic dissertation to be publicly discussed, by permission of the Faculty of Education and Psychology of the University of Jyväskylä, in building Agora, auditorium 2, on September 4, at 12 o'clock noon.



JYVÄSKYLÄ 2020

Editors Markku Leskinen Department of Education, University of Jyväskylä Päivi Vuorio Open Science Centre, University of Jyväskylä
Cover picture photographed by Harri Lemmetty and edited by Karoliina Vaararinne ("code" by Pexels).
Copyright © 2020, by University of Jyväskylä
Permanent link to this publication: http://urn.fi/URN:ISBN:978-951-39-8196-9
ISBN 978-951-39-8196-9 (PDF) URN:ISBN:978-951-39-8196-9

ISSN 2489-9003

ABSTRACT

Lemmetty, Soila Self-directed workplace learning in technology-based work Jyväskylä: University of Jyväskylä, 2020, 108p. (JYU Dissertations ISSN 2489-9003; 243) ISBN 978-951-39-8196-9 (PDF)

This study focuses on the nature of the self-directed learning (SDL) at work. The aim of this study was to develop a sociocultural understanding of the concept of self-directed workplace learning (SDWL) by examining the nature of the SDWL phenomenon in technology-based work. The study examined SDL in Finnish technology organizations through three research questions: How self-directed learning is described in the context of technology-based work? How does selfdirected learning as sociocultural phenomenon emerge in technology-based work? What kinds of sociocultural frames are linked in self-directed learning in technology-based work? This study utilizes an ethnographic research strategy based on observations and interviews. Three Finnish technology organizations participated in the study. Data were collected due fieldwork. Observations were written in a field diary and interactions recorded as field recordings. In addition, interviews were conducted with 46 employees in the target organizations. Discourse analysis, thematic analysis and ethnographic analysis tools were used as analytical methods. The results showed that SDWL is a sociocultural and paradoxical phenomenon. Although the role of the individual is important in the sociocultural context, the possibility for and nature of SDWL depends on situational, contextual, collective, cultural and structural factors in organisations. SDWL can produce creativity and manifest as a productive phenomenon but it can also be a burden and thus a problematic phenomenon. A key issue is how SDWL is enabled and supported in organizations from a sociocultural perspective. The study contributes theoretically, as the results question the utility of examining SDL as individual phenomenon. SDL is based not only on the abilities of individuals, but on the environment in which it is expected to occur. Moreover, the positivity of the phenomenon of SDL can also be questioned, as it seems that SDL can, at worst, manifest as a stressful and problematic phenomenon. For practice, the findings can help workplace actors, managers and supervisors to address the opportunities and challenges of SDL in working life, and thereby develop organizational structures, cultures and practices that support the positive benefits of SDL in organizations. Societal level, this study offers new understanding to the challenges of individualism.

Keywords: self-directed learning, andragogy, workplace learning, creative activity, ethnography, technology-based work

TIIVISTELMÄ

Lemmetty, Soila Itseohjautuva työssä oppiminen teknologia-alan työssä. Jyväskylä: Jyväskylän yliopisto, 2020, 108p. (JYU Dissertations ISSN 2489-9003; 243) ISBN 978-951-39-8196-9 (PDF)

Tämän väitöskirjatutkimuksen kohteena on aikuisten itseohjautuva oppiminen työelämässä. Tutkimuksen tavoitteena on lisätä ymmärrystä itseohjautuvan työssä oppimisen sosiokulttuurisesta luonteesta. Tähän pyritään tarkastelemalla itseohjautuvaa oppimista teknologia-alan työssä kolmen tutkimuskysymyksen kautta: Miten itseohjautuvaa oppimista kuvataan teknologia-alan työssä? Miten itseohjautuva oppiminen sosiokultturisena ilmiönä ilmenee teknologia-alan sosiokulttuurisia kiinnittyy Millaisia raameja itseohjautuvaan oppimiseen teknologia-alan työssä? Tutkimuksessa on hyödynnetty etnografista tutkimusstrategiaa, jonka mukaisesti aineisto koostuu kolmesta kohdeorganisaatiosta havainnointihaastatteluaineistosta. kerätystä ja Kenttätyön tehdyt havainnot kirjattiin aikana kenttäpäiväkirjaan vuorovaikutustilanteita tallennettiin kenttätallenteiksi. Haastattelut (N=46) toteutettiin puolistrukturoituina teemahaastatteluina. Aineistot analysoitiin diskurssianalyysin, teema-analyysin sekä etnografisten analyysimenetelmien avulla. Tulokset osoittivat, että itseohjautuva työssä oppiminen on sekä sosiokulttuurinen että paradoksaalinen ilmiö. Yksilön rooli sosiokulttuurisessa kokonaisuudessa on huomionarvoinen, mutta mahdollisuudet itseohjautuvalle oppimiselle sekä oppimisen luonne riippuvat useista tilannekohtaisista, kontekstuaalisista, kollektiivisista, kulttuurisista sekä rakenteellisista tekijöistä organisaatioissa. Itseohjautuva työssä oppiminen voi edistää luovuutta ja ilmetä tuottavana, mutta se voi myös muodostua kuormittavaksi ja ongelmalliseksi ilmiöksi. Oleellista itseohjautuvan oppimisen luonteen osalta on se, millä tavalla oppimista mahdollistetaan ja tuetaan organisaatioissa. Tutkimus tarjoaa itseohjautuvan teoreettisesti uutta ymmärrystä oppimisen monipuolisena sosiokulttuurisena ilmiönä sekä tuottaa uudenlaisia analyyttisiä lähtökohtia itseohjautuvan oppimisen tutkimiseen. Tutkimuksen tuloksia voidaan hyödyntää käytännön työelämässä kehitettäessä oppimista tukevia käytäntöjä, johtamistoimintaa, rakenteita ja kulttuuria. Tutkimus tarjoaa lisäksi ymmärrystä ja keskustelua itseohjautuvuudesta laajempana yhteiskunnallisena ilmiönä.

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ACKNOWLEDGEMENTS

In February 2015, I exited the catering and restaurant work to take maternity leave. At that moment, I decided to close one door in my life - I would not be going back into the restaurant business. However, I did not foresee that I would relive those experiences and memories with increasing excitement. Over the past four years, I have again reviewed my 8-year history of restaurant work but through the spectacles of a working life researcher. I have drawn on those earlier years in developing my understanding of workplace learning, leadership, teamwork, organizational cultures and situations - the meanings of words and deeds. Although, five years ago, I imagined that my years in the restaurant work had given me a few (very important) human relationships and a professional chef's cooking skills, and that was the end of it, I have since reversed this notion. Those years in the restaurant business laid the foundation for where I am now, as I write these words.

The last four years, occupied with my PhD project, work, family and friends, have passed quickly. I feel joy, pride, longing, and humble gratitude to all the people without whom this work would never have begun, or, more importantly, seen its end. First, my boundless gratitude goes to the main supervisor of my dissertation, Associate Professor Kaija Collin, for guidance, mentoring, friendship and all the insane experiences at work and alongside it. One like me who ruthlessly charges ahead, who wants answers right away and things done now, needs a supervisor, whose calming presence provides the backdrop for better outcomes and, if necessary, good reason for taking time out. However, the best things about our working together are the moments of collective state of enthusiasm in which there seems to be no end of the formation of new and better ideas. Those ideas create outcomes which we can both be proud of. This dissertation is one of them. I have been privileged to receive guidance from someone who has strong expertise and leadership skills, but is also encouraging and ever willing to offer support.

I am grateful for my supervisor, Senior Lecturer Susanna Paloniemi, for her tremendous support and for all the moments she spent helping me clarify my thoughts. Everyone should have a person like Susanna close by who can undo knots when they seem at their tightest. I want to thank also my supervisor, Doctor Ulla Maija Valleala, for all her feedback and supportive boosts that I received along the way in both writing my articles and this summary. Many thanks also go to Associate Professor Vlad Glaveanu for my memorable research visit to the University of Webster, Geneva. Six weeks is a short time, but with inspiring and knowledgeable guidance, watching Mont Blanc, I learnt more about creativity during that time than during all the previous years in total. Thank you for shared moments at lunch and numerous discussions about what the future of creativity looks like.

I express my special thanks to Docent Anu Kajamaa and Professor Stephen Billet, the pre-examiners of my work, for their careful and important review as well as excellent detailed and constructive feedback, which was central in putting the finishing touches to my work. In addition, I am grateful for Anu for agreeing to act as my opponent.

During my doctoral studies, I have worked in different jobs, communities and teams. They have all been invaluable to my career, my dissertation and to myself as a person. I am grateful to the Open University of the University of Jyväskylä, for providing me with my first contact with university studies and, after graduating with a master's degree, with work as an educational coordinator. I especially thank educational manager Paula Savela for her trust and for giving me the opportunity to be involved in the TRY-project. I also express my warmest thanks to the Institute of Educational Leadership - especially to the head of the Institute Mika Risku and to the educational manager Anu Sopanen, for offering me the work experience, one in which I learned so much about Finnish education policy, educational leadership and education systems.

For two important years, I was able to do working life research as a project researcher in the HeRMo project. This project became a learning journey for me, in which I was able to grow and test my limits both as a researcher and as a member of the team. My huge thanks go to research group members Kaija Collin, Panu Forsman, Sara Keronen, Sanna Herranen, Tommi Auvinen, Elina Riivari and Marianne Jaakkola. The multidisciplinary nature of our team has been an asset in my own work and your expertise has been an invaluable support for my own development. Many thanks to each of you for sharing your thoughts and collegiality with me, and for your endurance of me and my lists.

I would also like to thank all the people in the unit of education and adult education at the University of Jyväskylä, for a homely, safe, inspiring and collaborative atmosphere. I especially want to thank Professor Anna Rönkä for being a member of the follow-up group of my doctoral studies and for all her kind words. In additionally, university lecturer Anita Malinen deserves my thanks for the enlightening discussions about self-directedness. My gratitude goes also to the head of the Department of Education, Leena Halttunen and to the secretaries and coordinators in our University, for all kinds of practical arrangements and answers to thorny questions. I want to express my thanks to Michael Freeman, who did an excellent and careful job of checking the language of my dissertation. I also thank Markku Leskinen for academic editing of this work. I feel honoured that my research and related mobility have been funded by Faculty of Education and Psychology (University of Jyväskylä), Department of Education (University of Jyväskylä), Finnish Work Environment Fund (TSR), Finnish Concordia Fund and Foundation for Economic Education.

Ethnographic working life research cannot be done without committed participating organizations. I want to express the huge thanks to all the employees and leaders of the target organizations who took part in the interviews and discussions and allowed me to observe their work and, as a result, dive into the daily practices, processes and projects of working life. HR managers, with whom I was able to share many thoughts, deserve special thanks for their trust.

I send greetings to Toivakka, my own small bubble where I can live just like I want. A place from where I can take off to the ends of the world and always

come back and feel safe. Toivakka is not only a place to live, but it is the place that connects me, year after year, with the most important friends I have. Friends to have fun with, to share joys and sorrows with, friends who know that I was not neglecting them during the years when I was rushing about. You know who you are. I want to say a huge thanks to Suvi and Janette for lifelong friendship, from our childhood days in the playgrounds to unbelievable tours all over in Finland.

Last but not least, my family deserves special thanks. First, I want to say thanks to my mummu, for giving me the opportunity to understand the time before me, so that I can understand the present. I want to thank Pertti for the inspiration that your life attitude, encouragement and helpfulness produce. I am grateful to Sanna and Make for your selfless help and ever-full coffee pots. I want to say a big thanks to Iskä, Leena, Sonja and Sofia for your support and numerous memorable evenings with lively discussions. Thanks to my brother, Hene, that my early skills at fighting back grew as they did and to Kati, without whom I would never have started studying at the university. Special thanks to my sister Karo for endlessly supporting my, from time to time weak, self-confidence. You and your family have often saved me from my own nerves. Äiti, you are always available, day or night, your support is infinite. And to the men of my life, Harri and Eemil, thank you for showing your love and strong trust. Sometimes life goes on in minor chords, sometimes in major chords. You two keep my life in harmony – and this is how it must be ever after.

The year 2020 has taught us that life is nothing without a sense of community. Even if we live and learn self-directedly, we always do it for each other - not only for ourselves - in the end.

Toivakka, in voluntary isolation at home with the boys, 30th of April 2020

Soila Lemmetty

ORIGINAL PAPERS

The study is based on the following publications, which are referred in the text as follows: "Lemmetty & Collin, 2019", "Lemmetty & Collin, 2020" and "Lemmetty, 2020".

- Article 1 Lemmetty, S. & Collin, K. (2019). Self-directed learning as a practice of workplace learning. Interpretative repertoires of self-directed learning in ICT work. *Vocations and Learning*, 13, 47 70. https://doi.org/10.1007/s12186-019-09228-x
- Article 2 Lemmetty, S. & Collin, K. (2020). Self-directed learning in creative activity: An Ethnographic study in technology-based work. *Journal of creative behaviour*, early online: https://doi.org/10.1002/jocb.438
- Article 3 Lemmetty, S. (2020). Employee opportunities for self-directed learning at technology organisations: Features and frames of self-directed learning projects. *Studies in Continuing Education*, early online: https://doi.org/10.1080/0158037X.2020.1765758

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FIGURES

FIGURE 1	Theoretical approach, frameworks and perspectives of the study30	J				
FIGURE 2	Levels of examination of the research interests	2				
FIGURE 3	The relationship between the empirical sub-studies and the					
	overarching research questions32	2				
FIGURE 4	Ethnographic research design of the study39	9				
FIGURE 5	Sociocultural and paradoxical nature of SDWL64	4				
TABLES	TADIEC					
IADLES	•					
TABLE 1	The organizations participating to study4	4				
TABLE 2	Data of the study4	6				
TABLE 3	Interviewees of the study48	8				
TABLE 4	Analysis of the study49	9				
TABLE 5	Introduction to the findings of the sub-studies	5				
	Summary of the main findings in relation to the overarching research					
	questions	2				

CONTENTS

ABSTRACT
TIIVISTELMÄ
ACKNOWLEDGEMENTS
ORIGINAL PAPERS
FIGURES AND TABLES
CONTENTS

1	INT	RODUCTION	13
	1.1	Frameworks behind the study - from the individual viewpoint to	оа
		sociocultural approach	
		1.1.1 Andragogy	
		1.1.2 Workplace learning	
		1.1.3 Creativity and creative activity	
	1.2	Three perspectives on the concept of SDL	
		1.2.1 Self-directed learning as practice	
		1.2.2 Self-directed learning as process	
		1.2.3 Self-directed learning as projects	
	1.3	Summary of the theoretical approach, frameworks and perspecti	
		of the study	
	1.4	Research aim, questions and sub-studies	
2	ME	THODOLOGY	35
	2.1	Ethnographic framework	35
	2.2	Epistemology and ontology	37
	2.3	Ethnographic research as a process: how did I put it into practice	?.38
	2.4	Technology organizations as contexts of the study	40
		2.4.1 The diverse structures and practices of organizations	41
		2.4.2 The expectation of self-directed learning in organizations	41
		2.4.3 Technology as a source of creativity: "Beautiful code" and	new
		solutions	42
		2.4.4 Target organizations of the study	43
	2.5	Data of the study	45
	2.6	Analysis of the study	
		2.6.1 Discourse analysis yields knowledge about practice and	
		culture	50
		2.6.2 Thematic analysis as a method to support ethnographic	
		research	51
		2.6.3 Ethnographic analysis as a tools for examining practices as	nd
		cultures	

3	FIN	DINGS	54
	3.1	Sub-study I: Interpretative repertoires of self-directed learning as a	l
		practice of workplace learning	56
	3.2	Sub-study II: Manifestations of self-directed learning processes in	
		creative activity	58
	3.3	Sub-study III: Occurrences of self-directed learning projects and	
		frames in technology-based work	
	3.4		
		the phenomenon of self-directed workplace learning	62
4	DIS	CUSSION	65
-		Sociocultural nature of SDWL	
		4.1.1 Individual and collective SDWL	
		4.1.2 Contextual and situational SDWL	
		4.1.3 Culturally and structurally framed SDWL	
	4.2		
5	CON	NCLUSIONS	74
		Evaluating the research process from the point of view of ethics an	
	0.1	trustworthiness	
	5.2	Theoretical, practical and societal implications	
	5.3		
ΥHΊ	ΓΕΕΝ	VETO	82
REF	EREN	NCES	87
ORI	GINA	AL PAPERS	

1 INTRODUCTION

Self-directedness, work and learning - the concepts that are combined in this dissertation - are nowadays more important than perhaps ever before. As the nature of work changes, working life practices and demands, problems and solutions have become topics of intense debate in society. As problem-solving and expertise-driven (creative) work replace simple routine tasks, advances in technology create new jobs, tools and forms of action (Harteis, 2017) and requirements for faster and higher quality work (Noe & Ellingson, 2017). At the same time, an ethos of individualism is prevalent in society (Beck, 2016; Harris-Boundy & Flatt, 2010) meaning that work represents the fulfilment of individual needs, responsibilities and autonomy (Noe & Ellingson, 2017). These changes in work and society have brought the phenomena of employee learning and selfdirection into the debate on working life. Self-directed learning (SDL), which emphasizes learners' responsibility in different learning situations (Lindeman, 1926; Knowles, 1975), has become a requirement in today's working life (Bell, 2017) for four grounded reasons: 1) technological changes force employees to develop and learn more and more faster (Harteis, 2017); 2) learning is strongly embedded in daily work itself (Collin, 2006; Germain & Grenier, 2015; Ha, 2008; Milligan, Fontana, Littlejohn & Margaryan, 2015; Yeo, 2008); 3) the responsibility for work and learning have shifted from organizations to individual employees and teams (Ellinger, 2004; Noe & Ellingson, 2017; Rigby & Ryan, 2018); and 4) SDL has mainly been described as a phenomenon enhancing the motivation, creativity and productivity (Edmondson, Boyer & Artis, 2012) of individual and whole organization (Davis & Daley, 2008; Guglielmino, 2008).

In light of these requirements, the employee is often expected to be as naturally self-directed (Usher & Johnson, 2006), a motivated learner for whom learning is inherently a positive and rewarding phenomenon. Such expectations are, however, problematic for four reasons. First, even in an era of individualism, learning is not a phenomenon independent of context and culture (Baskett, 1993; Bell, 2017). Second, self-directedness is not only an ability which can 'just move' from one situation to another (Candy, 1991; Usher & Johnsson, 2006). Third, SDL

is not necessarily a solely positive phenomenon (Bell, 2017; DeRue & Wellington, 2009; Kirjonen, 2005). Fourth, research on the sociocultural nature of SDL in contemporary working life remains limited (Artis & Harris, 2007; Baskett, 1993; Bell, 2017; Candy, 1991; Song & Hill, 2007).

The concepts of self-directedness and SDL derive from adult education and andragogy theories. SDL has been largerly described in terms of the individual's skills and skill level, personality, ability and motivation (Guglielmino, 1977; Guglielmino, 2008; Grow, 1991; Merriam, 2001; Raemondoc, Thjissen & de Greef, 2017; Schmidt & Hunter, 1998; Zacher, Kooij & Beier, 2018; Zhoc & Chen, 2016). Training adults to be 'self-directed' has also been a goal of adult education (Candy, 1991; Garrison, 1997; Merriam, 2001). However, this dominant aspect of self-directedness has been criticized over the years for implying that individuals are autonomous and their learning emerge independently, detached from the others and from the environment (Bell, 2017; Candy, 1991; Merriam, 2001). Some researchers have shown that self-directedness is also determined by the individual's situation and the environment (Bell, 2017; Foucher, 1995) and have called for a shift in attention away from the characteristics of the individual to SDL as a wider phenomenon and to the different situations of individuals, groups and organizations (Artis & Harris, 2007). At the same time, there has been a call for more critically oriented research: learning or self-direction at work is not solely a positive phenomenon (Järvensivu & Koski, 2012; Kirjonen, 2005; Ohlsson, 2001). Learning can sometimes be detached from an individual's personal choices (Arnesson & Albinsson, 2019) and may lead to a conflict between one's own needs and the goals of the environment (Järvensivu & Koski, 2012). The mechanism behind this negative aspect related to learning is not precisely known, even it has been said that in organisations "it is the managers who direct what to learn" (Arnesson & Albinsson, 2019, 146). Thus, when considering SDL, the focus should be on the sociocultural nature of the phenomenon, as this is the way to define the concept of SDL holistically and hence understand its multidimensional nature, issues and frames (Baskett, 1993).

In this study, SDL is not approached as an attribute of the individual, but as a sociocultural phenomenon and thus involves looking also at collective activities and the frameworks created by the environment, situation and contexts. Such a sociocultural examination does not eliminate the significance of the individual but integrates the individual's perspective into the sociocultural whole. Drawing on the SDL research literature, this study examines the concept of SDL based on the framework of andragogy and the perspectives of SDL as practice (Khiat, 2017; Tough, 1971), process (Brocket & Hiemstra, 1991; Knowles, 1975; Knowles, Holton & Swanson, 2012; Raemondock et al., 2017) and project (Artis & Harris, 2007; Clardy, 2000; Tough, 1971). These perspectives have been chosen because they have an empirical and theoretical background in SDL research and through them, SDL can be viewed from different levels: as a broad practice, as progressive processes, and as situational projects. Together, they provide an opportunity for diverse observation of the phenomenon. According to this basis, learning concerns and activates the learner in many ways (Knowles

et al, 2012; Kolb, 1984). Because the sociocultural approach is partially missing from these andragogy-based SDL perspectives, this study also applies the theoretical frameworks of practice-based workplace learning (e.g. Billett, 2001; Collin, 2006; Gherardi, 2006) and creative activity (e.g. Glaveanu, 2011). These frameworks are appropriate to use in the present study, as some previous studies (e.g. Gerber, Lankshear, Larsson & Svensson, 1995; Edmondson, Boyer & Artis, 2012) have found SDL to be intertwined with workplace learning and creativity and because in this study SDL is explored in the contexts of workplace learning and creative activity situations. In summary, to answer the research questions, this study aims to develop a sociocultural understanding of the concept of SDL at work. In the study, SDL at work becomes the concept of self-directed workplace learning (SDWL), the nature of which the study strives to describe. Through this theoretical contribution, knowledge and new understanding on the themes of self-directedness, learning and working life can be constructed for use in society for supporting organizational development as well as employee learning and well-being.

Over the years, while self-directedness has received much attention in formal adult education, it has also from time to time, been considered in working contexts. It has very often been seen as a conscious goal or way of action in socalled "self-directed" learning situations, such as e-learning and online learning (Agonács & Matos, 2019; Canter, 2012; Conn, 2000; Song & Hill, 2007). The concept of self-directedness has also been taken into account in the contexts of self-organized organizations (Lee & Edmondson, 2017; Salovaara & Bathurst, 2016), problem-based learning situations (Cox, 2002; Loyens, Madga & Rikers, 2008) or situations where the individual is initially thought to act in a clearly selfdirected manner. Thus, while often seen as a somewhat separate and distinct entity, in reality, as the responsibility and active role of individuals and groups, SDL is integrated into everyday work and activities - including day-to-day learning (Yeo, 2008). It is not the opposite of informal or even formal learning, as all forms of learning can include self-directed elements (Artis & Harris, 2007; Clardy, 2000). For this reason, this research focuses on the most authentic situations and descriptions of everyday work: the phenomenon of SDL is present, whether we are aware of it or not.

SDL studies have mainly utilized quantitative methods (see e.g., Artis & Harris, 2007; Guglielmino, 2008; Raemondoc et al., 2017; Raemondock et al., 2013; Stockdale, 2003) and previous qualitative studies have mostly focused on interviews (e.g., Foucher, 1995; Foucher & Brezot, 1997; Kops, 1997). Studies have addressed individual factors (Guglielmino, 2008; Clardy, 2000; Cnossen, Loots and Witteloostuijn, 2019; Merriam, Baumgardtner & Caffarella, 2007) and skills (Blaschke, 2012; Hase & Kenyon, 2000) or surveyed the number and duration of different learning processes (Brockett & Hiemstra, 1991). More studies from the contextual-, situational- and cultural-based perspectives have been called for (Confessore & Kops, 1998), the aim being to generate a more comprehensive picture of the phenomenon (Baskett, 1993). To this end, versatile research methods have been proposed (Pintrich, 2004), especially qualitative (Artis &

Harris, 2007) and observational methods (Baskett, 1993). In this study, this methodological gap has been addressed through the application of an ethnographic research method (Hammershey & Atkinson, 2007), including data based on observations (Davies, 1999). An ethnographic approach can help reveal the sociocultural nature (Rumrill & Bellini, 2017; Collin, 2005; Hammershey & Atkinson, 2007) of learning by concentrating on interactions and activities among individuals and groups and in the contexts and cultures in which the target activities are manifested. In an ethnographic research project, data collection, analysis and interpretations are intertwined (Davies, 1999). The process could be described as continuous hermeneutical interpretation (Tikkamäki, 2006), which, in the present case, including the stages of observation and interviewing, furthering theoretical understanding, and formulating the research findings, took four years.

Organizations spend a lot of money each year on formal training and courses, though these are not seen as the sole key to supporting employee learning (Livingstone, 2008; Bunch, 2007). According to Billett (2014), human resource developers should also understand the potential for learning in employees' daily work, daily activities and interactions. Measured as success in the workplace, the most important way to support employee learning is both by providing formal training and by enabling everyday learning at work (Spaan, Dekker, van der Velden & de Groot, 2016; Slotte, Tynjälä & Hytönen, 2004). While the concept of self-directedness seems easy to understand in practical working life, it is also partly misleading and therefore inadequately understood. Selfdirectedness in working life has sometimes been talked about in the Finnish media and literature only as an aspirational phenomenon (Salovaara, 2018), or as a natural skill or trait of adult humans (Martela & Jarenko, 2018). Such one-sided discourse can lead to dubious organizational practices and solutions, such as those noted in the Finnish media: the drive for self-directedness has eroded organizational hierarchies and leadership (see Yle, 2018) and led to a focus on valuing employees with the best "self-management skills" (see Kauppalehti, 2018). However, it can be problematic for companies if self-directedness is used to eliminate managerial and employee support (see Kauppalehti, 2019; Yle, 2018). Thus, the general debate on self-directedness has partly lacked close scrutiny and research-based understanding; instead, attention has been paid to ideas based on successful experiments by individual actors or companies (Collin & Lemmetty, 2019). In developing working life, it would be important to first understand the nature of both self-directedness and learning as phenomena (Loftus & Higgs, 2010), and only then to look at organization-specific practices and solutions that enable people and businesses to succeed.

As already mentioned, the notions of collectivity and sociocultural frames have been explored in SDL research, but a comprehensive picture of the sociocultural nature of SDL which combines different perspectives of SDL at work is lacking. Next, I present the frameworks and perspectives adopted in this study in more detail and conclude with a summary of these.

1.1 Frameworks behind the study – from the individual view-point to a sociocultural approach

The concept of SDL, that emphasizes the responsibility and active role of learners in a learning situation, is at the heart of this research. Other, similar concepts have been used in workplace research, such as autonomous learning (Noe & Ellingson, 2017), self-learning (Ha, 2008), self-regulated learning (SRL) (Pintrich, 2004), agency (e.g Goller & Paloniemi, 2017; Raemdonck et al., 2017) and selfmanagement (Lee & Edmondson, 2017). This multiplicity of terms is understandable in an era when employees have increasing responsibility for making decisions related to their work (Ellinger, 2004), including how much time they spend on learning at work (Bell, 2017). All of the above-mentioned concepts share the idea that actors have an important role in relation to their own action (London & Mone, 1999). Nonetheless, these concepts differ in their background and use. For example, the concept of self-management derives from organizational and leadership research (e.g., Lee & Edmondson, 2017; Salovaara & Brathurst, 2018) and refers to the individual's ability to lead and organize his or her own activities (Neck & Mantz, 2013). Self-regulated learning has evolved within the discipline of psychology and is based more on metacognitive components of self-monitoring (Raemdonck et al., 2017). Personal agency underlines the importance of individual choice and decision-making (Raemdonck et al., 2017). Compared to these concepts, SDL is more often used in adult education (e.g., Loyens, et al. 2008; Raemondock et al., 2017) and refers more strongly to the responsibilities of actors in relation to learning.

SDL has been largely described as an ability or attribute of the individual (e.g. Guglielmino, 2008), as a goal itself (Merriam, 2001) or as a skill to be developed (Blache, 2012; Brockett & Hiemstra, 1991; Knowles, 1975; Raemondock et al., 2017). From the beginning, the tradition of SDL research has been based on the argument that self-directedness is a feature of adult human beings (Lindeman, 1926). However, the need to take into account not only the characteristics, practices, acts or motivational issues of the individual but also the importance of the learning environment and collaboration, has also be been proposed (Loyens et al., 2008). In SDL research, the concept of SDL has been criticized for giving a picture of learning as an individual and unsupported phenomenon, despite also being associated with a collectivity (Loyens et al., 2008; Maehl, 20000), contexts and cultures (Brockett & Hiemstra, 1991; Candy, 1991). Thus, it is a sociocultural phenomenon, according to which learning is the result of interaction with others and the environment (Vygotsky, 1978).

Despite the emphasis in SDL on the learner's responsibility for his/her own learning and taking into account the sociocultural nature of learning, the importance of external frames for SDL is not neglected. For example, autonomy has been a topic of debate in research on SDL. According to Candy (1991), an individual's possibilities to learn self-directly depend very much on the level of autonomy - no one can be self-directed in a situation without some level of

autonomy. In turn, Merriam and Caffarella (1999) claim that autonomy should not be a necessary concept for in SDL, as complete autonomy is not always possible. For others, SDL does not exclude seeking or receiving help from others in a learning situation (Brookfield, 1993). Bell (2017) has emphasized that, in learning situations, support is as essential as autonomy.

SDL is based on the framework of andragogy (Lindeman, 1926; Knowles, 1975), which has been described as an adult learning theory but has mostly been studied from an individual perspective (Artis & Harris, 2007; Candy, 1991; Knowles, 1975). To develop a sociocultural understanding of SDL, I apply the sociocultural approaches provided by the frameworks of practice-based workplace learning and creativity. Next I present these important frameworks behind the study.

1.1.1 Andragogy

"You don't learn technical tasks in school, it (learning) is joining the team, sticking your nose in everywhere and turning over stones to see what is underneath"

(Interview citation, Developer)

Andragogy has been described as an adult learning theory or approach (Knowles, 1975). It is based on experiential and constructivist perspectives on learning, in which learning is seen as a functional process that concerns and activates the learner in many ways and as the continuous construction of one's own knowledge (Knowles et al., 2012; Kolb, 1984). Since the early days of the concept, andragogy has been characterized by different schools of thought (see Taylor & Kroth, 2009). The andragogy of Malcom Knowles (1975; see also Knowles et al., 2012) emphasizes an individualistic and pragmatic approach to adult learning, whereas Eduard Lindeman (1926) saw adult learning goals as more societal and socially productive.

However, a key starting point in developing andragogy has been the separation of adult learning from children's learning, i.e. pedagogy (Knowles, 1970; Merriam & Caffarella, 2000; Taylor & Kroth, 2009). In andragogy, this difference was initially described by five factors: 1) adults are motivated to learn through experience, needs and self-interest; 2) adult learning orientation is broadly based on aspects of life; 3) experience is the richest resource in adult learning; 4) adults have a natural need for self-direction; and 5) individual differences between people increase with age (Lindeman, 1926). The starting points for andragogy are largely based on the psychological definition of adulthood, which defines adulthood by the extent to which one takes responsibility for one's own life (Mezirow, 1990). Hence, one of the basic reasons for distinguishing adult learning from children's learning has been the idea that an adult is naturally self-directed, has an independent self-image, is able to direct his or her own learning, has lived experiences, and is problem-driven and motivated by internal rather than external factors (Knowles, 1980). Thus, adult education was based on the idea that adults who are responsible for their own

lives in other ways are able to act in a self-directed way and to control or at least assist in their own learning (Knowles, et al., 2012).

Over the years, the theory of andragogy has met with criticism (see Holton, Swanson & Naquin, 2001). One such criticism has been whether andragogy should be considered as a theory of adult learning at all but rather a description of what an adult learner should be (Hartree, 1984). In addition, it has been questioned whether self-directedness is an attribute typical only of an adult, as adults can be highly dependent on structures and highly motivated by external factors (Merrictm, Moot & Lee, 1996), and children often learn out of sheer curiosity (Merriam, 2001). Because of these criticisms, more advanced descriptions have seen andragogy and pedagogy as a continuation of the teacher-orientation but in the direction of a learner-orientation rather than as the two in confrontation (e.g. Canning, 2010; Knowles, Holton & Swanson, 1998).

The strongest criticism, which extends beyond the present-day selfdirectedness debate, is that self-directedness and andragogy have not been properly considered as a context-specific or situational phenomenon. On the contrary, in Knowles's (1980) andragogy, the fact that everyone is shaped by their culture and community was overlooked (Merriam, 2001). According to Grace (1996), Knowles described an adult learner as an individual who behaved in a certain way, regardless of the environment or situation. The goals of andragogy also appeared to be strongly individual-driven, rather than social or collective. However, this criticism has been defended from the philosophical point of view. Holton, Swanson & Naguin (2001) state that the humanistic philosophy behind andragogy (see Knowles, 1989) is primarily concerned with the self-actualization of the individual while pragmatic philosophy (see Dewey, 1993; Lindeman, 1926) values knowledge from experience rather than formal authority. Although the goal of andragogy is not societal change but individual change, it does not mean that the learner should be regarded as a completely individual and autonomous actor.

Knowles (1984, see also Knowles et al., 2011) himself later emphasized the view that andragogy should be portrayed more by the learning situation than by the learner, although this aspect has thus far been less researched (Artis & Harris, 2007; Baskett, 1993; Bell, 2017; Candy, 1991; Foucher, 1995). Instead, in recent efforts to develop andragogy and the continuation of pedagogy-andragogy has been expanded into the concept of heutagogy, the individualistic perspective has even become more pronounced (Blaschke, 2012; Canning, 2010; Hase & Kanyon, 2000). Heutagogy is based on the concept of self-determination (See Ryan & Deci, 2000) and is described as a more radical version of andragogy from the point of view of individualism: the learner is the main actor and decision-maker in his or her own learning, which is made possible by personal experience. According to heutagogy, volunteering in learning requires the learner to have the ability and knowledge to deal with different problem situations or to deal with new and unfamiliar situations. At the core of heutagogy is the idea of the development of the individual's ability to learn and learning to learn (Blaschke, 2012). Self-

determined learning thus appears to be possible only with highly experienced experts, which all employees simply cannot be.

In recent years, andragogy has been advocated as an approach to adult learning, not as a theory that applies as such to any context or environment (Holton et al., 2001). In this study, andragogy was chosen as a starting point for considering adult learning in the context of working life for three main reasons. First, the roots of SDL are in andragogy. Second, with its individual goals, SDL appears to be workable in the context of modern working life, where the responsibility and freedom of workers are increasingly emphasized. Third, it provides concrete assumptions about adult learning practices and starting points that allow detailed use of qualitative data collected from working life. In particular, I see the development of andragogy as of continuing importance, and hence we should first pay attention to the sociocultural nature of andragogy (see also Knowles et al., 2011) before developing new individualistic learning approaches (see Canning, 2010; Blaschke, 2012) based on andragogy.

1.1.2 Workplace learning

"Almost everything in this job is learning - by doing" (Interview citation, Project manager)

Present study investigate SDL in the workplaces, which makes the theoretical framework of workplace learning important for the study. Although SDL has long been studied in adult education and andragogy, the need to examine and study the multidimensional nature of SDL from the perspective of workplace learning has been highlighted (see Ellinger, 2004; Gu, 2016; Rana, Archivili & Polesello, 2016). Decades ago, Knowles (1950) suggested that adults learn best in informal settings - as workplaces. Over the years, SDL has, from time to time, reemerged as a topic of workplace learning. For example, in the 1990s, when continuous education and the importance of training at work were being increasingly discussed, a 'spike' could also be observed in research on SDL (Brockett & Hiemstra, 1997; Candy, 1991; Conn, 2000; Koro, 1993). At that time, web-based courses through, for example, individual assignments became more widespread and the concept of SDL was introduced (Conn, 2000). Nowadays it is suggested that 80% of learning at work is self-directed in nature (e.g. Yeo, 2008), which is why this study approaches SDL as an important practice in workplace learning. As the framework of practice-based workplace learning has already evolved towards a socio-cultural approach, it makes sense to combine this framework with the SDL in this study, with the aim of developing a sociocultural understanding of SDL as well.

The concept of workplace learning derives from adult education and is linked to the needs and aims of individuals and groups within the organization. This premise distinguishes it from the perspectives of organizational learning (e.g. Brandi & Elkjaer, 2011; Elkjaer, 2005), human resource development (e.g. Ellinger, 2004) and competence management (e.g Jimenez-Jimenez & Sanz-Valle, 2012), which combine learning with development and leadership at the

organizational level as a whole (Elkjaer, 2005). The learner-centered perspective also strongly links workplace learning to the previously presented framework of andragogy, where the goals of learning flow from the needs of individuals (Knowles, 1975). One of the main aims of workplace learning has been the development of the competence of individuals and teams. Rowod & Kauffeld (2009) found that constant learning activities assisted employees most in increasing their relevant work-related competencies. According to Matthews (1999), all learning at work should aim to promote sustainable development of both the individual and organization. The concept of competencies has been used to describe the skills and abilities of individuals (Paloniemi, 2006), whereas, for example, the term 'knowledge' has been utilized in both organizational- and individual-level descriptions (Lehner & Sundby, 2017). The definition of a competence is thus ambiguous; however, it is often described as an individual's ability to perform the tasks assigned to him or her (Streumer & Björkvist, 1998).

With respect to workplace learning supporting and constructing competencies, the practice-based perspective of workplace learning can be broadly defined as learning activities both for work and at work (Billett, 2008), the aim being to produce learner professional development (e.g. Paloniemi, 2006) and coping at work (Segers, Mesmann & Dochy, 2017). In the context of practice-based workplace learning, 'practice' is as system of activities in which knowledge is not separate from doing (Gherardi, 2000). It generally refers to the routines, norms and beliefs in which everyday activities are embedded (Bourdieu, 1977, 1990). 'Communities of practice' refers to participation in social practices that leads to a sense of belonging in the community (Fuller & Unwin, 2003; Lave & Wenger, 1991; Yeo, 2008), and can be defined as a one of the social forms of practice. That means that employees have the possibility to learn from their participation in the everyday activities of a community (Fenwick, 2008).

Research in the field of practice-based workplace learning has evolved in many directions and disciplines in recent years (Manuti, Pastore, Scardigno & Morciano, 2015; Tynjälä, 2008, 2013). In the debate on workplace learning, it has been typical to dismiss various dichotomies characterizing the phenomenon, including formal vs. informal learning (see e.g. Lave & Wenger, 1991; Marsick & Watkins, 1990), individual and autonomous learning (e.g. Noe & Ellingson, 2017) vs. social/collective learning (Brandi & Elkjaer, 2011; Collin, 2005) and learning as acquisition vs. learning as participation (Sfard, 1998).

Lively debate on the role of formal and informal learning in the context of work has continued over the past three decades. Formal learning refers to learning situations that are guided by clear structures and practices (Kyndt & Baert, 2013). Typically, formal learning has seen as formal education, as teacher-based learning and, in the context of working life, courses and training (Tynjälä, 2008). The efficacy of formal learning is supported by the fact that learning at work is often based on knowledge constructed in formal environments (Collin, 2002) or needs to be renewed so rapidly that occasional formal training is needed (Sommer, 2014). However, most workplace learning has been described and argued to happen informally and to be strongly linked to tasks and work

activities (Marsick & Watkins, 1990). Informal learning refers to all learning activities that employees undertake in relation to their work (Janssen, Smet, Onghena & Kyndt, 2016; Kyndt & Baert, 2013). Informal learning at work has been identified in situations and everyday practices (Lave & Wenger, 1991; Livingstone, 2008) where employees define learning goals and guide their learning process (Wilson & Hartung, 2015) through problem solving (Bereiter & Scardamalia, 1993) and outside of formal training and guidance (Billett, 2001). It is precisely this type of on-the-job learning that is combined with the SDL perspective (Yeo, 2008), because SDL has been seen as a employee-driven activity which emerges particularly in informal work situations.

However, scholars (e.g. Billett, 2001, 2004; Manuti et al., 2015) have also criticized the prevailing formal-informal division. The criticism is based on the fact that so-called informal learning situations (which occur during work) also contain formal elements; workplace cultural practices, norms, constraints, and opportunities (Billet, 2004). For this reason, workplaces should be strongly considered as learning environments that also contain structures, guidance and pedagogical features, from interaction to participation opportunities (Billett, 2000, 2001, 2004, 2014). Indeed, the most influential way of learning in working life has been through the combination of informal and formal learning opportunities (Slotte et al., 2004; Spaan et al., 2016). As learning becomes an increasingly large part of daily work-based activity (Boud & Rooney, 2018; Messman, Segers & Dochy, 2018), observation of formal elements that occur in the work also becomes important (Billett 2002, 2004, 2014).

According to Sfard (1998), there are two metaphors for learning: the acquisition metaphor (AM) and the participation metaphor (PM). The major difference between them is that the AM emphasizes the mind of the individual, the knowledge transition process and the individual as a kind of knowledge holder. The PM metaphor, on the other hand, describes learning as a larger entity in which knowledge is formed in a group and is shared. In this case, the learner participates in various activities and joins the community instead of independently seeking information for him- or herself (Sfard, 1998). Manuti et al. (2015) prefer to combine the learning as acquisition and learning as participation metaphors rather than separating them. According to them (p.13), "new metaphors (to guide workplace learning) might powerfully recognize that the 21st century is no longer only about knowing (acquisition) but also about doing (participation) and that these are neither academic nor vocational in the sense of being mutually exclusive within individuals or teams or organizations but are skills and dispositions from both traditions that can usefully be combined within individuals, teams and organizations".

Although workplace learning increasingly appears to be work-related (Yeo, 2008) and practice-based, it can nonetheless contain so-called formal elements (Billett, 2000, 2004, 2014) or be either individual or collective in nature (Collin & Paloniemi, 2008). For this reason, learning should not be compartmentalized as something separate; instead attention should be paid to different situations (Collin, 2005) and different industries (Tynjälä, 2008) as well as context-specific opportunities for learning (Billett, 2004; Bell, 2017). Workplaces can influence the opportunities they offer for employee learning (Ashton, 2004; Billett, 2001).

Knowledge-intensive workplaces, in particular, (e.g. technology organisations) have been proven to offer a large variety of both individual and collegial-based resources for learning. These resources can also be termed affordances (Billett, 2001). The workplace culture can enable or limit learning opportunities. Communality and collectivity (Billett, 2000; Brown & Duguid, 2001; Sfard, 1998; Tynjälä, 2013), shared experiences (Collin, 2005; Collin & Paloniemi, 2008), management support and feedback (Eraut, 2004; Skule, 2004), opportunities for employees to engage in different activities, get guidance from colleagues, or just listening to and observing the work environment (Billett, 2001) all enable learning. In addition, organizational hierarchies and structures influence learning (e.g Collin et al., 2018; Skule, 2004). However, controversy and uncertainty continue about how, for example, organizational structures affect learning (e.g. Bundersom & Boumgarden, 2010; Burns, 1995) and what factors can support learning in different work situations (Bell, 2017). SDL is not detached from these kinds of frameworks for workplace learning: individual responsibility and active role-taking can be present in working life alongside formal frameworks. Consequently, for a deeper understanding of the sociocultural nature of SDL a clear need exists for more studies in different work contexts and situations (Artis & Harris, 2007; Baskett, 1993; Bell, 2017; Loftus & Higgs, 2010).

1.1.3 Creativity and creative activity

"In this job, you can develop your knowledge, which is a tool for creativity" (Interview citation, Software developer)

In this study, SDL is also considered in work situations, which have been identified as 'creative'. Hence, the framework of creative activity is also essential alongside andragogy and workplace learning frameworks. SDL is strongly associated with creativity (Cox, 2002; Edmondson et al., 2012), especially when creativity is described as problem solving (Loyens et al., 2008). Creativity has been identified as one of the most important tools for supporting an organization's competitiveness, growth and development, as well as continuous learning and the development of professional skills (e.g. Amabile & Khaire, 2008; Caniels, De Stobbeleir & De Clippelee, 2014; Florida & Goodnight, 2005; Grant & Ashford, 2008; Shalley, Zhou & Oldham, 2004). In the context of work, while the concept of creativity is complex and difficult to define (Amabile, 2017; Glaveanu, 2015, 2018; Littleton, Taylor, & Eteläpelto, 2012), it is strongly connected to dealing with work tasks and flexibility (Littleton et al., 2012), both of which are especially important for technology-based work (Ulrich & Mengiste, 2014).

Creativity is often defined by either results and solutions (Amabile, 1996) or the process by which these are achieved (Amabile, 1996; Ness & Soreide, 2014). In research, the criteria for a creative outcome are often novelty (e.g. Kaufman & Sternberg, 2007), usability (e.g. Gryus, Munshi & Dewett, 2011) and high quality (Amabile, 1996). Novelty means that creativity produces something new (John-Steiner, 2000; Sawyer, 2004; Sternberg, 2006) and usability emphasizes the importance of the outcome for the individual or society (Ford, 1996). Creativity

is seen as different kinds of processes in the workplace, in which the participants act creatively (Drazin, Glynn & Kazanjian, 1999). This point of view has led to a shift in thinking about the value of creativity in everyday work, problem solving and development (Collin, Lemmetty, Herranen, Paloniemi, Auvinen & Riivari, 2017). According to Blomberg (2019), work is creative if the individual feels it is and that the individual is creative if he or she is identified as creative (see Drazin et al., 1999; Taylor & Littleton, 2012).

An individual approach to creativity (Amabile, 2017) sees creativity as the generation of individuals' thoughts and ideas (Lubart, 2001; Mumford, Medeiros, & Partlow, 2012; Sawyer, 2004). For example, Amabile (1996) showed that the creative (idea-generation) process progresses from identifying the problem to finding information, creating an idea, and finally evaluating it. In the work context, especially, this kind of individual creativity is often linked to innovation processes (Bammens, 2016; Yuan & Woodman, 2010), where creativity manifests as thoughts and ideas that are important only at the beginning of the process (Bammens, 2016). Another prevalent approach to creativity is sociocognitive. In this approach, creativity begins in the individual mind, and the social aspect of creativity is its manifestation (Oddane, 2014). When creativity is seen solely as an individual or sociocognitive process, it appears as an unchanging attribute that is incapable of development (Glăveanu, 2011). Therefore, creativity should be approached from a sociocultural perspective, in which it is a social process generated by interactions between people and thus a developing, collective phenomenon (Glăveanu, 2011; Csikzentmihályi, 1996).

The sociocultural perspective on creativity favors the idea that anyone can act creatively (Loewemberger, 2013). Indeed, in the debate on creativity strong emphasis has been placed on the social aspect of creativity (Boden, 1990). Creative activity is perceived as creating something new, developing work methods and solving problems – individually or collectively (Collin et al., 2017). Problem-solving situations at work progress through different acts (Newell & Simon, 1972) in which creativity itself manifests as an activity-based process (Collin et al., 2017). Nemiro (2002) found that the creative process of virtual teams is a comprehensive team action, which progresses through idea creation, development and finalization, including the closure stages of the evaluation phase. Thus, the process of creative activity is not solely the formation of an individual mental idea but, according to Glaveanu (2015, p. 167), it "necessarily engages self-other, symbolic-material, and past-present-future relations that turn it into a social, embodied, and temporal act." Although creativity is increasingly seen as a sociocultural process and activity, more research has been called for on the frames of creative activity. Although the effect of the organizational and operative culture on employees' possibilities to have an influence on their work (Collin, Herranen & Riivari, 2017) and the affordances offered them (Glaveanu, 2015) seem to impact on the process of creative activity. In investigating creativity as a sociocultural phenomenon in organizations, researchers have shown increasing interested in various manifestations of creative activity and processes (Forsman, 2018; Craft, 2008) in which the

importance of interaction and other practices are obvious (Martins & Terblanche, 2003; Ness & Soreide, 2014).

Creativity and learning have been found to contain the same elements and to support each other (Beghetto, 2016; Cox, 2002; Edmondson et al., 2012). Creativity is linked to employees' prior knowledge and expertise (e.g. Amabile, 1996; Ford, 1996; Ness & Soreide, 2014; Simonton, 2012). Learning in creative activity has been highlighted, especially when creativity is described as a problem-solving activity (Seges et al., 2018). This is based on the idea that competence development follows from the constant pursuit of problems, the resolution of which expand knowledge and skills. Thus, problem solving not only provides a solution to the situation, but also enables learning (Goller & Billett, 2014; Harteis & Goller, 2014) and new knowledge resources for future use (Bereiter & Scardamalia, 1993). Problem solving can thus be viewed as a provider of continuous learning (Watkins & Marsick, 1993). Consequently, the importance of learning (Beghetto, 2016; Gajda, Beghetto & Karwowski, 2017; Gerken et al., 2018) in creativity has been strongly noted. It is key in creativity both that the creative actor can promote the process of creative activity with the support of his or her environment and how the actor's active role appears in the creative process. This brings us close to the field of SDL (Loyens et al., 2008), especially if creative activity is seen as a learning process. In this case, it can be assumed that SDL in problem solving arises from the processes of creative activity.

1.2 Three perspectives on the concept of SDL

"Self-learning is present every day -in fact, it's my job" (Interview citation, Software developer)

The concept of SDL is considered in this study from three perspectives in the SDL research literature: 1) SDL as learning practice (Khiat, 2017; Tough, 1971), 2) SDL as learning process (Brocket & Hiemstra, 1991; Knowles, 1975; Knowles et al. 2012; Raemondock et al. 2017) and 3) SDL as learning project (Artis & Harris, 2007; Clardy, 2000; Tough, 1971). These perspectives have been chosen because they have an empirical and theoretical background in SDL research and through them SDL can be viewed from different levels: as a broad practice, as progressive processes, and as situational projects. Together, they provide an opportunity for diverse observation of the phenomenon. These perspectives are expanded in the present study to form a sociocultural approach that utilizes the frameworks of practice-based workplace learning and the sociocultural approach to creative activity presented above. The practice of SDL could, by definition, be seen as an important workplace learning practice (Yeo, 2008). From the process perspective, SDL is associated in this study with the processes of creative activity, whereas the project perspective focuses more closely on learning situations and the external factors that frame them. I will now describe in more detail what these different perspectives mean in the light of previous research.

1.2.1 Self-directed learning as practice

One SDL perspective is based on the idea of SDL as a practice (Caffarella, 1993; Khiat, 2017; Knowles et al. 2012). Tough (1971) explored nonformal adult learning practices that he identified as self-directed since these practices were designed, embedded and controlled by adults themselves. SDL as practice is emphasized when an employee or group take responsibility of their learning (Gerber et al., 1995). There are some indications attempts to link the practice of SDL to the practice-based context of workplace learning (Artis & Harris, 2007; Candy, 1991; Confessore & Kops, 1998; Ellinger, 2004; Gerber et al., 1995; Knowles et al., 2012). These mainly focus on individuals' independent or even autonomous acts as autonomous information retrieval (Edwards, 2010) or selfmanaged observation (Gerber et al., 1995). Less attention has been paid to collective or interactive practices, although, for example, training others has been considered an SDL activity (Gerber et al., 2015). Despite the limited research, the practice of SDL should be seen more broadly as a practice of workplace learning (Gerber et al., 1995; Yeo, 2008) which emphasizes learners' responsibility and activity in workplace learning situations.

As already mentioned, workplace learning has been increasingly approached as work-related and practice-based over the last couple of decades (Billett, 2001, 2014; Collin, 2006). However, despite the growing interest in understanding different collective 'learning through work' activities, as well as interaction and participation (Billett, 2014), interest in individual responsibility in learning has also increased (e.g., Ellinger, 2004; Karakas & Manisaligil, 2012; Noe & Ellingson, 2017). Individual or SDL practices at work have been viewed as independent information retrieval activities (Edwards, 2010), whereas collective practices occur within the framework of interaction and collaboration (Tynjälä, 2013; Wenger, 2009). Thus, workplace learning practices can refer to both individual (Noe, Clarke & Klein, 2014) and shared and collective-level activities (Billett, 2001; Collin, 2006). The foundations of SDL are discernible in practice-based discussions of workplace learning, which focus on individual or even autonomous practices, taking little account of the role of individual responsibility in, for example, collective situations. It can be argued, therefore, that SDL research in the context of workplace learning remains limited (Ellinger, 2004; Gu, 2016; Rana et al., 2016). In this study, I adopt a practice-based workplace learning framework (see e.g. Brown, Collins & Duguid, 1989; Gherardi, 2006) on employees' SDL by considering the practice of SDL as the responsibility of actors, taking into account both any other actors involved in the practice and relevant organizational aspects. The focus is thus on the kinds of organizational work practices through which individuals participate or learn simultaneously (Billett, 2014). From this perspective, learning is part of practice, and the focus is on the continuous construction and reconstruction of this practice (Elkjaer & Brandi, 2014; Gherardi, 2009).

Self-directed activity in the workplace conveys an ideal and positive image of the phenomenon (Lee & Edmondson, 2017), although in reality descriptions of the nature of SDL, its benefits or problems produced by learners themselves, have not been the subject of research. Hence, this study explores the practice of SDL in the context of workplace learning via the descriptions produced by employees themselves.

1.2.2 Self-directed learning as process

The practice-based view is also the starting point for several process descriptions in which SDL is manifested as individual acts at different stages of the learning process. These studies of the SDL process have examined how an individual works in a self-directed manner in learning and what kinds of SDL stages, acts or practices this process involves (Knowles, 1975; Merriam & Caffarella, 1999; Tough, 1971). The initial process descriptions were very linear and ignored the effect of context (e.g. Knowles, 1975), while later-developed models also partially took into account the environment, the nature of the SDL in question, the strategies used and external elements affecting the process (Merriam, 2001). These descriptions all shared the view that a learner who is using SDL can manage the learning process from the beginning to the end (e.g. Knowles 1975; Brockett & Hiemstra, 1991; Brookfield, 1986; 1993; Pintrich, 2004; Zimmerman, 2008). Therefore, the individual is responsible for the setting, design, implementation and evaluation of her or his learning goals (Merriam & Caffarella, 1999; Merriam, 2001). In this sense, SDL at work can take place in a variety of learning contexts: formal, informal, online or social (Noe, Clarke & Klein, 2014).

SDL process descriptions have mostly adopted an individual perspective. For example, Raemondock et al. (2017) define self-directedness in work-related learning processes as "a characteristic adaption to self-direct work related learning processes that is to steer and take responsibility in diagnosing learning needs and setting goals, choosing and implementing appropriate learning strategies and evaluating and adjusting the learning process" (p. 402). According to Brockett and Hiemstra (1991), the process of SDL involves the following stages: 1) learners evaluate and set their learning needs; 2) they seek out the right learning resources and lead their planned learning activities; and 3) they evaluate the results of their learning. From this process description, SDL practice can be interpreted to mean a collection of various SDL acts which manifest in different stages. This description of the SDL process also serves as a starting point for locating SDL in this study; however, in addition to the actions of the individual, attention is paid to the collective and sociocultural manifestations of SDL.

Because SDL is strongly associated with creativity (Cox, 2002; Edmondson et al., 2012), and especially problem-solving (Loyens, et al. 2008), I locate SDL processes specifically in the context of creative activity. Creative work-related problem-solving situations (Amabile, 1996; Collin et al., 2017) progress through different acts (Newell & Simon, 1972). Nemiro (2002) found that the creative process of virtual teams is a comprehensive team action, which progresses through idea creation, development and finalization, including the closure stages

of the evaluation phase. Descriptions of creative processes in the earlier theorizing are very similar to the SDL processes described above. However, creative activity and SDL differ in their problem-based and fundamental starting points: the creative problem-solving process starts with an emergent problem. Thus, it can be said that while researchers have described both the stages of the process of SDL (e.g. Brockett & Hiemstra, 1997; Knowles, 1975) and the process of creative activity (Nemiro, 2002; Amabile, 1996), they have often focused on the individual or on abilities and thinking processes, to the relative neglect of situations, contexts, sociocultural backgrounds and collective factors. This study examines SDL in creative activity, taking into account not only the actions of the individual or group but also the external frames that influence the progression of the process.

In this study, creative activity is assumed to be a process in which the process of SDL is realized through SDL acts and practices (see Forsman, Lemmetty & Collin, 2019). The context of creative activity is a valid starting point for considering SDL in a technology field where work itself includes creative elements: continuous problem-solving, working method development, and new creation (Collin et al., 2018). It has also been noted that individual self-directed action seems to be key in enabling both continuous competence development and creativity (Gijbels et al. 2012).

1.2.3 Self-directed learning as projects

SDL has also been described as projects (Artis & Harris, 2007; Clardy, 2000; Tough, 1971). Self-directed learning projects (SDLPs) can be described as situations in which SDL emerges through different phases (Tough, 1971), as learner-driven practices (see e.g. Brockett & Hiemstra, 1991; Knowles 1975; Merriam, 2001; Tough, 1971) and through individual-driven factors such as willingness to learn and prior knowledge (Artis & Harris, 2007; Clardy, 2000). Studies of SDLPs have also largely focused on the skills or features of individual learners or the number and duration of projects (Clardy, 2000). For this reason, Clardy (2000) and Artis and Harris (2007) have developed and expanded the theory to include organizational conditions experienced by individuals.

According to Clardy (2000), SDLPs can be categorized into four types: *induce, synergistic, voluntary* and *scanning*. The first type (induce) is a learning situation that is initiated on behalf by the company and refers to a situation where the role of the employer is to promote employees' understanding of where new information can be found and reinforce what they learn while the employees themselves regulate their own learning (Artis & Harris, 2007). The synergistic type refers to a situation where learning materials are produced by the organization, leaving and employees to choose whether to participate, and the learning is reinforced by the employees themselves. The voluntary type refers to an employee-oriented learning situation where the demand for learning comes from the organization, but the employees themselves assess what information they need and where and how to get it. The scanning type resembles the previous one but differs in that it has no externally defined outcomes or goals and is more

of a continuous and daily learning process (Clardy, 2000). The topics of interest in previous studies on SDLPs can be divided into three areas: the first asks how important individual-experienced work conditions are for allowing the individual to act in a self-directed way; the second asks what kind of individual-driven factors, such as willingness to learn and prior knowledge, contribute to the progress of the SDLP and how important these are in different learning projects (Artis & Harris, 2007; Clardy, 2000); and the third considers the time frame of different learning projects. Given that the manifestation of SDL in working life depends not only on the individual's skills or motivation but also occurs in situations which the individual cannot influence, attention should be paid to the factors that guide, enable and support individuals in SDL in their working lives (Bell, 2017; Clardy, 2000).

The project perspective is also interested in the idea of what opportunities an individual has for decision-making in SDL (Candy, 1991; Nunan & Lamb, 1996). In organizations, the degree of autonomy of individuals and groups directly influences the scope for SDL (Nunan & Lamb, 1996). Thus, it has been argued that employee autonomy is a key factor in SDL (Candy 1991); however, many studies have shown that mere autonomy does not guarantee SDL (Bell 2017). In certain situations, autonomy has even been shown to be a negative factor that challenges learning; without control, learners may choose questionable ways to learn or omit important issues (Brown 2001; Tannebaum, Beard, McNall & Salas, 2010). In addition to the debate on autonomy, some studies have found that organizational-oriented factors that support SDL have been inspired by a prudent atmosphere and appreciation (Baskett, 1993), acceptance of errors (Kops, 1997) and support and guidance (Bell, 2017; Knowles et al., 2012). Colleagues and supervisors play an important role in support (Foucher, 1995). Thus, support and guidance are factors enabling SDL, while at the same time there is a call for employee autonomy (Banks, 2010). The essential question is thus, what is the ideal mix of autonomy and support for an individual learner in a given situation? (Bell, 2017).

While previous studies have found some sociocultural factors affecting SDL, the results, such as those on the significance of organizational structures for learning, have been contradictory (see e.g. Bunderson & Boumgarden, 2010; Burns, 1995), or the nature of the factors that allow SDL has not been sufficiently considered. Therefore, it is important to find out what other organizational factors frame SDL in the workplace (Bell, 2017) and what factors seem to increase or restrict the possibilities for SDL (Baskett, 1993; Clardy, 2000). It has been found necessary to carry out this examination on a context and situation basis (Baskett, 1993), that is, to explore the different frameworks and opportunities for SDL in each situation (Candy, 1991; Fleming & Artis, 2014). In this study, SDL is explored extensively in a wide variety of work-related situations, such as formal and informal meetings and events, including discussions between managers and employees, and discussions between workers, during coffee breaks, daily work and problem- solving situations and training or educational occasions. Thus, the possibility of the manifestation of learning is not limited solely to situations

identified in advance as learning situations; instead the starting point is to observe a number of different situations, the actions of individuals and groups in them, and the organizational factors that frame them.

1.3 Summary of the theoretical approach, frameworks and perspectives of the study

The concept cutting across this study is SDL. Its roots lie in the framework of andragogy (Knowles, 1975; Lindeman, 1926), which has previously been described as adult learning theory (Artis & Harris, 2007; Candy, 1991; Knowles, 1975). In this study, I applied the frameworks of practice-based workplace learning and creativity to SDL. This combination made it possible to extend the examination to SDL as the way of learning that does not remove the importance of the individual but integrates the individual perspective into a sociocultural approach. This study examined SDL in the workplace from three perspectives: as practice, process and project. The theoretical approach, frameworks and perspectives are presented in figure 1.

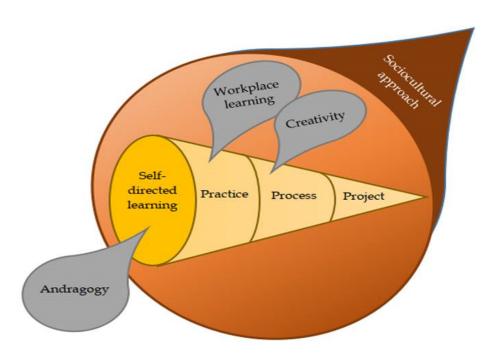


FIGURE 1 Theoretical approach, frameworks and perspectives of the study

In this study, 'practice', which refers the routines, norms and beliefs forming the system of activities (Bourdieu, 1990; Gherardi, 2006), draws on the existing understanding of SDL as a practice but is supported by a sociocultural approach through the practice-based workplace learning framework (Billett, 2004; Collin, 2006; Gherardi, 2006). The 'process' perspective, in which SDL is seen as a process that involves a variety of actions, practices and stages, draws on the knowledge

of SDL as a process, but extended to include the theories of creative activity processes and the sociocultural starting points within them (Glaveanu, 2011, 2015; Sawyer, 2004). The 'project' perspective, referring to situations in which learning emerges as an individuals' projects, utilizes the theory of self-directed learning projects (SDLPs) (Artis & Harris, 2007; Clardy, 2000; Tough, 1971) based on andragogy, but expanded to include the sociocultural understanding addressed in the first two sub-studies (see Lemmetty & Collin, 2019, 2020). This research thus progressed from broad descriptions of SDL towards to the more focused perspectives of SDL as practice, process and projects.

1.4 Research aim, questions and sub-studies

The aim of this study was to develop a sociocultural understanding of the concept of self-directed workplace learning (SDWL) by examining the nature of the SDWL phenomenon in technology-based work. The overall aim is addressed through three overarching research questions:

- 1) How is self-directed learning described in the context of technology-based work?
- 2) How does self-directed learning as a sociocultural phenomenon emerge in technology-based work?
- 3) What kinds of sociocultural frames are linked in self-directed learning in technology-based work?

For a comprehensive description of the phenomenon and concept of SDWL, the study focused on SDL at three levels: descriptions (of SDL as practice), manifestations (of SDL as process), and occurrences (of SDL as projects) (see figure 2). The whole research process thus progressed from the broad descriptions given by individuals towards to more focused levels of examination.

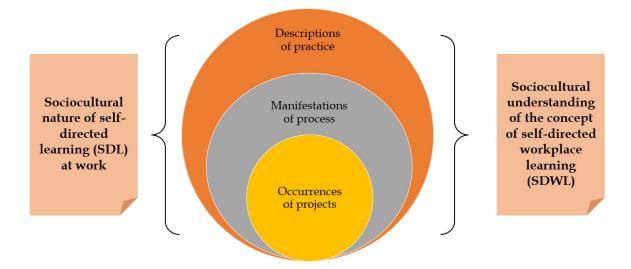


FIGURE 2 Levels of examination of the research interests

The overarching research questions and the levels of examination were investigated through three empirical sub-studies. The relationship between empirical sub-studies I-III and the overarching research questions is shown in Figure 3. The sub-studies were not interdependent, although several levels of examination were necessary to achieve the overall aim of the study.

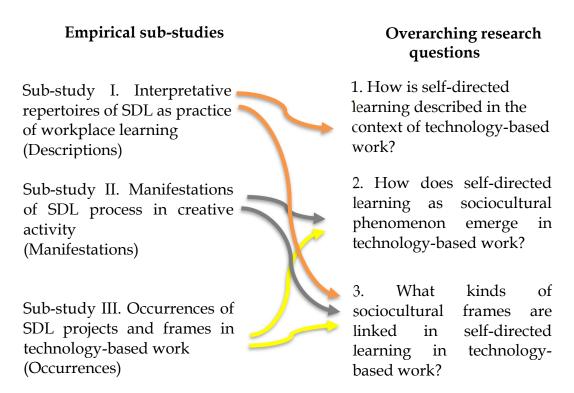


FIGURE 3 The relationship between the empirical sub-studies and the overarching research questions

The first sub-study focused on looking at SDL as a workplace learning practice. The starting point was based on the findings of previous studies (e.g. Yeo, 2008), according to which 80 % of learning at work occurs informally and is self-directed in nature. This means that responsibility for learning lies with individuals or teams themselves, and hence the nature of SDL in practice must be considered in research (Harteis, 2017). To this end, the first sub-study explored descriptions given by employees of the target organizations on their practice of SDL in the workplace learning context. Interviews conducted with employees in the participating organizations comprised the research data. This data set enabled me to form an understanding of how the actors in the organizations - the learners themselves - describe learning. The research question of the first sub-study was: What kinds of interpretative repertoires of SDL practice do employees in the ICT sector produce in their speech? In addition, the purpose was to find out how the interviewees would position themselves, other members of the work community and the organisation in each repertoire, what contexts they would refer to in their speech and what meanings they convey through their ways of speaking. It was possible not only to gain understanding about SDL practice but also to find sociocultural frames related to the practice of SDL. Thus, the first sub-study found answers overarching research questions 1 and 3.

In the second sub-study, SDL was approached as a process in which the responsibility of an individual or a group is emphasized at different stages (Brockett & Hiemstra, 1997; Knowles, 1975). The purpose of the sub-study was to examine the manifestation of processes at work. Attention was focused on creative problem-solving situations at work, which were seen as typical everyday learning situations in technology work. The second sub-study investigated the manifestation of the SDL process identified in previous studies (e.g., Brockett & Hiemstra, 1997) on the creative activity processes identified in the target organizations through interviews and ethnographic observation. The research question of sub-study 2 was: *How does the phenomenon of "SDL in creative activity" manifest in technology-based work?* The sub-study provided an opportunity to understand the manifestations of SDL processes in technology-based work. In addition, ethnographic observation made it possible to understand the different social and cultural frameworks attached to the processes. Thus, the second sub-study answered overarching research questions 2 and 3.

In the third sub-study, SDL was understood as project-based – that is, as situations in which learners themselves manage and take responsibility for their own learning (Artis & Harris, 2007; Tough, 1971) while being strongly dependent on how far their work conditions allow them to act in a self-directed way (Artis & Harris, 2007; Clardy, 2000). The aim of the third sub-study was to examine employee opportunities for SDL in different learning situations. The sub-study focused on a wide range of ethnographically observed learning situations and, more broadly, on the organizational frames behind them. These were explored through two research questions: 1) What types of SDL projects occur in technology work and what are their features? and 2) What organization-based frames can be detected in SDL projects and how do these frames increase or restrict employee opportunities for

SDL? The study made it possible to see what opportunities employees actually have to learn in a self-directed way in different situations. In addition, various factors related to organizational structures and culture that influence the occurrence of SDL in working life could be identified. Thus, the third sub-study answered overarching research questions 2 and 3.

By examining the phenomenon of SDWL from the practice, process and project perspectives and paying attention to descriptions, manifestations and occurrences of the phenomenon, it was possible to find answers to the overarching research questions. The main aim set for the study - 'to develop a sociocultural understanding of the concept of self-directed workplace learning (SDWL)' – was achieved through these three sub-studies, in which the nature of self-directed workplace learning in technology work was comprehensively investigated.

2 METHODOLOGY

As a qualitative and more multifaceted methodology, especially the need for observation data, has been called for in SDL research (Baskett, 1993), this study is based on an ethnographic research strategy (Davies, 1992; Hammersley & Atkinson, 2007) from the data collection to data analysis. Previous research on SDL has mainly focused on the features and personality of individual learners (e.g. Guglielmino, 2008), to the partial neglect of the sociocultural and situational nature of learning. In this study, an ethnographic approach can help to reveal the sociocultural nature of SDL by concentrating on the interaction and activities that take place between individuals and groups, and the contexts and cultures in which these activities manifest. In ethnography, data collection, analysis and interpretations are intertwined (Davies, 1999). The ethnographic research process of this study can be described as continuous interpretation as the researcher's previous understanding, theory and knowledge evolve (Tikkamäki, 2006) through observations, discussions and the various stages of analysis. Next, I describe ethnographic framework as well as ontological and epistemological premises of the study. I also describe how this ethnographic research project progressed in practice. Finally, I present the research contexts, the data collected and the methods of analysis.

2.1 Ethnographic framework

Ethnographic research is not a clearly identifiable research process or trend (Davies, 1992; Collin, 2005). However, its starting points can be linked to the research goals, process, aims, roles and data in question. The aims of ethnographic research are often: a) to describe, structure and theorize complex cultural, and often mundane (Paloniemi & Collin, 2010) phenomena and processes and their implications for individuals and communities (Heyl, 2001); b) to describe and understand situations and phenomena from the point of view of

the participants (Cohen, Manion & Morrison, 2007; Pole & Morrison, 2003); and c) to create a comprehensive and detailed description of the target phenomenon (Heyl, 2001). Thus, the starting point of an ethnographic study can be understood as a desire to thoroughly investigate the nature of the (social) phenomenon at hand.

There are no clear guidelines for conducting an ethnographic research process or its progress or stages. The process of an ethnographic research project is a continuous alternation between observations, interpretations, the views of the researcher and the researcher's prior knowledge, which also complement each other (Hammersley & Atkinson, 2007). This process often progresses from an examination of an extensive research area or entity to a more detailed focus on smaller, more structured areas (Collin, 2006; Davies, 1992). The role of the researcher as observer, participant and learner (Croucher & Cronn-Mills 2015; Eskola & Suoranta, 1998) in ethnographic research is significant and must be taken into account at every stage of the process, as the interpretations based on ethnography are ultimately those of the researcher (Spradley, 1980). Thus, the researcher's own previous experiences, views and backgrounds are integrated into the interpretation and strongly influence how the researcher sees his / her research environment. While the aim of ethnographic writing is to illuminate an interesting situation or event, it also always involves the researcher's interpretation of the situation (Spradley, 1980). According to Hammersley & Atkinson (2007), an ethnographer does not have to commit to a single theoretical framework but can increase the richness of perspectives through theory triangulation.

The data of ethnographic research derive from fieldwork and observations made by researcher (O'Reilly, 2011). Typically, observation data such as field notes and field tapes are supplemented by interviews or discussions with the participants. Combining data (from observation and interviews) can also be described as cross-validation (Cohen et al., 2007). In any case, the importance of fieldwork in initiating or advancing an ongoing process of interpretation is crucial: observing and interviewing the participants are the main means by which a comprehensive description of the phenomenon or culture is constructed (Heyl, 2001).

Through the above procedures, ethnographic research, based on in-depth analysis of culture and interpretations of different meanings, guided and defined the entire research process of the present study. In this study, ethnography includes both cultural and conceptual description through the process of interpretation (Willis, 2000). The aim of the study is to describe and explain people's activities in their environment (Croucher & Cronn-Mills, 2015). Ethnography is well suited for exploring community activities, social interactions and cultures and often focuses on researching a small group (Pole & Morrison, 2003), such as the present workers in technology organizations, whose behavior was observed in their own context (see Coffrey, 1999; Hammershey & Atkinson, 2007).

2.2 Epistemology and ontology

The epistemological and ontological basis of ethnographic research lies in hermeneutics (Hämeenaho & Koskinen-Koivisto, 2014), which emphasizes the understanding and interpretation of entities and meanings (Goldstein, 2001; Habermas, 1970; Knoblauch & Scnetter, 2012). In this study, as in the hermeneutic tendency in general, information is produced by outlining the relationships between things and their contexts and by looking at phenomena in relation to other simultaneous phenomena. Ethnography is also a process of continuous interpretation (the hermeneutic circle), in which interpretations and knowledge are continuously refined (Atkinson et al., 2008; Goldstein, 2001; Hammersley & Atkinson, 2007; Hämeenaho & Koskinen-Koivisto, 2014; Tikkamäki, 2006). The process of continuous interpretation characterizing this study is further described in section 2.3. (Ethnographic research as a process), but it is worth mentioning here that continuous interpretivism, meaning that knowledge is formed, shaped and evolves through different stages and interpretations (Davies, 1992; Collin, 2006; Atkinson et al., 2008) informed the starting point for the whole process and design of the present research. Due to its ongoing interpretive nature, hermeneutics can be seen as one of the numerous philosophical tendencies attached to interpretivism (Cantrell, 1993). Interpretivism, or the paradigm of interpretability (Knoblauch & Schnettler, 2012), is a broader philosophy that encompasses a number of more limited orientations (Cantrell, 1993).

With respect to the individual methods or areas of analysis of this study, constructivism also informed the philosophical background of this study. The constructivist viewpoint is particularly strong in the first sub-study, where, through discourse analysis, knowledge is seen to be built on social and linguistic interactions (Gergen, 1999) and its construction is observed at the level of the social community (Berger & Luckmann, 1994), excluding individual psychological structures and processes (Gergen, 1999). The notion constructivist learning is justified by the fact that humans are also social beings in the realm of learning and that learning produces meaning through active human activity and participation (Wenger, 2009). From the epistemological point of view, the combination of constructivism and interpretivism in the study does not appear contradictory or problematic (see Atkinson et al., 2008), because ethnographic research is based on the idea of combining different understandings of knowledge and information and these tendencies, hermeneutics and constructivism, are very closely related to each another in the research literature. Both are based on similar ideas about the nature of reality and knowledge: constructivism, like hermeneutics, does not espouse unchanging or pre-existing truths or knowledge; instead, scientific knowledge and truth are constructed by researchers. For this reason, these frameworks make it possible to understand interpretation-based knowledge. It is also important that in hermeneutic and constructivist research, knowledge is often 'true' in the specific environment in which it is conducted (van Dijk, 1998). In researching learning,

based on such frameworks, it is essential to focus on both the individual and community levels, and/or on the development of phenomena in different learning contexts, which may include speech acts and discourse (Tynjälä, 2013), and also the positions, roles, cultures and contexts of human activities (Atkinson et al., 2008; Gergen, 1999).

2.3 Ethnographic research as a process: how did I put it into practice?

Ethnographic research process of this study can be described as a continuous interpretation where the researcher's previous understanding, theory and knowledge evolve through observations, discussions, various stages of analysis, and deepening theoretical understanding (Collin, 2006; Davies, 1992, 1999; Hammersley & Atkinson, 2007; Tikkamäki, 2006). Ethnographic research is based on empirical evidence, where field data and interaction determine the progress of the whole process and thus the results of the research. At the core of the ethnographic research process is the researcher's involvement and continuous interaction with the field and the research subjects, both during the data collection and in other (e.g. reporting) stages of the research. A close relationship with the field, and changes in research questions and interpretations, are natural consequences of the situations and opportunities that arise in the field when (Hämeenaho perspectives Koskinen-Koivisto, & Unpredictability and surprise (Malkki & Cherwonka, 2007) and constant change in the researcher's understanding are typical of ethnographic research and contribute to why it is impossible to plan an ethnographic research process in advance. Earlier interpretations lead to new perspectives, knowledge and insights, and thus new interpretations. For this reason, ethnography has been referred to as a process of continuous interpretation.

In present study, the ethnographic process has been realized as a process of continuous interpretation such as that described above. The steps of this research process can consequently be displayed with the aid of the hermeneutic circle, which describes the process of continuous interpretation (see Tikkamäki, 2006). As shown in Figure 4, the research process alternates between fieldwork and changes in theoretical understanding. The formation of the various phases has been guided by phenomena typical of ethnography in the field, my own deepening theoretical understanding, and the sub-studies (1-3) completed during the process. At this point, it should be noted that the progress of the research process in the dissertation work has, of course, also been influenced by the framework set for doctoral education, such as the four-year time limit for dissertation research and the facilities offered by my university. All the above have contributed to the final ensemble: factors at each stage have influenced the formation of the next stage.

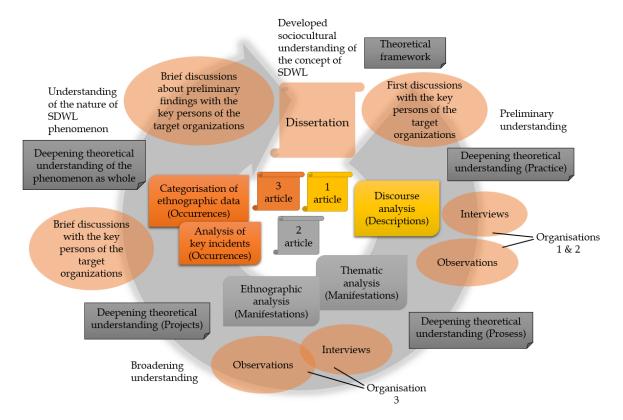


FIGURE 4 Ethnographic research design of the study

In the early stages, my research was strongly guided by the research plan required for admission to doctoral education which included the delineation of preliminary frameworks and research areas. At this stage, the themes of selfdirected learning, workplace learning, and creativity were the starting points for the research. These themes had already been limited to the aspect of self-direction, following the initial discussions with key persons in the target organizations, which revealed which the phenomena of low hierarchy and self-direction as a likely starting point. The first data collection took place during a period of half a year when several individual visits lasting 2 to 8 hours were made to the target organizations. The visits began with observation periods, but interviews soon became part of the time spent in the field. First, data were collected in two organizations. The ethnographic research approach partly guided the process to include sociocultural analysis. The idea of focusing specifically on workplace learning and related speech was reinforced by the transcriptions of the interview data, as the interviews exhibited an interesting range of different speech modes. At the same time, I strengthened my understanding of previous studies of SDL and found couple of interesting research gaps - especially in relation to the sociocultural nature of the phenomenon. I also found, from reading previous studies, that creativity and SDL shared similarities as phenomena. This new understanding inevitably directed the observation to creative activity. In fact, the field diaries came to contain numerous descriptions of creative, everyday problem-solving situations and learning issues related to them. The observations overlapped with the interviews, it was only natural that the first two articles and

analyses would proceed in tandem. In the development phase of the second article, the data collection in the third target organization had already begun, and hence the analysis of the second article was supplemented with data from the third organization. After the first two articles, my theoretical and field-based understanding was already clear and delimited enough to form the starting point and final research questions for the third article. This, of course, was also helped by the fact that the data had been collected at this stage and its contribution was already known. With the third article, the whole body of dissertation research began to take visible shape: this promoted both the writing of the third article and my sense of understanding of the dissertation as an entity.

Although in practice the data collection was conducted only once in each organization (observation period at the beginning + interviews), my interaction with key persons in the organizations was continuous throughout the process. Meetings, email conversations, and social media news were maintained. This "hidden data" has not been officially included in the study; however, it would be impossible to claim that it had no effect on my interpretations. Since these are individual observations, that sometimes appeared on social media, it would be completely impossible to write them all down in a diary. Thus, it is not possible to assess which individual observations over the four years influenced the progress and outcome of the study. While this may be problematic from the point of view of the reliability of the research, it is acceptable in ethnographic research. It should also be mentioned that the results of this research are fully justified by both the data and theory, meaning that the significance of some of the hidden observations does not extend to the findings proper.

2.4 Technology organizations as contexts of the study

In this study, I examined SDL in the context of technology-based work in Finland. I chose Finland as the target country as it is one of the Nordic welfare states and has a culture of flexibility (Ramsdalin & Skorstadin, 2016). Finnish working life is reflected in a culture of autonomy and freedom, and hence self-directedness is obviously strongly reflected in Finnish organizations. However, this also means constant changes in duties that, in turn, challenge the competencies of personnel and their learning. In such organizations, employees have more responsibility for their own work than in more the traditional hierarchical organizations (Lee & Edmondson, 2017).

The technology industry is booming, and organizations are growing both in numbers of employees and profits. This situation is illustrated, for example, by the difficulties the ICT industry has in finding skilled workers. Opportunities for the development of the entire organization also depend on maintaining and developing the employees' skills (Caniels, 2014; Grant & Ashford, 2008; Shalley et al., 2004) and applying knowledge in new situations. Continuous change is a characteristic of the technology industry, as change is often a sign of organizational growth and development (Lewis, 2011). Thus, typical changes in

organizations, such target organizations of this study, reflect in particular in a) technologies, b) organizational structures and cultures, and c) the requirements generated by both a) and b). Next, drawing on theory, I describe in more detail the specific features of the context of the technology field from the perspective of the key phenomena of research.

2.4.1 The diverse structures and practices of organizations

In modern times, especially in technology organizations, organizational structures have shifted away from hierarchical and managerial types of structures to structures that increasingly focus on the employee autonomy and self-directedness (Bauer, Hemmer-Schanze, Munz & Wagner, 2012; Covin & Slevin, 1990; Cerasoli et al., 2018). Self-directedness in organizations has been understood as a broad operational mode in which an individual or a team is empowered by allowing them responsibility for their own work (Moe, Dingosyr & Dypa, 2008) in all their work-related activities, and not only learning. Such organizations have been termed 'agile', 'fast-paced', 'low-hierarchy' and 'selforganized' or 'self-managed organizations' (Holbeche, 2015; Lee & Edmondson, 2017; Nerur & Balijebally, 2007; Salovaara & Bathurst, 2016). The reason for this change in organizational structures lies in a wider societal change: new products, services and solutions need to be produced more and more rapidly, requirements that traditional top-down organizations cannot meet (Lee & Edmondson, 2017; Hankinson, 1999). At the same time, the younger generation expects more and more meaningfulness and enjoyment from work, for example in the form of greater autonomy and responsibility (Noe & Ellingson, 2017; Banks, 2010). According to Mintzberg (1980), lower hierarchies function well in versatile and multidimensional work environments. In practice, organizations can implement this, for example, by creating autonomous or self-directed teams (Auvinen, Riivari, & Sajasalo, 2018; Langfred, 2000; Tata, 2000) which carry the responsibility for the entire project. Inside the team, tasks are clearly divided among the different members, who are then expected to carry them out responsibly (Moe et al., 2008). Salovaara (2019), however, states that selforganised organizations do not exist in the ideal sense, but are hybrids in which structures, practices and cultures vary according to situations.

2.4.2 The expectation of self-directed learning in organizations

In low hierarchical organizations, authority, responsibility and the ability to make decisions are entirely or partly decentralized depending on the nature and the context of the work (Lee & Edmonson, 2017; Mintzberg, 1980). In the technology field, digitalization provides employees with new technology that requires rapid learning (Ha, 2015; Harteis, 2017). At the same time, flexible working arrangements encourage employees to commit to working and learning in a self-directed manner (e.g. Heinz, 2010). For employees to do this entails their reading and obtaining information from various sources (e.g. Internet), familiarizing themselves with programming languages and tools and

participating in projects (Edwards, 2010; Ha 2008, 2015). Learning in technology-based work is supported by challenging and interesting tasks and collaboration, while routine-like tasks, the need to rush, old technologies, boundaries between professional groups, and the expectations of short-term work effectiveness constrain learning and creativity (Vähäsantanen & Eteläpelto, 2018). In the field of technological engineering (see e.g. Collin 2006; Havness & Sneby, 2014; Nerland, 2008), work is highly problem driven and employees are involved in short-term loops of problem-driven learning (Hirschmann & Mulder, 2018). Workplaces of this kind have proven that they can offer a wide variety of both individual- and collegial-based resources for learning (Billett, 2001; Schümann & Beausaert, 2016).

Despite the positive meanings of learning described in some previous studies, the negotiation that takes place when a learner discovers his or her identity might be demanding for this specific group of employees (Ha, 2015; Kirpal, 2009; Soreide, 2016). This is because employees in technology organizations are immersed in a culture that requires ongoing learning driven by both their employers' and other employees' expectations (Fuller & Unwin, 2010; Riddell, Ahlgren & Weedon, 2009). Here, learning is approached as a necessary function of the organization (Ha, 2015; Scheeres, Solomon, Boud & Rooney, 2010).

2.4.3 Technology as a source of creativity: "Beautiful code" and new solutions

Technology employees work in knowledge-intensive expert roles. Rapid technological advances, increased global competition and the growth of a knowledge-intensive industry have highlighted the importance of creativity in organizations (Cumming & Oldham, 1997; Martins & Terblanche, 2003; Powell, 2008). Such organizations are increasingly dependent on employee creativity (Caniels et al., 2014; Shalley et al., 2004). Considering creativity as part of technology work is particularly interesting because such work is basically seen as involving data processing, inventing new solutions, and non-routine tasks (Caniels et al., 2014; Lapierre & Giroux, 2003). Previous research on technology organizations has found that creativity is often described as problem solving, developing working methods or the creation of something new (Collin et al., 2018). It is thus a very practical and everyday activity (see Moran, 2011). However, this does not mean that creative problem-solving in the field of technology is a simple process; on the contrary, it is a complex whole combining researching, experimenting and playing with potential (Oddane, 2014).

The organizations studied here work on technologies that are both persistent but increasingly changing. In particular, the work of software developers seems very problem-oriented, requiring solutions created together and separately, while the success of the endpoint is evaluated from the perspective of clients and the organization. Thus, creativity, along with individual activity, also appears to be strongly community-produced and social (see Craft, 2008; Littleton & Miell, 2004). However, the result of creative problem-solving in the everyday life of the technology industry is not always major

innovations or societal solutions, but "simplifying the problem, compacting it into a beautiful solution" (Software Developer, Resolution).

2.4.4 Target organizations of the study

Three organizations working in the field of technology participated in this study. The three organizations were labeled "Group (divided into "Group S" and "Group T"), "Device" and "Resolution", respectively. Common to all these organizations is not only the industry they represent but also the fact that they deviate from the so-called "traditional" type of organization in the problem-solving and expert nature of their work and the freedom of their employees, and in their expectations of employee responsibility. For these reasons, the target organizations have features that are particularly interesting for research related to SDL and creative activity. The importance of these phenomena is emphasized in the target organizations as a part of their everyday work and activities. Table 1 presents information on the organizations' personnel, industry, job titles and structure. Next, I describe the participating organizations in more detail.

TABLE 1 The organizations participating to study

Organization	Group		Device	Resolution	
	Group S	Group T			
Number of employees	160	120	25	30	
Business area	Information technology	Electrical engineering, automation technology	Information technology	Information technology, technological consulting	
Job titles	Software developers, customer electrical service developers, experts, IT design experts (sales persons), project business manager, project managers		Installers, customer service employees, seller, technical experts, software developers	Software developers, project managers, consultants	
Structural notes	Designated managerial responsibilities, designated supervisory responsibilities, HR department and defined HR roles. Operational structure based on self-directed project teams		No designated managerial responsibilities, CEO acts as manager, no HR department or defined HR roles	Designated managerial responsibilities, designated supervisory responsibilities and HR roles. Operational structure based on project teams.	

Group is a rapidly internationalizing technology company with a total of more than 400 digitalization and industrial design experts. The company was founded 30 years ago and today has almost 20 offices in Finland and abroad. Group's organization is divided into a few main business areas and the business units operating within them, which in turn comprise concentrations of professional expertise and industry expertise. Two business units from *Group* participated in this study: *Group S* and *Group T*. *Group S* is business unit that focuses on ICT work and has more than 100 employees. The unit has grown extensively in recent years. Its organisational structure consists of departments based on work tasks: software development, sales, customer service and IT support. Smaller teams within these departments are responsible for ongoing projects. Group T is a business unit that produces industrial design, electrical and automation design also with more than 100 employees. Both, *Group S* and *Group T* have been striving for a low-hierarchy, minimal bureaucracy that places the responsibility for work on their employees. The departmental teams work in a self-directed manner: a team and individuals are responsible for a project, directly connecting with customers and ensuring agreement among the team members regarding the project's content and responsibilities. The leadership goal in these teams is to eliminate obstacles and factors that disturb everyday work. Software teams have project leaders who are responsible for supporting and guiding everyday work. Project leaders also work with customers. In addition, employees have a human resources (HR) manager with whom they can discuss employment issues.

Resolution is a small ICT company operating in Finland and employs fewer than 30 people. It has one main office and one other office in Finland. Some of the employees also work at customers' offices on customers' projects. This company offers software design and consulting services. The employees are software designers, software developers and consultants. The company also employs a chief executive officer, HR manager, marketing persons and salespersons. The company has also been striving for a low-hierarchy, minimal bureaucracy that places the responsibility for work on the employees. Every employee has a superior, and every project has a project leader who is responsible for everyday work and support.

Device is a Finnish ICT company which has its main office in central Finland and another office in southern Finland. The company has about 25 employees in expert positions. The company delivers hardware and software along with Internet and IT support services. The company was founded about 20 years ago. The company has an organizational structure based on a low hierarchy, which means that employees do not have supervisors. Officially, the CEO is the supervisor of all staff members.

2.5 Data of the study

The empirical data for the present research (see Table 2) were collected by ethnographic fieldwork and interviews (see e.g. Hammershey & Atkinson, 2007; Heyl, 2001). The research (including its aims, themes, data collection, progression, anonymity) was introduced to employees via handouts and e-mail bulletins provided by the researchers and the organizations' managers. In each of the organizations, data collection began by gaining familiarity with the organization: I visited the participating organizations several times before starting the data collection, familiarizing myself with them by following the daily activities of their personnel. The data collection was conducted stepwise in the three organizations in 2017 and 2018.

TABLE 2 Data of the study

Organization	Group		Resolution	Device
	Group S	Group T		
Number of	17	10	13	6
interviews				
Number of	63h	42h	28h	14h
observing hours				
Number of field	26 pages	14 pages	4 pages	5 pages
notes				
Number of	139 pages		56 pages	-
transcribed audio				
records				
Data collection	Spring 2017	Autumn	Spring	Spring and
epoch		2017	2017	autumn 2018

Data collecting began with observations, focusing on the daily work of the technology personnel and the work situations and interactions that they encountered. In particular, problem-solving situations, interactive moments, and other situation-related activities were examined. In this study, the research focused on the study of the everyday work of the employees. Observations of as many different organizational events as possible were made, such as educational and informational events, meetings, everyday work hours, coffee breaks, managerial discussions and formal and informal discussions. Observations were written in field diaries (see Davies, 1999) and conversations recorded in audio documentation after which they were transcribed prior to analysis. Field notes were written in the field diary at the time the observations were made but also, afterwards, based on the recollection of the researcher (see Coffey, 1999). Field notes therefore include the researcher's own interpretation (Spradley, 1980), although attempts to avoid over-interpretation were consciously made (Hammersley & Atkinson, 2007).

Interviews (N = 46) were conducted after and within the observation periods and participants with different job titles were either randomly selected or selected based on the observation periods. Participation was voluntary and every individual was requested to give his/her consent to use the interview material for research purposes. At the beginning of the interviews, participants were again told about the study in detail (subject of the research, its goal, the schedule and for what the data will be used and how). Privacy practices and data retention principles were also discussed. The interviews were conducted as individual, semi-structured thematic interviews, aiming at a conversional style between interviewer and interviewee. The overall themes discussed pertained to workplace learning and competency development as well as creativity and creative activity and leadership and supervisory work. The interview questions included, for example: "What do you think about learning at work?", "How do you learn or develop your competencies at work?", "What do you understand by learning in your job?", "How does your organization support your workplace learning or competency development?", "How would you describe creativity or creative activity in your work?", "How do you learn at work?", and "How is learning or creativity supported in your organization?" The questions varied depending on the interview situation and the interviewee. Advisory questions were asked if the employee found it difficult to spontaneously speak about the theme at hand. Details of the data collection are presented in Table 2.

The interviewees were developers, IT experts, engineers, consultants and salespersons performing client support or other duties in the technology sector. Details on the interviewees are presented in Table 3. Observations were made in many different situations in organizations, and hence it is impossible to fully depict all the workers who were present in the observation situation. In everyday situations, observation focused on employees. Coffee breaks also often included managers and HR staff. In addition to occasional day-to-day events, HR managers and supervisors were observed, for example, during various information events and managerial discussions.

Before starting the analysis, all the interviews and audio recordings were transcribed. I did not take note of or transcribe sighs, breaks or silent moments during speech because the data were everyday discussions and interview talk and because this level of verbatim transcription was not necessary for the purposes of the study (Nunan 1993; Stubbs 1983). After transcription, the data were thoroughly read to establish an overview of the interviews.

Observations, field diaries, recorded documents and interviews make it possible to construct picture of the phenomena and culture at hand that is as comprehensive as possible (Heyl, 2001), and provide empirical data that can be analyzed with many different analytical tools. Below, I introduce the methods and tools of analysis that I used in this study.

TABLE 3 Interviewees of the study

	Job title	Organization
1.	Technical expert	Device
2.	Technical expert	Device
3.	Technical expert	Device
4.	Installer	Device
5.	Customer service employee	Device
6.	Customer service employee	Device
7.	IT expert / Marketing developer	GS
8.	IT expert / Salesperson	GS
9.	IT expert / Salesperson	GS
10.	IT expert / IT support	GS
11.	Software developer	GS
12.	Software developer	GS
13.	Software developer	GS
14.	Software developer	GS
15.	Software developer	GS
16.	Software developer	GS
17.	Software developer	GS
18.	Software developer	GS
19.	Software developer, project leader	GS
20.	Software developer, project leader	GS
21.	Software developer, project leader	GS
22.	Software developer, project leader	GS
23.	Business manager (sales)	GS
24.	Automation developer	GT
25.	Automation developer	GT
26.	Automation developer	GT
27.	Automation developer	GT
28.	Electrical developer	GT
29.	Electrical developer	GT
30.	Design engineer	GT
31.	Design engineer	GT
32.	Project manager	GT
33.	Project manager	GT
34.	Consultant	Resolution
35.	Consultant	Resolution
36.	Consultant	Resolution
37.	Consultant	Resolution
38.	Consultant	Resolution
39.	Consultant	Resolution
40.	Software developer	Resolution
41.	Software developer	Resolution
42.	Software developer	Resolution
43.	Software developer	Resolution
44.	Software developer	Resolution
	Software developer, project leader	Resolution
4 5.		

2.6 Analysis of the study

In conducting ethnography, a variety of qualitative analytical tools are available to the researcher (Atkinson, Delamont & Housley, 2008; Kajamaa, 2011; Spradley, 1980). In this study (see Table 4), the analytical methods were selected in accordance with the research questions and included discourse analysis (Edley 2001; Potter and Wetherell 1987), thematic analysis (Braun & Clarke, 2006), ethnographic analysis methods (Hammersley & Atkinson, 2007) such as the analysis of key incidents (Emerson, 2004, Fetterman, 2008) and the categorization of ethnographic data (Bodgan & Biklen, 1998; Tikkamäki, 2006). All the analytical tools selected have been shown to be applicable in ethnographic research. Instruments of discourse analysis can help to uncover and understand different interpretations of the same phenomenon that shape unique cultures (Zastavker & Darer, 2014; Atkinson et al., 2008). Thematic analysis offers tools to structure and analyze qualitative ethnographic data (Braun & Clarke, 2006), while ethnographic analysis was used when aim was to more deeply understand cultural and structural issues in organizations. Next, I will describe in more detail on how the various methods of analysis were applied in this study and why they were found to be suitable to answer the questions addressed by the study.

TABLE 4 Analysis of the study

	Sub-study 1	Sub-study 2	Sub-study 3
Analytical methods	Discourse	Ethnographic	Analysis of key
	analysis	analysis & thematic	incidents &
	-	analysis	categorization of
			ethnographic data
Data of the study	Interviews	Observations (field	Observations (field
		notes) & interviews	notes & audio
			records) &
			interviews
Examination level	Descriptions	Manifestations	Occurrences
The perspective onto SDL	Practice	Process	Project

2.6.1 Discourse analysis yields knowledge about practice and culture

The word 'discourse' originally comes from Latin and means to circulate or run around (Renkema, 2004). Discourse is defined when several texts or speeches repeatedly or frequently have the same features (Lehti, Haapanen & Kääntä, 2018; Virsu, 2012). These features form linguistic social practices that can be viewed as characteristic of a particular group of people (Lehti et al., 2018). For this reason, discourse can be seen as describing the culture of which it is embedded (Zastavker & Darer, 2014) which in turn explains why discourse analysis seems eminently suited to ethnographic research (Atkinson et al., 2008). The concept of discourse is not entirely clear, but has at least two different meanings. "Discourse" (individual) can mean any linguistic activity, in the other words, the use of language as a social activity that also has interactive consequences. "Discourses" (plural) instead refers to ways of describing things and phenomena from some point of view (Pietikäinen & Mäntynen, 2009). In this study, the concept of "discourses" is based on the latter (plural) description. Discourses in this study mean ways of describing the practice of self-directed learning.

In this dissertation study, discourse analysis methods, tools and instruments were applied (e.g., Silverman, 1997; Taylor, 2001) in the first substudy. The aim of the analysis was to find different kinds of discourses or ways of talking (i.e. speech) (Potter & Wetherell, 1987) about the practice of SDL.

The analysis began by identifying fragments that have the kinds of meanings, entities and sets of meanings of relevance to SDL. In accordance with discourse analysis, I termed these sets of meanings interpretative repertoires (Edley 2001; Potter & Wetherell, 1987; Wetherell, 1998). The analysis focused on the use of speech and language ignoring cognitive functions, schemas and phrase linguistics (Potter & Wetherell, 1987). The aim was to examine how the interviewees constructed the reality of SDL as practice in the context of workplace learning in their ICT organizations. Attention was paid to the various ways the interviewees talked about SDL and the meanings, adjectives, depictions, metaphors or examples given by the interviewees when speaking about SDL in the context of their work. The definition of the variability of speech acts, referring to the multiple ways of talking about the same thing, is essential when forming interpretative repertoires (Wetherell & Potter, 1992). A speech act is not usually dominated by a single interpretative repertoire; instead it may comprise several competing or collaborating repertoires (Wetherell & Potter, 1988). Therefore, discourse analysis is well suited for the study of SDL practice, where the aim is to study the interdimensional nature of the phenomenon (see Pintrich, 2004). Utilizing this method, learning-related speech acts were examined in detail - one by one - to reveal similarities. In this phase of the analysis, I paid attention to the different kinds of metaphors, examples and descriptions used by the interviewees' in their speech. While I noticed various types of content, speech about SDL was constructed in a very similar manner throughout the data. As a result, four interpretative repertoires were identified.

To better understand these interpretative repertoires, I used three different discourse analysis instruments: 1) function, 2) context and 3) subject position. In the present study, function refers to the purpose of speech (i.e., why the interviewee is talking in this way). To better understand the meaning of speech and the function of learning-related speech, I also had to examine the context (i.e., time and space) in which the repertoires occurred. Contexts are discovered by examining the situations or settings in which the speech acts attached to each repertoire take place. The contexts create the structures and positions to which the actor or speaker relates him- or herself or others (Silverman, 1997). For this reason, I also examined how the actor or speaker *positioned* him- or herself in each repertoire, as well as individual commitments, responsibilities, rights or statuses. To gain information on the collective nature of SDL practice, I also examined the interviewees' talk to see how they positioned others (colleagues, supervisors) in each interpretation repertoire. In addition, I explored how the employees positioned their organization, and thus investigated how the organizations' practices and culture appeared in the employees' talk (Edley, 2001).

2.6.2 Thematic analysis as a method to support ethnographic research

Thematic analysis is a widely used qualitative research method that provides a suitable and theoretically flexible way of analyzing qualitative data. It is not limited to specific epistemological or ontological positions but can be applied independently from a variety of theoretical and epistemological perspectives (Braun & Clarke, 2006). The purpose of thematic analysis is to analyze and report on themes identified in the data and to interpret various aspects of the research topic (Braun & Clarke, 2006; Boyatzis, 1998). The purpose of the identification of themes is to capture something relevant to the research question in the data. As is very often the case in ethnographic research, as in qualitative research generally, identifying themes is in one way or another a part of the analysis when the aim is to detect and locate different phenomena in diverse data sets. Thematic analysis is also a useful tool as it can be based on either theory or on empirical data (Braun & Clarke, 2006). In the present study, the use of thematic analysis was theory-based in the second sub-study, as the purpose was to confirm a theory-based assumption (i.e. that SDL practices are included in creative activity) and provide a description of the phenomenon based both on previous theory and on the interview data obtained from the target organizations, thereby providing a starting point for the second phase of the analysis. Thus, I wanted to know whether and how the SDL practices included in the descriptions of creative activity processes were highlighted by interviewees.

The analysis proceeded through the stages of thematic analysis presented by Braun and Clarke (2006). These stages are as follows: exploring the data, identifying themes, examining the relationship between phenomena, looking at the observed themes in relation to the entire dataset and pre-understanding formed in the first stage, defining and naming the themes, and reporting on the themes. When applying thematic analysis to interview data, descriptions of creative activity were identified using the previously created theoretical definition of the creative (activity) process (see Amabile, 1996, Collin et al., 2017; Nemiro, 2002). I then proceeded to categorize the practices of SDL thematically (see Brocket & Hiemstra, 1991). This preliminary analysis, utilizing previous research, produced a description of the phenomenon of SDL practices in creative activities.

2.6.3 Ethnographic analysis as a tools for examining practices and cultures

In sub-studies 2 and 3, slightly different, ethnographic methods of analysis were applied. These were 'ethnographic analysis', 'analysis of key incidents' (Emerson, 2004) and 'categorization of ethnographic data' (applied by Bodgan & Biklen, 1992). In sub-study 2, in addition to the thematic analysis described above, an ethnographic analysis based on content division was applied. 'Ethnographic analysis' is not a clear method or tool of analysis but, based on the starting points of ethnographic research, a way of identifying, recognizing and describing the nature of the phenomenon under investigation. Hence, 'ethnographic analysis', in the second sub-study is justified by reference to previous studies, where ethnographic analysis refers to dialogue between theory, context and interpretation (see e.g. Collin, 2006; Davies, 1999; Hammersley & Atkinson, 2007; Silverman, 2001).

Ethnographic analysis is a straightforward process that starts in earnest after collecting the data, although it is already taking place during the observations. The analysis has been described as a "funnel-shaped process": in the first, observing, stage the researcher looks for interesting situations (Davies, 1999), also termed key events (Fetterman, 2008). Ethnographical analysis proceeds from unclear foci to more detailed interpretations (Collin, 2006; Davies, 1999; Hammersley & Atkinson, 2007). In the analysis of the second sub-study, I identified episodes (situations where SDL practices in creative activity manifest) in the field data, utilizing the overview (findings) from the first analytical phase and my own understanding of the interesting situations observed in the observation phase. I read all the transcribed scripts to develop an overall picture of the field notes. Applying ethnographic analysis, I then searched for the roles and actions of different actors and for features included in the manifestations of SDL practices in structuring creative activity in different environments, roles or practices (see e.g. Atkinson et al., 2008; Collin, 2006). I confirmed my interpretation of the field notes with the help of the interview data. For example, in the case of uncertain interpretations derived from the field notes, I returned to the interview data to confirm the description given by an employee in a similar situation. By combining ethnographic analysis with the interview and the field notes data, I was able to discover the individual, collective, and cultural nature of SDL practices in creative activity process. The aim of the ethnographic analysis was to find out the nature of SDL in creative activity, as manifested in the observations made of technology work. My purpose was therefore to describe the specificity of the case and the phenomenon and not to generalize the phenomenon (Hammersley & Atkinson, 2007; Pole & Morrison, 2003).

Another method of analysis related to ethnography, Emerson's (2004) method for the analysis of key incidents, was used in the third part of the dissertation. Applying this method, SDL-related events were sought in the field notes and recordings (Fetterman, 2008). The aim of the method of key incidents is to locate, reveal and depict various events pertaining to the study topic, and to analyze issues and factors that produce information about why social life works in the way it does (Emerson, 2004; Katz, 2001). Three factors have been identified as characteristics of key events: 1) they are not necessarily dramatic or profoundly relevant from the perspective of the examinees; 2) events are part of everyday life; and 3) the significance of these events is not necessarily clear right from the start of the analysis but arouse the researcher's interest in examining them more closely (Emerson, 2004). In my study, the key incidents observed were categorized and informed by the SDLP theory (Artis & Harris, 2007; Clardy, 2000). This was done while paying attention to the context, content and goals of the incidents and, therefore, to employees' opportunities for SDL. Thus, the analysis process proceeded from broad description to more detailed analysis and structuring (see also Emerson, 2004).

The third method of ethnographic analysis is described in the second phase of my third sub-study and is based on the categorization by Bodgan and Biklen (1992). According to Bodgan and Biklen (1992) ethnographic observation parses social reality into different environments, such as the economic, social, cultural (e.g., leadership culture), semantic, human, learning and normative. This framework was utilized in my study, in which the aim was to find frames for SDLPs through the categorization of data. Because in everyday life the above structured categories are overlapping and simultaneous (see Tikkamäki, 2006) and my study did not include the activities of the participants, for example at the semantic level (spoken words, expressions), it was not meaningful to limit the observations at hand. Instead, the categories proposed by Bodgan and Biklen (1992) were combined to examine only the cultural and structural factors and environments that frame SDLP. This allowed for an examination of the projects found in the first phase and the frames, or environments and factors, attached to these. In addition to the frames themselves, their ability to increase or restrict SDL opportunities was further examined. In this phase, the interviews were also used as supporting data during the analysis.

3 FINDINGS

In this study, SDL was examined in three sub-studies. The purpose was to develop a sociocultural understanding of SDWL, examining at the phenomenon in a versatile way, with a focus on descriptions of SDL as practice, manifestations of SDL as process and occurrences of SDL as projects. Table 5 introduces the three sub-studies and their findings.

This study suggests that SDWL can be approached as sociocultural phenomenon that can take the form of practice, process and projects in workplaces. In the studied organizations SDWL was found to be an obligatory practice, a practice that enhanced creativity and motivation, a flexible and fast-paced practice, and a practice tied to work itself. In practice, the roles of the individual, colleagues and the organization vary according to how different actors are positioned in different situations. As a process, SDWL takes the form of acts in a creative process, acts which can be both individual and collective, but which are always framed by the culture of the organization. SDWL as a project takes places in different learning situations, where employees' opportunities for SDL vary depending on whether the project is organization, work community, work task or employee oriented. Next, I present the sub-studies of this dissertation, focusing on their findings. Finally, I summarize the findings and, based on the findings of the sub-studies, provide answers to the overarching research questions of the study.

TABLE 5 Introduction to the findings of the sub-studies

		Sub-study 1	Sub-study 2		Sub-study 3			
Perspective	Self-directed learning as practice		Self-directed	learning as process	Self-directed learning as projects		projects	
Level of examination		Descriptions	Manifestations		Occurrences			
Findings	Obliged practice	Obligated by external factors: Individual as obliged learner, colleagues as helpers, organization as forcer	Combination of individual and collective action	Silent and focused moments Alternating between silence and talk The problem solver as learner and colleagues as counsellors	Organization oriented -projects	increasing opportunities: Supported collaboration Guidance based supervision Cultural frames restricting opportunities: Neglected collaboration Control based supervision Control based supervision Lack of cregarding environments.	Opportunities: Clear responsibilities and roles Versatile environments	
	Creativity and motivation enhanced practice	Importance of wellbeing: Individual as motivated learning, colleagues and organisation as enablers	Solving common problems through dialogue and discussion	The exchange of questions and answers between peers Shared experiences as a prerequisite for joint decision making	Work community oriented -projects		restricting opportunities:	Structural frames restricting opportunities:
	Flexible and fast-paced practice Practice tied to work itself	Hecticness and situation- specificness: Individual as decision maker, colleagues as accessories, organisation as enabler Continuous activity: Individual as active actor, colleagues as enablers, organisation as job provider	An organizational culture framing	Autonomy and freedom in everyday work A culture of guidance and shared information Claims of flexibility and easygoingness	Work task oriented -projects Employee oriented -projects		 Complex responsibilities and roles Lack of choice regarding environments and tools 	

3.1 Sub-study I: Interpretative repertoires of self-directed learning as a practice of workplace learning

Numerous studies have been conducted on SDL, but knowledge on its nature as a work-related phenomenon is limited (Ellinger, 2004; Gu, 2016; Rana et al., 2016). Researchers (Knowles, 1975; Merriam, 2001) have described the practice of SDL, but learners' own descriptions of the nature, benefits or problems of SDL have not previously been researched. The aim of the first sub-study (see Lemmetty & Collin, 2019) was to investigate how personnel in ICT organizations describe the practice of SDL in the context of workplace learning. More specifically, this sub-study sought to answer the question: What kinds of interpretative repertoires of SDL practice do employees in the ICT sector produce in their speech? A further purpose was to find out how the interviewees positioned themselves, other members of the work community and the organization in each repertoire, the contexts of their speech and what they wanted to say through their ways of speaking. The study thus utilized discourse analysis as a method (Edley, 2001; Nunan, 1993; Potter & Wetherell, 1987; Silverman, 1997; Stubbs, 1983), which is well suited for examining the nature of practices and phenomena. In this study, "discourses" refers to ways of describing the practice of self-directed learning (Pietikäinen & Mäntynen, 2009).

The data were gathered from two technology organizations (Group S & Resolution) and consisted of 23 interviews collected in 2017. The interviewees were consultants, IT experts, software developers and project leaders. The interviews were conducted as individual, semi-structured, thematic interviews, emphasizing a conversational style between the interviewer and interviewee. The themes discussed concerned workplace learning and competence development. The following interview questions were used: "What do you think about learning at work?"; "How do you learn or develop your competence at work'; "What do you mean by learning in your job"; and "How does your organization support you workplace learning or competency development".

The aim of this discourse analysis was to identify different interpretative repertoires, i.e. ways of talking (Potter & Wetherell, 1987), by examining fragments of talk that exhibit meanings, sets of meanings and entities of relevance to SDL. The notion of the variability of speech acts, i.e. that the same thing can be talked about in multiple ways, is of crucial importance when forming interpretative repertoires (Wetherell & Potter, 1992). Four interpretative repertoires used by the interviewees when talking about SDL practice in the context of workplace learning were found. These repertoires described SDL practice and its function, context and subject positions in very different ways. The employees described SDL as 1) an obligatory and negative practice, 2) as a practice that enhances motivation and creativity, 3) as a flexible and fast paced

practice, and 4) as a practice tied to work. Next, I elaborate on these four interpretative repertoires.

The first repertoire was named 'SDL as an obligatory practice'. In this repertoire, SDL was described as a requirement and area of work that must be mastered to perform the work in the first place. Such a practice was described as constrained, indispensable, challenging and problematic, and it manifested exclusively as a stressful and burdensome phenomenon that one could not always find time for, despite being obliged to do so. In this repertoire, the employees positioned themselves as obliged learners, their organizations as forcers and colleagues as helpers. This repertoire revealed a critical perspective on SDL practice, one that perceives SDL as compulsory in nature and obliged by external factors.

The second repertoire was named 'SDL as a practice that enhances creativity and motivation. In this repertoire, SDL was described as tool for creativity, viewed as essential in ICT work. In addition to creativity, learning was described and talked about as trigger for motivation, and it was described as pleasant and as something that increases knowledge and enthusiasm. In this repertoire, the interviewees positioned themselves as *motivated learners* and their colleagues and organizations as *enablers*. This repertoire *highlighted the importance* and positive effects of learning.

The third repertoire was named 'SDL as a flexible and fast-paced practice'. Flexibility in this repertoire means that an SDL practice could include many different learning activities that employees could use in a situational and flexible way. Of importance here was when and where each method was used. Situations were often described as requiring a quick reaction and fast learning from employees. The customer's need should be addressed as quickly as possible, allowing the employee to make independent decisions about what she or he needs to learn and how this new learning is achieved. In this repertoire, the individual subject was positioned as a decision maker, colleagues were accessories and the organization was described as an enabler. This repertoire highlighted the speed and hecticness of SDL, situation-specificness and flexible methods.

The fourth repertoire was named 'SDL as a practice tied to work itself'. In this repertoire, learning was considered an intrinsic and inextricable part of work, as a self-evident and automatic practice. Work was described as, for example, a problem-solving activity in which learning is embedded and where it was not necessary to 'separately practice' learning because it occurs naturally during every-day work. In this repertoire, learning was regarded as part of everyday work, indicating that one must be very active when working. Thus, the individual was positioned as an *active actor*. The organization was positioned as a *work provider* and colleagues were described as *enablers*. This repertoire emphasized *the significance and relevance of SDL*.

The findings of this sub-study confirmed the need to investigate the contexts influencing SDL, i.e. to examine what issues frame the creativity-producing SDL situation and what frames make SDL a stressful and negative phenomenon.

3.2 Sub-study II: Manifestations of self-directed learning processes in creative activity

SDL practices, such as learner evaluation and setting learning needs, seeking the right learning resources and evaluating the results of learning (Brocket & Hiemstra, 1991) form the stages of the SDL process. These stages and practices resemble those of the creative process (Amabile, 1996; Nemiro, 2002), especially when creativity is seen as creative activity, such as-developing work methods, everyday problem-solving or creating something new (Collin et al., 2017). In the second sub-study (see Lemmetty & Collin, 2020), I explored how SDL practices manifest in individual and collective creative activity. The aim of the study was to reveal the nature of the phenomenon of "SDL practices in creative activity" Thus, in this sub-study the research question was: How from a sociocultural perspective does the phenomenon of "SDL practices in creative activity" emerge in technology-based work? The empirical data for this ethnographic research were collected through interviews and field work (see also Hammerhey & Atkinson, 2007; Heyl, 2001) from the three participating organizations (Group, Device and Resolution). The data collection was conducted stepwise in the organizations in 2017 and 2018. Field work based on observations focused on the daily work of the technology personnel and the work situations that they encountered. Interviews were conducted after and during the observation periods and participants were employees (software developers, technical developers, automation developers, IT experts, consultants and project leaders). The interview questions were, for example "How would you describe creativity or creative activity in your work", "How do you learn at work" and "How is creativity supported in your organization".

The thematic analysis revealed that SDL practices were included in all creative activity processes in every phase. These SDL practices appeared as the same practices found by Brockett & Hiemstra (1991): self-directed assessment of existing skills and learning needs, setting learning goals, designing learning methods, leading and implementing planned SDL activities, application of learning, evaluating one's own learning and the methods used, and evaluating possibilities for utilizing learning in the future. The ethnographic analysis yielded three main themes that pertain to the sociocultural nature of SDL practices in creative activity: 1) combining individual and collective action, 2) solving common problems through dialogue and discussions, and 3) organizational culture framing of SDL in creative activity. Below, I introduce these themes in more detail.

The first theme of SDL practices manifested in creative activity was "combining individual and collective action". This theme was manifested in the organizations both as silent and focused moments and as alternation between silence and talk. Such situations included creative problem-solving processes where silent moments occur during autonomous and independent problem solving and common and collective problem-solving situations in which talk

occurs. A typical problem-solving situation was one where the problem was the responsibility of an individual employee who first tried to solve it alone, and if he or she was unable to find a way to solve it, help was sought from others. In these situations, SDL appears to be both an individual and a collective action during which the individual's work alternates with conversations with colleagues. In the case of SDL, the field data showed that when a problem is the responsibility of an individual employee, he or she is often in the role of a learner and needs guidance, advice, help and support from colleagues. In such cases, more knowledgeable colleagues in the work environment will act as counselors.

The second theme of SDL practices manifested in creative activity was "solving common problems through dialogue and discussions". This theme was manifested in organizations as an exchange of questions and answers between peers and as joint decision-making based on shared experiences. Many creative activity episodes found in the field notes revealed that problem-solving and SDL were collective activities from the beginning. In cases where a problem affected more than one employee, the above-mentioned learner-counselor roles were not observed. Instead, employees seemed to be peers and equal actors. Concrete common problem solving was achieved through dialogue or discussion. In problem situations and in situations pertaining to learning needs, goals and plans, problem solving and learning appeared as shared reflection and an exchange of ideas. When sharing their own experiences and trying to form a new shared understanding, the group members learn from each other, and the knowledge generated is then used as the basis of the joint decision making.

The third theme of SDL-practices manifested in the creative activity process was "organizational culture framing of SDL in creative activity". This theme indicated that SDL in creative activity requires autonomy and freedom, a culture of guidance and shared information as well as flexibility and easygoingness. A culture of autonomy and freedom enables an individual employee or a team to make decisions without the permission of a supervisor. Freedom also means that employees themselves decide when they need guidance and, if necessary, obtain it from their colleagues through discussion. A culture of guidance and shared information in which one knows who to ask for help or who might have had a similar problems is important for people who need help with problems. It is the organization's responsibility to promote and share information on the different areas of expertise used. A culture of flexibility and easygoingness was strongly present in the research data; for example, problems were solved immediately and time was made for discussion in the middle of the process. In these cases, the work also progressed quickly. Problem-solving situations come and go, and they involve a great deal of collective action that takes place immediately. The schedules must therefore be flexible enough to enable employees to help their colleagues in problem-solving situations.

The second sub-study reinforces the understanding of SDL as a collective and sociocultural phenomenon that is dependent not only on individual abilities and skills but also on autonomy and support in learning. However, it remains unclear how such conditions can be simultaneously implemented and supported

in organizations (Nunan & Lamb, 2006; Bell, 2017). What is problematic about supporting self-directedness is its contextual and situational nature (Foucher, 1995; Knowles et al., 2012), prompting the question: what is the right amount of autonomy and support in each situation (Bell, 2017)?

3.3 Sub-study III: Occurrences of self-directed learning projects and frames in technology-based work

In the third sub-study (see Lemmetty, 2020), I focused on different SDL situations, using the theory of SDLPs (Artis & Harris, 2006; Clardy, 2000). The purpose of this study was to examine employee opportunities for SDL in different learning situations. These were explored through two research questions: 1) What types of SDL projects occur in technology work and what are their features? and 2) What organization-based frames can be detected in SDL projects and how do these frames increase or restrict employee opportunities for SDL? The empirical data for this ethnographic sub-study were based on the fieldwork data, which were collected through observations, field notes and field records. Theme interviews (=40) collected in the organizations (Group and Resolution) were used as supporting data during the analysis. The themes of these interviews were workplace learning and development, supervisory work and organizational support. Observations were taken from as many different organizational events as possible, such as educational and informational events, meetings, everyday work hours, coffee breaks, managerial discussions and other formal and informal discussions.

Through the analysis of key incidents (Emerson, 2004) and categorization of the ethnographic data (Bodgan & Biklen, 1992), I found four types of SDL projects that had different features and were linked to various organization structural and cultural frames. These SDL project types were: 1) organization-oriented, 2) work community-oriented, 3) work task-oriented and 4) employee-oriented. The frames of SDL projects were divided into 1) cultural frames increasing or restricting SDL opportunities and 2) structural frames increasing or restricting SDL opportunities. Next, I present the four different types of SDL projects and the cultural and structural frames attached to them.

The first phase of the analysis, guided by an earlier SDLP theory (Clardy, 2000), yielded four different types of SDL projects. Organization-oriented SDL projects offered employees only minor opportunities for SDL. In these projects, managers or supervisors decided what and how information should be given to employees and how the project should be implemented. Self-direction was only possible for individuals in the matter of deciding how newly received information would be applied in their own work or tasks. Work community-oriented SDL projects, in turn, seemed to provide employees with moderate opportunities for SDL. In these projects, the role of the employee was that of a scheduler and enabler and employees were able to make decisions about content

and participation. These projects aimed to increase the sharing of information within the work community, to the benefit of both the development of work community practices and the development of know-how at the community level. Work task-oriented projects included adequate possibilities for SDL, meaning That individuals could determine their own learning needs and make decisions about how to learn new things and how to apply and evaluate their learning. The goals of these projects were based on work tasks. In employee-oriented projects, the possibilities for employees' SDL were broad. These projects usually took place in employees' leisure time, at home or during 'empty moments' at work. As their goals were employee-based, these projects were also fully designed and implemented by employees.

The second phase of this study resulted in four frame categories that appeared in some way in all the SDL projects described above. The four categories were 1) collaboration, 2) supervisory work, 3) roles and responsibilities and 4) working environments and tools. Collaboration and supervisory work were seen as cultural frames, while working environments and tools as along with roles and responsibilities were categorized as structural frames. Collaboration appeared to be one of the most important frames for all SDL projects. The data show that organizations can support different forms of collaboration: they can raise employee awareness of others' skills or responsibilities; create a culture of dialogical values; and foster development and cooperation by giving time and resources for these. In cases where collaboration was supported, opportunities for employee SDL were increased. In contrast, if collaboration was not supported, and instead neglected, such opportunities became limited. Supervisory work also seemed to frame all the SDLPs: when managers do not monitor or instruct their employees continuously but guide them and give them freedom, the opportunities for SDL increased. If the supervisory work was control-oriented, the opportunities for SDL were restricted. When SDLPs were examined, organizational structures, responsibilities and roles appeared as frames. Clear and well-defined roles and responsibilities helped contribute to SDL projects at the same time as complex responsibilities and roles limited the possibilities for SDL. Various physical environments and working tools may also help to frame SDLPs. For example, while working in an open office environment gave employees an opportunity to talk with colleagues, it also interfered with the work of individuals. Thus, it is essential that work environments are versatile and open to alternative solutions and that, if necessary, employees have the opportunity to work from home or use headphones or 'quiet rooms'. Electronic communication tools, such as Internet search engines, channels and websites, are resources that allow employees to learn collectively regardless of their physical location and decide for themselves when to reach out to others and when not to. Thus, versatile work environments and tools extend the possibilities for employees' SDL.

3.4 Summary of the main findings in relation to the research questions: the phenomenon of self-directed workplace learning

The aim of this study was to develop a sociocultural understanding of the concept of self-directed workplace learning (SDWL) by examining the nature of the SDWL phenomenon in technology-based work due three overarching research questions. The first overarching research question focused on descriptions of the SDWL in the context of technology work. This question was answered in the first sub-study. On this basis, SDWL appeared to be an obliged and a negative practice, a creativity and motivation enhanced practice, flexible and fast-paced practice as well as practice tied to work itself. The second overarching research question asked how does SDL as sociocultural phenomenon emerge in technology-based work. The second and third substudies showed that SDWL emerge as combination of individual and collective actions as well as dialogues and discussion, but is either organization, work community, work task or employee oriented as nature. The third overarching research question focused on the sociocultural frames linked in SDWL. All substudies provided answers to this question. Based on the sub-studies it is possible to say that frames for SDWL in technology-based work emerge from organisations' cultural and structural features. Summary of the main findings in relation to the overarching research questions are presented in the table 6.

TABLE 6 Summary of the main findings in relation to the overarching research questions

Overarching	How self-	How does self-directed	What kinds of sociocultural	
research directed learning		learning as	frames are linked in self-	
question is described in		sociocultural	directed learning in	
	the context of	phenomenon emerge	technology-based work?	
	technology-	in technology-based		
	based work?	work?		
Sub-study	I	II & III	I, II & III	
Main	Obligated	Combination of	Autonomy and freedom	
findings	practice	individual and	Culture of guidance and	
	Motivation and	collective action	shared information	
	creativity	Dialogues and	Claims of flexibility and	
	enhanced	discussions	easygoingness	
	practice	Organization oriented	Collaboration	
	Flexible and	Work community	Supervision	
	fast-paced	oriented	Responsibilities	
	practice	Work task oriented	Roles	
	Practice tied to	Employee oriented	Environments	
	work		Tools	
Nature of	Paradoxical	Sociocultural	Paradoxical & sociocultural	
the SDWL	& Sociocultural			

The study drew attention to the nature of the SDWL phenomenon. Based on the findings of the study, two major conclusions about SDWL can be drawn: 1) SDWL is a sociocultural phenomenon and 2) SDWL is a paradoxical phenomenon. Figure 5 illustrates the synthesis drawn from the findings of this study.

The sociocultural nature of the phenomenon can be described from three perspectives: 1) SDWL takes both independent and individual forms (Lemmetty & Collin, 2019; Lemmetty & Collin, 2020; Lemmetty, 2020), but is nevertheless realized more strongly as a collective (Lemmetty, 2020); 2) SDWL is a contextual and situational phenomenon (Lemmetty & Collin 2019; Lemmetty, 2020); and 3) SDWL and its empowerment are influenced by the cultural and structural frames of the organization (Lemmetty, 2020). Whether SDWL was viewed as a practice, a process or a project, the data showed that it always involved not only individual activity but also sociocultural factors. Thus, sociocultural considerations do not erode the importance of the individual; however, the sociocultural dimension provides insight into why and how the individual acts in his or her environment. From the point of view of practice, the sociocultural aspect can be described through the actors who influence the individual's activities, i.e. colleagues in the immediate work environment and those in the organization, such as managers and supervisors. From a process perspective, the activities of SDL in the creative process phases seemed to progress through cultural characteristics of the organization such as autonomy, freedom, guidance, shared information, flexibility and easygoingness. From the project perspective, it was found that supporting or neglecting collaborative work, guidance-based or control-based supervisory work, complex or clear roles and responsibilities, and versatility or lack of choice regarding the environments and tools all framed employees' opportunities for SDL. Thus, it can be said that although the individual has an important role in SDWL (see also Noe & Ellingson, 2017), it also needs collectivity (see also Billett, 2001; Brown & Duguid, 2001; Gherardi, 2006). In addition, the opportunities provided by the environment, the work of supervisors, the organizational climate and the tools available (see also Schein, 1990) are essential for the realization of SDWL and the nature of the phenomenon. Thus, this study confirms the indications from previous studies (e.g. Bell, 2017) that SDL at work is also a sociocultural phenomenon in which learning is the result of interaction with others and the environment (Vygotsky, 1978).

Based on this study, the paradoxical nature of SDWL can be described from two perspectives: 1) SDWL as productive of creativity (Lemmetty & Collin, 2019; Lemmetty & Collin, 2020) and 2) SWDL as a burden on the learner and problematic (Lemmetty & Collin, 2019; Lemmetty, 2020). Paradoxical refers to the contradictory nature of a phenomenon - the fact that the same phenomenon can take different forms in speech, action, or interpretation. When the paradoxical elements are examined individually and detached from the phenomenon per se, they seem logical, but when approached as intertwined and aligned, they seem inconsistent and contradictory (Lewis, 2000; Smith & Lewis, 2011). Indeed, paradox refers to the coexistence of tensions between opposing elements

(Hargrave & Van de Ven, 2017). The paradoxical nature of SDWL observed in this study can be described as one in which two aspects of the phenomenon are present simultaneously. The paradox of SDWL is that learning and self-directedness are not only positive but also problematic.

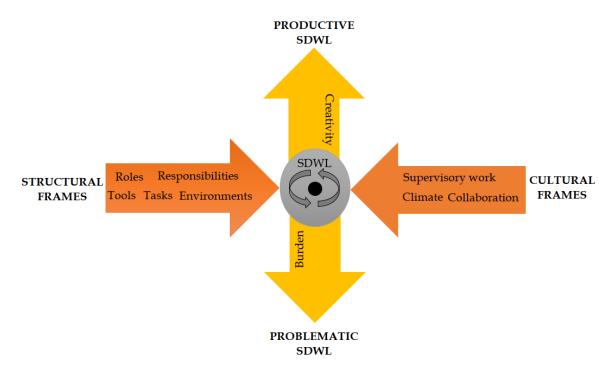


FIGURE 5 Sociocultural and paradoxical nature of SDWL

According this study, socioculturalism and paradoxicality also seem to be intertwined: sociocultural factors strongly influence whether SDWL is productive of creativity or problematic. Although SDL has been mostly been described as a positive and even ideal phenomenon at work (Edmondson et al., 2012; Cox, 2002; Guglielmino, 2008), the present research showed that SDL can also be a burdensome and problematic practice (Lemmetty & Collin, 2019). For this reason, it is important to understand the sociocultural nature of SDL, as this understanding helps to determine when SDWL is productive and at what point it becomes problematic. It seems to be essential, when considering the nature and consequences of SDL, to be aware of how these cultural and structural frameworks manifest and occur at work.

The conclusion of this study is therefore that self-directed workplace learning as practice, process and project can be defined as a sociocultural and paradoxical (productive or problematic) phenomenon in which the individual alone or as part of a group takes responsibility for his or her own learning within the constraints or opportunities presented by the prevailing social, cultural, and physical environment.

4 DISCUSSION

In this section, I discuss about the sociocultural and paradoxical nature of SDWL formed by combining the findings of all three sub-studies. My aim is to describe more precisely what kind of understanding my research findings on the nature of SDWL contribute to previous research on the topic. I describe in detail what, based on the findings of this study, the sociocultural nature of SDWL means in terms of collectivity, context and situations, and cultural and structural organizational frames. Finally, I present the paradox revealed by the study and the sociocultural factors underlying it.

4.1 Sociocultural nature of SDWL

SDL research has partially lacked a sociocultural framework, although its importance has been emphasized in several studies (Artis & Harris, 2007; Baskett, 1993; Bell, 2017). It is noteworthy that while this sociocultural aspect has long been a topic in the field of workplace learning research (Billett, 2001; Collin, 2006; Fenwick, 2008) it has only more recently been considered in the field of creativity research (Glaveanu, 2011, 2015; Sawyer, 2004). This study showed that a similar evolution is also taking place in the concept of SDL. Next, I highlight, based on the current study, the key notions describing the phenomenon of SDWL from the sociocultural point of view. These key notions are related to nature of SDWL as individual and collective, contextual and situational as well as culturally and structurally framed phenomenon.

4.1.1 Individual and collective SDWL

In this study, the practice of SDL was described both as an individual and as a 'shared responsibility'. Especially when individual was obliged to be self-directed, he or she described the team as 'easing the learning pain', thus assisting

learning (Lemmetty & Collin, 2019). Since SDL is based on the idea of the learner's responsibility for learning (Knowles, 1975), it is not surprising that the descriptions of individual responsibility and freedom in relation to learning were emphasized in the descriptions both of SDL and of SDL related to creative processes. Although individual-driven activities were found in the data, the notion of autonomous learning could be questioned: even in situations of 'autonomous learning', it was found that employees use external sources to facilitate their learning, most typically the Internet. "Independent information retrieval" has been previously described as an SDL activity of employees (Edwards, 2010); however, in reality, information retrieval, including on the Internet, may include activities like chat discussions with others, watching blogs or YouTube videos. Thus, SDWL, even when it looks very individual from the outside, is not realized autonomously or independently. External sources emerge as artefacts (see Glaveanu, 2011), whereby the autonomy of individual learning is externally influenced.

In addition to so-called individual learning, collective situations and descriptions based on community, teamwork and group situations were also observed in the present research (Lemmetty & Collin, 2019, 2020; Lemmetty, 2020). The importance of collectivity has been strongly recognized in creative processes in previous studies (e.g Craft, 2008; Glaveanu, 2011, 2015; Nemiro, 2002; Sawyer, 2004). For SDL, the present findings make a significant contribution: on the one hand, SDL processes can, in principle, be individual-driven and become collective as soon as an individual receives resources for learning from other members of the group (Lemmetty & Collin, 2020; see also Brookfield, 1993; Collin & Paloniemi, 2008). On the other hand, an SDL process can be collective from the beginning, when the problem to be solved basically affects a larger group of people and its solution proceeds through group interaction (Lemmetty & Collin, 2020). Similar findings have been reported in previous workplace learning research (see Brandi & Elkjaer, 2011; Collin, 2006; Paloniemi & Collin, 2010; Billett, 2014), including in the technology field (Schümann & Beausaert, 2016). However, these studies have not primarily been interested in the roles and responsibilities of individuals or groups, which are linked to SDL in workplace learning in the present study. Of relevance to this study is the fact that, despite its name, SDWL can also be a collective responsibility shared by the group in the form of dialogue and discussion (Lemmetty & Collin, 2020) or of helping and supporting others (Lemmetty & Collin, 2019). Thus, while learning, especially in technology work, takes independent forms, it should not become totally autonomous and independent. Rather, the individual, also in the context of SDL, should be viewed as part of the sociocultural whole and self-directedness should in the future also be seen more broadly as collective activity.

4.1.2 Contextual and situational SDWL

In this research, learning was found to be strongly framed by its context: that is, the technical nature of the work and constant change in technologies as along with its problem-based nature (see also Ha, 2008, 2015; Hirschmann & Mulder,

2018; Nerland, 2008) frames learning. Thus, SDL was perceived as a natural part of technology work (Lemmetty & Collin, 2019; see also Heinz, 2010), which includes continuous changes in technologies, day-to-day problem-solving situations as well as changing standards in the ICT-sector (see also Ha, 2015). All these emerged in many kinds of different learning and work situations (Lemmetty, 2020). According to these notions, the study appear to be strongly in line with those of previous studies where learning at work has been found to be strongly intertwined with work practices themselves (Billett, 2001; Collin, 2006; Gherardi, 2009; Edwards, 2010) and to occur during working and problem solving (Collin et al., 2018; Havnes & Smeby, 2014; Nerland, 2008). Additionally, customer situations and requirements have a direct impact on what employees need to learn. To summarize, learning is an important and integral part of technology-based work.

Another interesting context for SDL is the organizational structure based on a low hierarchy and project teams. The purpose of a low organizational hierarchy (Lee & Edmondson, 2017; Salovaara & Bathurst, 2016) is to cut down on daily bureaucracy so that employees do not constantly have to ask senior managers in the organization for permission. This naturally facilitates decision-making in everyday life and thus increases self-direction. As stated previously, SDWL is also a collective phenomenon and self-directed individuals also sometimes need help and support from others in their work. In such cases, however, hierarchical levels also seem necessary if the problem is one that the employee, even with the support of his or her team, cannot solve, but instead needs help from supervisors. However, although colleagues and immediate supervisors (project managers) are often described as the primary supporters of learning, the project team structure (see Inkson, 2008; Moe, Dingosyr & Dypa, 2008) appears to be a rich resource, providing an intimate home base context for learning, especially for new workers (Lemmetty & Collin, 2019).

It should also be remembered that learners' possibilities to contribute to processes in a self-directed manner depend heavily on the possibilities that different situations offer for this purpose (Candy, 1991). This perspective was strongly highlighted in sub-study 3 (Lemmetty, 2020), which looked at the opportunities for SDL of individuals and groups in different kinds of work situations. The nature, aims and purposes of the situations studied greatly influenced the way in which opportunities for the SDL were created. The more organizational and business-oriented the goal of the situation was, the fewer the opportunities individuals and groups found for SDL. What is interesting, however, is that, as a situational phenomenon, SDL is no longer a detached phenomenon, that is, a phenomenon that occurs only in certain types of autonomous situations (see e.g. Blaschke, 2012; Conn, 2000). According to the present study, the problem of whether, assuming a requirement for SDL exists in the organization, self-directedness is possible within the constraints of the work situation and working hours, remains. In other words: SDL is not possible if employees are required to undertake SDL in every situation in an environment that does not enable self-directedness (Lemmetty, 2020; see also Bell, 2017).

These findings provide insights into organizations preferring self-directedness on a larger scale: the opportunities of individuals for SDL is emphasized when self-directed action is also culturally or structurally encouraged. The everyday life of organizations is strongly guided and framed by the cultural and structural factors that they adopt. It is precisely the areas covered by these themes that have been among the major foci of this study. Next, the findings of the study on the cultural and structural frames of SDL in organizations are examined.

4.1.3 Culturally and structurally framed SDWL

According to previous studies (Billett, 2001; Bunderson & Boumgarden, 2010; Eraut, 2004; Tynjälä, 2013), many aspects linked to organizational culture and structure affect workplace learning. Cultural aspects of organizations enumerated by Schein (1990) include, for example, the climate and leadership practices. Based on the present study, the above also can be applied to the SDL of individuals and work groups. In the technology sector especially, the nature of learning has shifted partly to SDL, a development that has thus also changed the support needs for this kind of learning (Bauer et al., 2012). In this study, the cultural factors, which frame SDWL, were found to be supervisory work, collaboration and climate, while the structural frames were roles, responsibilities, environments, tools and tasks (Lemmetty, 2020). The most important point, however, in enabling SDL, is *how* the above-mentioned cultural and structural frames manifest in the workplace

The present results showed that supervisory work based on supporting, coaching, and helping employees promotes opportunities for SDWL. The result resembles previous reports that SDL needs to be supported by adequate support, feedback and guidance (Bell, 2017; Knowles et al., 2011; Candy, 1991) in which colleagues and supervisors play an important role (Foucher, 1995; Skule, 2004). Descriptions of SDL-supported supervisory work come close to the definition of coaching leadership: the role of the coaching leader is to support the continuous learning, development, performance and autonomy of employees by facilitating and empowering them (Ellinger & Bostrom, 1999: Hagen, 2012). According to Hunt and Weinraub (2002), a coaching manager promotes reflection and learning, encouraging employees to take ownership, to develop and to engage in the organization. In supervisory work, the limiting factors were leadership and management that were controlling and commanding. As already explained, combining this type of leadership with the drive for self-direction is a doomed idea (Lee & Edmondson, 2017; Salovaara & Bathurst, 2016). The importance of managerial work observed in this study is interesting and partly contradicts some studies which explicitly describe supervisory work as a constraint on selfdirection (see e.g. Lee & Edmondson, 2017). Although there are many views, for example in the field of coaching leadership, on how coaching and empowering leadership can support self-directedness, learning, and creativity in the workplace, research which looks at the nature of daily supervisory work in

depth and does not describe leadership solely as a controlling and commanding activity is clearly needed.

Collaboration, another cultural issue which was found important for SDL in the present study (Lemmetty & Collin, 2020; Lemmetty, 2020), describes the supported collectivity of the work community, the ability to interact and share experiences and dialogue (see also Collin, 2006; Sfard, 1998). Technology-based workplaces have been proven to offer a large variety of both individual and collegial-based resources for learning (Billett, 2001). Thus, the importance of collaboration at work has long been recognized, whereas it has not received so much attention in the field of SDL, which is why this finding is significant in developing a collective definition of SDWL. This study also identified factors that restrict the opportunities of individuals and groups to engage in SDL at work. Moreover, neglected collaboration did not appear to be an enabling phenomenon for SDL. This concurs with previous workplace learning studies showing that cultural factors at work, such as collectivity (Billett 2001; Brown & Duguid 2001; Tynjälä 2013), shared experiences (Collin 2005; Collin & Paloniemi 2008), opportunities for employees to engage in various activities and to be guided by colleagues, or to simply listen and observe the work environment (Billett, 2001), have commonly been found to be resources for workplace learning. It is now possible to say that these have also been found to be resources for SDL at work (Lemmetty, 2020).

Climate, on the other hand, refers to an atmosphere that could allow employees freedom in everyday decision-making, flexibility in work tasks and work-related activities. Earlier studies on the work atmosphere have found that a prudent atmosphere and high levels of appreciation (Baskett, 1993) and the acceptance of errors (Kops, 1997) supports SDL at work. However, some studies have shown that increased autonomy does not guarantee SDL (Bell, 2017), as excessive freedom can also lead the individual to take the easiest option, a strategy that does not always lead to learning (Tannebaum et al., 2010). In this current study, the importance of autonomy as an enabler of SDL mainly focused on the employee's ability to make decisions about everyday issues that occur in the workplace. Autonomy does not therefore have to mean empowering learners at every conceivable level of the organization. This study's findings related to supporting or enhancing SDL are therefore partially same as those found in previous studies.

In this study, the structural factors of the organization also seemed to provide an interesting frame for SDWL (Lemmetty, 2020). Previously, organizational structural issues, such as hierarchy and roles (e.g., Auvinen, Riivari & Sajasalo, 2018; Collin et al., 2018; Langfred, 2000; Moe et al., 2008; Skule, 2004), have been found to be relevant for learning at work. However, results regarding whether or not hierarchies, for example, support learning at work have been partially contradictory (see Bunderson & Boumgarden, 2010; Burns, 1995). Based on the present research, clear structures, responsibilities and roles can promote individual opportunities for SDL (see also Bunderson & Boumgarden, 2010). Similar signs have been reported in previous studies. It has been found

that, even in self-directed teams, structure, hierarchy and job clarity (Bunderson & Boumgarden, 2010) and managerial responsibilities (Skule, 2004) promote learning. Therefore, it cannot automatically be assumed that structures or hierarchies invariably limit SDL possibilities, as some previous studies have concluded (Burns, 1995; Lee & Edmondson, 2017). However, unclear structures and roles, as well as lack of versatile work environments and tools, were described in this study as challenging SDL. According to the present findings, hierarchies and structures per se do not seem to directly affect SDL: what matters is how clear or unclear these structures are.

Many kinds of frames in organizations — colleagues, supervisors, leaders, and organizational practices and structures — play a role in promoting but also restricting SDWL (Lemmetty & Collin, 2019). The organization's role appeared negatively when SDWL was talked about as an obligation (Lemmetty & Collin, 2019). Instead, an organization was positioned as an enabling actor in the case of a motivation- and creativity-enhanced practice or a flexible and fast-paced practice (Lemmetty & Collin, 2019). It was only when SDL was described as a practice tied to work that the organization was perceived as just a 'job provider'.

4.2 Paradox of SDWL: problematic or productive?

Both SDL and workplace learning have previously been mostly approached as positive, as increasing creativity, productivity and innovation in organizations, and increasing the well-being and motivation of employees (e.g. Davies & Daley, 2008; Guglielmino, 2008; Cox, 2002; Edwards, 2010; Loyens et al., 2008). Moreover, for decades, less attention has been paid to the critical examination of themes (Fenwick, 2001; Järvensivu & Koski, 2012). The question is, what 'dark sides' do self-directedness and / or learning at work have? In this study, I observed the 'positive' aspect of SDWL but also, and equally strongly, a dark side. The reasons for the these diverse manifestations and consequences of SDL were found in this study to be related to issues of collectivity as well as to the cultural (Lemmetty & Collin, 2020) and structural frames in organizations (Lemmetty, 2020). Next, I comment on the paradoxical, problematic and productive, nature of SDL in the workplace. The paradoxical nature of SDL in work was especially visible in the first sub-study: the practice of SDL in the context of workplace learning was simultaneously constructed as productive practice of creativity and motivation but also as an obligatory and problematic practice.

SDL, like learning in general, has over time been strongly associated with creativity (Edmondson et al., 2012; Cox, 2002; Beghetto, 2016). Creativity is described as the context in which learning takes place (Goller & Billett, 2014; Harteis & Goller, 2014; Bereiter & Scardamalia, 1993), but also as the output that is validated through the learning process and previous knowledge (Amabile, 1996; Ford, 1996; Ness & Soreide, 2014). Indeed, in this study, learning was viewed as a tool for creativity: the creative process progresses through SDL towards a high-quality endpoint, such as 'beautiful code' in the IT field

(Lemmetty & Collin, 2020). It has been seen in the field of workplace learning that a person with learning opportunities at work is better motivated. Again, this study clearly found that learning was often the most important reason why working in technology was described as motivating: SDL was constructed as very positive, as enhancing creativity and motivation (Lemmetty & Collin, 2019). In the first and second sub-studies, learning appeared to support the creation of technical innovations and creative processes (see also Amabile & Khaire, 2008; Collin et al., 2018; Florida & Goodnight, 2005; Paloniemi & Collin, 2010).

Surprisingly, however, the study also revealed SDL to be a forced, negative, and even stressful phenomenon at work (Lemmetty & Collin, 2019). However, this perception is not unprecedented. Kirjonen (2005), for example, found that the feeling of being controlled in some situations can even lead to harmful mental strain. According to him, research has also found that the desire to gain control varies greatly from one individual to another, and that people's willingness to take responsibility for their own lives varies. As workplace learning becomes more autonomous and 'self-directed', employees may perceive learning as a strain and challenging (Lemmetty & Collin, 2019; see also Bell, 2017; DeRue & Wellmann, 2009). The principles of low-hierarchy organizations and SDL, the freedom and autonomy of learning, and the responsibility for learning appear to be thrust onto individuals. Thus, learning can be perceived as problematic and stressful if an employee cannot monitor and constrain his or her learning and the employer does not provide the requisite opportunities, support and tools for monitoring learning. According to previous studies (e.g. Collin et al., 2018), employees may experience themselves as left alone and abandoned in the absence of organizational support. Not all employees may see SDL as solely a positive practice; some may feel that it is also a burden and stressful obligation (Lemmetty & Collin, 2019). It is also good to note, that organizational-level development goals do not always meet, and cannot meet, employees 'own goals. This can lead to conflicts and imbalanced power relations (Arnesson & Albinsson, 2019), regardless of the level of hierarchy in the organization.

In this study, opportunities for SDL were found to be as best in 'employee-oriented' learning projects. The problem with this premise is that these learning projects were often manifested either as single, informal conversational moments with colleagues during work or, for example, coffee breaks or in home-based leisure-time projects (Lemmetty, 2020). The importance of leisure-time learning was emphasized, as technology workers often described working on home projects that also supported their tasks at work. Home learning was encouraged but also coerced by organizations: Supervisors appreciated and rewarded home learners with licenses and cash bonuses, for example, and urged other workers to follow those who learn at home. This manifestation of SDL is challenging, as it strongly reflects these organizations' limited resources to support learning during working hours. Employees are urged to take responsibility without the provision of sufficient resources (see also Järvensivu & Koski, 2012), as when a learner needs to find these resources elsewhere, such as during leisure time. This not only reveals the burden of SDWL but also highlights the problem of equality:

if learning extends outside working hours, how does can this be reconciled with family or leisure? (see also Todd & Bins, 2010). If employees are left to bear the burden of their learning alone, both individual development and organizational performance suffer (Bell, 2017). A mixture of work and leisure has been observed, for example, in Finland, where many researchers believe that much unpaid voluntary work is done outside working hours (Antila, 2006; Järvensivu & Koski, 2012).

Interestingly, the emphasis placed on self-directedness in by the participants in this study indicates that self-directedness might become a generally accepted idea both among employees and in the culture of work. If so, this gives rise to an important question about how employee well-being and developmental opportunities will be addressed when work and learning are not as inspiring as they might be or when there is so much work that learning, during the work day is impossible (Lemmetty & Collin, 2019). This study, however, offers a way out of this paradox. As I have made clear, in a learning situation, learners' responsibility and freedom vary according to that situation and the external factors and objectives framing it. Hence, when approached from the perspective of andragogy — the learner-centered approach to both goal setting, motivation and the learning process — contextual frameworks and starting points must be taken into account (see also Artis & Harris, 2007, Bell, 2017; Foucher, 1995; Baskett, 1993). In working life, human activity is inevitably driven by external factors such as customers and other external stakeholders, business objectives, financial factors, and resources. For this reason, I argue that the starting points of andragogy and SDL cannot be realized in working life in accordance with the theoretical ideal (Knowles, 1975; Merriam, 2001). Thus, the individual employee is never able to operate in workplace learning situations during working hours in a fully self-directed way (see also Arnesson & Albinsson, 2019), because, for example, as found in this study, learning aims in the workplace are always either organizational, work community-oriented or work task-oriented (Lemmetty, 2020). The study showed that learning aims were only employee-oriented in specifically 'employee-oriented' projects, did not usually arise during actual work. Moreover, assessment of what is learned in working life is not based on what the employee himself or herself learned in relation to what he or she wanted to learn but on the basis of how the employee's learning contributed to achieving organizational or job goals. When talking about SDL in working life, we should abandon the ideal of SDL and instead see SDL as individual and collective moments of employee responsibility, manifested in everyday decision-making in relation to the employees' own work goals. Such self-direction may be driven, for example, by how the employee himself or herself wants to achieve externally set learning goals, the methods he or she chooses from among those available in the organization, how much time or other resources he or she needs, and so on. Although an individual can at the same time learn and develop his or her own competence at work, such development will inevitably also be externally directed. The ideal situation in the workplace is rather one where the employee's own interests coincide with the needs of the

organization, work community, or job (see also Burke & Hutchins, 2007). In this case, the goal of developing the individual's own skills will be contributing at the same time to one of the above-mentioned, externally set goals.

What types of structures and cultures, then, present opportunities for creativity and productive SDL or, on the other side of the coin, provide a breeding ground for burdensome and problematic SDL? Based on the findings and overarching synthesis of this study (see Figures 5 and 6), it can be concluded that cultural elements, such as leadership, collaboration, and climate, produce negative SDL outcomes when they are based on employee control and command or neglect (Lemmetty & Collin, 2019; Lemmetty, 2020). Similarly, from the structural perspective, unclear roles and responsibilities appear to constrain opportunities for SDL and thus render the process slow, stressful and challenging (Lemmetty, 2020). SDL, which fosters creativity, and thus productivity, is enabled by freedom and autonomy in relation to everyday work, supportive supervisory work, and strong collectivity, meaning that colleagues play an important role in the learning process in a climate which is dialogic and flexible (Lemmetty & Collin, 2019; Lemmetty & Collin, 2020). The observations made in this study on the extent of autonomy in employee decision-making related to work and on the role of supervisors as supporters are not necessarily contradictory. Self-direction does not have to mean the complete freedom and autonomy of individuals in all activities; it can also mean smaller moments of freedom, such as opportunities to participate in discussions and express views, or group activities and support from the supervisor. However, to understand the need for employee support and autonomy requires that supervisors to make a careful analysis of each situation as it arises.

5 CONCLUSIONS

In this section, I describe the ethical considerations related to the research process and the reliability of the findings. I then look at the theoretical, practical and societal implications of the research. Finally, I present further research challenges identified during this study.

5.1 Evaluating the research process from the point of view of ethics and trustworthiness

Next, I look at the research process and the findings from the point of view of ethics, reliability, trustworthiness and usability. Carrying out ethnographic research involves several ethical issues (see e.g. American Anthropological Association, Statement of Ethics, 2012). Many ethical considerations were dealt with before commencement of the actual study. The proposed concrete actions and progress of the study were agreed with the target companies in advance. Organizations and participants were told about the study in detail (subject of the research, goals, the schedule and for what purposes the data will be used and how). Privacy practices and data retention principles were also discussed. Thus, ethically unsustainable hidden observation (see Grönfors, 1985) was not possible at the time of the data acquisition, as the researcher's role was solely that of a researcher in the organizations and was known to the participants throughout. In addition, if observees were confused about what was being observed, they were reminded why there was an extra person in the room, who she was, and for what reason. Similarly, at the beginning of the interviews, participants were again told about the study in detail. The interviewees participated as volunteers and had the opportunity to withdraw at any time. The researcher is bound by the confidentiality of the business affairs of the companies and the material collected has been and will be used only by the researcher. The present target organizations and individual respondents have been pseudonymized and are not thus identifiable in the research reports. All these actions contributed to the

credibility and dependability of the research (see Elo, Kääriäinen, Kanste, Pölkki, Utriainen & Kyngäs, 2014; Shenton, 2004), and helped the researcher to follow the appropriate ethical guidelines.

Although many things may have been anticipated before the start of the research, the uniqueness of each situation in a field and case study means that ethical issues and procedures must always be re-considered at all stages of the research process (National Advisory Board on Research Ethics 2003). Due to the nature of the data collection and the rapid pace of everyday work, it is possible that during workplace observations, the researcher will deal with matters or persons for whom, for example, the need for prior informed consent could not have been predicted. These situations were prepared for here and the research and objectives could be discussed with new observees. Contextual considerations of this kind of are part and parcel of ethnographic research in general.

The analysis and reporting stages of the study include several issues that impact on the trustworthiness of the study (see Lincoln & Cuba, 1985; Shenton, 2004; Rodgers & Cowles, 1993). Understanding of the researcher's own role and awareness of its implications for interpretations of the data are particularly important in ethnographic research (Croucher & Cronn-Mills, 2015). Fortunately, I collected a large amount of diverse data (Patton, 2005), as this also supports the credibility and confirmability of the findings in qualitative research (Lincoln & Cuba, 1985; Shenton, 2004). In this study, I used multiple analysis tools and methods in investigating the sociocultural nature of SDWL. This allowed for a deeper understanding of the phenomenon and also contributed to the dependability of my interpretations (see e.g. Elo et al., 2014; Shenton, 2004). The use of many different ways of data collection and analytical methods and tools enhances validity and trustworthiness of the research (Patton, 2002). Method triangulation means that different aspects of the research phenomenon and contexts (including cultural and contextual differences) are considered when putting different data sets together. Method triangulation is thus used to increase the internal validity of the data analysis and to create a multifaceted understanding of the phenomenon of interest. Thus, with the help of these tools, I was able to make interpretations about the practices, processes and projects of SDL in different areas, about the contexts they appear in, and about the role of the individual and the roles of others in these.

In addition, especially in ethnographic research, due to its unpredictable and 'funnel-shaped' nature, it is important that the entire research process is reported in as much detail as possible. In this present study I have described the process as transparently as possible. To strengthen the trustworthiness of my findings, I would emphasize the detailed descriptions I have given of the data collection and analysis phases along with the references to published articles and data-based citations and examples that support the interpretations (see Lincoln & Cuba, 1985). A more detailed description of the progress of the research process can be found in section 2.3. (Ethnographic research as a process). In addition, trustworthiness is supported through the scientific and timely nature

of the sources used in the research, the consistency of the source references and reporting, and the clear presentation of the results (Tuomi & Sarajärvi, 2009).

Using qualitative, ethnographic research strategies as well as many different types of analysis enabled me to investigate the multifaceted nature of SDL (see Pintrich, 2004). On the issue of the transferability of the findings, I believe that while the findings can reasonably be applied to technology work, in low-hierarchy (see Lee & Edmondson, 2017), they will in the future also become increasingly applicable in all fields of industry. This can be considered a valid argument, as research suggests that workplace learning will become important in many different industries (Noe & Ellingson, 2014). On the other hand, as responsibility and freedom shift in organizations to individual actors (Ellinger, 2004; Rigby & Ryan, 2018) and teams, self-direction, will increasingly enable decision-making by those actors themselves. It is also expected that the prevailing phenomena and challenges associated with ICT workers' learning (e.g., circumstances related to instituting and maintaining low-hierarchy and self-managing organizations) will spread to other fields of working life (Lee & Edmondson, 2017). Thus, in the future it would be useful to compare the nature of SDWL in different vocational fields and across organizational structures.

Despite the credibility of the findings, the ethnographic method may have resulted in a strong emphasis on context and cultures, which might have had an impact on the findings or on my interpretations. It would have been possible to broaden understanding of SDL by utilizing additional data, for example surveys. In this way, it would have been possible to find even stronger evidence of the importance of the individual in SDL.

5.2 Theoretical, practical and societal implications

Based on the findings of this study, a number of theoretical, practical and societal implications can be identified. The increased understanding of SDWL, especially from a sociocultural perspective, led to an understanding of the diverse nature of the phenomenon. Rather than fully understanding self-directed learning as an individual-driven or positive phenomenon, this study yielded four theoretical contributions.

The first theoretical contribution of this study is that the individual should be seen as a learner in a specific social and cultural context (such as the workplace), in which he or she is always framed by the external environment. Thus, theories based solely on the individual perspective can be questioned and, instead, the nature of self-directedness as an action of both the individual and the community, framed by context, situation, and cultural and structural factors, must be emphasized. This reinforces the point made earlier: self-directedness is not only a trait of the individual that transfers from one situation to another (Candy, 1991). Thus, it is possible to question the notion suggested by heutagogy (Blache, 2012; Canning, 2010; Hase & Kenyon, 2000) that a sufficiently experienced and knowledgeable individual can act on a voluntary basis in a

situation where he or she has good enough 'learning to learn' skills. The heutagogical notion is also challenged by the fact that organizational change is accelerating and that technological innovations are constantly supplanting their predecessors, with the result that no one can be experienced enough to control themselves in every situation. Although adults have different abilities, levels of readiness, skills and experience to act in a self-directed way (Billett, 2018; Hämäläinen, De Wever, Nissinen & Cincinnato, 2017; Virtanen & Tynjälä, 2018), it is only together with the right opportunities in the right environment that these abilities and skills can be fully exploited.

The second theoretical contribution of this study is that the social and physical contexts afford different kinds of opportunities for workers to learn. This means both cultural and structural, informal and formal frameworks that affect an individual's acting. The importance of continuous learning is, and will likely continue to be, emphasized in the future (see also Noe & Ellingson, 2017) and work become increasingly self-directed: learning will be integrated into work and work practices. If so, the division of learning itself into informal or formal is questionable, since all frameworks, structures and cultures (be they formal or informal) frame the work itself and therefore they also frame learning at work. Thus, instead of dividing learning into informal or formal, workplaces should be viewed as learning environments with both informal and formal frameworks (see also Billett, 2002) that offer different starting points, opportunities and support for both learning and self-direction.

The third theoretical contribution of this study is that SDL is a strongly paradoxical phenomenon. SDL can be creative and productive in certain circumstances, but stressful and problematic in others. The problematic aspects of SDL found in the study provide new insights into the long-anticipated 'dark side' of learning at work. Learning at work should not be approached as an activity, which is entirely the responsibility of the individual, as the purposes and aims of learning in working life, however, are not fully employee-oriented. Negative consequences can manifest themselves, for example, in the form of excessive learning requirements and the resulting strain, if support and clear goals are not available.

The fourth contribution is a more methodological one. The study offers an interesting and useful analytical framework for studying self-direction or self-directed learning from the sociocultural perspective. The descriptions of SDWL that have emerged from this study can provide a good starting point for future research on workplace learning from the perspectives of both individuals and groups. The weakness of the study is that it does not take individual traits and personalities, or mentalities into account but is based on practice-based starting points from which the phenomenon is seen to be validated in work practices. In addition, the organizational cultural and structural frames identified in the study offer a new starting point and a tool for future exploration of the nature and features of cultures and structures not only within organizations but also elsewhere in society.

Based on this study, it can be concluded that self-directedness, like creativity (Loewemberger, 2013), is not dependent on individual-driven factors alone; organizations also have a variety of features that either limit or enable selfdirectedness. For this reason, organizations' leaders should not expect individuals to be self-directed from situation to situation, but rather to focus on creating structures and cultures where self-direction is possible. At the same time, however, careful consideration needs to be given to when the self-direction of individuals and groups is appropriate. In light of findings related to the burdensome nature of SDL at work (DeRue & Wellman, 2009; Lemmetty & Collin, 2019), it should also be investigated when self-direction in organizations is not needed, i.e., when it does not add value to the development of the individual or the organization. The framing factors seem to vary by situation, time and organization (see e.g. Lemmetty & Collin 2019). If so, then it can also be questioned whether it is possible to develop individual self-direction as a property or whether it is more useful to develop context-specific factors that enable self-direction. In any case, merely learning to acquire skills (see 'Heutagogy' by Canning, 2010; Hase & Kenyon, 2000) is clearly not enough if the environment does not support and participate in SDWL. It should be noted that the realization of SDL in the workplace, especially with respect to actor-based goals, is highly questionable; since learning goals are based on customer needs, context, and the business objectives of organizations, the latter should focus on exploring employees' own interests and development in relation to their goals (Burke & Hutchins, 2007) and/or on whether it is possible to link individuals' interests to a broader range of activities and practices throughout the organization.

If self-directedness as individual practice become a generally accepted idea both among employees and in work culture, an important question arises: how will employee well-being and developmental opportunities be addressed when work and learning are not as inspiring as they could be, or when work demands make learning impossible? To summarize the findings, learning is a very important part of work, especially technology-based work. However, the nature of learning has been translated into SDL performed alone, which in turn has implications for the supervision of this kind of learning (Bauer et al., 2012). Because digitalization will also increasingly become part of the work of all kind of organizations in the future, these findings are also applicable to other fields.

Self-directedness is associated with individualism, which seems to be the dominant ideology in Western society and in economics. Descriptions of individualism range from political, to social and psychological perspectives; however, but they all share the idea that the best interests of adults are served by allowing them maximum freedom and responsibility in relation to setting their own goals. Individualism is thought to be positive (Fischer & Boer, 2011; Inglehart, Foa, Peterson & Welzel, 2008; Triandis, 1995; Waterman, 1981): individualism, freedom and autonomy contribute to a good quality of life (Frey & Stutzer, 2002; Sen, 1999), the idea being to enable the maximum welfare and freedom of the individual, with society existing only for the sake of its members.

However, the individualism is not unproblematic (Beck, 2016; Triandis, 1995). According to Hofstede (1991), individualism is associated with a society in which communality has disappeared and everyone is expected to look after himself or herself alone. Hui and Triandis (1986) argued that individualism can also be described as a lack of concern for others. This societal argument has also challenged us to consider Knowles's idea of self-direction from the point of view of whether self-direction is an intrinsic need of the individual or, in reality, is it just an ideal produced by society and not necessarily the way individuals think (Meyer, 1990).

The paradox revealed in my research can be linked to this broader social debate on individualism: self-directedness generates well-being, but can also burden workers. Perhaps the idea of self-control and satisfying one's own needs and built into self-directedness, will inadvertently form a way of working that will be realized as lack of concern for others. Such a shift could be very harmful both in society in general and in the workplace. When individuals subscribe to a "my life first" mentality, the individual's motivation and creativity will grow until a problem arises. Assuming the people around have the same mentality, the question must be asked, who will support and help a person with a problem? The present finding is that such an ideal of self-directedness in working life cannot be realized without conflict, as every-day work has a multiplicity of external frames attached to it. Thus, one should also ponder whether ideal selfdirectedness is realizable in a society where laws, values and the world around us inevitably guide our actions. It is for this reason that self-directedness should be seen as a sociocultural phenomenon: we should do things in relation to our own goals, but also in relation to the goals of our peers, colleagues, fellows, environments and others.

If SDL becomes a burden at work, this is also a societal challenge, especially when the current high rates of stress and sickness lead to increased early retirement rates. Examining SDL at work and exposing its paradoxical nature contributes to an understanding of the problematic nature of individualism in society as a whole and in working life in particular. A shift towards seeing self-directedness as a limited phenomenon and as a sociocultural phenomenon would promote collectivity, support and care, and would eliminate the risk of burdening individuals with problems that have repercussions for society.

5.3 Suggestions for future research

Some important challenges for further research can be suggested. First, the paradoxical nature of SDWL calls into question one important principle of learning: sustainability. Sustainability is a much debated issue nowadays, In the field of learning (Benn, Edwards & Angus-Leppan, 2013; Brandi & Christensen, 2018; Kearney & Zuber-Skerritt, 2012), sustainability is not directly related to environmental sustainability (Scully-Russ, 2012; Pfeffer, 2010), but more closely to human and social sustainability (Goodland, 2002; Pfeffer, 2010). It refers to the

well-being and coping of people, both at work and in society (Pfeffer, 2010). If SDL at work becomes burdensome, it will challenge people's resilience in working life. Research is needed on this issue: it must be asked, how, if learning becomes one of the stress factors in working life, can we prevent its unsustainable effects? This study also provided insights into the organization-oriented framework for SDL. Reference was also made to the boundary conditions produced by customers. However, more information is needed on the nature of SDWL and the factors that influence it, broadening the focus from the organizational context to clients and, for example, reconciling family and work, hobbies and leisure.

In adult education, andragogy emphasizes adult experiential learning and self-direction, heutagogy (see Hase et al., 2014; Blaschke, 2012) in turn emphasizes complete autonomous self-learning and self-direction. At the same time, with the digitalization of working life and learning environments, learning has been combined with technology, with the result that heutagogic research has focused on these views of 'independent learning'. Thus, because a significant proportion of communication work as well as learning occurs in digital environments, interaction in digital applications and technology-based interaction channels should also be explored as a context in SDL research. This means that, ethnographically, online learning and its sociocultural frameworks should be methodologically examined. Today, online is not just about autonomous and independent learning, but it is also interactive. Virtual ethnography (see Rouleau, de Rond & Musca, 2014) could offer good tools for this kind of investigation.

Integrating organizational development activities with an ethnographic process of continuous interpretation could be a fruitful avenue of research. In the context of this dissertation, the interaction and discussion with key persons in the studied organizations (e.g. supervisors and leaders) has also led to many concrete development and organizational changes. From the perspective of longitudinal research, it would be interesting to examine recent changes and how these are affected by earlier ethnographic work and how organizations can develop their activities supported by the ethnographic research process.

Finally, I question the view expressed by Felstead et al. (2011) on the radical change in the learning culture, 'from learning to work to working to learn'. Is it the case that radical change has happened the other way around? We do not work to learn, but we learn to cope with our work. Therefore, what matters today and in the future is not so much whether the organization provides learning opportunities — they will automatically be part of everyday work. What matters, however, is how employees are supported in everyday learning. The study of self-directedness and workplace learning has come a long way since it was found that adults are capable of learning and that they learn differently from children (Merriam, 2001). Despite this, Knowles's observation in the 1950s that adults learn best in an informal, flexible and non-depressing environment — such as at work — remains topical. How to make workplaces learning environments, employees on-the-job learners, supervisors leaders of learning, colleagues as

learning facilitators, and work projects and tasks interesting learning situations, is perhaps a more relevant question now than ever before.

YHTEENVETO

Itseohjautuva työssä oppiminen teknologia-alan työssä

Tutkimuksen tausta

Tutkimuksen tavoitteena on lisätä ymmärrystä itseohjautuvan oppimisen sosio-kulttuurisesta luonteesta työelämässä. Tähän pyritään tarkastelemalla itseohjautuvaa oppimista teknologia-alan työssä kolmen tason kautta: työntekijän kuvauksista, itseohjautuvan oppimisen ilmentymistä sekä itseohjautuvan oppimisen raameista organisaatioissa. Tutkimus kiinnittyy ajankohtaisuudessaan laajempaan työelämän muutokseen, jossa aikuisten jatkuva oppiminen on välttämätöntä esimerkiksi teknologioiden kehittymisen vuoksi. Samaan aikaan itseohjautuvuuden merkitys korostuu yhä vahvemmin työhön liittyvien vastuiden siirtyessä organisaatioilta työntekijöille itselleen.

Tutkimuksen taustalla ovat teoreettiset, käytännölliset ja yhteiskunnalliset tarpeet tarkastella itseohjautuvuutta ja oppimista aikuisten keskeisellä elämänalueella, työssä ja työpaikoilla. Teoreettisesti itseohjautuvan oppimisen tutkimuksessa on aikaisemmin keskitytty yksilölähtöisiin kuvauksiin, oppijoiden persoonallisuuden piirteiden, taitojen ja taitotasojen sekä kykyjen mittaamiseen. Yhteisöllistä ja sosiokulttuurista tarkastelua on aikaisemmissa tutkimuksissa peräänkuulutettu, mutta laajaa ymmärrystä itseohjautuvan oppimisen sosiokulttuurisesta luonteesta ei ole muodostettu. Käytännön tasolla itseohjautuvuus on viime vuosina näyttäytynyt suomalaisilla työpaikoilla tavoitteena, minkä seurauksena yksilöiden automoniaa ja vapautta on lisätty ja yksittäisten itsensä johtamisen taitojen merkitystä korostettu. Samaan aikaan yleisessä keskustelussa itseohjautuvuuden ja itseohjautuvan oppimisen määrittelyt ovat kuitenkin jääneet vajavaisiksi tai sen tukemisen muodot osin heikoiksi. Tästä syystä on tärkeää ensin tarkastella ilmiötä laajempana sosiokulttuurisena kokonaisuutena, jonka jälkeen on mahdollista pohtia sen hyötyjä ja ilmenemismuotoja käytännön työelämässä.

Yhteiskunnallisesti itseohjautuvuus on liitettävissä laajempaan keskusteluun individualismista. Individualismiin pohjautuvassa yhteiskunnassa arvostetaan yksilöiden vapautta ja mahdollisuuksia päätöksentekoon, mutta individualismin rajoitteista ja ongelmista tarvitaan myös ymmärrystä. Tämä tutkimus tuottaa uutta tietoa itseohjautuvuudesta ja itseohjautuvan oppimisen luonteesta ja raameista myös yhteiskunnallisella tasolla sekä tarjoaa uudenlaisen sosiokulttuurisen näkökulman itseohjautuvan oppimisen ymmärtämiseen ja tutkimiseen tulevaisuudessa.

Teoreettinen viitekehys

Tutkimuksen pääkäsitteenä on itseohjautuva oppiminen, jota tarkastellaan aikuisten oppimisen kontekstissa työelämän tilanteissa. Itseohjautuvalla oppimi-

sella tarkoitetaan oppijan vastuuta ja aktiivista roolia erilaisissa, työhön kiinnittyvissä, oppimistilanteissa. Käsitettä lähestytään tutkimuksessa andragogiikan, työssä oppimisen ja luovan toiminnan teoreettisista viitekehyksistä, joiden kautta se nivotaan laajempaan sosiokulttuuriseen lähtökohtaan.

Andragogiikan mukaan aikuisten oppimiseen liittyy vahvasti itsenäisyys, vastuullisuus sekä kokemuksellisuus. Toistaiseksi itseohjautuvaa oppimista on andragogisessa viitekehyksessä usein lähestytty oppimisympäristöstä ja oppimiseen vaikuttavista yksilön ulkopuolisista tekijöistä irrallisena, jolloin sosiokulttuurinen näkökulma on saanut yksilölähtöiseen tarkasteluun verrattuna vähemmän huomiota. Tästä syystä tässä tutkimuksessa sosiokulttuurisen ymmärryksen kehittämiseksi teoreettista pohjaa tuodaan käytäntöperustaisen työssä oppimisen sekä luovan toiminnan viitekehyksistä, joiden tarkastelussa juuri yksilön ulkopuolisten tekijöiden merkitys on huomioitu vahvemmin. Käytäntöperustainen työssä oppimisen viitekehys näkee oppimisen työssä erilaisina yksilöllisinä tai kollektiivisina käytäntöinä, eli yksittäisistä toimista muodostuvina kokonaisuuksina, joihin vaikuttavat monet organisaation tekijät. Luovan toiminnan sosiokulttuurinen tarkastelu nojaa ajatukseen, jonka mukaan kuka tahansa voi toimia luovasti ja luovuus on yksilön ominaisuuden sijaan pikemminkin yhteisöissä ja ympäristöissä määriteltävä, useiden tekijöiden summana kehittyvä ilmiö. Kaiken kaikkiaan sosiokulttuurinen lähestyminen tässä tutkimuksessa tarkoittaa, että oppiminen on sosiaalinen ilmiö, joka toteutuu ihmisten välisessä vuorovaikutuksessa sekä ympäristön tuottamien tekijöiden vaikutuksesta.

Näkökulmiksi itseohjautuvan oppimisen tarkasteluun on valittu aikaisemmasta teoriasta paikannetut käytäntö, prosessi ja projekti –näkökulmat, joiden avulla tutkimuksessa suunnataan huomiota erilaisiin itseohjautuvan oppimisen muotoihin työelämässä. Käytäntö –näkökulma viittaa itseohjautuvaan oppimiseen oppimiskäytäntönä, jossa yksilö tai ryhmä ottaa vastuuta oppimisestaan. Prosessi –näkökulma tarkoittaa yksittäisten toimien tai niiden kautta muodostuneiden käytänteiden kautta kehittyvään oppimisprosessiin, jonka eri vaiheissa yksilöllä tai ryhmällä on aktiivinen ja vastuullinen rooli. Projekti –näkökulmalla kuvataan laajemmin erilaisia oppimistilanteita, joissa käytännöt ja prosessit toteutuvat.

Tutkimuskysymykset ja tutkimuksen toteutus

Tutkimuksen tavoitteena on lisätä ymmärrystä itseohjautuvan oppimisen sosiokulttuurisesta luonteesta työelämässä. Tutkimuskysymykset ovat seuraavat:

- 1. Miten itseohjautuvaa oppimista kuvataan teknologia-alan työssä?
- 2. Miten itseohjautuva oppiminen sosiokulttuurisena ilmiönä ilmenee teknologia-alan työssä?
- 3. Millaisia sosiokulttuurisia raameja kiinnittyy itseohjautuvaan oppimiseen teknologia-alan työssä?

Tutkimus koostuu kolmesta osatutkimuksesta, niistä julkaistuista kansainvälisistä tutkimusartikkeleista sekä teorian, metodologian ja tulokset kokoavasta yhteenvedosta. Tutkimuksessa on hyödynnetty etnografista tutkimusstrategiaa, jonka mukaisesti aineisto koostuu kolmesta kohdeorganisaatiosta kerätystä havainnointi- ja haastatteluaineistosta. Havainnointiaineiston keruu toteutettiin vuosina 2017 – 2018 kaikissa organisaatioissa seuraamalla ja tarkkailemalla organisaatioiden henkilöstön arkea, erilaisia vuorovaikutustilanteita, työtilanteita, ongelmanratkaisutilanteita, informaaleja ja formaaleja keskustelutilanteita, kahvitaukoja, koulutustilanteita sekä johtaja-alais keskusteluja. Havainnot kirjattiin kenttäpäiväkirjaan ja vuorovaikutustilanteita tallennettiin kenttätallenteiksi. Haastattelut (N = 46) toteutettiin puolistrukturoituina teemahaastatteluina. Aineistot analysoitiin diskurssianalyysin, teema-analyysin sekä etnografisten analyysimenetelmien avulla.

Tutkimuksen tulokset

Tutkimuksen tulokset osoittivat, että itseohjautuvaa työssä oppimista voidaan kuvata neljällä eri tavalla. Diskurssianalyysi paljasti työntekijöiden kuvaavan itseohjautuvaa oppimista työssä 1) pakotettuna 2) luovuutta ja motivaatiota tuottavana 3) nopeana ja joustavana sekä 4) työhön sisältyvänä käytäntönä. Tulkintarepertuaarit tuottivat ymmärryksen ilmiön paradoksaalisesta luonteesta: itseohjautuva työssä oppiminen on sekä tuottavaa, että kuormittavaa.

Tutkimuksessa havaittiin, että itseohjautuva oppiminen teknologia-alan työssä ilmenee vahvasti sosiokulttuurisena kokonaisuutena, jossa yksilön merkitys osana oppimista ei kuitenkaan ole poissuljettu. Ilmiön sosiokulttuurinen luonne ilmeni luovan toiminnan tilanteissa, joissa itseohjautuvan oppimisen prosessi eteni sekä yksilöllisten että kollektiivisten toimien, toimijoiden välisten dialogien ja keskustelujen kautta. Lisäksi prosessia raamittivat organisaatiolähtöiset tekijät, jotka liittyivät muun muassa työntekijöiden arkiseen autonomiaan ja vapauteen, organisaation ohjaukselliseen ja jaettuun vuorovaikutukseen perustuvaan kulttuuriin sekä työn joustavuuteen.

Lisäksi kävi ilmi, että itseohjautuvan oppimisen projekteja ja niissä havaittuja itseohjautuvan oppimisen mahdollisuuksia määrittelivät useat organisaation kulttuuriset ja rakenteelliset tekijät: johtaminen, yhteistyö, vastuut ja roolit sekä työympäristöt ja työvälineet. Itseohjautuvan oppimisen mahdollisuuksien osalta oleellista näyttää tutkimuksen mukaan olevan se, millaisena edellä kuvatut kulttuuriset ja rakenteelliset raamit ilmenevät. Oppimisen mahdollisuuksia edistää organisaatiolähtöisesti tuettu yhteistyö, ohjauksellinen lähijohtamistyö, selkeät vastuut ja roolit sekä vaihtoehtoiset työympäristöt ja työvälineet. Sen sijaan oppimismahdollisuuksia rajoittaa laiminlyöty yhteistyö, kontrolloiva lähijohtaminen, epäselvät organisaatiorakenteet ja roolit sekä työympäristöjen vaihtoehdottomuus ja tarpeen mukaisten työvälineiden puutteet.

Tarkasteltaessa itseohjautuvan oppimisen projekteja, havaittiin, että oppimistilanteet voidaan jakaa organisaatiolähtöisiin, työyhteisölähtöisiin, työtehtävälähtöisiin sekä työntekijälähtöisiin oppimisprojekteihin. Kaikissa projekteissa

esiintyi itseohjautuvaa oppimista kuvaavia tekijöitä, mutta mahdollisuudet itseohjautuvaan oppimiseen olivat vähäisimmät organisaatiolähtöisissä projekteissa ja suurimmat työntekijälähtöisissä projekteissa. Organisaatiolähtöiset, työyhteisölähtöiset ja työtehtävälähtöiset projektit olivat tyypillisimpiä työajalla ja työpaikalla esiintyviä projekteja, joissa työntekijöiden vaikutusmahdollisuudet suhteessa oppimiseen rajoittuivat päätöksentekoon sen suhteen, millä tavalla tarvittava uusi osaaminen saavutetaan käytettävissä olevia resursseja hyödyntämällä. Työntekijät eivät näissä projekteissa voineet asettaa itse oppimisensa perimmäisiä tavoitteita, sillä vaateet uuden oppimiselle tulivat joko asiakkaan, organisaation, tiimin tai työtehtävän puolesta. Näin ollen myöskään opitun arviointi ei useinkaan toteutunut työntekijälähtöisesti, vaan opittua tuli arvioida suhteessa ulkoa asetettuun tavoitteeseen. Työntekijälähtöiset oppimisprojektit olivat nimensä mukaisesti työntekijän toimesta toteutuvia ja niissä itseohjautuva oppiminen mahdollistui vahvimmin. Nämä projektit eivät useinkaan toteutuneet työajalla tai työpaikalla, vaan työntekijän vapaa-ajalla. Ne nähtiin tästä huolimatta itseohjautuvan työssä oppimisen tilanteiksi, koska niiden tuottamaa osaamista voitiin toisinaan hyödyntää myös työelämässä.

Tutkimusten tulosten perusteella voidaan todeta, että itseohjautuva työssä oppiminen teknologia-alan työssä on sekä sosiokulttuurinen että paradoksaalinen ilmiö. Itseohjautuvan oppimisen mahdollistuminen on vahvasti riippuvaista yksilön ulkopuolisista tekijöistä, yhteisöstä ja ympäristöstä sekä näiden välisestä vuorovaikutuksesta. Itseohjautuvuuden toteutuminen työelämässä sellaisena ideaalina, jossa oppija itse hallitsee kokonaisuutta alusta loppuun asti, kyseenalaistuu tutkimuksen tulosten myötä. Itseohjautuva oppiminen ei tutkimuksen mukaan näyttäydy ainoastaan positiivisena, motivaatiota ja luovuutta tuottavana ilmiönä vaan se voidaan kuvata myös kuormittavaksi ja pakotetuksi käytännöksi. Sosiokulttuurisilla raameilla, kuten yhteistyön, lähijohtamistyön, ympäristön, rakenteiden ja roolien laadulla voidaan vaikuttaa itseohjautuvan oppimisen mahdollisuuksiin sekä sen luonteeseen työelämässä.

Johtopäätökset

Tutkimuksen johtopäätöksenä voidaan todeta, että itseohjautuva työssä oppiminen tulisi nähdä yksilölähtöisten tekijöiden sijaan useiden yhteisöllisten ja ympäristöllisten tekijöiden summana. Itseohjautuvuus ei ole ainoastaan yksilön kyky, joka siirtyy sellaisenaan tilanteesta toiseen. Tällöin se tulisi nähdä lähtökohtaisesti myös yksilöstä riippumattomien tekijöiden rajoittamana ja toisaalta tuettuna ilmiönä. Itseohjautuvuuteen aikaisemminkin liitetty autonomia näyttää tutkimuksen mukaan itseohjautuvan oppimisen edellytyksenä, mutta työn tuomat raamit huomioiden autonomian merkitys ulottuu työntekijöiden arkiseen päätöksentekoon – ei täydelliseen vapauteen. Samalla itseohjautuva työssä oppiminen edellyttää ohjausta ja tukea. Lähijohtaminen voi parhaillaan mahdollistaa itseohjautuvaa oppimista toteutuessaan työntekijää valmentavalla ja ohjaavalla tavalla. Organisaatiosta käsin pakotettuna käytäntönä itseohjautuva oppiminen muodostuu negatiiviseksi ja tuen puuttuessa työntekijää kuormittavaksi. Tästä

syystä itseohjautuvaa oppimista ei tulisi organisaatioissa odottaa kaikilta työntekijöiltä kaikissa tilanteissa vaan tilannekohtaisesti tulisi tarkastella myös sitä, milloin itseohjautuvuus on mahdollista tai edes tarkoituksenmukaista.

Käytännön työelämälle on tärkeää ymmärtää itseohjautuvan oppimisen mahdollistumisen rajoitteet. Koska itseohjautuva oppiminen ei voi työelämässä, useiden ulkopuolisten vaikuttimien vuoksi, toteutua alusta loppuun yksilöiden hallitsemana kokonaisuutena, emme voi myöskään tarjota itseohjautuvuuden tukemiseksi ilmiön ideaaliin kuvaukseen perustuvia ratkaisuja. Itseohjautuvan oppimisen muuttuessa työntekijää kuormittavaksi tekijäksi, samaan aikaan kun oppimisen vaateet työelämässä muutoinkin kasvavat, nousee esiin huoli työntekijöiden kestävyydestä ja hyvinvoinnista.

Sama huoli voidaan liittää myös individualismiin pohjautuvaan yhteiskuntaan, jossa itseohjautuvuuden odotus esiintyy ihmisten vapauden ja autonomian kautta. Itseohjautuvuuden ongelmallinen luonne yhteiskunnassa voi käytännössä ilmetä tilanteina, jossa yksilöt toimivat lähtökohtaisesti omia tarpeitaan ja etujaan tavoitellen. Tällöin ongelmia kohdattaessa avun saanti toisilta voi muodostua vaikeaksi. Itseohjautuvuus voi olla motivoivaa ja luovuutta tuottavaa, mutta liian vahvana ja yksilölähtöisenä se voi haastaa yhteisöllisyyden ja ihmisten hyvinvoinnin.

Työelämän muutosten tuottamissa oppimisvaateissa korostuu ajatus työstä jatkuvana oppimisena. Tällöin oppimismahdollisuuksien tietoinen lisääminen organisaatioissa ei enää tulevaisuudessa ole merkityksellistä, vaan tärkeämmäksi muodostuu se, miten työntekijöitä tuetaan päivittäisten oppimishaasteiden ratkaisemisessa. Malcom Knowlesin jo 1950 –luvulla tekemä havainto siitä, että aikuiset oppivat parhaiten epämuodollisissa, joustavissa ja ei-painostavissa ympäristöissä – kuten työpaikoilla, voidaan nähdä edelleen ajankohtaiseksi. Miten saada työpaikoista oppimista tukevia ympäristöjä, lähijohtajista oppimisen ohjaajia, kollegoista oppimisen fasilitaattoreita ja työprojekteista tai tehtävistä mielenkiintoisia oppimistilanteita, on ehkä ajankohtaisempi kysymys nyt kuin koskaan aiemmin.

REFERENCES

- Agonács, N. & Matos, J. (2019). Heutagogy and self-determined learning: a review of the published literature on the application and implementation of the theory. *Open Learning: The Journal of Open, Distance and e-Learning,* 34(3), 223-240. doi.org/10.1080/02680513.2018.1562329
- Arnesson, K. & Albinsson, G. (2019). Reflecting talks: a pedagogical model in the learning organization. *Reflective Practice*, 20(2), 234-249. doi.org/10.1080/14623943.2019.1575198
- Amabile, T. M. (1996). *Creativity in context*. Boulder, CO: Westview.
- Amabile, T. M. (2017). In pursuit of everyday creativity. *The Journal of Creative Behavior*, *51*(4), 335–337. doi.org/10.1002/jocb.200
- Amabile, T. M. & Khaire, M. (2008). Creativity and the Role of the Leader. *Harvard Business Review*, 86(10), 100–109.
- American Anthropological Association, Statement of Ethics 2012. *AAA*Statement of Ethics: Principles of Professional Responsibility. Retrieved from: http://ethics.aaanet.org/category/statement/Accessed 10.8.2019
- Antila, J. (2005). Veteen piirretty viiva? Työn ja yksityiselämän välisen rajapinnan tarkastelua. [Examining the interface between work and private life]. *Työpoliittinen tutkimus* 272. Helsinki: Työministeriö.
- Artis, A. B. & Harris, E. G. (2007). Self-directed learning and sales force performance: An integrated framework. *Journal of Personal Selling and Sales Management*, 27(1), 9-24. doi.org/10.2753/PSS0885-3134270101
- Ashton, D.N. (2004). The impact of organisational structure and practices on learning in the workplace. *International Journal of Training and Development*, 8(1), 43-53. doi.org/10.1111/j.1360-3736.2004.00195.x
- Atkinson, P., Delamont, S. & Housley, W. (2008). *Contours of culture. Complex ethnography and the ethnography of complexity*. New York, NY, USA: Rowman & Littlefield Publishers.
- Auvinen, T., Riivari, E. & Sajasalo, P. (2018). Lessons learned from traditional and "new-age" leadership. In A. Eskola (Eds.), *Navigating through changing times* (pp. 95–112). New York, NY, USA: Routledge.
- Bammens, Y. P. M. (2016). Employees' innovative behavior in social context: A closer examination of the role of organizational care. *The Journal of Product Innovation Management*, 33(3), 244–259. doi.org/10.1111/jpim.12267
- Banks, M. (2010). Autonomy guaranteed? Cultural work and the "art-commerce relation." *Journal for Cultural Research*, 14, 251–269. doi.org/10.1080/14797581003791487
- Baskett, H. K. M. (1993). Workplace factors which enhance self-directed learning, 7th International Symposium on Self-Directed Learning, West Palm Beach, FL, USA. 21 23.1.1993. Retrieved from: https://files.eric.ed.gov/fulltext/ED359354.pdf
- Bauer, H.G., Hemmer-Schanze, C., Munz, C. & Wagner, J. (2012). Learning innovation work: Learning concept and framework. In F. Böhle, M. Bürgermeister & S. Borschen (Eds.), *Innovation management by promoting the*

- *informal. Artistic, experience-based, playful* (pp. 171–189). Dordrecht: Springer.
- Beck, U. (2016). Varieties of second modernity and the cosmopolitan vision. *Theory, Culture and Society, 33*(7-8), 257-240. doi.org/10.1177/0263276416671585
- Beghetto, R.A. (2016). Creative learning: A fresh look. *Journal of Cognitive Education and Psychology*, 25, 6–23. doi.org/10.1891/1945-8959.15.1.6
- Bell, B. S. (2017). Strategies for supporting self-regulation during self-directed learning in the workplace. In R. A. Noe & J. E. Ellingson (Eds.), *Autonomous learning in the workplace* (pp. 117-134). New York, NY, USA: Routledge. doi.org/10.4324/9781315674131
- Benn, S., Edwards, M. & Angus-Leppan, T. (2013). Organizational learning and the sustainability community of practice: The role of boundary objects. *Organization & Environment*, 26(2), 184–202. doi.org/10.1177/1086026613489559
- Bereiter, C. & Scardamalia, M. (1993). Surpassing Ourselves: An Inquiry into the Nature of Expertise. Chicago, IL, USA: Open Court.
- Berger, P. L. & Luckmann, T. (1966). *The Social sonstruction of reality: A treatise in the sociology of knowledge*. New York, NY, USA: Anchor Books.
- Billett, S. (2008). Learning throughout working life: A relational interdependence between social and individual agency. *British Journal of Education Studies*, 55(1), 39-58. doi.org/10.1111/j.1467-8527.2007.00394.x
- Billett, S. (2000). Guided Learning at Work. *Journal of Workplace Learning*, 12(7), 272–285. doi.org/10.1108/13665620010353351
- Billett, S. (2001). Learning through work: Workplace affordances and individual engagement. *Journal of Workplace Learning*, 13(5), 209-214. doi.org/10.1108/EUM000000005548.
- Billett, S. (2004). Learning through work: Workplace participatory practices. In H. Rainbird, A. Fuller, and A. Munro (Eds.), *Workplace learning in context*. (pp. 109-125). London: Routledge.
- Billett, S. (2014). Mimesis: Learning through everyday activities and interactions at work. *Human Resource Development Review*, 13(4), 462-482. doi.org/10.1177/1534484314548275
- Billett S. (2018). Student readiness and the integration of experiences in practice and education settings. In S. Choy, G.B. Wärvik & V. Lindberg (Eds.), Integration of Vocational Education and Training Experiences. Technocal and vocational education and training: Issues, concerns and prospects, vol 29 (pp. 19-40). Singapore: Springer.
- Blaschke, L.M. (2012). Heutagogy and lifelong learning: A review of heutagogical practice and self-determined learning. *The International Review of Research in Open and Distance Learning*, 13(1), 56-71. doi.org/10.19173/irrodl.v13i1.1076
- Blomberg, A. (2019). Luova autonomia ja autonominen luovuus –kriittinen katsaus niiden muotoihin ja merkityksiin. [Creative autonomy or autonomous creativity critical review to their shapes and meanings.] In

- K. Collin & S. Lemmetty. (Eds). *Siedätystä johtamisallergiaan. Vastuullinen johtajuus itseohjautuvuuden ja luovuuden tukena työelämässä.* [Ethical leadership supporting self-directedness and creativity at work] (pp. 96-122). Helsinki: Edita.
- Boden, M.A. (1990). *The Creative Mind: Myths and Mechanisms*. London: Weidenfield and Nicholson.
- Bodgan, R. C. & Biklen, S. K. (1992). *Qualitative methods of education to theory and methods*. Boston, MA, USA: Allyn and Bacon.
- Boud, D. & Rooney, D. (2018). The potential and paradox of informal learning. In G. Messman, M. Segers & F. Dochy (Eds.) *Informal learning at work. Triggers, antecedents, and consequences* (pp. 134-154). London: Routledge. doi.org/10.4324/9781315441962
- Bourdieu, P. (1977). *Outline of a theory of practice*. Cambridge: Cambridge University.
- Bourdieu, P. (1990). The logic of practice. Cambridge: Polity Press.
- Boyatzis, R.E. (1998). *Transforming qualitative information: Thematic analysis and code development.* Thousand Oaks: Sage.
- Brandi, U. & Elkjaer, B. (2011). Organizational learning viewed from a social learning perspective. In M. Easterby-Smith & M. A. Lyles (Eds.), *Handbook of Organizational Learning and Knowledge Management* (pp. 23-41.) London: John Wiley and Sons.
- Brandi, U. & Christensen, P. (2018). Sustainable organisational learning a lite tool for implementing learning in enterprises. *Industrial and Commercial Training*, 50(6), 356-362.
- Braun, V. & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology*, 3(2), 77–101. doi.org/10.1191/1478088706qp063oa
- Brockett, R. G. & Hiemstra, R. (1991). *Self-direction in adult learning: Perspectives on theory, research, and practice.* London: Routledge.
- Brookfield, S. (1986). *Understanding and facilitating adult learning*. San Francisco, CA, USA: Jossey Bass.
- Brookfield, S. (1993). Self-directed learning, political clarity and the critical practice of adult education. *Adult Education Quarterly*, 43(4), 227-242. doi.org/10.1177/0741713693043004002
- Brown, J. S. & Duguid, P. (2001). Knowledge and organization: A social-practice perspective. *Organization Science*, *12*(2), 198–213. doi.org/10.1287/orsc.12.2.198.10116
- Brown, J. S., Collins, A. & Duguid, P. (1989). Situated cognition and the culture of learning. *Educational Researcher*, *18*, 32-42. doi.org/10.3102/0013189X018001032
- Brown, K. G. (2001). Using computers to deliver training: Which employees learn and why? *Personnel Psychology*, *54*(2), 271-296. doi.org/10.1111/j.1744-6570.2001.tb00093.x
- Bunch, K. (2007). Training failure as a consequence of organizational culture. Human Resource Development Review, 6(2), 142-163. doi.org/10.1177/1534484307299273

- Bunderson, J. S. & Boumgarden, P. (2010). Structure and learning in self-managed teams: Why "bureaucratic" teams can be better learners. *Organization Science*, 21(3), 609-624. doi.org/10.1287/orsc.1090.0483
- Burke, L.A. & Hutchins, H. M. (2007). Training Transfer: An Integrative Literature Review. *Human Resource Development Review*, *6*(3), 263-296. doi.org/10.1177/1534484307303035
- Burns, R. (1995). *The adult learner at work, business and professional publishing.* Sydney: Allen & Unwin.
- Caffarella, R. S. (1993). Self-directed learning. *New directions for adult and continuing education*, *57*, 25-35. doi.org/10.1002/ace.36719935705
- Candy, P. S. (1991). *Self-direction for lifelong learning*. San Francisco, CA, USA: Jossey-Bass.
- Caniëls, M. C. J., De Stobbeleir, K. & De Clippeleer, I. (2014). The antecedents of creativity revisited: A process perspective. *Creativity and Innovation Management*, 23(2), 96-110. doi.org/10.1111/caim.12051
- Canning, N. (2010). Playing with heutagogy: Exploring strategies to empower mature learners in higher education. *Journal of Further and Higher Education*, 34(1), 59-71. doi.org/10.1080/03098770903477102
- Canter, M. (2012). E-heutagogy for lifelong e-learning. *Procedia Technology*, 1, 129-131. doi.org/10.1016/j.protcy.2012.02.025
- Cantrell, D. C. (1993). Alternative paradigms in environmental education research: The interpretive perspective. In R. Mrazek (Eds.), *Alternative paradigms in environmental education research* (pp. 81-104). Troy, OH, USA: North American Association of Environmental Education.
- Cerasoli, C. P., Alliger, G. M., Donsbach, J. S., Mathieu, J. E., Tannenbaum, S. I. & others. (2018). Antecedents and outcomes of informal learning behaviors: A meta-analysis. *Journal of Business and Psychology*, 33(2), 203–230. doi.org/10.1007/s10869-017-9492-y
- Clardy, A. (2000). Learning on their own: Vocationally oriented self-directed learning projects. *Human Resource Development Quarterly*, 11(2), 104-125. doi.org/10.1002/1532-1096(200022)11:2<105::AID-HRDQ2>3.0.CO;2-5
- Cnossen, B., Loots, E. & van Witteloostuijn, A. (2019). Individual motivation among entrepreneurs in the creative and cultural industries: A self-determination perspective. *Creativity and Innovation Management*, 28(3), 389-402. doi.org/10.1111/caim.12315
- Coffey, A. (1999). *The ethnographic self: Fieldwork and the representation of identity*. London: Sage. doi.org/10.4135/9780857020048
- Cohen, L., Manion, L. & Morrison, K. (2007). *Research methods in education*. London: Routledge.
- Collin, K. & Lemmetty, S. (2019). (Eds.) Siedätystä johtamisallergiaan. Vastuullinen johtajuus itseohjautuvuuden ja luovuuden tukena työelämässä. [Ethical leadership supporting self-directedness and creativity at work]. Helsinki: Edita.

- Collin, K. & Paloniemi, S. (2008). Supporting experience sharing as participatory workplace practice. In S. Billett, C. Harteis & A. Eteläpelto (Eds.), *Emerging perspectives on workplace learning* (pp. 167-181). Rotterdam: Sense Publisher.
- Collin, K. (2002). Development engineers' conceptions of learning at work. *Studies in Continuing Education*, 24(2), 133-152. doi.org/10.1080/0158037022000020956
- Collin, K. (2005). *Experience and shared practice design engineers' learning at work* (Doctoral dissertation, Jyväskylä studies in education, psychology and social research 261, University of Jyväskylä, Jyväskylä, Finland). Retrieved from:
 - https://jyx.jyu.fi/bitstream/handle/123456789/13310/9513921883.pdf?sequence=1&isAllowed=y
- Collin, K. (2006). Connecting work and learning design engineers' learning at work. *Journal of Workplace Learning*, 18(7/8), 403-413. doi.org/10.1108/13665620610692971
- Collin, K., Herranen, S. & Riivari E. (2017). What kinds of aspects frame professional agency and creativity in information technology work? *Business Creativity & the Creative Economy*, 3(1), 88-98. doi.or/10.18536/bcce.2017.10.3.1.08
- Collin, K., Herranen, S., Paloniemi, S., Auvinen, T., Riivari, E., Sintonen, T. & Lemmetty, S. (2018). Leadership as an enabler of professional agency and creativity in information technology organisations. *International Journal of Training and Development*, 22(3), 222-232. doi.org/10.1111/ijtd.12130
- Collin, K., Lemmetty, S., Herranen, S., Paloniemi, S., Auvinen, T. & Riivari, E. (2017). Professional agency and creativity in information technology work. In M. Goller & S. Paloniemi (Eds.), *Agency at work An agentic perspective on professional learning* (pp. 249-270). Cham: Springer. doi.org/10.1007/978-3-319-60943-0_13
- Confessore, S.J. & Kops, W.J. (1998). Self-directed learning and the learning organization: Examining the connection between the individual and the learning environment. *Human Resource Development Quarterly*, 9(4), 365-375. doi.org/10.1002/hrdq.3920090407
- Conn, A.N. (2000). *Self-directed learning in the workplace* (Doctoral dissertation. University of Maryland, Baltimore, MD, USA).
- Covin, J.G. & Slevin, D.P. (1990). New venture strategic posture, structure, and performance: An industry life cycle analysis. *Journal of Business Venturing*, *5*, 123-135. doi.org/10.1016/0883-9026(90)90004-D
- Cox, B. F. (2002). The relationship between creativity and self-directed learning among adult community college students (Doctoral dissertation, University of Tennessee, Knoxville, TN, USA). Retrieved from: https://trace.tennessee.edu/cgi/viewcontent.cgi?referer=https://www.google.com/&httpsredir=1&article=3934&context=utk_graddiss
- Craft, A. (2008). Studying collaborative creativity: Implications for education. *Thinking Skills and Creativity, 3*(3), 241-245. Retrieved from:

- https://dantao.weebly.com/uploads/8/5/4/9/8549343/studying_collab orative_creativity-implications_for_education.pdf
- Croucher, S.M. & Cronn-Mills, D. (2015). *Understanding communication research methdos*. *A theoretical and practical approach*. Longon: Routledge.
- Csikszentmihályi, M. (1996). *Creativity: Flow and the psychology of discovery and invention*. New York, NY, USA: HarperCollins.
- Cummings, A. & Oldham, G. R. (1997). Enhancing creativity: Managing work contexts for the high potential employee. *California Management Review*, 40(1), 22-38. doi.org/10.2307/41165920
- Davies, A. C. (1992). *Reflexive ethnography. A guide to researching selves and others.* London: Routledge.
- Davies, C. A. (1999). *Reflexive ethnography. A guide to researching selves and others.* London: Routledge.
- Davis, D. & Daley, B. (2008). The learning organization and its dimensions as key factors in firms' performance. *Human Resource Development International*, 11(1), 51-66. doi.org/10.1080/13678860701782352
- DeRue, D. S. & Wellman, E. (2009). Developing leaders via experience: The role of developmental challenge, learning orientation, and feedback availability. *Journal of Applied Psychology*, 94(4), 859-875. doi.org/10.1037/a0015317
- Dewey, J. (1993). Experience and education. New York, NY, USA: Macmillan.
- Drazin, R., Glynn, M. A. & Kazanjian, R. K. (1999). Multilevel theorizing about creativity in organizations: A sensemaking perspective. *Academy of Management Review*, 24, 286-307. doi.org/10.2307/259083
- Edley, N. (2001). Analysing masculinity: Interpretative repertoires, ideological dilemmas and subject positions. In M. Wetherell, S. Taylor & S. J. Yates (Eds.), *Discourse as data. A guide for analysis* (pp. 89-228). Milton Keynes: Open University.
- Edmondson, D. R., Boyer, S. L. & Artis, A. B. (2012). Self-directed learning: A meta-analytic review of adult learning constructs. *International Journal of Education Research*, 7(1), 40-48. Retrieved from: http://debdavis.pbworks.com/w/file/fetch/96898755/edmondson%20b oyer%20artis%20--%20self-directed%20learning%20a%20meta-analytic%20review.pdf
- Edwards, A. (2010). Being an expert professional practitioner: The relational turn in expertise. Dordrecht: Springer.
- Elkjaer, B. (2005). From digital administration to organisational learning. *Journal of Workplace Learning*, 17(8), 533-544. doi.org/10.1108/13665620510625390
- Elkjaer, B. & Brandi, U. (2014). An organizational perspective on professional learning. In S. Billett, C. Harteis & H. Gruber (Eds.), *International handbook of research in professional and practice-based learning* (pp. 835-856). Dordrecht: Springer. doi.org/10.1007/978-94-017-8902-8
- Ellinger, A. D. (2004). The concept of self-directed learning and its implications for human resource development. *Advances in Developing Human Resources*, 6(2), 158-177. doi.org/10.1177/1523422304263327

- Ellinger, A.D. & Bostrom, R.P. (1999). Managerial coaching behaviours in learning organizations. *The Journal of Management Development, 18*(9), 752-771. doi.org/10.1108/02621719910300810
- Elo, S., Kääriäinen, M., Kanste, O., Pölkki, T., Utriainen, K. & Kyngäs, H. (2014). Qualitative content analysis: A focus on trustworthiness. *Sage Open 4*, 1-10. doi.org/10.1177/2158244014522633
- Emerson, M.R. (2004). Working with 'key incidents'. In C. Seal, G. Gobo, J. F. Gubrium & D. Silverman (Eds.), *Qualitative research practice* (pp.457-472). Thousand Oaks: Sage.
- Eraut, M. (2004). Informal learning in the workplace. *Studies in Continuing Education*, 26(2), 247-273. doi.org/10.1080/158037042000225245
- Eskola, J. & Suoranta, J. (1998). *Johdatus laadulliseen tutkimukseen.* [Introduction to qualitative research]. Tampere: Vastapaino.
- Felstead, A. (2011). Employee involvement, the quality of training and the learning environment: an individual level analysis. *Development and Learning in Organizations*, 25(3), 1667-1688. doi.org/10.1108/dlo.2011.08125cad.008
- Fenwick, T. J. (2001). Critical Questions for Pedagogical Engagement of Spirituality. *Adult Learning*, 12(3), 10-12. doi.org/10.1177/104515950101200304
- Fenwick, T. (2008). Workplace learning: Emerging trends and new perspectives. *New Directions for Adult and Continuing Education, 119, 17-26.* doi.org/10.1002/ace.302
- Fetterman, D. M. (1998). Ethnography step by step. Thousand Oaks: Sage.
- Fischer, R. & Boer, D. (2011). What is more important for national well-being: money or autonomy? A meta-analysis of well-being, burnout and anxiety across 63 societes. *Journal of Personality and Social Psychology, 101*(1), 164-84. doi.org/10.1037/a0023663
- Fleming, D. E. & Artis, A. B. (2014). Technology perceptions in employees' use of self-directed learning. *Journal of Services Marketing*, 28(1), 50-59. doi.org/10.1108/JSM-03-2012-0062
- Florida, R. (2012). *The rise of the creative class revisited*. New York, NY, USA: Basic Books.
- Florida, R. & Goodnight, J. (2005). Managing for Creativity. *Harvard Business Review*, 83(7-8), 124-131.
- Ford, C. (1996). A theory of individual creative action in multiple social domains. *Academy of Management Review*, 21(4), 1112-1142. doi.org/10.2307/259166
- Forsman, P. (2018). Creativity is just a small emerging moment: An ethnographic investigation of work practices in a changing human resource development. *Business Creativity and the Creative Economy, 3,* 17-30. doi.org/10.18536/bcce.2017.10.3.1.02
- Forsman, P., Lemmetty, S. & Collin, K. (2019). Luova toimijuus, toiminta ja lopputulos. Organisaatiolähtöiset edellytykset luovuudelle työssä. [Creative agency, activity and outcome. Organizational based enablers for

- creativity at work]. In K. Collin & S. Lemmetty (Eds.), Siedätystä johtamisallergiaan. Vastuullinen johtajuus itseohjautuvuuden ja luovuuden tukena työelämässä. [Ethical leadership supporting self-directedness and creativity at work] (pp. 96-122). Helsinki: Edita.
- Foucher, R. & Brezot, F. (1997). Self-directed learning in healt care institutions: An analysis of policy and practices. In H.B. Long (Eds.), *Expanding horizons in self-directed learning* (pp. 101-116). Norman: University of Oklahoma.
- Foucher, R. (1995). *Enhancing self-directed learning in the workplace: A model and a research agenda*. Montreal: University of Quebec.
- Frey, B.S. & Stutzer, A. (2002). What can economists learn from happiness research? *Journal of Economic Literature*, 40(2). doi.org/10.1257/002205102320161320
- Fuller, A. & Unwin, L. (2003). Learning as apprentices in the contemporary UK workplace: creating and managing expansive and restrictive participation. *Journal of Education and Work, 16*(4), 408-426. doi.org/10.1080/1363908032000093012
- Fuller, A. & Unwin, L. (2010). 'Knowledge workers' as the new apprentices: The influence of organisational autonomy, goals and values on the nurturing expertise. *Vocations and Learning*, *3*(3), 203-222. doi.org/10.1007/s12186-010-9043-4
- Gadja, A., Beghetto, R.A. & Karwowski, M. (2017). Exploring creative learning in the classroom: A multi-method approach. *Thinking skills and Creativity*, 24, 250-267. doi.org/10.1016/j.tsc.2017.04.002
- Garrisson, D.R. (1997). Self-directed learning: Toward a comprehensive model. *Adult education quarterly, 48*(1), 18-33. doi.org/10.1177/074171369704800103
- Gerber, R., Lankshear, C., Larsson, S. & Svensson, L. (1995) Self directed learning in a work context. *Education* + *Training*, *37*(8), 26-32. doi.org/10.1108/00400919510096952
- Gergen, K. J. (1999). An invitation to social construction. London: Sage.
- Gerken, M., Messmann, G., Froehlich, D.E., Beausaert, S.A.J., Mulder, R.H. & Segers, M. (2018). Informal learning at work as a facilitator of employees' innovative work behavior. In G. Messman, M. Segers & F. Dochy (Eds.), *Informal learning at work. Triggers, Antecedents, and consequences* (pp. 80-99). London: Routledge. doi.org/10.4324/9781315441962
- Germain, M-L. & Grenier, R. S. (2015). Facilitating workplace learning and change. *Journal of Workplace Learning*, 27(5), 366-386. doi.org/10.1108/JWL-03-2013-0017
- Gherardi, S. (2000). Practice-based theorizing on learning and knowing in organization. *Organization*, 7(2), 211-223. doi.org/10.1177/135050840072001
- Gherardi, S. (2006). *Organizational knowledge. The texture of workplace learning.* Oxford: Blackwell.
- Gherardi, S. (2009). Practice? It's a matter of taste! *Management Learning*, 40(5), 535-550. doi.org/10.1177/1350507609340812

- Gijbels, D., Raemdonk, I., Vervecken, D. & van Herck, J. (2012). Understanding work-related learning: The case of ICT workers. *Journal of Workplace Learning*, 24(6), 416-429. doi.org/10.1108/13665621211250315
- Glăveanu, V. P. (2011). How are we creative together? Comparing sociocognitive and sociocultural answers. *Theory & Psychology*, 21(4), 473-492. doi.org/10.1177/0959354310372152
- Glăveanu, V. P. (2015). Creativity as a sociocultural act. *The Journal of Creative Behavior*, 49(3), 165-180. doi.org/10.1002/jocb.94
- Glăveanu, V. P. (2018). Educating which creativity? *Thinking Skills and Creativity*, 27, 25–32. doi.org/10.1016/j.tsc.2017.11.006
- Goldstein, D.M. (1991). Hermeneutics and ethnography: An interpretation of two texts. *Arizona Antropologist*, *7*, 21-30. Retrieved from: https://journals.uair.arizona.edu/index.php/arizanthro/article/view/18 254
- Goller, M. & Billett, S. (2014). Agentic behaviour at work: Crafting learning experiences. In C. Harteis, A. Rausch & J. Seifried (Eds.), *Discourses on professional learning: on the boundary between learning and working* (pp. 25-44). Dordrecht: Springer. doi.org/10.1007/978-94-007-7012-6_3
- Goller, M. & Paloniemi, S. (2017). *Agency at Work. An agentic perspective on professional learning and development*. Cham: Springer. doi.org/10.1007/978-3-319-60943-0
- Goodland, R. (2002). Sustainability: Human, social, economic and environmental.

 Retrieved from:
 http://www2.econ.iastate.edu/classes/tsc220/hallam/TypesOfSustainability.pdf
- Grace, A. (1996). Striking a critical pose: andragogy missing links, missing values. *International Journal of Lifelong Education*, 15(5), 382-392. doi.org/10.1080/0260137960150506
- Grant, A. M. & Ashford, S. J. (2008). The dynamics of proactivity at work. *Organizational Behaviour*, 28, 3-34. doi.org/ 10.1016/j.riob.2008.04.002
- Grow, G. O. (1991). Teaching learners to be self-directed. *Adult Education Quarter*, *41*(3), 25-49. doi.org/10.1177/0001848191041003001
- Grönfors, M. (1985). Kvalitatiiviset kenttätyömenetelmät [qualitative fieldwork methods]. Helsinki: WSOY.
- Guglielmino, L.M. (1977). Development of the self-directed learning readiness scale (Doctoral dissertation, University of Georgia, Georgia, USA). *Dissertation Abstracts International*, 38, 6467.
- Gu, J. (2016). Understanding self-directed learning in the context of mobile web 2.0 Case study with workplace learners. *Interactive Learning Environments*, 24(2), 306-316. doi.org/10.1080/10494820.2015.1113708
- Guglielmino, L. (2008). Why self-directed learning? *International Journal of Self-Directed Learning*, 5(1), 1-12.
- Gruys, M.L., Munshi, N. & Dewett, T.C. (2011). When antecedents diverge: Exploring novelty and value as dimensions of creativity. *Thinking skills and creativity*, 6(2), 123-137. doi.org/10.1016/j.tsc.2011.01.005

- Ha, T. S. (2008). How IT workers learn in the workplace. *Studies in Continuing Education*, *30*(2), 129–143. doi.org/10.1080/01580370802097728
- Ha, T. S. (2015). Learning stories from IT workers. Development of professional expertise. *Studies in Continuing Education*, *37*(1), 79-98. doi.org/10.1080/0158037X.2014.967347
- Habermas, J. (1970). Hermeneutics and the social sciences. In K. Mueller-Voilmer (Eds.) (1985). *The Hermeneutics Reader*. New York, NY, USA: Continuum.
- Hagen, M. S. (2012). Managerial coaching: A review of the literature. *Performance Improvement Quarterly*, 24(4), 17-39. doi.org/10.1002/piq.20123
- Hammersley, M. & Atkinson, P. (2007). *Ethnography: Principles in practice*. London: Roudledge.
- Hankinson, P. (1999). Managing successful brands. An empirical study which compares the organisational structures of companies managing the World's top 100 brands with those managing outsider brands. *Journal of Product and Brand Management*, 8(5), 402-414. doi.org/10.1362/026725799784870487
- Hargrave, T. J. & Van de Ven, A. H. (2017). Integrating dialectical and paradox perspectives on managing contradictions in organizations. *Organization Studies*, 38(3-4), 319-339. doi.org/10.1177/0170840616640843
- Harris-Boundy, J. & Flatt, S. J. (2010). Cooperative performance of millennials in teams. *Review of Business Research*, 10, 30-46.
- Harteis, C. & Goller M. (2014). New skills for new jobs: Work agency as a necessary condition for successful lifelong learning. In T. Halttunen, M. Koivisto & S. Billett (Eds.), *Promoting, assessing, recognizing and certifying lifelong learning* (pp. 37-56). Dotrecht: Springer.
- Harteis, C. (2017). Machines, change and work: An educational view on the digitalization of work. In C. Harteis (Eds.), *The impact of digitalization in the workplace. An educational view* (pp. 1-12). Cham: Springer. doi.org/10.1007/978-3-319-63257-5
- Hartree, A. (1984). Malcolm Knowles' theory of andragogy: a critique. *International Journal of Lifelong Education*, *3*(3), 203-210. doi.org/10.1080/0260137840030304
- Hase, S. & Kenyon, C. (2000). *From andragogy to heutagogy*. Retrieved from https://epubs.scu.edu.au/gcm_pubs/99/
- Havnes, A. & Smeby, J-C. (2014). Professional development and profession. In S. Billett, C. Harteis, and H. Gruber (Eds.), *International handbook of research in professional and practice-based learning* (pp. 915-986). Dordrecht: Springer. doi.org/10.1007/978-94-017-8902-8
- Heinz, W. R. (2010). Vocational identity and flexible work: A contradicting or constructing relation? In F. Rauner, E. Smith, U. Hauschildt & H. Zelloth (Eds.), *Innovative apprenticeships. Promoting successful school to work transitions* (pp. 33-47). Berlin: Lit Verlag.

- Heyl, B. S. (2001). Ethnographic interviewing. In P. Atkinson, A. Coffey, S. Delamont, J. Lofland & L. Lofland (Eds.), *Handbook of ethnography* (pp. 369–383). London: Sage.
- Hirschmann, K. & Mulder, R. H. (2018). Effects of complexity of work tasks on informal learning at work in the IT domain. In G. Messmann, M. Segers, & F. Dochy (Eds.), *Informal learning at work. Triggers, antecedents and consequences* (pp. 40–62). New York, NY, USA: Routledge. doi.org/10.4324/9781315441962
- Hofstede, G. (1991). *Cultures and Organizations: Software of the Mind.* London: McGraw-Hill.
- Holton, E.F., Swanson, R.A. & Naquin, S.S. (2001). Andragogy in practice: Clarifying the andragogical model of adult learning. *Performance Improvement Quarterly*, *14*(1), 118-143. doi.org/10.1111/j.1937-8327.2001.tb00204.x
- Holbeche, L. (2015). *The agile organization: How to build an innovative, sustainable and resilient business.* London: Kogan Page.
- Hui, C. H. & Triandis, H. C. (1986). Individualism-Collectivism: A study of cross-cultural researchers. *Journal of Cross-Cultural Psychology*, 17(2), 225-248. doi.org/10.1177/0022002186017002006
- Hunt, J.M. & Weimtraub, J.R. (2002). *The coaching manager. Developing top talent in business.* Thousand Oaks: Sage.
- Hämeenaho, P. & Koskinen-Koivisto, E. (2014). Etnografian ulottuvuudet ja mahdollisuudet. [Dimensions and opportunities of ethnography]. In P. Hämeenaho & E. Koskinen-Koivisto (Eds.), *Moniulotteinen etnografia* [*Multidimensional ethnography*](pp. 7-31). Helsinki: Ethnos ry.
- Hämäläinen, R., De Wever, B., Nissinen, K. & Cincinnato, S. (2017). Understanding adults' strong problem-solving skills based on PIAAC. *Journal of Workplace Learning*, 29 (7-8), 537-553. doi.org/10.1108/JWL-05-2016-0032
- Inglehart, R., Foa, R., Peterson, C. & Welzel, C. (2008). Development, Freedom, and rising happiness: A Global perspective (1981–2007). *Perspectives on Psychological Science*, *3*(4), 264–285. doi.org/10.1111/j.1745-6924.2008.00078.x
- Inkson, K. (2008). Are human resources? *Career Development International*, 13(3), 270-279. doi.org/10.1108/13620430810870511
- Janssen, L., Smet, S., Onghena, P. & kyndt, E. (2017). The relationship between learning conditions in the workplace and informal learning outcomes: a study among police inspectors. *International journal of training and developing*, 28(2), 92-112. doi.org/10.1111/ijtd.12095
- Jimenez-Jimenez, D. & Sanz-Valle, R. (2012). Studying the effect of HRM practices on the knowledge management process. *Personnel Review*, 42, 28-49. doi.org/10.1108/00483481311285219
- John-Steiner, V. (2000). *Creative Collaboration*. Oxford: Oxford University Järvensivu, A. & Koski, P. (2012). Combating learning. *Journal of Workplace Learning*, 24(1), 5-18. doi.org/10.1108/13665621211191078

- Kajamaa, A. (2011.) *Unraveling the helix of change: An activity-theoretical study of health care change efforts and their consequences* (Doctoral dissertation, Studies in Educational Sciences 241, University of Helsinki, Helsinki, Finland). Retrieved from: http://urn.fi/URN:ISBN:978-952-10-6990-1
- Karakas, F. & Manisaligil, A. (2012). Reorienting self-directed learning for the creative digital era. *European Journal of Training and Development*, 36(7), 712–731. doi.org/10.1108/03090591211255557
- Katz, J. (2001). From how to why: On luminous description and causal inference in ethnography (Part I). *Ethnography*, 2(4), 443–473. doi.org/10.1177/146613801002004001
- Kaufman, J. C. & Sternberg, R.J. (2007). Resource review: Creativity. *Change*, 39, 55-58.
- Kauppalehti (2018, November 17). Monet korostavat itsensä johtamista mutta hierarkialla on etunsa. 10.6.2019. Retrieved from https://www.kauppalehti.fi/uutiset/monet-korostavat-itsensa-johtamista-mutta-hierarkialla-on-etunsa/c99eeef5-0fdf-3379-8ab2-3f6ee2de81c9
- Kauppalehti (2019, February 14). Viranomaispaperit paljastavat Esperi Caresta yhä erikoisempia piirteitä yhtiö sätti tarkastajia työntekijöiden kuuntelemisesta. 5.2.2019. Retrieved from https://www.kauppalehti.fi/uutiset/kl/898ed588-13ab-4b7a-9934-f181910e7ae7
- Kearney, J. & Zuber-Skerritt, O. (2012). From learning to learning community: Sustainability through lifelong learning. *The Learning Organization*, 19(5), 400-413. doi.org/10.1108/09696471211239703
- Khiat, H. (2017). Academic performance and the practice of self-directed learning: The adult student perspective. *Journal of Further and Higher Education*, 41(1), 44-59. doi.org/10.1080/0309877X.2015.1062849.
- Kirjonen, J. (2005). Asiantuntijan itseohjautuvuuden rajat: kokemuksia Lääninhallinnon organisaatiomuutoksesta [Boundaries of expert's self-direction: Experiences of organizational change in the county administration.] In A. Eteläpelto & P. Tynjälä (Eds.), Oppiminen ja asiantuntijuus: työelämän ja koulutuksen näkökulma [Learning and Expertise: A Working Life and Education Perspective] (pp. 48-63). Helsinki: WSOY.
- Kirpal, S. (2009). *Labour market flexibility, work orientations, and skills. A comparative study of nurses and ICT technicians in Germany and UK.* Dordrecht: Springer.
- Knoblauch, H. & Scnetter, B. (2012). Videography: analysing video data as a 'focused' ethnographic and hermeneutical exercise. *Qualitative Research*, 12(3), 334-356.doi.org/10.1177/1468794111436147
- Knowles, M. (1970). *The modern practice of adult education: Andragogy versus Pedagogy*. Houston, TX, USA: Gulf Publishing Co.
- Knowles, M. (1975). Self-directed learning. Chicago, IL, USA: Follet.

- Knowles, M. (1980). The modern practice of adult education: From pedagogy to andragogy. New York, NY, USA: Cambridge Books.
- Knowles, M. (1984). *The Adult learner: A neglected species*. Houston, TX, USA: Gulf Publishing.
- Knowles, M. (1989). *The making of an adult educator: An autobiographical journey*. San Francisco, CA, USA: Jossey-Bass.
- Knowles, M. S. (1950). *Informal Adult Education A Guide for Administrators, Leaders, and Teachers*. New York, NY, USA: Association.
- Knowles, M., Holton, E. F. & Swanson, R. A. (2012). *The adult learner: The definitive classic in adult education and human resource development.* London: Routledge.
- Knowles, M., Holton, E. & Swanson, R. (1998). *The adult learner*. Houston, TX, USA: Gulf Publishing.
- Kolb, D. A. (1984). *Experiential learning. Experience as the source of learning and development*. Englewood Cliffs, NJ, USA: Prentice Hall.
- Kops, W. J. (1997). Managers as self-directed learners: Findings from public and private sector organizations. In H. B. Long (Eds.), *Expanding Horizons in Self-Directed Learning* (pp. 71-86). Norman, OK, USA: University of Oklahoma.
- Koro, J. (1993). Aikuinen oman oppimisensa ohjaajana: itseohjautuvuus, sen kehittyminen ja yhteys oppimistuloksiin kasvatustieteen avoimen korkeakouluopetuksen monimuotokokeilussa [Adults as managers of their own learning: self-directiveness, its development and connection with the cognitive learning results of an experiment on distance education for the teaching of educational science] (Doctoral dissertation, Jyväskylä studies in education, psychology and social research 98, University of Jyväskylä, Jyväskylä, Finland).
- Kyndt, E. & Baert, H. (2013). Antecedents of employees' involvement in work-related learning: A systematic review. *New Media & Society, 83*(2), 1506-1522. doi.org/10.1177/1461444817698776
- Langfred, C. W. (2000). The paradox of self-management: Individual and group autonomy in work groups. *Journal of Organizational Behavior*, 21, 563-585. doi.org/10.1002/1099-1379(200008)21:5<563::AID-JOB31>3.0.CO;2-H
- Lapierre, J. & Giroux, V-P. (2003). Creativity and work environment in high-tech context. *Creativity and Innovation Management*, 12(1), 11-23. doi.org/10.1111/1467-8691.00263
- Lave, J. & Wenger, E. (1991). *Situated Learning. Legitimate Peripheral Participation*. Cambridge: Cambridge University.
- Lee, M. Y. & Edmondson, A. C. (2017). Self-managing organizations: Exploring the limits of less-hierarchical organizing. *Research in Organizational Behavior*, *37*, 35-58. doi.org/ 10.1016/j.riob.2017.10.002
- Lehner, F. & Sundby, M. W. (2017). IT capabilities for SMEs: An analysis at the organisational level. In C. Harteis (Eds.), *The impact of digitalization in the workplace. An educational view* (pp. 125-140). Cham: Springer. doi.org/10.1007/978-3-319-63257-5

- Lehti, L., Haapanen, L. & Kääntä, L. (2018). Diskurssintutkimus monitieteinen ja monimenetelmäinen ala. [Discourse study a multidisciplinary field.] In L. Haapanen, L. Lehti & L. Kääntä (Eds.), Diskurssintutkimuksen menetelmistä. [On the methods in discourse studies] (pp. 4-19). Helsinki: Suomen Soveltavan Kielitieteen Yhdistys AFinLA ry. doi:10.30660/afinla.75057
- Lemmetty, S. & Collin, K. (2019). Self-directed learning as a practice of workplace learning. Interpretative repertoires of self-directed learning in ICT work. *Vocations and Learning*, *13*, 47-70. doi.org/10.1007/s12186-019-09228-x
- Lemmetty, S. & Collin, K. (2020). Self-directed learning in creative activity: An Ethnographic study in technology-based work. *Journal of creative behaviour*, early online. doi.org/10.1002/jocb.438
- Lemmetty, S. (2020). Employee opportunities for self-directed learning at technology organizations: Features and frames of self-directed learning projects. *Studies in Continuing Education*, early online. doi.org/10.1080/0158037X.2020.1765758
- Lewis, L. K. (2011). Organizational change: Creating change through strategic communication. Chichester: Wiley-Blackwell.
- Lewis, M. (2000). Exploring paradox: Toward a more comprehensive guide. *Academy of Management Review, 25, 760–776*. doi.org/10.5465/amr.2000.3707712
- Lincoln Y. S. & Cuba E. G. (1985). *Naturalistic inquiry*. Beverly Hills, CA, USA: Sage Publications.
- Lindeman, E. (1926). *The meaning of adult education*. New York, NY, USA: New Republic Inc.
- Littleton, K. & Miell, D. (2004). Collaborative creativity: Contemporary perspectives. In D. Miell & K. Littleton (Eds.), *Collaborative creativity: Contemporary perspectives* (pp. 1-8). London: Free Associated Books.
- Littleton, K., Taylor, S. & Eteläpelto, A. (2012). Special issue introduction: Creativity and creative work in contemporary working contexts. *Vocations and Learning Studies in Vocational and Professional Education*, *5*(1), 1-4. doi.org/10.1007/s12186-011-9067-4
- Livingstone, D. W. (2008). Mapping the field of lifelong (formal and informal) learning and (paid and unpaid) work. In D. W. Livingstone, K. Mirchandani & P.H. Sawchuk (Eds.), *The Future of Lifelong Learning and Work: Critical Perspectives* (pp. 13-26). Rotterdam: Sense Publishers.
- Loewemberger, P. (2013). The role of HRD in stimulating, supporting and sustaining creativity and innovation. *Human Resource Development Review*, 12, 422-455. doi.org/10.1177/1534484313481462
- Loftus, S. & Higgs, J. (2010). Researching the individual in workplace research. *Journal of Education and Work*, 23(4), 377-388. doi.org/10.1080/13639080.2010.495712

- Lombardo, S. & Kvålshaugen, R. (2014). Constraint-shattering practices and creative action in organizations. *Organization Studies*, *35*(4), 587-611. doi.org/10.1177/0170840613517597
- London, M. & Mone, E. M. (1999). Continuous learning. In E. D. Pulakos (Eds.), *The changing nature of performance: Implication for staffing, motivation and development* (pp. 119-153). San Francisco, CA, USA: Jossey-Bass.
- Loyens, S., Magda, J. & Rikers, R. (2008). Self-directed learning in problem-based learning and its relationship with self-regulated learning. *Educational Psychology Review*, 20, 411-427. doi.org/10.1007/s10648-008-9082-7
- Lubart, T. (2001). Models of creative process: Past, present and future. *Creativity Research Journal*, 13(3-4), 295–308. doi.org/10.1207/S15326934CRJ1334_07
- Maehl, W. H. L. (2000). *Lifelong learning at its best*. San Francisco, CA, USA: Jossey Bass.
- Malkki, L. & Cerwonka, A. (2007). *Improvising Theory: Process and Temporality in Ethnographic Fieldwork*. Chicago, IL, USA: Chicago University.
- Manuti, A., Pastore, S., Scardigno, A. F. & Morciano, D. (2015). Formal and informal learning in the workplace: A research review. *International Journal of Training and Development*, 19(1), 1-17. doi.org/10.1111/ijtd.12044
- Marsick, V. J. & Watkins, K. E. (1990). *Informal and incidental learning in the workplace*. London: Routledge.
- Martela, F. & Jarenko, K. 2017. *Itseohjautuvuus. Miten organisoitua tulevaisuudessa.* [Self direction. How to be organized in future?]. Helsinki: Alma Talent.
- Martins, E. C. & Terblanche, F. (2003). Building organizational culture that stimulates creativity and innovation. *European Journal of Innovation Management*, *6*(1), 64–74. doi.org/10.1108/14601060310456337
- Matthews, P. (1999) Workplace learning: Developing an holistic model. *The Learning Organization*, *6*(1), 18-29. doi.org/10.1108/09696479910255684
- Merriam, S. & Caffarella, R.S. (1999). *Learning in adulthood*. San Francisco, CA, USA: Jossey-Bass.
- Merriam, S. (2001). Andragogy and self-directed learning: Pillars of adult learning theory. *New Directions for Adult and Continuing Education*, 89, 3–13. doi.org/10.1002/ace.3
- Merriam, S., Baumgartner, L. & Caffarella, R. (2007). *Learning in Adulthood: A comprehensive guide*. San Francisco, CA, USA: Jossey-Bass.
- Merrictm, S., Mott, V. & Lee, M. (1996). Learning that comes from the negative interpretation of life experience. *Studies in Continuing Education*, *18*(1), 1-23. doi.org/10.1080/0158037960180101
- Messaman, G., Segers, M. & Dochy, F. (2019). *Informal learning at work. Triggers, Antecedents, and consequences.* London: Routledge. doi.org/10.4324/9781315441962
- Meyer, J. (1990). Individualism: Social experience and cultural formulation. In J. Rodin, C. Schooler & K. Warner Schaie (Eds.), *Self Directedness: Cause and Effects Throughout the Life Course* (pp. 51-58). New York, NY, USA: Psychology Press. https://doi.org/10.4324/9780203772003

- Mezirow, J.E. (1990). Fostering critical reflection in adulthood: A guide to transformative and emancipatory learning. San Fransisco, CA, USA: JosseyBass.
- Milligan, C., Fontana, R. P., Littlejohn, A. & Margaryan, A. (2015). Self-regulated learning behaviour in the finance industry. *Journal of Workplace Learning*, *27*(5), 387-402. doi.org/10.1108/JWL-02-2014-0011
- Mintzberg, H. (1980). Structure in 5's: A synthesis of the research on organization design. *Management Science*, 26(3), 322-341. doi.org/10.1287/mnsc.26.3.322
- Moe, N. B., Dingsoyr, T. & Dypa, T. (2008). Understanding self-organizing teams in agile software development. *Proceedings of the 19th Australian Conference on Software Engineering*, 76-85. Retrieved from: https://dl.acm.org/doi/abs/10.5555/1395083.1395657
- Moran, S. 2011. Creativity in school. In K. Littleton, C. Wood & J. K. Straarman (Eds.), *International Handbook of Psychology in Education* (pp. 319-359). Bingley: Emerald
- Mumford, M. D., Medeiros, K. E. & Partlow, P. J. (2012). Creative thinking, processes, strategies and knowledge. *The Journal of Creative Behavior*, 46(1), 30-47. doi.org/10.1002/jocb.003
- National Advisory Board on Research Ethics, 2003. TENK Annual Report. Retrievew from:
 - https://www.tenk.fi/sites/tenk.fi/files/annualreport_2003.pdf
- Neck, C.C. & Manz, C. P. (2013) Mastering Self Leadership: Empowering Yourself for Personal Excellence. San Antonio, TX, USA: Pearson.
- Nemiro, J. E. (2002). The creative process in virtual teams. *Creativity Research Journal*, 14(1), 69-83. doi.org/10.1207/S15326934CRJ1401_6
- Nerland, M. (2008). Knowledge cultures and the shaping of work-based learning: The case of computer engineering. *Vocations and Learning*, *1*(1), 49-69. doi.org/10.1007/s12186-007-9002-x
- Nerur, S. & Balijepally, V. (2007). Theoretical reflections on agile development methodologies. *Communications of the ACM*, 50(3), 79–83. doi.org/10.1145/1226736.1226739
- Ness, I. J. & Soreide, G. E. (2014). The room of opportunity: Understanding phases of creative knowledge processes in innovation. *Journal of Workplace Learning*, 26(8), 545-560. doi.org/10.1108/JWL-10-2013-0077
- Newell, A. & Simon, H. A. (1972). *Human problem solving*. Englewood Cliffs, NJ, USA: Prentice Hall.
- Noe, R. A. & Ellingson, J. E. (2017). Autonomous learning in the workplace: An introduction. In J. E. Ellingson & R. A. Noe (Eds.), *Autonomous learning in the workplace* (pp. 1-12). New York, NY, USA: Routledge. doi.org/10.4324/9781315674131
- Noe, R. A., Clarke, A. D. M. & Klein, H. J. (2014). Learning in the twenty-first century workplace. *Annual Review of Organizational Psychology and Organizational Behavior*, 1(1), 245-275. doi.org/10.1146/annurev-orgpsych-031413-091321

- Nunan, D. (1993). Introducing discourse analysis. London: Benquin Group.
- Nunan, D. & Lamb, C. (1996). *The self-directed teacher: Managing the learning process*. Cambridge: Cambridge University.
- Oddane, T. (2014). The collective creativity of academics and practitioners innovation projects. *International Journal of Managing Projects in Business*, *8*(1), 33-57. doi.org/10.1108/IJMPB-10-2013-0060
- O'reilly, K. (2011). Ethnographic methods. London: Routledge.
- Paloniemi, S. & Collin, K. (2010). Discursive power and creativity in interprofessional work. *Vocations and Learning*, *5*(1), 23-40. doi.org/10.1007/s12186-011-9064-7
- Paloniemi, S. (2006). Experience, competence and workplace learning. *Journal of Workplace Learning*, 18(7/8), 439-450. doi.org/10.1108/13665620610693006.
- Patton, M. (2015). *Qualitative research & evaluation methods integrating theory and practice*. London: Sage.
- Pfeffer, J. (2010). Building sustainable organisations: The human factor. *The Academy of Management Perspectives*, 24(1), 34-45. doi.org/10.5465/amp.24.1.34
- Pietikäinen, S. & Mäntynen, A. (2009). *Kurssi kohti diskurssia* [Course towards a discourse]. Vastapaino, Tampere.
- Pintrich, P. R. (2004). A conceptual framework for assessing motivation and self-regulated learning in college students. *Educational Psychology Review*, 16(4), 385–407. doi.org/10.1007/s10648-004-0006-x
- Pole, C. & Morrison, M. (2003). *Ethnography for education. Doing qualitative research in educational settings.* Buckingham: Open University Press.
- Potter, J. & Wetherell, M. (1987). Discourse and social psychology: Beyond attitudes and behavior. London: Sage.
- Powell, S. (2008). The management and consumption of organisational creativity. *Journal of Consumer Marketing*, 25(3), 158-166. doi.org/10.1108/07363760810870653
- Raemdonc, I., Thjissen, J. & de Greef, M. (2017). Self-directedness in work-related learning processes. Theoretical perspectives and development of a measurement instrument. In M. Goller & S. Paloniemi (Eds.), *Agency at Work. An agentic perspective on professional learning and development* (pp. 401-424). Cham: Springer. doi.org/10.1007/978-3-319-60943-0_13
- Raemondoc, I., Meaurant, C., Balasse, J., Jacot, A. & Frenay, M. (2013). Exploring the concept of "self-directedness in learning". Theoretical approaches and measurement in adult education literature. In D. Gijbels, V. Donche, J.T.E. Richardson & J.D. Vermut (Eds.), *Learning patterns in higher education: Dimensions and research perspectives* (pp. 78-101). London: Routledge.
- Ramsdalin, H. & Skorstadin, E. J. (2016). *Flexible organizations and the new working life: A European perspective*. New York, NY, USA: Routledge.
- Rana, S., Ardichvili, A. & Polesello, D. (2016). Promoting self-directed learning in a learning organization. *European Journal of Training and Development*, 40(7), 470-489. doi.org/10.1108/EJTD-10-2015-0076

- Renkema, J. (2004). *Introduction to Discourse Studies*. Philadelphia, PA, USA: John Benjamins Publishing.
- Riddell, S., Ahlgren, L. & Weedon, E. (2009). Equity and lifelong learning: Lessons from workplace learning in Scottish SMEs. *International Journal of Lifelong Education*, 28(6), 777-795. doi.org/10.1080/02601370903293252
- Rigby, C. S. & Ryan, R. M. (2018). Self-determination theory in human resource development: New directions and practical consideration. *Advances of Developing Human Resources*, 20(2), 133-147. doi.org/10.1177/1523422318756954.
- Rodgers, B. L. & Cowles, K. V. (1993). The qualitative research audit trail: A complex collection of documentation. *Research in Nursing & Health, 16*(3), 219-226. doi.org/10.1002/nur.4770160309
- Rouleau, L., de Rond, M. & Musca, G. (2014). From the ethnographic turn to new forms of organizational ethnography. *Journal of Organizational Ethnography*, *3*(1), 2-9. doi.org/10.1108/JOE-02-2014-0006
- Rowold, J. & Kauffeld, S. (2009), Effects of career related continuous learning on competencies. *Personnel Review*, *38*(1), 90-101. doi.org/10.1108/00483480910920732
- Rumrill, B. D. & Bellini, J.R. (2017). Research in Rehabilitation Counseling: A Guide to Design, Methodology, and Utilization. Springfield, IL, USA: Charles C. Thomas Publisher.
- Ryan, R.M. & Deci, E.L. (2000). Self-determination theory and the facilitation of intrinsic motivation, social development, and well-Being. *American Psychologist*, *55*(1), 68-78. doi.org/10.1037/0003-066X.55.1.68
- Salovaara, P. (2018). Riisuttu organisaatio. Itseohjautuvuus ja monikollinen johtajuus maailmassa, joka on kyllästynyt hierarkioihin. [Self-directedness and leadership in the world without hierarcies.]. Tampere: Perttu Salovaara. Retrieved from: http://www.monikollinen.fi/?fbclid=IwAR3XwBlGzHNtoN86pjXQIqnWc0tPyBo0fhCMW7JuB781OPOxeZAzU0TdFTg
- Salovaara, P. (2019). Itseohjautuvat organisaatiot mitä on johtajuus ilman esimiehiä? [Self-organized organizations leadership without supervisors]. In Collin, K. & S. Lemmetty (Eds.), *Siedätystä johtamisallergiaan*. *Vastuullinen johtajuus itseohjautuvuuden ja luovuuden tukena työelämässä*. [Ethical leadership supporting self-directedness and creativity at work (pp. 96-122). Helsinki: Edita.
- Salovaara, P. & Bathurst, R. (2016). Power-with leadership practices: An unfinished business. *Leadership*, 14(2), 179-202. doi.org/10.1177/1742715016652932
- Sawyer, K. (2004). Creative teaching: Collaborative discussion as disciplined improvisation. *Educational Researcher*, 33(2), 12-20. doi.org/10.3102/0013189X033002012
- Scheeres, H., Solomon, N., Boud, D. & Rooney, D. (2010). When is it OK to learn at work? The learning work of organisational practices. *Journal of Workplace Learning*, 22(½), 13-26. doi.org/10.1108/13665621011012825

- Schein, E. H. (1990). Organizational culture. *American Psychologist*, 45(2), 109-119. doi.org/10.1037/0003-066X.45.2.109
- Schmidt, F.L. & Hunter, J.E. (1998). The validity and utility of selection methods in personnel psychology. *Psychological Bulletin*, 124(2), 262-274. Retrieved from: 10.1037/0033-2909.124.2.262
- Schümann, E. & Beausaert, S. (2016). What are drivers for informal learning? European Journal of Training and Development, 40(3), 130-154. 10.1108/EJTD-06-2015-0044
- Scully-Russ, E. (2012). Human resource development and sustainability: Beyond sustainable organisations. *Human Resource Development International*, 15(4), 399-415. doi.org/10.1080/13678868.2012.707529
- Segers, M., Mesmann, G. & Dotchy, F. (2018). Emergence, theoretical foundation, and conceptualization of informal learning at work. In G. Messaman, M. Segers & F. Dochy (Eds.), *Informal learning at work*. *Triggers, Antecedents, and consequences* (pp. 1-11). London: Routledge. doi.org/10.4324/9781315441962
- Sen, A. (1999). Development as freedom. Oxford: Oxford University.
- Sfard, A. (1998). On two metaphors for learning and dangers of choosing just one. *Educational Researcher*, 27(1), 4-13. doi.org/10.3102/0013189X027002004
- Shalley, C., Zhou, J. & Oldham, G. (2004). The effects of personal and contextual characteristics on creativity: Where should we go from here? *Journal of Management*, 30(6), 933-958. doi.org/10.1016/j.jm.2004.06.007
- Shenton, A.K. (2004). Strategies for ensuring trustworthiness in qualitative research projects. *Education for Information*, 22(2), 63-75. doi.org/10.3233/EFI-2004-22201
- Silverman, D. (1997). *Discourses of counselling. HIV counselling as social interaction*. London: Sage.
- Silverman, D. (2001). Interpreting qualitative data. London: Sage.
- Simonton, D.K. (2012). Creativity, problem solving, and solution set sightedness: Radically reformulating BVSR. *Journal of Creative Behavior*, 46(1), 48-65. doi.org/10.1002/jocb.004
- Smith, W.K. & Lewis, M.W. (2011). Toward a theory of paradox: a dynamic equilibrium model of organizing. *Academy of Management Review*, 36(2), 381–403. doi.org/10.5465/amr.2009.0223
- Skule, S. (2004). Learning conditions at work: a framework to understand and assess informal learning in the workplace. *International Journal of Training and Development*, 8(1), 8-20. doi.org/10.1111/j.1360-3736.2004.00192.x
- Slotte, V. Tynjälä, P. & Hytönen, T. (2004). How do HRD practitioners describe learning at work? *Human Resource Development International*, 7(4), 481-499. doi.org/10.1080/1367886042000245978
- Sommer M. (2014) Professional learning in the ambulance service. In S. Billett, C. Harteis & H. Gruber (Eds.), *International Handbook of Research in Professional and Practice-based Learning. Springer International Handbooks of Education* (pp. 857-885). Dordrecht: Springer.

- Song, L. & Hill, J.R. (2007). A Conceptual model for understanding self-directed learning in online environments. *Journal of Interactive Online Learning*, 6(1), 27-42.
- Soreide, G. E. (2016). High-skilled newcomers' identity: Learners or experts? *Journal of Workplace Learning*, 28(1), 2-16. doi.org/10.1108/JWL-12-2014-0088
- Spaan, N.R., Dekker, A.R.J., van der Velden, A.W. & de Groot, E. (2016). Informal and formal learning of general practitioners. *Journal of Workplace Learning*, 28(6), 378-391. doi.org/10.1108/JWL-12-2015-0090
- Spradley, J. P. (1980). *Participant observation*. New York: Holt, Rinehart and Winston.
- Stockdale, S.L. (2003). *Development of an instrument to measure self-directedness*. (Doctoral dissertation, University of Knoxville, Tennessee, USA). Retrieved from: https://trace.tennessee.edu/cgi/viewcontent.cgi?article=3026&context=utk_graddiss
- Sternberg, R.J. (2006). The nature of creativity. *Creativity Research Journal*, *18*(1), 87 98. doi.org/10.1207/s15326934crj1801_10
- Streumer, J. & Björkvist, D. (1998). Moving beyond traditional vocational education and training: Emerging issues. In W. J. Nijhof, & J. N. Streumer (Eds.), *Key qualifications in work and in education* (pp. 249-264). Dordrecht: Kluwer Academic Publishers.
- Stubbs, M. (1983). *Discourse analysis: The sociolinguistic analysis of natural language.* Chicago, IL, USA: University of Chicago.
- Tannenbaum, S. I., Beard, R. L., McNall, L. A. & Salas, E. (2010). Informal learning and development in organizations. In S. W. J. Kozlowski & E. Salas (Eds.), *Learning, Training, and Development in Organizations* (pp. 303-332). New York, NY, USA: Routledge.
- Tata, J. (2000). Autonomous work teams: An examination of cultural and structural constraints. *Work Study*, 49(5), 187-193. doi.org/10.1108/00438020010337405
- Taylor, B. & Kroth, M. (2009). Andragogy's transition into the future: Metaanalysis of andragogy and its search for a measurable instrument. *Journal* of Adult Education, 38(1), 1-11.
- Taylor, S. (2001). Locating and conducting discourse analytic research. In M. Wetherell, S. Taylor & S. J. Yates (Eds.), *Discourse as data. A guide for analysis* (pp. 5-48). Milton Keynes: Open University.
- Tough, A. (1971). *The adults' learning projects*. Toronto: The Ontario Institute for Studies in Education.
- Tikkamäki, K. (2006). Työn ja organisaation muutoksissa oppiminen. Etnografinen löytöretki työssä oppimiseen [Learning about work and organizational change. An ethnographic study of workplace learning]. (Doctoral dissertation, Acta Electronica Universitatis Tamperensis, University of Tampere, Tampere, Finland). Retrieved from:

- https://trepo.tuni.fi/bitstream/handle/10024/67625/951-44-6650-0.pdf?sequence=1&isAllowed=y
- Todd, P. & Binns, J. (2013). Work-life balance: Is it now a problem for management? *Gender, Work and Organization, 20*(3), 219-231. doi.org/10.1111/j.1468-0432.2011.00564.x
- Triandis, H. C. (1995). Individualism and Collectivism. Boulder, CO: Westview.
- Tuomi, J. & Sarajärvi, A. (2009). Laadullinen tutkimus ja sisällönanalyysi. [Qualitative research and content analysis]. Helsinki: Tammi.
- Tynjälä, P. (2008). Perspectives into learning at the workplace. *Educational Research Review*, 3(2), 130-154. doi.org/10.1016/j.edurev.2007.12.001
- Tynjälä, P. (2013). Toward a 3-P model of workplace learning: A literature review. *Vocations and Learning*, *6*(1), 11-36. doi.org/10.1007/s12186-012-9091-z
- Ulrich, F. & Mengiste, S. A. (2014). The challenges of creativity in software organizations. In B. Bergvall-Kåreborn & P. A. Nielsen (Eds.), *Creating value for all through ITB* (pp. 16–34). Dordrecht: Springer. doi.org/10.1007/978-3-662-43459-8_2
- Usher, R. & Johnston, R. (2006). Exploring problems of self-directed learning within practice and discourse. *Studies in Continuing Education*, 10(2), 137-151. doi.org/10.1080/0158037880100204
- Virtanen, A. & Tynjälä, P. (2019). Factors explaining the learning of generic skills: a study of university students' experiences. *Teaching in Higher Education*, 24(7), 880-894. doi.org//10.1080/13562517.2018.1515195
- Van Dijk, T. A. (1998). The study of discourse. In T. A. van Dijk (Eds.), *Discourse as structure and process* (pp. 1-34). London: Sage.
- Virsu, 2012. Sitouttamisretoriikkaa yritysviestinnässä. [Rhetorical construction of work commitment in business communication.]. (Doctoral dissertation, Annales Universitatis Turkuensis 331, University of Turku, Turku, Finland). Retrieved from:

 https://www.utupub.fi/bitstream/handle/10024/73970/AnnalesC331Virsu.pdf?sequence=1&isAllowed=y
- Vygotsky, L. S. (1978). Mind in society. The development of higher psychological processes. In M. Cole, V. John-Steiner, S. Scribner & E. Souberman (Eds.), *Mind in society* (pp. 19-58). Cambridge, MA, USA: Harvard University.
- Vähäsantanen, K. & Eteläpelto, A. (2017). Professional agency and learning in the work of software professionals. In C. Harteis (Eds.), *Machines change work: An educational view on the digitalization of work* (pp. 161-179). Cham: Springer. doi.org/10.1007/978-3-319-63257-5
- Waterman A. S. (1981). Individualism and interdependence. *American Psychology*, *36*, 762-773. doi.org/10.1037/0003-066X.36.7.762
- Watkins, K. E. & Marsick, V. J. (1993). Sculpting the learning organization: Lessons in the art and science of systemic change. San Francisco, CA, USA: Jossey-Bass.

- Wenger, E. (2009). A Social theory of Learning. In K. Illeris (Eds.), *Contemporary Theories of Learning* (pp. 209-219). New York, NY, USA: Routledge.
- Wetherell, M. (1998). Positioning and interpretative repertoire: Conversation analysis and post-structuralism in dialogue. *Discourse and Society*, *9*(3), 387-412. doi.org/10.1177/0957926598009003005
- Wetherell, M. & Potter, J. (1988). Discourse analysis and the identification of interpretative repertoires. In C. Antaki (Eds.), *Analysing everyday explanation: A casebook of methods* (pp. 168-183). London: Sage.
- Wetherell, M. & Potter, J. (1992). *Mapping the language of racism. Discourse and the legitimation of exploitation*. New York, NY, USA: Harvester Wheatsheaf.
- Willis, P. (2000). The ethnographic imagination. Cambridge & Malden: Polity.
- Wilson, D.G. & Hartung, K. (2015). Types of informal learning in cross-organizational collegial conversations. *Journal of workplace learning*, 27(8), 596-610. https://doi.org/10.1108/JWL-09-2014-0070
- Yeo, R. K. (2008). How does learning (not) take place in problem-based learning activities in workplace contexts. *Human Resource Development International*, 11(3), 317-330. doi.org/10.1080/13678860802102609
- Yle (2018, October 15). Työpaikan tehottomin osa saattaa olla oma pomosi Suomen parhaina työpaikkoina pidetään yrityksiä, joissa ei ole esimiehiä. 1.3.2019. Retrieved from: https://yle.fi/uutiset/3-10453540
- Yuan, F. & Woodman, R. W. (2010). Innovative behavior in the workplace: The role of performance and image outcome expectations. *Academy of Management Journal*, 53(2), 323–342. doi.org/10.5465/AMJ.2010.49388995
- Zacher, H., Kooij, D.T.A.M. & Beier, M. E. (2018). Active aging at work: Contributing factors and implications for organizations. *Organizational Dynamics*, 47(1), 37-45. doi.org/10.1016/j.orgdyn.2017.08.001
- Zastavker, Y. & Darer, V. (2014). Beyond reflection: Using discourse analysis to understand your classroom culture. IEEE Frontiers in Education Conference (FIE), Madrid, Spain, 22-25.10.2014. Retrieved from: https://www.researchgate.net/publication/281065263_Beyond_Reflection_Using_Discourse_Analysis_to_Understand_Your_Classroom_Culture
- Zhoc, K.C.H. & Chen, G. (2016). Reliability and validity evidence for the self-directed learning scale. *Learning and Individual Differences*, 49, 245-250. doi/10.1016/j.lindif.2016.06.013
- Zimmerman, B. (2008). Investigating self-regulation and motivation: Historical background, methodological developments, and future prospects. *American Educational Journal*, 45(1), 166–183. doi.org/10.3102/0002831207312909



ORIGINAL PAPERS

Ι

SELF-DIRECTED LEARNING AS A PRACTICE OF WORKPLACE LEARNING. INTERPRETATIVE REPERTOIRES OF SELF-DIRECTED LEARNING IN ICT WORK

by

Soila Lemmetty & Kaija Collin, 2019

Published in Vocations and Learning 13, 47 - 70. DOI:10.1007/s12186-019-09228-x

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Self-directed learning as a practice of workplace learning: Interpretative repertoires of self-directed learning in ICT work

Abstract

Changing technologies and competition in the field of information and communication technology (ICT) are challenging the learning of individual workers and teams alongside and through work. Organisations call for employees' autonomy and self-directedness executed by agile operations and low hierarchies, where learning is also increasingly the responsibility of the individuals and teams themselves and occurs in practice without strong control of the organisation. Therefore, the multidimensional concept of self-directed learning becomes essential in the context of learning at work. In this study, we examine how employees in the ICT sector describe self-directed learning practices in the context of workplace learning. Our data consist of interviews with ICT employees in two organisations, which undergo an applied discourse analysis. The workers talked about self-directed learning as an obliged, creativity-enhanced as well as flexible and fast-paced practice. Self-directed learning was also described as a practice tied to work itself. The paper concludes with a discussion on how these partly conflicting discourses about self-directed learning practice in work could be considered in practices related to enhancing such learning in the ICT field. Suggestions for future investigations are also presented.

Keywords: workplace learning, self-directed learning, discourse analysis, interpretative repertoires, ICT organisation

Introduction

Technological changes in the field of information and communication technology (ICT) are challenging workers to continuously learn and develop professionally (Ha 2008). According to the study of Yeon (2008), 80% of learning at work occurs informally and is self-directed in nature. Thus, responsibility to learn lies on the individual or teams themselves. Workplace learning does not only mean formal training, but it should also carry a focus on the activities in the work (Billett 2014), where learning has shown to be practice based, work related and self-directed. Studies also have shown that learning embedded in work practices can improve both individual employees', teams' and organisations' competitiveness and is an important means for continuing competence development (Manuti et al. 2015).

Organisations have begun to transfer power from organisations to individuals for more flexible, faster and effective operations (Rigby and Ryan 2018). This has become possible by lowering organisational structures and creating self-directed teams that can respond to individual projects (Holbeche 2015; Lee and Edmondson 2017; Moe et al. 2008). At the same time, responsibility for learning at work has also increasingly moved to the individuals and teams themselves (Ellinger 2004; Friedman 2005). As coping on the job has become increasingly the responsibility of workers themselves and work itself more fast-paced (Harteis 2017), learning practices promoting professionals' competence development are changing as well. The nature of these self-directed practices must also be considered in research (Harteis 2017). Therefore, the framework of self-directed learning (SDL) practice (e.g., Knowles 1975) would seem to be a topical starting point when considering the practice of learning at work in these organisations underlining employees' and teams' self-directedness. Although SDL has long been studied in adult education and andragogy, the need to examine and study the multidimensional nature of SDL in the context of workplace learning has been highlighted (cf. Gu 2016; Ellinger 2004; Rana et al. 2016).

The participants of the current study are employees working in the ICT sector; this sector is one of the drivers of current economic growth and increased employability. ICT professionals are expected to produce high-quality products and services for their customers, and learning and creativity are promoted as responses to the increasing demands of their working life (Ulrich and Mengiste 2014). Because of the innovative, artistic and fast-paced nature of ICT work based on continuous problem solving and development (Bauer et al. 2012), SDL is needed to answer to the requirements of competence development through work practices.

Although, there has been earlier research on learning practices at work, some researchers have argued that studies on the topic have been too theoretical and have lacked empirical evidence (Lee and Roth 2006). Some of the empirical studies have been conducted as ethnographic case studies (e.g., Valleala et al. 2015) or primarily based on interviews and surveys (e.g., Milligan et al. 2014; Vanthournout et al. 2014). However, there is a need also for in-depth tools to understand learning and SDL as phenomena in the context of work and to determine the learning methods or resources employees use to achieve their learning goals (Pintrich 2004; Ha 2008; Loftus and Higgs 2010). Discourse analysis and its instruments have been described as a useful method for generating information about different dimensions and descriptions of multidimensional phenomena (Wetherell and Potter 1988), such as learning. However, in the field of workplace learning there is a lack of studies utilising discourse analytical methods (cf. Lee and Roth 2006; Boud and Solomon 2003.) For these reasons, in this study, the nature of practice of self-directed learning is examined with the help of discourse analysis to better understand employees' descriptions and multiple interpretations of SDL practice at work. Thus, in the current study, we ask the following: How do employees of ICT organisations describe the practice of SDL in the context of workplace learning?

Workplace Learning as Practices and SDL at Work

Workplace learning practices producing employees' competencies and organisational goals

The ability of organisations to innovate and be successful in the labour market depends on employees' continuous learning (Davis and Daley 2008). Over the past couple of decades, learning at work has strongly been approached as formal training, but also as work related and practice based (Billett 2001, 2014; Collin 2006). Research in the field has also focused on the development of employees' skills and competencies while working (Noe and Ellingson 2017; Paloniemi 2006; Collin 2006). Although there is growing interest in understanding different 'learning through work' activities, as well as interaction and participation (Billett 2014), the perspective of individual autonomy in learning has also increased (e.g., Ellinger 2004; Karakas and Manisaligil 2011; Noe and Ellingson 2017). Thus, learning at work can be seen as different practices that are emerging when working. 'Practice' generally refers to the routines, norms and beliefs in which everyday activities are embedded (Bourdieu 1977, 1990). In the context of workplace learning, practice is a system of activities in witch knowledge is not separate from doing (Gherardi 2000). Workplace learning practices can appear both as individual (e.g., autonomous problem solving) (Noe et al. 2014) or shared and collective-level (e.g., interaction) activities (Collin 2006; Billett 2001).

According to Matthews (1999), all learning at work should aim to and promote sustainable development of both the individual and organisation. However, learning at work has been merely described as a way to develop individuals' own competencies (Paloniemi 2006). The concept of competencies has been used to describe the skills and abilities of individuals, whereas, for example, the term 'knowledge' has been utilised in both organisational- and individual-level descriptions (Lehner and Sundby 2017). The definition of a competence is thus ambiguous, but it is often described as an individual's ability to perform the tasks assigned to him or her (Streumer and Bjorkquist 1998). Because the current study specifically examines the practice of learning at work as an activity that develops the competencies of the individual (Matthews 1999), we use the term 'competence' to describe an individual's skills, abilities and expertise (cf. Paloniemi 2006). The competencies of ICT professionals include programming languages and software development tools and the skills to deliver technical support to users. Workplace learning, especially self-directed practices (e.g., reading professional literature), but also through participation in communities and through working on projects, has been seen as some of the prerequisites for developing such skills (Edwards 2010; Ha 2015).

SDL as a practice of workplace learning

Most of learning at work emerges informally and in a self-directed manner (Yeon, 2008). Gerber et al. (1995) found that typical workplace learning activities, such as learning from mistakes, self-managed observation, training others and learning through interaction, were SDL activities because employees emphasised the responsibility of individuals and groups when speaking about their learning. Ellinger (2004) also underlined learning at work as being inherently self-directed because learning is nowadays seen as an essential part of work. In addition, the responsibility for learning has shifted to the individuals and teams themselves. In the workplace, there is an increased interest in transferring power from institutions to individuals (Rigby and Ryan 2018) because individual self-directed action seems to be the key for enabling both continuous competence development and creativity (Gijbels et al. 2012). Thus, the practice of SDL is recognized as a topical and important part in the field of workplace learning research and practice, especially in case where aim of the learning is to grow employees' competency.

The concept of self-directedness has been emphasised since the 1920s, originally referring to the natural need of adults to act in a self-directed way (Lindeman 1926). The idea of self-directedness in learning emerged from andragogy, according to which adult learners are independently capable of elaborating on their learning goals, have a lot of experience as learning resources, can apply situation sensitivity based on their experiences and are motivated to learn through internal factors instead of external ones (Knowles 1975). The framework of SDL has also been brought into the context of workplace learning (Candy 1991; Artis and Harris 2007; Knowles et al. 2012), which has recently been accompanied by the concepts of autonomous learning (Noe and Ellingson 2018), self-learning (Ha 2008) and self-regulated learning (SRL) (Pintrich, 2004). However, there are differences in the background of the concepts, but all of them share the idea of the responsibility of the actors in relation to their learning activities and the individual's awareness of his or her own learning needs and opportunities (London and Mone 1999). However, SDL is a broader concept and unlike SRL, it takes into account not only the characteristics of the individual, but also the importance of learning environment and collaboration (Loyens, Magda & Rikers, 2008). In SDL autonomy is not a necessary concept for learning. Instead, enabling autonomy depends on how much responsibility the individual has regarding the different decisions in learning (Nunan and Lamb 1996). No one can always be completely autonomous (Merriam and Caffarella 1999). Brookfield (1993) described the SDL as a practice in which the individual takes responsibility for a situation either with or without others' help. Thus, self-directedness does not directly translate into a completely autonomous individual learning activity: SDL can also occur collectively and it can also be influenced by the organization in the context of work (Maehl 2000; Candy 1991). Therefore, the concept of self-directedness should be criticised for giving an image of a one-sided and autonomous activity (Candy 1991), even though studies have found that SDL is not realised in such a radical way that no other people would have any effect on learning (Loyens et al. 2008.)

SDL is described as a goal itself or a skill to be developed (e.g., Brocket and Hiemstra 1991; Knowles 1975) and as an individual feature (e.g., Lindeman 1926; Guglielmino 2008). However, the broadest framework for SDL is based on the idea of SDL as a practice (Khiat 2017; Caffarella 1993; Knowles et al. 2012). In his research, Though (1971) explored nonformal adult learning practices that he identified as self-directed because these practices were designed, embedded and controlled by the adults themselves. This practice-based view is also the starting point for a number of very linear process descriptions of SDL. Common to all these descriptions is that a learner who is employing SDL can manage the learning process from the beginning to the end (e.g., Knowles 1975; Brocket and Hiemstra 1991; Brookfield 1986, 1993; Pitrich 2004). Therefore, the individual is responsible for the setting, design, implementation and evaluation of learning goals (Merriam and Caffarella 1999; Merriam 2001). In this sense, SDL at work can take place in a variety of contexts: formal, informal, online or social interaction (Noe et al. 2014). In the current study, we approach SDL as one of many workplace learning practices. In this practice, individuals or teams take responsibility (cf. Merriam and Caffarella 1999; Brookfield 1993; Though 1971) for their own 'on-the-job' or 'through work' workplace learning (Billett 2014).

Consequently, the development of one's own competencies also helps in achieving an organisation's developmental goals (Matthews 1999).

The importance of SDL in the ICT sector

In ICT sector, flexible work guides employees to commit to working and learning in a self-directed manner (e.g., Heinz 2010). This type of development entails reading and obtaining information from various sources (e.g., the Internet), becoming familiar with programming languages and tools and participating in projects (Edwards 2010; Ha 2008, 2015). Learning in ICT work is supported by challenging and interesting tasks and collaboration, while routine-like tasks, the need to rush, old technologies, the boundaries between professional groups and the expectations of short-term work effectiveness constrain learning and creativity (Vähäsantanen and Eteläpelto 2017). In the field of software engineering (cf. Collin 2006; Havnes and Smeby 2014; Nerland 2008), work is highly problem driven, and employees are involved in short-term loops of problem-driven learning (Hirschmann and Mulder 2018). These kind of workplaces have proven they offer a large variety of both individual- and collegial-based resources for learning (Billett 2001; Schürmann and Beausaert 2016). Despite the positive meanings of learning described in some previous studies, the negotiations that take place when a learner discovers his or her identity might be demanding for this specific group of employees (Ha 2015; Kirpal 2009; Soreide 2016) because employees in ICT organisations are immersed in a culture that requires ongoing learning driven by both the employers' and employees' expectations (Fuller and Unwin 2009; Riddell et al. 2009). Here, learning is approached as a necessary function of the organisation (Scheeres et al. 2010; Ha 2015).

In modern times, especially in ICT organisations, organisational structures have changed from hierarchical and managerial-oriented structures to increasingly focusing on the autonomy of employees and self-directedness (Bauer et al. 2012; Cerasoli et al. 2017). These kinds of organisations have been called as 'agile', 'fast-paced', 'low-hierarchy' and 'self-organised' (Lee and Edmondson 2017; Holbeche 2015; Salovaara and Bathurst 2018). In practice, this means, for example, that the teams are so-called 'self-directed teams' that carry the responsibility for the entire project. Inside the team, the tasks are clearly divided to be carried out by different people whose handle these tasks responsibly (Moe et al. 2008). We do not know exactly how learning and competency development in this kind of work and structure should be promoted or supervised (Bauer et al. 2012). Therefore, it is possible to assume that the responsibility for learning within this kind of work will increasingly be placed on the individuals and teams themselves. However, there is a lack of research on self-directed practices in organisations and the nature of learning in these organisations (Lee and Edmondson 2017). Consequently, looking at SDL in modern self-organised ICT organisations is very topical.

In this study, we approach SDL as a practice of workplace learning where individuals and groups take responsibility for their learning in different situations, aiming to develop their own competency. Emphasizing the practice of SDL in the context of work is important because of the complexity and scarce research on the concept, but also from the point of view of the culture and structures that emphasize the self-directedness in organizations. Self-directed learning will be an important part of employee' learning in the future as both learning needs and employee responsibility increase (Noe et al. 2014). According to Pintrich (2004), SDL should be explored through methodology that highlights the diversity of the phenomenon at hand. Consequently, we used a discourse analysis, obviously suitable method aiming to comprehensive understanding of this multi-faceted phenomenon (Wetherell and Potter 1998).

Aim and Research Questions

The aim of the current study is to investigate how personnel in ICT organisations describe SDL practice at work. Our aim is to understand the interviewed employees' views, accounts and multiple interpretations of SDL practice in the context of workplace learning through co-constructed speech and to gain new knowledge about the interdimensional nature of SDL (cf. Pintrich 2004). Thus, in the present study, which is based on discourse analysis, we ask the following: How do employees of IT organisations describe the practice of SDL in the context of workplace learning? More specifically, we ask the following: What kinds of interpretative repertoires of SDL practice do employees in the ICT sector produce in their speech? In addition, the purpose is to find out how the interviewees position themselves, other members of the work community and the organisation in each repertoire, what contexts of the speech can be seen and what the employees want to say through their ways of speaking.

Methodology

The current study is based on social constructivism, which states that knowledge, reality and its structures and phenomena are constructed in social and linguistic interactions (Gergen 1999). The construction of knowledge is examined at the social community and cultural levels, ignoring individual psychological structures and processes (Gergen 1999). From a social constructivist point of view – and in the field of workplace learning research – it is crucial to explore the modes of speech and discourses that people use to construct their views

(Tynjälä 2013; Burr 1995). The current study focuses on discourses (i.e., the speech of the target organisations' personnel) and ignores cognitive functions, schemas and phrase linguistics (Potter and Wetherell 1987; van Dijk 1998). Our purpose is to discover what kinds of different ways of talking about SDL practice are used, thereby increasing our understanding of the different aspects and nature of SDL. Therefore, the current research employs a discourse study (Stubbs 1983; Nunan 1993; Silverman 1997; Edley 2001; Potter and Wetherell 1987). An applied discourse study focuses on the actual research of cultural actors, and a discourse is seen as the result or outcome of an actor's active social interaction. In this kind of activity, a discourse is defined as the sum of commonly agreed-upon views on the nature of reality, and these views are true in a specific environment when experienced and presented by certain people (van Dijk 1998).

Data

The data of the current study were gathered together with the data collection of the HeRMo (Ethical Human Resource Management and Leadership Practices Promoting Creative Activity in Finnish Growth Companies) research project, which looks at phenomena of leadership, creativity and learning at work. The participants in the current study included one large (130 employees) and one small (30 employees) ICT organisation. These organisations were chosen because of their low-hierarchy, agility-focused and self-directed practices - features that are generally present in the ICT sector (Salovaara and Bathurst 2018) - and because of the central meaning of learning for ICT work in the future (Martins and Terblanche 2003). Organisation A is an ICT company with more than 100 employees. The company has grown extensively in recent years. The company's main office is in central Finland, but it also has four smaller offices across the country. Its organisational structure consists of departments that are based on work tasks: software development, sales, customer service and IT support. Smaller teams within these departments are responsible for ongoing projects. The company has been striving for a low-hierarchy, minimal bureaucracy that places the responsibility for work on the employees. The departmental teams work in a self-directed manner; a team and individuals are responsible for a project, directly connecting with customers and ensuring agreement among the team members regarding the project's content and responsibilities. The leadership goal within these teams is to eliminate obstacles and factors that disturb everyday work. Software teams have project leaders who are responsible for supporting and guiding everyday work. Project leaders also work with customers. In addition, software developers have a human resources (HR) manager with whom they can discuss employment issues. Salespersons and IT support providers have HR managers as well. Organisation B is a small ICT company operating in Finland and employs fewer than 30 people. It has one main office and one other office in Finland. Additionally, some of the employees work at customer offices on customers' projects. This company offers software design and consulting services. The employees work as software designers, software developers and consultants. The company also employs a chief executive officer, HR manager, marketing persons and salespersons. The company has been striving for a low-hierarchy, minimal bureaucracy that places the responsibility for work on the employees. Every employee has a superior, and every project has a project leader who is responsible for everyday work and support.

Research (e.g its aims, themes, data collection, progression, anonymity) was introduced to employees via handouts and e-mail bulletins provided by the researchers and the organizations' managers. The researchers visited the participating organizations several times before starting the data collection, familiarizing themselves with the organizations by following the personnel's daily activities. Interviewees were randomly selected, however, representing different job titles. Participation was voluntary and every individual was requested to give his/her consent to use the interview material for research purposes. The data consisted of 23 interviews (see Table 1) collected in 2017. In the interviews, the descriptions of the interviewees' learning were addressed. At the beginning of the interviews, the participants were again told about the study in detail (subject of the research, the goal, the schedule and what for and how the data will be used). Privacy practices and data retention principles were also discussed. The target organisations and the individual respondents were anonymised so that it is not possible to identify the respondents in the research reports. All of the described actions also ensured the credibility and dependability of this research (see Shenton, 2004; Elo et al., 2014), and helped the researchers to follow ethical guidelines.

Table 1. Interviewees of the study

Id. number	Job title	Organization
1	Consultant	В
2	Consultant	В
3	Consultant	В
4	IT expert / Marketing developer	A
5	IT expert / Sales person	A
6	IT expert / Sales person	A

7	IT expert / IT support	A
8	Software developer	A
9	Software developer	A
10	Software developer	A
11	Software developer	A
12	Software developer	A
13	Software developer	A
14	Software developer	A
15	Software developer	В
16	Software developer	В
17	Software developer	В
18	Software developer	В
19	Software developer, project leader	A
20	Software developer, project leader	A
21	Software developer, project leader	A
22	Software developer, project leader	В
23	Software developer, project leader	В

The interviews were conducted as individual, semistructured, thematic interviews, emphasising a conversional style between the interviewer and interviewee. The overall themes discussed touched on leadership and managerial work, injustice, creativity and creative activity, workplace learning and competency development. In the present study, the interview questions that were part of the theme 'workplace learning and competence development' were used primarily, such as for the following interview questions: 'What do you think about learning at work?'; 'How do you learn or develop your competencies at work?'; What do you mean by learning in your job?'; and 'How does your organization support your workplace learning or competency development?' The questions varied depending on the interview situation and the interviewee. Advisory questions were utilised if the employee found it difficult to spontaneously speak about the theme at hand.

In line with the discourse study, speech stored in text format (Stubbs 1983; Nunan 1993) constitute the data of the current study. The interviewees were software developers and salespersons performing client support or other duties in the ICT sector. The participants did not work in formal managerial positions, but some had other expert roles in the organisations (e.g., project leader). Before starting the analysis, all the interviews were transcribed. We did not take note of or transcribe the sighs, breaks or silent moments during the speech because the data consisted of interviews instead of, for example, everyday discussions and because this level of verbatim transcription was not necessary for the purposes of the current study (Stubbs 1983; Nunan 1993). After transcription, the data were thoroughly read to establish an overview of the interviews. Altogether, 71 pages (30,871 words) of learning-related speech were found. This pretreated material was used as the data for the discourse analysis.

Analysis

In the current study, discourse analysis methods, tools and instruments were applied (e.g., Silverman 1997; Taylor 2001). The aim of the analysis was to find different kinds of discourses or ways of talking (i.e., speech) that ignore cognitive functions, schemas and phrase linguistics (Potter and Wetherell 1987). First, we searched for all the fragments in which employees are talking about the practice of SDL. The following quote serves as an example of a fragment of interview material that was interpreted as describing the 'practice of SDL in the context of workplace learning':

Interviewer: Are there any opportunities for learning, here, at work?

Software developer (8): The most obvious opportunity is that if a customer comes up with a request that 'we would like this feature in this system', when you start to think either alone or with a group, that if it is possible to do it at all then you may need to check things using Google and see if anyone else has done it before, and usually, there is a blog or something similar that somebody has done. You read it and take the things that you can apply or use, and this is how the knowledge and competency are accumulating.

We began the analysis by identifying fragments that have the kinds of meanings, entities and sets of meanings for self-directed learning. In accordance with a discourse analysis, we termed these sets of meanings

interpretative repertoires (Edley 2001; Potter and Wetherell 1987; Wetherell 1998). The analysis focused on the use of speech and language and on how the interviewees constructed the reality of SDL in the context of workplace learning in ICT organisations. Attention was paid to the various ways of talking about SDL and the meanings, adjectives, depictions, metaphors or examples given by the interviewees when speaking about SDL in the context of work. The definition of the variability of speech is essential when forming interpretative repertoires; it means that speeches may include many ways of talking about the same thing (Wetherell and Potter 1992). A speech is not usually dominated by a single interpretative repertoire; there can be several competing or collaborating repertoires in speeches (Wetherell and Potter 1988). Therefore, a discourse analysis is suitable for the study of SDL, where the aim is to study the interdimensional nature of the phenomenon (cf. Pintrich 2004). Utilising this method, learning speech acts were examined in detail – one by one – to reveal similarities. In this phase of the analysis, we paid attention to different kinds of metaphors, examples and descriptions in the interviewees' speech. We noticed various types of content, but speech about self-learning was constructed in a very similar manner throughout the data. As a result, four interpretative repertoires were revealed.

To better understand these interpretative repertoires, we used three different discourse analysis instruments: 1) function, 2) context and 3) subject position. In the current study, *function* means the purpose of speech (i.e., why the interviewee is talking in this way). To better understand the meaning of speech and the function of learning speech, we also had to examine the *context* (i.e., time and space) in the repertoires. Contexts are discovered by examining the situations or settings in which the speeches attached to each repertoire take place. The contexts create structures and positions to which the actor or speaker relates him- or herself or others (Silverman 1997). For this reason, we also examined how the actor or speaker *positions* him- or herself in each repertoire, as well as individual commitments, responsibilities, rights or statuses. To gain information of the collective nature of SDL practice, we also looked at the interviewees' talk about how they position others (colleagues, supervisors) in each interpretation repertoire. In addition, we wanted to explore from what kinds of positions the employees describe the organizations, and thus find out how the organizations 'practices and culture appear in the employees' talk (Edley 2001). Examples of carrying out the analysis are summarised in Appendix 1.

Findings

In the current study, we found four interpretative repertoires the interviewees used when talking about SDL practice in the context of workplace learning. These repertoires describe SDL practice and its function, context and subject positions in very different manners. Example extracts from the data can also be found in Appendix 1.

Next, we present these four different interpretative repertoires of SDL practice we discovered during the current study. We also present the functions, contexts and subject positions (individual, others and organisation) of each repertoire. Table 2 summarises the interpretative repertoires of SDL.

Table 2. The interpretative repertoires of SDL in the context of workplace learning

Repertoire	Obliged practice	Creativity and motivation enhanced practice	Flexible and fast-paced practice	Practice tied to work
Function	Reveal a critical perspective of SDL practice, which is what is obliged in nature and obligated by external factors	To highlight the importance of learning from the individual's well-being and employee-oriented viewpoints	To highlight the speed and hecticness of SDL, situation- specificness and flexible methods	To indicate the meaning and relevance of SDL as continuous activity in one's work
Context	ICT sector-specific standards Constant change in technologies	Employee orientation	Customer requirements and situations New problem- solving situations	The nature of work as project-based ICT field

Subject position of individual	Obliged learner	Motivated learner	Decision maker	Active actor
Subject position of others	Helper	Enabler	Accessory	Enabler
Subject position of organisation	Forcer	Enabler	Enabler	Job provider

Obliged practice

In this interpretative repertoire, SDL was described as a requirement and area of work that one *must* master to perform the work in the first place. Practice was described as constrained, indispensable, challenging and problematic, and it exclusively manifested as a stressful and burdening phenomenon that one could not always find time for, even though he or she was obliged to do so. Through their speeches, the interviewed personnel expressed a very critical and negative picture of SDL. The function of the speech could, therefore, *reveal a critical perspective of SDL practice, one that is obliged in nature and obligated by external factors*. Employees spoke of SDL as an obligation and requirement for work, even when they were not willing to learn. The next interview fragment shows that an employee sees SDL as an indispensable and obliged action for reasons beyond his control. This is particularly evident in the way in which learning and responsibility for learning from one's own learning is described as a problematic, non-motivating and time-consuming practice and is not something the employee wants to implement in his own time. At the same time the environment (e.g., organisation and ICT sector), however, requires it:

Software developer (9): Because I don't want to work at home, after I started the job, my home coding is over, because 8 hours a day is enough for me. I didn't have any longer a motivation to do at home and now when it came to the obligation (from the organisation) to spend 24 hours a year working outside of working hours; it was quite a bit miserable for me because it is out of my other hobbies, and I have a lot of hobbies.

Interviewer: But do you do any work-related study outside of working hours? So you deliberately learn nothing at home, learn anything new?

Software developer (9): No, I don't, and it has been a problem for years when the technologies are going to develop all the time, but when I have another life there at home, and so I have told many times to my supervisors that I don't want to do work-related things in my own time. [xxx]. But the problem is that you fall by the wayside. In spite of that, I'm not doing it at home, except now that came the duty, I have learned that new system in my own time. [xxx]. But there are those people who do a lot of things with their free time and then share that knowledge with others at work.

In this interpretative repertoire, the context and reasoning for the speech could be the *constant development of technologies* and *vocational field–specific obligations*, which the personnel viewed as the reason for compulsory SDL. As is apparent from the previous data fragment, employees position themselves as *obliged learners* in this repertoire. The realisation of SDL was not described as being generated by the free will of the individual but rather externally. Employees talk about *'finding time for themselves'*, *'finding the right moments to learn'* and, for example, *'look[ing] for solutions to relieve learning pressures'*. The speech reflects the role of employees as learning respondents as challenging. The obligation of SDL was not limited to working time, as can be seen from the interviews above, but learning was also expected to take place during leisure time. The role of the organisation was seen as a *forcer* of SDL. In concrete terms, this could be seen in the speech of the Organisation A's employees, which prompted the organisation to require employees to spend 24 hours per year of free time on independent learning. However, forcing SDL could be interpreted as including the phenomena described within working hours; the development of technologies requires continuous learning, but the employer does not offer extra time or opportunities to do, instead expecting that the employees themselves *'try to find solutions'*. In this interpretative repertoire, speech about the individual and his or her learning strain were generally found, but some references to

colleagues were also found. Colleagues were described in the repertoire as *helpers* in learning. Workers who have the time and opportunities to develop themselves outside working hours and want to share their new learning with other members of the work community were seen as helpers. This was seen as reducing the speakers' own commitment to learn in their leisure time while also allowing new information to be shared with colleagues.

Creativity and motivation enhanced practice

SDL in the context of workplace learning was considered a meaningful aspect from the viewpoint of one's creativity and enthusiasm. SDL was described as tool for creativity, which is essential in ICT work. In addition to creativity, learning was described and talked about as a trigger for motivation. In this interpretative repertoire, SDL was described using phrases such as 'one gets to learn' and 'one gets to challenge', making it seem like a very positive phenomenon. Regarding the function of the speech, the need to highlight the importance and positive effects of learning was promoted. SDL was described as central, specifically in terms of the joy of work: 'New technologies and matters keep coming all the time, so you get to learn. If you did the same thing over and over again or worked with the same product, it would be pretty boring' (Software developer, Organisation A). The following data fragment shows that the individual's desire and motivation to learn and deeply understand the case (in this case the code) promote the creative process:

Software developer (15): That you get to learn new things is the one motivator here; the second motivator is to develop your own skills, which also brings new things. [xxx]. The company level has also been positively surprised by the fact that when there is a small company, it is able to take care of the employees a little differently. [xxx]. They are able to take the members of the company more individually into consideration.

Interviewer: We talked that you have a many of different skills, so how have they come about?

Software developer (15): In this job, Google is your friend and YouTube videos, and you get that information from online. Many people in this field just find a ready example (from the Internet) and copy it into the code. It's bad because if you just take some code and don't know how it works (it just works), it doesn't help learning or the creative process.

Creativity and enthusiasm, described as the outcomes of SDL, were presented as increasing an employees' sense of freedom and autonomy at work and their own learning, thus forming the broader context of the speech as having an *employee orientation*. The contextual interpretation was confirmed by how the employees position the organisation in this repertoire: the organisation was described as an actor that enables creative activity, for example, by taking workers as individuals, giving sufficient freedom and autonomy to do the work and otherwise working in employee-oriented ways. In this repertoire, one could observe in the interviewees' speech that they positioned themselves as *motivated learners* in terms of both creativity and enthusiasm. SDL was described as pleasant and as something that increases knowledge, creativity and enthusiasm. Even in this interpretation repertoire, there was not much talk about other employees or the team. The individuals focused on describing their own activities and personal goals for the learning and developing competency. It was possible to detect other positions of the actors by interpreting those mentioned in the speech, such as, 'I really want to develop over the next five years to such a level that I will say if not now the best of the company, but at least in the top ten of the company in terms of expertise' (Software developer 10), where colleagues are described mainly as benchmarks, as a mirror of their own level of expertise and thereby supporting the setting of development goals.

Flexible and fast-paced practice

The practice of SDL was also said to be flexible and fast-paced. Flexibility in this repertoire illustrates that an SDL practice could include many different learning activities utilised by employees in a situational and flexible way. In terms of learning methods, it became essential when and where each method was used. The situations were often described as requiring a quick reaction and fast learning from the employees. The context of the learning speech was either customer orientation and/or problem-solving situations, which triggered the need for fast-paced and flexible SDL. The customer's needs should be addressed as quickly as possible, allowing the employee to make independent decisions about what is needed to learn and how the new understanding is achieved. Thus, the employee's subject position became a *decision maker*. Customer and problem-based situations

were also often described as team wide, where the practice of SDL was manifested collectively: the team meets quickly to address a common problem and through discussion and shared views tries to form a solution. In this case, an *accessory* was formed as a subject position of the others. An example of the practice of SDL, which appears as a fast-paced form, is seen in the following fragment:

Interviewer: Are there any opportunities for learning, here, at work?

Software developer (8): The most obvious opportunity is that if a customer comes up with a request that 'we would like this feature in this system', then you start to think either alone or with a group, that if it is possible to do it at all, then you may need to check things using Google and see if anyone else has done it before. And usually, there is a blog or something similar that somebody has done, you read it, and take the things that you can apply or use, and this is how the knowledge and competence are accumulating.

Interviewer: And do you feel that within the working hours you are able to follow the blogs and read and know the information, get to know things?

Software developer (8): Well, it really varies a lot, so how busy you are with your job, [xxx] but usually, I can at least make a quick check of something. [xxx]. At least if somebody else suggests that you should read this or that, then I read it.

The fragments attached to the interpretative repertoire repeated the descriptions of 'haste', 'customer requirements', and listing various methods and their utility in relation to the problem or customer's need. The organisation was described as an *enabler* of learning in the repertoire. Enabling in this context means, for example, that the organisation has different electronic communication channels available to employees, whereby common problem solving is possible, even if the employees are not physically at the same place. In addition, it was interpreted as meaning that work planning was carried out within the organisation so that employees would have 'even a moment' to learn new things in all problem-solving situations. The function of speech was the need to highlight the speed and hectioness of SDL, situation-specificness and flexible methods.

Practice tied to work itself

The fourth interpretative repertoire was found in speech, where work was described as continuous SDL. Learning was thus considered an intrinsic and inextricable part of work; it was described as neither a negative nor positive phenomenon, but rather as neutral, self-evident and automatic. The function of the speech was to describe the significance and relevance of SDL, particularly in ICT work. The context of the speech was the nature of the work as project-based and IT field. The work was described as, for example, problem solving in which learning is embedded and where it was not necessary to 'separately practice' learning because it occurred naturally during everyday work. The following fragment shows how employees described their work as continuous SDL:

Software developer, project leader (22): Whenever a new thing comes in, you have to study yourself, and of course, you can get some information from your colleagues, but the possibilities of such an employer are really limited. [xxx]. How would I describe the software work, you have to read a lot of codes of other software and understand why it was made and how it was made and what practices it has used and then in some way adapted to it, to the particular environment.

Interviewer: So you're going to change the project, will it force you to learn new?

Software developer, project leader (22): Yes, yes. Self-development is present every day. It is actually my job. I mean, self-development is kind of intrinsic to the work. [xxx]. It is really hard to me to see that it would be something separate, you are going somewhere and learning because it is intrinsic. [xxx]. 3% of learning is about attending some courses, and 97% of it is like learning every day.

In this interpretative repertoire, the interviewed personnel described their roles in the learning as minor. Learning was seen as part of everyday work, indicating one must be very active when working. In this interpretative repertoire, the *active actor* became the subject position of the individual. Instead, the employer's support possibilities were described as limited, whereby the position of the organisation was only a *work provider* who

cannot prevent or promote SDL but only create a framework for doing the job. Colleagues were described as enablers, who acted as a resource in work situations when an employee has a task that he or she cannot contribute to.

Discussion

In the current study, we investigated how employees of ICT organisations describe the practice of SDL in the context of workplace learning. We found four different interpretative repertoires of SDL practice, in which contexts, functions and individual positions in relation to the self and others, as well as to the organisation, varied. The ICT workers talked about SDL as an obliged practice, creativity-enhanced practice, fast-paced and flexible practice and one tied to work itself. SDL practice was constructed as both, a phenomenon and activity individuals or teams should take responsibility for, and the processes where individuals or teams play an active role.

In line with previous studies, workplace learning (in which context SDL was considered in this study) was described as strongly intertwined with work practices themselves (Billett 2001; Collin 2006; Gherardi 2009). Workplace learning necessarily occurred during working and problem solving (Collin et al. 2018; Havnes and Smeby 2014; Nerland 2008), rather than taking place outside of work, such as with training and courses. Interestingly, unlike in most of the recent studies in the area of workplace learning, individuality in learning was emphasised in the employees' speech. This may have been detrimental in encouraging workplace learning, interaction and collaborative learning (Billett 2001; Brown and Duguid 2001; Gherardi 2006).

Interestingly, so far, the scarce empirical research has indicated self-directedness and SDL to be self-evident aspects (Moe et al. 2008) of contemporary agile and low hierarcy companies (Holbeche 2015). However, despite the increasing importance of SDL in ICT work (Ha 2008; Milligan et al. 2015; Germain and Grenier 2015), our findings indicate that learning should not become totally self-driven, as is the aim in some contemporary low-hierarchy, self-organising enterprises (cf. Lee and Edmondson 2017). Based on the principles of low-hierarchy organisations and SDL, the freedom and autonomy of learning, as well as the responsibility for learning, appear to be thrusted onto individuals. From this perspective, learning can be perceived as problematic and stressful if an employee cannot monitor and constrain his or her learning or if an employer does not provide the requisite opportunities, support and tools for monitoring learning. According to previous studies (e.g., Collin et al. 2018), employees may experience being left alone and abandoned if there is no support provided by the organizations. In this way, our findings can shed light on a more critical understanding of SDL. All employees may not see SDL only as a positive practice. On the contrary, it can also be felt as a burden and stressful obligation.

Self-directed learning was also constructed as a very positive image, where the nature of SDL practice was emphasised as creativity enhanced. In this speech, learning was approached as a possibility more than as a responsibility. The individual was positioned as a motivated learner. This dominant type of speech supports previous research that found a positive relationship between learning and creativity, as well as between creativity and professional agency (cf. Collin et al. 2018; Paloniemi and Collin 2012). In our findings, learning appears to support the creation of technical innovations and creative processes. Unlike in the previous repertoire, self-directedness was not seen as a negative issue because it enabled the selection of various means for individual development, as well as for technical innovation.

In our study, learning is strongly framed by the context: the technical nature of the work and the constantly changing technologies and digitalisation. Also, customers' needs and hopes and the problem-based nature of ICT work (Ha 2015; Hirschmann and Mulder 2018) frames learning. As a result, (self-directed) learning was perceived as a natural part of work. SDL was emphasised also by the hectic and simultaneity nature of learning situations when individuals and teams need to respond quickly and flexibly to the situation. This was not described as positive or negative, but rather as a natural and work-related activity. However, the speed of learning raises the question of how sustainable (cf. Matthews 1999) such hectic learning is.

The practice of SDL was most often described as a responsibility of the individual, but also as a 'shared responsibility'. Perhaps the work in the ICT sector is the reason why the ideal form of SDL appears to be more individual than team based. Instead, an organisation was positioned as enabling actors, not taking responsibility or even supporting practices. Therefore, our findings provide insights into organisations preferring self-directedness at a larger scale: the autonomy of the individual employee is emphasised when self-directed action is also culturally produced in learning as well. The organisation's role appeared negatively only when SDL was talked about as an obligation. In other cases, the organisation's role was either positive or neutral. Instead, team or colleagues were always described positive, even when an individual was forced to be self-directed, he or she described teams as 'easing the learning pain', thus assisting learning. Interestingly, the emphasis on self-directedness in our analysis also indicates that self-directedness might become a generally accepted idea both

among employees and in the working culture. If this occurs, an important question arises concerning how employee well-being and developmental opportunities will be addressed when work and learning are not as inspiring or when there is so much work that learning is impossible. To summarise our findings, learning is a very important part of ICT work. In this sector especially, the nature of learning has obviously transferred to merely SDL and thus also changed the need to supervise this kind of learning (Bauer et al. 2012).

Using a discourse analysis enabled us to investigate the multifaceted nature of SDL (cf. Pintrich 2004). The analysis produced four interpretative repertoires slightly different from each other but also partly overlapping. The instruments utilised in the analysis enabled us to make interpretations both on the individuals' and colleagues' and team's role for learning. Thus, we could better grasp the collegial nature of SDL as well. Additionally, individually produced positions also enabled interpretations related to an organisation's responsibility, role and meaning in the area of SDL. The 'context' instrument deepened the analysis in revealing the background trends behind the practice of SDL. Fortunately, we collected a large amount of interview data - which is uncommon in discourse studies - from two organisational contexts by utilising researcher triangulation (Patton 2015) that also ensures credibility and confirmability of findings as criteria of trustworthiness in qualitative research (see e.g. Cuba & Lincoln, 1985; Shenton, 2004). Despite the credibility of the findings, the discursive method may have resulted in a strong emphasis on the individual. Additionally, we did not strictly ask about collegial or collective learning, which might have had an impact on the findings or on our interpretations. It would have been possible to broaden our understanding of SDL by utilizing additional data, for example group discussions. In this way, it would have been possible to find repertoires that emphasize even more strongly the importance of the group to SDL. However, the individual emphasis on learning, found in this study, is interesting because it is not the dominant paradigm in the field of workplace learning research (cf. Manuti et al. 2015; Tynjälä 2008). Using a number of different tools for reviewing the interpretative repertoires allowed for a deeper understanding of SDL practice, also ensuring dependability of our interpretations (see e.g. Elo et al., 2014; Shenton). Thus, with the help of these tools, we could make interpretations about the practices of SDL in different areas, in what contexts they appear, what is the role of the individual and also the roles of others in each repertoire. To strengthen the trustworthiness of our findings, we have also drawn attention to detailed description of the data collection and analysis phases, presented data-based citations and examples in the text and in Appendix 1 that confirms the interpretations (cf. Lincoln and Cuba 1985).

The purpose was not to compare the differences between participating organizations in this study, and we did not have suggestions of any significant differences regarding SDL in the organizations. This is probably because the participating organizations were very similar, they work in the same industry and their management hierarchy is similar. Regarding the transferability of the findings, we suggest that the findings can undoubtedly be applied to ICT work, in low-hierarchy, self-organising enterprises (cf. Lee and Edmondson 2017). It is also expected that the prevailing phenomena and challenges associated with ICT workers' learning (e.g., circumstances related to launching and maintaining low-hierarchy and self-managing organisations) will spread to other fields of working life (Lee and Edmondson 2017). Thus, in the future it would be useful to compare the nature of self-directed learning in different vocational fields and organizational structures.

To change the nature of work relationships and understand the experiences of individuals performing these kinds of work, especially from a learning point of view, further investigation is needed. One promising direction for further studies is examining the relationship between (self-directed) workplace learning and creativity. Earlier studies have shown that creativity can be supported by exercising professional agency and learning, but we do not know how these concepts are concretely interrelated. The nature of learning in ICT work is transforming into becoming more flexible, fast-paced (Harteis 2017) and self-directed (Ellinger 2004) because of the many changes in workplace organisation. Because of the hectic nature of learning, its sustainability should also be critically examined: in the ICT sector, employees' competencies are linked to the technologies used, which are changing rapidly and continuously; future learning needs are difficult to predict when the question arises as to whether learning now and in the future can be seen as sustainable. Indeed, future investigations should also determine what kinds of structures, cultures and practices enhance workplace learning, as well as how these practices could be led and supervised to ensure that all employees are motivated to engage in practice-based learning. Our research provided information on the roles of different actors in self-directed learning, but more research is needed on the socio-cultural nature of self-directed learning at work. In the field of SDL at work, further consideration should be given to the collective practices and nature of SDL on the level of teams and organisation.

Acknowledgements

This work was supported by the Finnish Work Environment Fund (project number 117300). We would like to thank the target organisations and the participants who voluntarily spent their time with us.

Disclosure statement

No potential conflict of interest is reported by the authors.

References

- Artis, A. B., & Harris, E. G. (2007). Self-directed learning and sales force performance: An integrated framework. *Journal of Personal Selling and Sales Management*, 27(1), 9–24.
- Bauer, H.G., Hemmer-Schanze, C., Munz, C., & Wagner, J. (2012). Learning innovation work: Learning concept and framework. In F. Böhle, M. Bürgermeister, & S. Borschen (Eds.), *Innovation management by promoting the informal. Artistic, experience-based, playful* (pp. 171–189). Dordrecht: Springer.
- Billett, S. (2001). Learning through work: Workplace affordances and individual engagement. *Journal of Workplace Learning*, 13(5), 209–214. Retrieved from https://doi.org/10.1108/EUM00000000005548
- Billett, S. (2014). Mimesis: Learning through everyday activities and interactions at work. *Human Resource Development Review*, 13(4), 462–482.
- Boud, D., & Solomon, N. (2003). 'I don't think I am a learner': Acts of naming learners at work. *Journal of Workplace Learning*, 15(7/8), 326–331. Retrieved from https://doi.org/10.1108/13665620310504800
- Bourdieu, P. (1977). Outline of a theory of practice. Cambridge: Cambridge University Press.
- Bourdieu, P. (1990). The logic of practice. Cambridge: Polity Press.
- Brookfield, S. (1986). Understanding and facilitating adult learning. San Francisco: Jossey Bass.
- Brookfield, S. (1993). Self-directed learning, political clarity and the critical practice of adult education. *Adult Education Quarterly*, 43(4), 227–242.
- Brown, J. S., & Duguid, P. (2001). Knowledge and organization: A social-practice perspective. *Organization Science*, 12(2), 198–213. Retrieved from https://doi.org/10.1287/orsc.12.2.198.10116
- Brockett, R. G., & Hiemstra, R. (1991). Self-direction in adult learning: Perspectives on theory, research, and practice. London/New York: Routledge
- Burr, V. (1995). An introduction to social constructionism. London: Routledge.
- Caffarella, R. S. (1993). Self-directed learning. New directions for adult and continuing education, 57. pp. 25 35.
- Candy, P. S. (1991). Self-direction for lifelong learning. San-Francisco: Jossey-Bass.
- Cerasoli, C. P., Alliger, G. M., Donsbach, J. S., Mathieu, J. E., Tannenbaum, S. I., et al. (2018). Antecedents and outcomes of informal learning behaviors: A meta-analysis. *Journal of Business and Psychology*, 33(2), 203–230. doi:10.1007/s10869-017-9492-y
- Collin, K. (2006). Connecting work and learning Design engineers' learning at work. *Journal of Workplace Learning*, 18(7/8), 403–413. Retrieved from https://doi.org/10.1108/13665620610692971
- Collin, K., Herranen, S., Paloniemi, S., Auvinen, T., Riivari, E., Sintonen, T., & Lemmetty, S. (2018). Leadership as an enabler of professional agency and creativity in information technology organisations. *International Journal of Training and Development*, 22(3).
- Lincoln, Y.S. & Cuba, E. G. (1985). Naturalistic inquiry. Beverly Hills: Sage.
- Davis, D., & Daley, B. (2008). The learning organization and its dimensions as key factors in firms' performance.

 *Human Resource Development International, 11(1), 51–66. Retrieved from https://doi.org/10.1080/13678860701782352
- Edley, N. (2001). Analysing masculinity: Interpretative repertoires, ideological dilemmas and subject positions. In M. Wetherell, S. Taylor, & S. J. Yates (Eds.), *Discourse as data. A guide for analysis* (pp. 89–228). Milton Keynes: Open University.
- Edwards, A. (2010). Being an expert professional practitioner: The relational turn in expertise. Dordrecht: Springer.
- Ellinger, A. D. (2004). The concept of self-directed learning and its implications for human resource development. *Advances in Developing Human Resources*, 6(2), 158–177.
- Elo, S., Kääriäinen, M., Kanste, O., Pölkki, T., Utriainen, K. & Kyngäs, H. (2014). Qualitative Content Analysis: A Focus on Trustworthiness, *Sage Open* 4, 1-10.
- Friedman, T. L. (2005). The world is flat. New York: Farrar, Straus, & Giroux.
- Fuller, A., & Unwin, L. (2010). 'Knowledge workers' as the new apprentices: The influence of organisational autonomy, goals and values on the nurturing expertise. *Vocations and Learning*, 3(3), 203–222. Retrieved from https://doi.org/10.1007/s12186-010-9043-4
- Gerber, R., Lankshear, C., Larsson, S., & Svensson, L. (1995) Self-directed learning in a work context. *Education* + *Training*, 37(8), 26–32. Retrieved from https://doi.org/10.1108/00400919510096952
- Gergen, K. J. (1999). An invitation to social construction. London: Sage.

- Germain, M-L., & Grenier, R. S. (2015). Facilitating workplace learning and change. *Journal of Workplace Learning*, 27(5), 366–386. Retrieved from https://doi.org/10.1108/JWL-03-2013-0017
- Gherardi, S. (2000). Practice-based theorizing on learning and knowing in organization. *Organization*, 7(2), 211–223. Retrieved from https://doi.org/10.1177/135050840072001
- Gherardi, S. (2006). Organizational knowledge. The texture of workplace learning. Oxford: Blackwell.
- Gherardi, S. (2009). Practice? It's a matter of taste! *Management Learning*, 40(5), 16. Retrieved from https://doi.org/10.1177/1350507609340812
- Gijbels, D., Raemdonk, I., Vervecken, D., & van Herck, J. (2012). Understanding work-related learning: The case of ICT workers. *Journal of Workplace Learning*, 24(6), 416–429.
- Gu, J. (2016). Understanding self-directed learning in the context of mobile web 2.0 Case study with workplace learners. *Interactive Learning Environments*, 24(2), 306–316.
- Guglielmino, L. (2008). Why self-directed learning? *International Journal of Self-Directed Learning*, 5(1), 1–12. Ha, T. S. (2008). How IT workers learn in the workplace. *Studies in Continuing Education*, 30(2), 129–143. Retrieved from https://doi.org/10.1080/01580370802097728
- Ha, T. S. (2015). Learning stories from IT workers Development of professional expertise. *Studies in Continuing Education*, 37(1), 79–98. Retrieved from https://doi.org/10.1080/0158037X.2014.967347
- Harteis, C. (2017). Machines, change and work: An educational view on the digitalization of work. In C. Harteis (Ed.), *The impact of digitalization in the workplace. An educational view* (pp. 1 12). Dotrecht: Springer.
- Heinz, W. R. (2010). Vocational identity and flexible work: A contradicting or constructing relation? In F. Rauner,
 E. Smith, U. Hauschildt, & H. Zelloth (Eds.). Innovative apprenticeships. Promoting successful school to work transitions (pp. 33–47). Berlin: LIT VERLAG.
- Havnes, A., & Smeby, J-C. (2014). Professional development and profession. In S. Billett, C. Harteis, & H. Gruber (Eds.), *International handbook of research in professional and practice-based learning* (pp. 915–986). Dordrecht: Springer.
- Hirschmann, K., & Mulder, R. H. (2018). Effects of complexity of work tasks on informal learning at work in the IT domain. In G. Teoksessa Messmann, M. Segers, & F. Dochy (Eds.), *Informal learning at work. Triggers, antecedents and consequences* (pp. 40–62). Abingdon/New York: Routledge.
- Holbeche, L. (2015). The agile organization: How to build an innovative, sustainable and resilient business. London: Kogan Page.
- Karakas, F., & Manisaligil, A. (2012). Reorienting self-directed learning for the creative digital era. *European Journal of Training and Development*, 36(7), 712–731.
- Khiat, H. (2017). Academic performance and the practice of self-directed learning: The adult student perspective. *Journal of Further and Higher Education*, 41(1), 44–59. Retrieved from https://doi.org/10.1080/0309877X.2015.1062849.
- Kirpal, S. (2009). Labour market flexibility, work orientations, and skills. A comparative study of nurses and ICT technicians in Germany and UK. Dordrecht: Springer.
- Knowles, M. (1975). Self-directed learning. Chicago: Follet.
- Knowles, M., Holton, E. F., & Swanson, R. A. (2012). The adult learner: The definitive classic in adult education and human resource development. London: Routledge.
- Lee, M. Y., & Edmondson, A. C. (2017). Self-managing organizations: Exploring the limits of less-hierarchical organizing. *Research in Organizational Behavior*, 37(1), 35–58. Retrieved from https://doi.org/10.1016/j.riob.2017.10.002
- Lee, Y-J., & Roth, W-M. (2006). Learning about workplace learning and expertise from Jack. *Journal of Workplace Learning*, 18(4), 205–219. Retrieved from https://doi.org/10.1108/1366562061066581
- Lehner, F., & Sundby, M. W. (2017). IT capabilities for SMEs: An analysis at the organisational level. In C. Harteis (Ed.), *The impact of digitalization in the workplace. An educational view* (pp. 125–140). Dotrech: Springer.
- Lindeman, E. (1926). The meaning of adult education. New York: New Republic Inc.
- Lincoln Y. S., & Cuba E. G. (1985). Naturalistic inquiry. Beverly Hills: Sage Publications.
- Loftus, S., & Higgs, J. (2010). Researching the individual in workplace research. *Journal of Education and Work*, 23(4), 377–388. Retrieved from https://doi.org/10.1080/13639080.2010.495712
- London, M., & Mone, E. M. (1999). Continuous learning. In E. D. Pulakos (Ed.), The changing nature of performance: Implication for staffing, motivation and development (pp. 119–153). San Francisco: Jossey-Bass.
- Loyens, S., Magda, J., & Rikers, R. (2008). Self-directed learning in problem-based learning and its relationship with self-regulated learning. *Educational psychology review*, 20. 411–427.
- Maehl, W. H. L. (2000). Lifelong learning at its best. San Francisco: Jossey Bass.
- Manuti, A., Pastore, S., Scardigno, A. F., & Morciano, D. (2015). Formal and informal learning in the workplace: A research review. *International Journal of Training and Development*, 19(1), 1-17. Retrieved from https://doi.org/10.1111/ijtd.12044

- Martins, E. C., & Terblanche, F. (2003). Building organizational culture that stimulates creativity and innovation. European Journal of Innovation Management, 6(1), 64–74.
- Matthews, P. (1999) Workplace learning: developing an holistic model. *The Learning Organization*, 6(1), 18–29. Retrieved from https://doi.org/10.1108/09696479910255684
- Merriam, S., & Caffarella, R. S. (1999). Learning in adulthood. San Francisco: Josey-Bass.
- Merriam, S. (2001). Andragogy and self-directed learning: Pillars of adult learning theory. *New Directions for Adult and Continuing Education*, 89, 3–13.
- Milligan, C., Fontana, R. P., Littlejohn, A., & Margaryan, A. (2015). Self-regulated learning behaviour in the finance industry. *Journal of Workplace Learning*, 27(5), 387–402. Retrieved from https://doi.org/10.1108/JWL-02-2014-0011
- Moe, N. B., Dingsoyr, T., & Dypa, T. (2008). Understanding self-organizing teams in agile software development. Paper presented at 19th Australian Conference on Software Engineering (pp. 76–85). IEEE.
- Nerland, M. (2008). Knowledge cultures and the shaping of work-based learning: The case of computer engineering. Vocations and Learning, 1(1), 49–69. Retrieved from https://doi.org/10.1007/s12186-007-9002-x
- Nerur, S., & Balijepally, V. (2007). Theoretical reflections on agile development methodologies. *Communications of the ACM*, 50(3), 79–83. Retrieved from https://doi.org/10.1145/1226736.1226739
- Nunan, D. (1993). Introducing discourse analysis. London: Benquin Group.
- Nunan, D., & Lamb, C. (1996). The self-directed teacher: managing the learning process. Cambridge University Press.
- Noe, R. A., & Ellingson, J. E. (2017). Autonomous learning in the workplace: An introduction. In J. E. Ellingson & R. A. Noe (Eds.), *Autonomous learning in the workplace*. New York: Routledge. 1 12
- Noe, R. A., Clarke, A. D. M., & Klein, H. J. (2014). Learning in the twenty-first-century workplace. *Annual Review of Organizational Psychology and Organizational Behavior*, 1(1), 245–275.
- Paloniemi, S. (2006). Experience, competence and workplace learning. *Journal of Workplace Learning*, 18(7/8), 439–450. Retrieved from https://doi.org/10.1108/13665620610693006
- Paloniemi, S., & Collin, K. (2012). Discursive power and creativity in inter-professional work. *Vocations and Learning*, 5(1), 23–40.
- Patton, M. (2015). *Qualitative research & evaluation methods integrating theory and practice* (5th ed.). London: Sage.
- Potter, J., & Wetherell, M. (1987). Discourse and social psychology: Beyond attitudes and behavior. London: Sage.
- Pintrich, P. R. (2004). A conceptual frame work for assessing motivation and self-regulated learning in college students. *Educational Psychology Review*, 16(4), 385–407.
- Rana, S., Ardichvili, A., & Polesello, D. (20160. Promoting self-directed learning in a learning organization. European Journal of Training and Development, 40(7), 470–489.
- Riddell, S., Ahlgren, L., & Weedon, E. (2009). Equity and lifelong learning: Lessons from workplace learning in Scottish SMEs. *International Journal of Lifelong Education*, 28(6), 777–795. Retrieved from https://doi.org/10.1080/02601370903293252
- Salovaara, P., & Bathurst, R. (2018). Power-with leadership practices: An unfinished business. *Leadership*. Advance online version. Retrieved from https://doi.org/10.1177/1742715016652932
- Scheeres, H., Solomon, N., Boud, D., & Rooney, D. (2010). When is it OK to learn at work? The learning work of organisational practices. *Journal of Workplace Learning*, 22(1/2), 13–26, https://doi.org/10.1108/13665621011012825
- Schürmann, E., & Beausaert, S. (2016). What are drivers for informal learning? European Journal of Training and Development, 40(3), 130–154.
- Shenton, A.K. (2004). Strategies for ensuring trustworthiness in qualitative research projects. *Education for Information* 22(2), 63-75.
- Soreide, G. E. (2016). High-skilled newcomers' identity: Learners or experts? *Journal of Workplace Learning*, 28(1), 2–16. Retrieved from https://doi.org/10.1108/JWL-12-2014-0088
- Streumer, J., & Björkvist, D. 1998. Moving beyond traditional vocational education and training: Emerging issues. In W. J. Nijhof & J. N. Streumer (Eds.), *Key qualifications in work and in education* (pp. 249–264). Dordrecht: Kluwer Academic Publishers.
- Rigby, C. S., & Ryan, R. M. (2018). Self-determination theory in human resource development: New directions and practical consideration. Advances of Developing Human Resources, 20(2), 133–147. Retrieved from https://doi.org/10.1177/1523422318756954
- Silverman, D. (1997). Discourses of counselling. HIV counselling as social interaction. London: Sage.
- Stubbs, M. (1983). Discourse analysis: The sociolinguistic analysis of natural language. Chicago: The University of Chicago Press.

- Taylor, S. (2001). Locating and conducting discourse analytic research. In M. Wetherell, S. Taylor, & S. J. Yates (Eds.), *Discourse as data. A guide for analysis* (pp. 5–48). Milton Keynes: Open University.
- Though, A. (1971). The adults' learning projects. Toronto: The Ontario Institute for Studies in Education.
- Tynjälä, P. (2008). Perspectives into learning at the workplace. *Educational Research Review*, 3(2), 130–154. Retrieved from https://doi.org/10.1016/j.edurev.2007.12.001
- Tynjälä, P. (2013). Toward a 3-P model of workplace learning: A literature review. *Vocations and Learning*, 6(1), 11–36. Retrieved from https://doi.org/10.1007/s12186-012-9091-z
- Ulrich, F., & Mengiste, S. A. (2014). The challenges of creativity in software organizations. In B. Bergvall-Kåreborn, & P. A. Nielsen (Eds.), *Creating value for all through ITB* (pp. 16–34). Dordrecht: Springer.
- Valleala, U. M., Herranen, S., Collin, K., & Paloniemi, S. (2015). Fostering learning opportunities through employee participation amid organizational change. *Vocations and Learning*, 8(1), 1–34.
- Van Dijk, T. A. (1998). The study of discourse. In T. A. van Dijk (Ed.), *Discourse as structure and process* (pp. 1–34). London: Sage.
- Vanthournout, G., Noyens, D., Gijbels, D., & Van den Bossche, P. (2014). The relationship between workplace climate, motivation and learning approaches for knowledge workers. *Vocations and Learning*, 7(2), 191–214. Retrieved from https://doi.org/10.1007/s12186-014-9112-1
- Wetherell, M., & Potter, J. (1988). Discourse analysis and the identification of interpretative repertoires. In C. Antaki (Ed.), *Analysing everyday explanation: A casebook of methods* (pp. 168–183). London: Sage.
- Wetherell, M. (1998). Positioning and interpretative repertoire: Conversation analysis and post-structuralism in dialogue. *Discourse and Society*, 9(3), 387–412. Retrieved from https://doi.org/10.1177/0957926598009003005
- Wetherell, M., & Potter, J. (1992). Mapping the language of racism. Discourse and the legitimation of exploitation. New York: Harvester Wheatsheaf.
- Vähäsantanen, K., & Eteläpelto, A. (2017). Professional agency and learning in the work of software professionals. In C. Harteis (Ed.), *Machines change work: An educational view on the digitalization of work* (pp. 161–179). Dordrecht: Springer.

Appendix 1. Examples of the analysis and quotations of the interviews

Sections describing the context are **bolded.**Sections describing the subject position of individual are *italicised*.
Sections describing the subject position of others are <u>underlined</u>.
Sections describing the subject position of organisation are in grey.

Example 1. 'SDL as obliged practice'

Software developer (16): Well, this is the problem all the time that when those technologies run so hard, and then one should try to learn new things all the time [xxx], one should find some time to learn, know how to learn and what to learn, in a way. We are lagging behind where development goes.

Interviewer: How can you find that time for learning? How do you learn?

Software developer (16): *I don't do these* things outside my working life because I have the other hobbies also, but in working hours *I have to try to get* the moments to learn things, that *I usually try to get* some new technology into a new project to learn that way.

Software developer, project leader (23): The actual competence develops in practice through your own hobbies and learning at work, but when I try to find the rewards in this present situation (how and where to learn), my burden is my family situation. I can't use as much time for this adoption as I should, and it is out of the employer. [xxx]. Earlier, I have learned so that I have read and tried things [xxx], in the early 2000s, when I didn't have children, I was able to use a lot of time to work and learning for work. [xxx]. The technologies are very short term in effect, which is why it takes quite a bit of time to keep up with that development.

Example 2. 'SDL as a creativity and motivation enhanced practice'

Software developer (11): Creativity is a personal feature, and personal features cannot be developed, but you can develop your competence and skills, which supports, are a prerequisite for creativity. I think that guitar is a good example of this: you have to learn to play the instrument, that you can make a creative guitar solo, you don't have to know at some level how to play. It is the same in 'code creativity', you need to have a certain level competence [so] that you can start thinking about the creative solutions or model.

Interviewer: Where does that certain level competence then form?

Software developer (11): So **I practically got inspired** when *I wanted* to make web pages sometime in 2004, I studied myself and started working on scripts when <u>no one else did them there</u>, and I ended up here to do the code. *I'm self-studied, so practical it form by self-learning*.

Example 3. 'SDL as a flexible and faster-paced practice'

IT expert (7): We are problem solvers, if we think about the job of our team it is based on **customers' problem-solving** situations. [xxx]. Many of these daily cases are not solved just by covering the instructions and doing and starting to work but by learning and expanding your knowledge. Even though we have some instructions that these are the most common support questions what comes, and the answers is here, but every day there are the exceptions that there is something wrong and then you have to think about it. *You are going to ask help*

from your colleagues or team or try to find some information from the Internet – depending on the situation, you have to think about how to get the solution.

Software developer (13): We have a virtual chat channel for the team, that if somebody has a problem that one has to think about in a group, then

you will be involved in that discussion, but that's when the **problem comes**.

Interviewer: But if you have a problem or someone else has a problem, how do you actually act with these chat channels?

Software developer (13): Everybody puts the handphones on the ear, then we make a division of the screen and everyone looks at the problem and thinks. [xxx].

Interviewer: Will they usually succeed if you get the problem now, then within five minutes, you will get your colleagues to a virtual meeting?

Software developer (13): Yes, it usually works if such a situation comes. At least within the same day. [xxx], But if I have a problem, *then I first try to figure it out alone*, [xxx].

xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx

Interviewer: What is the meaning of learning in your work?

Software developer (17): [xxx]. I don't believe in those two-day trainings [xxx], some **sort of real need should be,** and then *you start exploring* how this works... so it is the way I learn best. [xxx]. Some **problem-solving situation** that now *I need to find quickly* what is the starting point, how to proceed and then go deeper and deeper. If any new technology comes up, it is a bit more challenging; then *you have to* find some advice on the Internet that you can learn how you could try to solve some problem.

Interviewer: How much of your work is learning?

Software developer (17): [xxx]. It depends of the need. If you need to do something new, then you study a lot of it and then get used to it. [xxx].

Example 4. 'SDL as a practice tied to work itself'

Interviewer: What is the role of competence developing or workplace learning in your work?

IT Expert (4): Well, with all the time, it (competence) develops in this work and the fact that when you are interested in it you are always looking for **new techniques** to do better.



II

SELF-DIRECTED LEARNING IN CREATIVE ACTIVITY. AN ETHNOGRAPHIC STUDY IN TECHNOLOGY-BASED WORK

by

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Published in Journal of Creative Behavior *Journal of creative behaviour*, early online DOI:10.1002/jocb.438

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Self-Directed Learning in Creative Activity: An Ethnographic Study in Technology-

Based Work

Abstract

Under conditions of rapid changes in working life, there is an urgent need to examine the

nature of creativity and learning in organisations. The aim of this study is to investigate the

nature of self-directed learning (SDL) practices in creative activity in technology-based work.

We focus on both individual and collective practices but also on the importance of

organizational culture. The data consist of 46 interviews and observational field notes

collected from participating organizations. Thematic and ethnographic analysis were utilized

as tools to reveal the nature of SDL in creative activity. We found three themes describing of

the nature of SDL in creative activity: a combination of individual and collective action,

solving common problems through dialogue and discussions, and the organizational culture

framing SDL in creative activity. Based on the findings, we provided support for that SDL in

creative activity is manifested as a sociocultural phenomenon and SDL practices are

intertwined with creative activity. We discovered organization cultural frames that can

support the realization of SDL and creative activity in working life. However, more research

on the relationship between these phenomena and the conditions for their realization is

needed.

Keywords: self-directed learning, creative activity, technology organization, ethnography

1

Introduction

Researching creativity in changing contemporary work is vitally important. The role of creativity and learning has been found to be crucial for long-term economic growth in the current global environment, which is characterized by rapid changes in technology and economics (Oddane, 2014). Creativity is one of the most important advantages for responding to the challenges produced by these changes (Florida & Goodnight, 2005). In technology-based organizations, work usually involves continuous problem solving (Collin, 2006; Havnes & Smeby, 2014; Nerland, 2008; Ha, 2015) and can thus be interpreted as constant creative activity (Collin et al., 2017). Research has shown that there is a link between creativity and learning (Beghetto, 2016; Gadja, Beghetto, & Karwowski, 2017). In particular, self-directed learning (SDL) practices, where individuals and groups take responsibility for learning (Knowles, 1975), has been found to have a positive relationship with creativity (Edmondson, Boyer, & Artis, 2012; Cox, 2002) because problem-based contexts support the progress of SDL (Hmelo & Lin, 2000).

Both creativity and SDL have been approached mainly as individual-driven phenomena, but they have recently also been examined from sociocultural perspectives (see Glaveanu, 2015, 2018; Candy, 1991; Brockett & Hiemstra, 1991). In the context of work, creativity has been described as solving problems through activities that often depend on teamwork and collaboration (Collin et al., 2017; Ness & Soreide, 2014) and, which are enabled by organizational cultures or practices (Martins & Terblanche, 2003). When individuals are increasingly expected to take responsibility for their own learning at work (Ellinger, 2004), the practice of SDL seems to be one of the prerequisite for creative activity (Lemmetty & Collin, 2019). However, more research is needed on the relationship between creativity and learning (Anderson, Potocnik, & Zhou, 2014) and the nature of creativity and SDL (Cox, 2002) at work. In this study, we consider the nature of the phenomenon of *SDL*

practices in creative activity in the context of technology work. Participating organizations were drawn from the information technology, electrical engineering, and automation industries in Finland.

Researching creativity and SDL has been found to be challenging. Said-Metwaly, Kyndt, and den Noortgate (2017) observed that creativity has mainly been studied with the help of quantitative instruments, which have many shortcomings; for example, some of the instruments concentrate on individual-level creativity, leaving the environment, the occupational field, and the context disregarded (see also Amabile, 2017). Thus, more microlevel, ethnographic research on creative processes and behavior is needed (Ness & Soreide, 2014). In this study, we aim to fill the conceptual and methodological gaps by concentrating on the nature of SDL practices in creative activity, also taking into account the cultural aspects in a technology organization. We do this by utilizing an ethnographic research approach.

The Phenomenon of "Self-Directed Learning Practices in Creative Activity" in the Technology Field

From creativity to creative activity at work

In the context of work, the concept of creativity is complex and difficult to define (Amabile, 2017; Glaveanu, 2015, 2018; Littleton, Taylor, & Eteläpelto, 2012). However, there is agreement that creativity is combined with novelty or a new way to approach a problem (Sawyer, 2004). In addition, creativity is associated with the idea of usefulness (Gruys, Munshi, & Dewett, 2011). Creativity can also occur as a creative process (e.g., Amabile, 1996) or as any process in which participants act creatively (Drazin, Glynn, & Kazanjian 1999). In working life, creativity is connected to dealing with work tasks and

flexibility (Littleton et al., 2012), which are important for knowledge-intensive (e.g., technology-based) work (Ulrich & Mengiste, 2014).

Creativity has mainly been defined from an *individual* perspective (Amabile, 2017) and viewed as the generation of individuals' thoughts and ideas (Sawyer, 2004; Lubart, 2001; Mumford, Medeiros, & Partlow, 2012). For example, Amabile (1996) showed that the creative (idea generation) process progresses from identifying the problem to finding information, creating an idea, and finally evaluating it. Especially in the context of work, this kind of individual creativity is often linked to innovation processes (Bammens, 2016; Yuan & Woodman, 2010), where creativity manifests as thoughts and ideas that are important only at the beginning of the process (Bammens, 2016). Another prevailing approach to creativity is based on a *sociocognitive* framework, according to which creativity begins in the individual mind, and the social aspect of creativity is its manifestation (Oddane, 2014).

Seeing creativity only as an individual or sociocognitive process, it appears unchanged and undeveloped (Glăveanu, 2011). Therefore, creativity should be approached in accordance with *sociocultural* perspective, whereby it is a social process generated by the interactions between people. From this perspective creativity seem to be a developing and collective phenomenon (Glăveanu, 2011; Csikzentmihályi, 1996), which is also influenced by the organization operational and organizational culture. For example, employees' possibilities to have an influence on their work (Collin et al., 2017), and the affordances offered them (Glaveanu, 2015), are related to creativity. In investigating creativity as a sociocultural phenomenon in organizations, researchers have been increasingly interested in various manifestations of creative activity and processes (Forsman, 2018; Craft, 2008) in which the importance of interaction and other practices are obvious (Martins & Terblanche, 2003; Ness & Soreide, 2014). Nemiro (2002) discovered that the creative process of virtual teams is a comprehensive team action, which progresses through idea creation, development, and

finalization as well as closure stages of the evaluation phase. In the technology field, creativity is perceived as creating something new, developing work methods, and solving problems—individually or collectively (Collin et al., 2017). Problem-solving situations at work progress through different acts (Newell & Simon, 1972) in which creativity itself manifests as a practice-based process (Collin et al., 2017). Thus, the process of creative action is not only an individual mental idea formation, but, according to Glaveanu (2015, p. 167), it "necessarily engages self-other, symbolic-material, and past-present-future relations that turn it into a social, embodied, and temporal act." Although creativity is increasingly seen as a sociocultural process and activity, there is still a need to examine the practices included in the creative activity process as well as the organization's cultural aspects, within which creative activity manifest. As cultural aspects of organisations, Schein (1990) has been described the climate, the leadership practices, the physical environment and tools. Additionally, the importance of learning (Gajda et al., 2017; Beghetto, 2016) as well as the practices of SDL (Loyens, Magda, & Rikers, 2008) in creative activity has been highlighted, which is why we assume creative activity to be a phenomenon that includes SDL practices.

Self-directed learning: Process and practices

The tradition of SDL research is derived from the field of adult education. From the beginning, self-directedness has been described as a feature of adults that are intended to be self-directed (Lindeman, 1926) and, for example, are more motivated by internal rather than external factors (Knowles, 1975). In addition to SDL being described as an individual's ability or attribute (e.g., Guglielmino, 2008), there are also several process descriptions in which SDL is manifested as the responsibility of the individual or group at different stages of the learning process. These studies of the SDL process have examined how an individual or group actually works in a self-directed manner in learning and what kind of SDL practices

this process involves (Tough, 1971; Knowles, 1975; Merriam & Caffarella, 1999). The first process descriptions were very linear and ignored the effect of the context (e.g., Knowles, 1975), while later-developed models also took into account the environment, the nature of the SDL, the strategies used, and the external elements of the process (Merriam, 2001). SDL is described as a process aimed at achieving set goals through different stages (Zimmerman, 2008), including planning, monitoring, managing, and reflecting on learning (Pintrich, 2004). According to Brockett and Hiemstra (1991), the stages of SDL involve the following different practices: a) learners evaluate and set their learning needs, (b) they seek out the right learning resources and lead the planned learning activities, and (c) they evaluate the results of their learning.

The concept of SDL has been criticized for giving an impression of learning as an individual and unsupported phenomenon, though in reality SDL can also be collective in nature (Candy, 1991; Loyens et al., 2008). Self-directedness in learning situations may refer to the responsibility of a team or other group, rather than an individual (Moe, Dingsoyr, & Dypa, 2008). The concept of SDL is also associated with a sociocultural approach. According to this approach, the formation of learning is the result of interaction with others and the environment (Vygotsky, 1978). Despite the learner's responsibility for his/her own learning being emphasized in SDL, it does not exclude the importance of context and culture for learning (Candy, 1991; Brockett & Hiemstra, 1991). On the contrary—how a self-directed learner can contribute to the process depends on the possibilities that the environment offers for this purpose (Candy, 1991). The cultures or practices that are linked to SDL in a work context include, for example, an inclusive leadership style, an experimental and error-tolerant atmosphere, employee autonomy and leaders' trust to their employees (Foucher, 1995), and opportunities for collaboration (Baskett, 1993). In addition, supportive but challenging organizational frameworks, open communication, sufficient time for learning (Kops, 1997),

orientation, support and guidance (Candy, 1991) enable SDL. In the current study, we approach SDL as learning practices that an individual or a group are responsible for as well as the practices that are influenced by external (organizational) frames.

Why it is important to study SDL practices in creative activity in the technology field?

In the technology field, digitalization provides new technology for the use of employees, but technology requires rapid learning (Harteis, 2017). Consequently, SDL practices seem to match these demands (Edwards, 2010; Ha, 2015). There are also changes in the ways that organizations operate and construct their cultures (Lee & Edmondson, 2017; Holbeche, 2015). In organizations, power has been increasingly transferred from the organizations to individual teams and employees (Rigby & Ryan, 2018) because selfdirectedness has been seen important in promoting both learning and creativity at work (Gijbels, Raemdonk, Vervecken, & van Herck, 2012). Self-directedness seemed to have become a goal and aspiration in organizations, especially in technology organizations, and is being implemented particularly by lessening hierarchies and creating autonomous teams. A self-directed team structure gives individuals and groups the power to make decisions about small problems (Moe et al., 2008), and this is considered to be an important principle in promoting creativity. At the same time, external control is seen to have a negative impact on creativity (Banks, 2010). These kinds of "self-directed" (Lee & Edmondson, 2017) or "agile" organizations differ from traditional ones, for example, in terms of their low organizational hierarchy and readiness for change: the changes are responded to flexibly and quickly (Nerur & Balijepally, 2007). There seems to be an ongoing trend in Finland where the idealization of an organizational culture based on self-direction and employee autonomy has increased. Many Finnish technology and knowledge-intensive organizations have lowered their hierarchy levels with the aim of increasing innovation and creativity and fast and agile

operations. However, the problem with such structural changes in organizations is that the true significance of the hierarchy level for creativity has not been studied, or the results of increased creativity and learning, especially in "agile" organizations, are not based on empirical research (Lee & Edmondson, 2017).

Summary of the starting points of the study

Based on earlier research, creativity and learning contain similar elements, they are often connected, and they support each other (Beghetto, 2016). Creativity has been often viewed as problem solving (Amabile, 1996; Collin et al., 2017), emerging in technology organizations in which the work itself is mostly problem-based (Collin, 2006; Havnes & Smeby, 2014; Nerland, 2008). In such creative work, the practices of SDL have been seen essential (Loyens et al., 2008; Hmelo & Lin, 2000), especially in low-hierarchy organizations, in which responsibility of work is shifting for the employees.

In this study, creative activity is defined as a practical problem-solving process (cf. Collin et al., 2017) proceeding from an examination of the problem to the actual resolution and evaluation stages (cf. Amabile, 1996; Nemiro, 2002). Creative activity seem to contain SDL practices (Loyens et al., 2008) in which learners evaluate and set their learning needs, seek appropriate learning resources, lead planned learning activities, and evaluate learning outcomes (Brockett & Hiemstra, 1991). Since creativity and SDL have been seen as interrelated (Edmondson et al., 2012; Cox, 2002), SDL practices in creative activity can be describe as an intertwined phenomenon. As we have presented above, both creativity and SDL can be seen as an individual or group activity that is influenced by organizational culture. By taking into account these cultural and collective frames (Glaveanu, 2015, 2017, 2018), the focus is on different manifestations of creativity and SDL (Lombardo & Kvålshaugen, 2014). According to the sociocultural point of view, SDL and creativity are phenomena that can be observed by an outsider. Thus, the ethnographic research seems to

offer a legitimate way to explore both, creativity (Glaveanu, 2015) and SDL (Baskett, 2013). In this study, we utilize the ethnographic research as a tool whereby we can focus on activities of individuals and groups (Heyl, 2001) as well as the meaning of the context, such as culture, other persons, and material factors (Glaveanu, 2015).

Research Formulation

Research aim and research questions

The aim of the study is to reveal the nature of the phenomenon of "SDL practices in creative activity." Our research question is *How does the phenomenon of "SDL practices in creative activity" manifest in technology-based work from a sociocultural perspective?*

Methodology

The methodological approach for this study is ethnographic. The aim of ethnographic research is to describe and understand situations and phenomena from the point of view of the participants (Pole & Morrison, 2003; Cohen, Manion, & Morrison, 2007). The research aims to construct an interpretation in which the researchers combine theoretical knowledge, their own perspectives, and those of the researched (Hammersley & Atkinson, 2007). Ethnographic research is often based on fieldwork. Observing the subjects of the research and interviewing the participants are means by which a comprehensive description of the phenomenon or culture is developed (Heyl, 2001). Thus, the starting point of an ethnographic study can be seen as a desire to thoroughly investigate the nature of a (social) phenomenon.

Data

The empirical data for the current ethnographic research were collected through interviews and field work (cf. Heyl, 2001; Hammershey & Atkinson, 2007). Field notes were collected during observation periods in the participating organizations where people's behavior was observed in their own context (cf. Coffey, 1999; Hammershey & Atkinson,

2007). The data collection was conducted stepwise in various organizations in 2017 and 2018. In each of the organizations, data collection began by gaining familiarity with the organizations. Next, we made observations, focusing on the daily work of the technology personnel and the work situations that they encountered. In particular, the problem-solving situations, the interactive moments, and other situation-related activities were examined. Field notes were written in the field diary at the time the observations were made but also afterwards based on the recollection of the researchers (cf. Coffey, 1999). The aim of ethnographic writing is to illuminate an interesting situation or event, but writing also always involves the researcher's interpretation of the situation (Spradley, 1980). The field notes therefore include the researchers' own interpretations, although attempts to avoid overinterpretation were consciously made (Hammersley & Atkinson, 2007). Interviews were conducted within the observation periods, and participants were either randomly selected or selected based on the observation periods. The interview questions were, for example, "How would you describe creativity or creative activity in your work?," "How do you learn at work?," and "How is learning or creativity supported in your organization?" The details of the data collection are presented in Table 1.

The participating organizations (see Table 1) included one large ("Group") and two small ("Device" and "Resolution") organizations. These organizations were chosen for the study because they are Finnish technology organizations where the project-based work is, in one way or another, problem solving, creating something new in its context, developing work methods, and continuing to learn (Collin et al., 2017; Martins & Terblanche, 2003).

Organizations were also chosen because of their "self-directed" working culture and structures (e.g., autonomous teams). Ethnographic research is often focused on researching one small group (Pole & Morrison, 2003). In this study, the research focused specifically on

the study of the everyday work of the employees and thus, for example, formal training sessions, supervisor discussions, and formal meetings were excluded.

Table 1. Participating organizations and data collection

Organization	Group		Device Oy (D)	Resolution Oy
	Solution (GS)	Technology (GT)		(R)
Number of employees	160	120	25	30
Business area	Information technology	Electrical engineering, automation technology	Information technology	Infromation technology, technological consulting
Job titles	Software developer, customer service employee, ICT expert	Atomation developer, electrical developer, design engineer	Installer, customer service employee, seller, technical expert	Software developer, consultant
Number of interviews	17	10	6	13
Number of observing hours	63h	42h	14h	28h
Number of field notes	26 pages (9405 words)	14 pages (5600 words)	5 pages (2864 words)	4 pages (1680 words)
Data collection epoch	Spring 2017	Autumn 2017	Spring and autumn 2018	Spring 2017

Analysis

The analysis consisted of two phases (see Table 2), a preliminary analysis in the first phase and the main analysis in the second phase. The purpose of the first (preliminary) phase was to support our theory-based assumptions (e.g., how SDL practices are included in the creative activity process) and to provide a description of the phenomenon based on previous theory and interview data and also to provide a starting point for the second phase of the analysis. The interview data were analyzed by theory-based thematic analysis (Braun & Clarke, 2006). The process of the creative activity was identified using the previously created

theoretical definition of the creative (activity) process (see Collin et al., 2017; Amabile, 1996, Nemiro, 2002). Thereafter, from the interviewees' descriptions of the creative activity process, we identified and categorized the practices of SDL (see Brocket & Hiemsta, 1991) according to themes. This preliminary analysis produced a description of the phenomenon of SDL practices in creative activity together with previous research (see Section 4, Findings). This description offered a starting point for the second (main) analytical phase.

In the second (main) analytical phase, our purpose was to identify the sociocultural nature of the phenomenon of SDL practices in creative activity from field note data. We used ethnographic analysis, which is typical when the aim is to reveal the dialogue between theory, context, and interpretation (see e.g., Collin, 2006; Hammersley & Atkinson, 2007; Davies, 1999; Silverman, 2001). According to Hammersley and Atkinson (2007), an ethnographer does not have to commit to a single theoretical framework but can increase the richness of the perspectives through theory triangulation.

Ethnographic analysis typically begins as early as during the data collection period, that is, observations. The analysis is often described as a "funnel-shaped process"; in the first stage (emphazised in the observing stage), the researcher looks for interesting situations and incidents (Davies, 1999), which can also be called key events (Fetterman, 2008). The ethnographic analysis proceeds from the unclear foci to more detailed interpretations (Davies, 1999; Hammersley & Atkinson, 2007; Collin, 2006). In the actual analysis, we read all the field notes to develop an overall picture of the data. After that we identified episodes (situations where SDL practices in creative activity manifest) from the field data, utilizing the descriptions (findings) from the first analytical phase, and also our own understanding of the significant situations that manifested during the observation phase. By means of ethnographic analysis, we searched for and identified cultural, material, or social environments, roles or practices (see e.g., Bogdan & Biklen, 1992; Collin, 2006), actions of different actors, and

features that were included in the manifestations of SDL practices in creative activity. We confirmed our interpretation of the field notes with the help of the interview data. For example, in the case of uncertain interpretations from the field notes, we returned to the interview data to confirm the description given by an employee in a similar situation. The aim of the ethnographic analysis was to determine the sociocultural nature of SDL in creative activity, as manifested in the observed technology work. Our purpose was therefore to describe the specificity of the case and the phenomenon and not to seek to generalize the phenomenon (Pole & Morrison, 2003; Hammersley & Atkinson, 2007).

Table 2. The analysis of the study

Phenomenon	Self-directed learning practices in creative activity		
Phase	First phase ie. preliminary	Second phase ie. main	
	analysis	analysis	
Analysis method	Thematic analysis	Ethnographic analysis	
Basis	Theory-based	Data-based	
Data	Interviews	Observations, field notes	
		and interviews	
Aim	Provide a description of the phenomenon based on previous theory and the interview data of the target organizations, which serves as a starting point for the second analysis phase	Get a description and understanding of the nature of self-directed learning practices in creative activity	
Outcome	Answer to the research question: "How does the phenomenon of 'SDL practices in creative activity' manifest in technology-based?		

Findings

In the technology field, work is characterized as the continuous problem-solving process through which projects progress. We found that problem-solving situations were defined as creative activity (processes). We deepened our understanding of the progression of three-phase process of creative activity based on previous theory and the preliminary (first phase) analysis of this study: 1) *structuring the problem (design phase)*, 2) *solving the problem (implementation phase)*, and 3) *evaluating the solution (evaluation phase)* (adopted

from Collin et al., 2017; Amabile, 1996; Nemiro, 2002). In the preliminary analysis, we also examined the different phases of creative activity to determine how SDL practices are intertwined with creative activity. Figure 1 illustrates the formulated description of the phenomenon of SDL practices in creative activity.

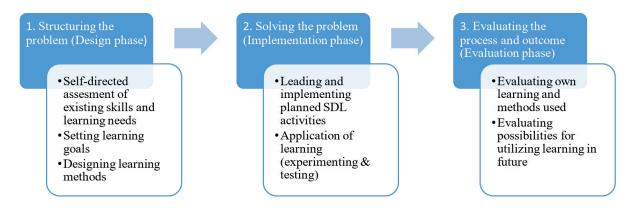


Figure 1. Description of self-directed learning practices in the creative activity process (Figure adopted from Amabile, 1996, Nemiro, 2002, and Brockett & Hiemstra, 1991)

SDL practices were identified in every phase of the creative activity process. At the design phase, the practices of SDL included a self-directed assessment of existing skills and learning needs, setting learning goals, and designing learning methods. The practices of SDL relating to solving the problem (i.e., the implementation phase) were leading and implementing planned activities and the application of the learning (experimenting and testing). In the third phase of the creative activity, SDL was identified as practices in which an individual or a group evaluated their own learning, the methods used, and the possibilities for utilizing the learning in the future (cf. Brockett & Hiemstra, 1991).

Based on this understanding, it was possible to proceed to the second (main) phase of the analysis. The main analysis phase explored how the phenomenon of SDL practices in creative activity manifests in technology-based work. We categorized the findings of the main analysis according to the following three main themes that present the sociocultural nature of the SDL practices in creative activity:

- A combination of individual and collective action
- Solving common problems through dialogue and discussions
- An organizational culture framing of self-directed learning in creative activity

 Next, we present each of the main themes, together with the related sub-themes, that were

 defined by our observers according to the different practices and their nature.

A combination of individual and collective action

Silent and focused moments

Many instances of creative activity were found in the field notes. We found several descriptions of *silent moments* in episodes of creative activity. Silent moments occur between conversation and other activities and refer to the employee's independent activity, which outwardly appears to be a focus on work and computer work in particular. Our interpretation, based on the field data, is that in a silent moment independent (autonomous) problem solving is carried out, but this is very challenging to interpret by means of ethnographic observation because it does not necessarily show many external signs. Therefore, in our research, we also used interview data to support our interpretations. The following quotation from the interview data confirms our interpretation based on our observations of silent moments that obviously relate to individual SDL in problem-solving situations:

At work, you have to develop some new code or solve a problem you haven't faced before, so you have to figure out alone how to do it. It is learning at work, all the time. (Interviewer: "How does this work in practice?"). In practice, using Google—asking how to do it and how to solve the problem. Usually there are X number of options, one of which is good, or many can be good, and you have to

think for yourself which of them you will experiment with. That it is the most common way to do it. (Software developer, R)

With the help of the interview and observational data, we discovered that at least some of the processes included in these silent moments involve independent and individual self-directed action. These moments may occur when an individual discovers the problem, makes independent decisions about the means of solving it, retrieves information from the Internet or blogs, and applies that learning to the current problem. All this happens in silent and focused moments at work. Thus, it seems that individual SDL in problem-solving situations is typical for technology work. The interviews seem to suggest that in the first instance employees are trying to solve problems, which are their responsibility, alone. Only as a secondary option do workers ask for help from colleagues: "If there is a big problem, then I won't bother my colleague immediately; I'll try to find out for myself" (Design engineer, GT).

Alternating between silence and talk

The field notes provided a great deal of information about the collective nature of creative activity and SDL. The material described frequent "continuous talking" or "conversational situations." These situations and descriptions were also identified in the instances of creative activity we found. A typical situation in problem solving wherein that problem is the responsibility of an individual employee who cannot find a way to solve it independently is that he or she seeks help from others. In these situations, SDL appears to be both an individual and a collective action during which the individual's work and conversations with colleagues alternate. The following quotation from the field note data describes this phase of creative activity:

Men are asking for Matt, whether he clarified some issue or not. I think that the issue has not been resolved before. Matt and others look at the screen of Matt's

computer. Matt asks some questions of others: how they acted in the same kind of situation. Matt is reflecting on the whole issue and making suggestions.

Sometimes I feel that Matt speaks more to himself than others, even if others are answering him. One of the men returns to his own workstation. Matt and the man who is still in the situation are talking about the case. The man asks something in particular, and another man, who is sitting near them, says something, giving his own view. Now all of them are pondering whether the mobile payment has been made or not. This seems to be related to the whole issue. (Field note entry [10.3.2017], GS)

The previous example shows that a worker has encountered a problem situation that he is not able to solve independently. In the situation, SDL occurs when Matt himself finds that he needs more information, and he turns to a colleague who he believes is knowledgeable about the case at hand. In this way, collective action begins. Matt has been working on the issue independently, but his colleagues' skills and experience are also needed in order to reach a solution. Discussion with colleagues increases Matt's understanding of the subject and thereby promotes the creative process. SDL seems to be individual-oriented in this situation, but its nature varies between individual and collective action. This interpretation of the field note entry was confirmed by reviewing the interviewees' own descriptions of similar situations. The interview data strengthen the interpretation that creative activity (e.g., problem solving) includes SDL, in addition to learning taking place as either individual or collective practices, depending on the situation: "If you don't know anything about the problem, then you have to know who knows, and someone who knows tells you that this and this will make it work" (Electrical designer, GT). Sometimes situations and cases in the technology field are completely new, in which case "you have to ask Mr. Google and try to find some information from there" (Electric designer, GT).

The problem solver as a learner and colleagues as counselors

In the case of SDL, the field data show that when the problem is the responsibility of an individual employee, he or she is often in the role of a learner and needs guidance, advice, help, and support from others. In this case, the more knowledgeable colleagues in the work environment will act as counselors, whose guidance and instruction help the problem solver. The following excerpt from the field data illustrates the learner—counselor situation:

An older man advises a younger person on the case, tells him where to find the relevant appendix, and describes what the process is all about. The younger man asks for more detailed information on the case, and the older employee explains what is usually done in this kind of process, what steps are likely to come next, and what the customer requires. It seems that this more experienced employee has a really sound knowledge of at least this thing, a good overall view of the process, and can also share his knowledge with other people. (Field note entry [13.5.2017], GT)

A typical situation illustrating the learner–counselor roles occurred when a novice needed supervision. Even though young people also worked independently, and "silent moments" were also found in their work, it seemed to be easy for them to ask for help from others. There were also particular individuals in organizations who often provided assistance, perhaps because of their experience or role (e.g., the project manager).

Solving common problems through dialogue and discussions

The exchange of questions and answers between peers

Many episodes of creative activity found in the field notes revealed that problem solving and SDL are a collective activity from the beginning. In this case, the problem affected more than one employee, and the above-mentioned learner–counselor roles were not

detected. Instead, employees seemed to be peers and equal actors. The following field note describes the implementation phase of a creative activity process in which SDL is fully shared:

Two people working together with the computer are solving some problem. Both make suggestions: "Should we do it like that?"; "How about this?" The design continues jointly, and both are involved in acting and reflecting. The work seems to progress well. However, the coding does not work as it should, and the men are laughing, still pondering what is wrong in this case. (Field note entry [10.3.2017], GS)

Concrete common problem solving was realized through dialogue or discussion. In situations, as well as learning needs, goals, and plans (design phase), the actual problem solving and learning (implementation phase) appeared as shared reflection and an exchange of ideas.

Shared experiences as a prerequisite for joint decision making

Problem-solving situations could also relate to the workplace or internal team processes, such as the development of communication. In such cases, the problem or the need for development touches the entire work community, or at least the team. The following field note describes a situation in which employees in the small organization collaboratively discuss the problems of internal communication in the workplace:

An employee is sitting at a computer. He has the software open, and three others stand behind him. The employees wonder what would be a sensible channel for communicating with the work community, organizing work, and getting things done. The current system is problematic and inefficient, so another solution must be developed. Sometimes some other employees leave, but then they come back. A person struggling with the software throws out more questions and thoughts. The conversation restarts. Eventually, the situation ends with the workers opting

to take the software for testing for a while, alongside the old one. I interpret that if the software affects the power after the test, they will decide to continue working with it. (Field note entry [13.9.2018], D)

The situation reflects the practice of SDL because the employees are discussing ways to develop internal communication and systems without external guidance offered by the organization. The need for learning emerges from the problem. The group members learn something new from each other when sharing their own experiences of different software's good and bad aspects, trying to form a new, shared understanding about the best possible software for their team and organization. This understanding is used as the basis of the joint decision making.

Organizational culture framing of SDL in creative activity

Autonomy and freedom in everyday work

D)

SDL in creative activity would not be possible without autonomy among the employees and teams involved in decision making relating to everyday work. In this context, the culture of autonomy and freedom enables an individual employee or a team to make decisions without the permission of the supervisor. The importance of autonomy appears in the following field note entry:

The development process related to the entire internal communication seemed to be progressed by the workers and ended their decision making, which was formed through discussion and the sharing of information. The CEO and the other owner did not seem to have anything to do with this process; they were not involved in any way in the spontaneous conversation situation. The situation is an excellent example of how self-directedness appears in the team's common practice when a problem situation or need for development arises. (Field note entry [13.9.2018],

In the episodes of creative action, we did not find any descriptions of command, intimidation, or any other use of power by which another person might have ordered the employee to do something against his or her will. Thus, freedom also means that the employees themselves decide when they need guidance and, if necessary, obtain it from their colleagues through common discussion and reflection. The interview data confirmed our interpretation of autonomy and freedom as a cultural factor enabling creative activity: "As I said, our work is like filling out crosswords: it doesn't progress if someone is yelling in your ear all the time and telling you what you need to do" (Software developer, R). In general, a commanding or controlling immediate leader or management culture was not seen as an incentive for creative activity. Freedom and autonomy seem to be a prerequisite for work, but assistance and guidance should also be available when needed.

A culture of guidance and shared information

The realization of collective SDL, and the progress of creative activity thereby, is slow and challenging if you do not know who to ask for help or who might have had similar problems. There were several descriptions of situations in the field notes in which the problem was not solved, for example, due to insufficient documentation or because it was not known who could help. The following field note entry reflects both the importance of shared information from the different areas of expertise in the organization's staff to the progress of creative activity and how this has been promoted by the organization:

Coffee break. I'm talking with the employees about the teams and projects. They say that some kind of sharing of experience happens, but the organization makes a general effort to increase awareness of who is doing what here. For example, a couple of times a month there is a "coffee thoughts" event, which showcases completed projects and problem situations in projects. According to Tom, this is a

good practice because it increases the knowledge among employees about who to ask for help with any kind of problem. (Field note entry [4.4.2017], GS)

We strengthened our understanding of this interpretation via interviews concerning the importance of shared information in the various areas of expertise in the organization to the progress of creative activity: "Sometimes, I have requested help from five people before I found the one who knew something" (Automation designer, GT). Knowledge of others' areas of expertise, demonstrations of other projects, and the joint evaluation of problems contribute to the development of future creative situations. It is the responsibility of the organization to promote and share information on the different areas of expertise throughout the organization.

Claims of flexibility and easygoingness

In addition to freedom and autonomy, and a culture of guidance, creativity is dependent upon a culture of flexibility and leisure-like activities. Flexibility and agility were strongly reflected in the field notes; for example, problems were solved immediately, and there was time for discussion in the middle of the process. In these cases, the work also progressed quickly. The following short quotations from the field notes serve as a description of how colleagues are ready to help each other with the problem at hand and have real potential to help:

At the same time, a project manager enters the room and asks Henry whether he will come to see something. Henry immediately leaves with the project manager. (Field note entry [4.4.2017], GS)

Alex comes to the door to ask when it is possible to discuss the project people, who will start doing something new. Thomas says: "Right away," and they start discussing it. (Field note entry [11.5.2017], GS)

Based on the field notes, it is clear that problem-solving situations come and go, and they involve a great deal of collective action that takes place immediately. This also tells us about the culture of the organization—the schedules must be flexible enough to enable employees to help their colleagues in problem-solving situations. However, lively and fast-paced problem-solving activity in organizations does not always emerge smoothly because time for learning may be limited: "You don't always have enough time to devote yourself to it because we sell a project at a certain price, and we have a certain amount of time to complete that project" (Design engineer, GT). The interview material and the above quoted extract confirms our interpretation that there should be more time for learning, and, if it is not available, learning, and thus the realization of creative activity, becomes challenging. A culture of urgency thus supports the possibility of SDL in the process of creative activity.

Discussion

In this study, we found evidence that SDL practices are linked to the creative activity process and its phases. Our empirical analysis provided support for the theory-based assumption that creative activity is a problem-solving process that begins with design, proceeds with the actual implementation, and ends with an evaluation of the process and the result (cf. Amabile, 1996; Nemiro, 2002). In this process, SDL practices emerge at the beginning of the process as an assessment of existing skills and setting the learning goals, in the implementation phase as the actual learning activities led by the actors, and at the end of the process as an assessment of the learning (cf. Brocket & Hiemstra, 1991). Thus, SDL seem to be an important part of creative activity. This finding is in line with the indication of a link between creativity and SDL also shown in previous research (Lemmetty & Collin, 2019; Edmondson et al., 2012; Cox, 2002). In the second (main) phase of the analysis, we found the following three themes that describe the nature of the SDL in creative activity: a combination

of individual and collective action, solving common problems through dialogue and discussions, and the organizational culture framing of SDL in creative activity. Based on the findings, we suggest that SDL in creative activity is manifested as a sociocultural phenomenon in technology-based work context (cf. Glaveanu, 2015, 2011; Craft, 2008).

SDL in creative activity appeared either as an independent or a collective activity or as a combination of these practices, depending on the situation. We found situations in which SDL appeared to be a very independent and autonomous activity. Even in these "silent moments," employees used external sources (such as the Internet) (cf. Glaveanu, 2011) or other means to learn. Thus, ideas or thoughts for designing or implementing solutions to problems do not appear to be completely individualized even though it is the responsibility of individuals to control their own actions and make decisions. Although the problem itself might be the responsibility of an individual, the observational data showed that assistance in solving problems is sought from others, and the action becomes collective (see also Paloniemi & Collin, 2012). However, we also found several situations in which the problem itself was originally shared. In these cases, the entire creative activity and SDL manifested itself collectively through interaction. These observations underline our interpretation of creativity as a collective phenomenon (cf. Csikzentmihályi, 1996).

SDL in creative activity is not limited to collaboration but is also dependent on the culture of the organization. Therefore, it can even be questioned whether it is possible to reach complete "self-directedness" in the work context. In other words, individual or team may not be fully responsible for learning because the organizational culture, customer requirements, and project resources often frame situations. SDL in creative activity seem to require freedom and autonomy. Sufficient autonomy for creativity in this study seemed to relate to the ability of employees to make small decisions in relation to their own work. In previous studies, certain autonomy has been suggested as a one of the prerequisite for self-

direction and creativity (Banks, 2010; Amabile, 1996). On the other hand, the need for autonomy in creativity has been challenged by the idea that constraints may actually act as triggers of creative activity (e.g., Rosso, 2014; Stokes, 2014). On the basis of our research, autonomy seem to be a prerequisite, but it is not necessary to extend beyond daily decisions. More research is needed to examine the level of autonomy that would be sufficient for creative activity in different situations. In the current study, autonomy did not exclude the need for guidance and assistance at work. This provides an interesting perspective on creativity: can creativity at work be guided and what is the role of guidance in creative activity?

According to current study, SDL in technology work emerges from a work situation or a problem that inevitably also directs the learning needs of an individual or a team. In these situations, SDL may not, for example, be the personal development goal of the actor, but learning seems to be related to problems that are based on the organization's business or customers' goals—not the individual's or team's own. For this reason, it can be questioned whether self-directedness in work can be realized as the ideal that has been described: learning, with its needs and objectives, that is fully based on an actor's goals and produced by internal motivation (cf. Knowles, 1975). SDL in creative activity seems to involve the setting of learning goals, leading the learning and evaluation of the learning by the individual or group but most often in relation to the work situation from which it emerges.

The ethnographic approach was well-suited to the current study focusing on the emergence of SDL practices in creative activity and the nature of the phenomenon (Pole & Morrison, 2003; Heyl, 2001). In particular, the collective and sociocultural nature of the phenomenon could be reliably detected from the field notes. The trustworthiness of the interpretations was increased by reviewing descriptions of the phenomena as described in interviews with staff in the participating organizations (Heyl, 2001). The research and its

methods made it possible to study everyday activities and revealed significant information about the nature of the phenomenon. The trustworthiness of ethnography is based on the continuation of observation for as long as the researcher sees the events repeated until they no longer provide new information about the subject (Cohen et al., 2007).

Limitations

In this study, we examined manifestations of SDL in creative activity, focusing on the observation of the subjects and the socio-cultural nature of the phenomenon. Ethnography examines the external manifestations of phenomena, so it was not possible to evaluate the individuals' mental processes, personalities, backgrounds, skills or characteristics. Hence, it is possible that the selected methodology partly affects the sociocultural emphasis of the findings and the importance of individual factors for creativity cannot be indicated in this study. The purpose of ethnography is to study the manifestation of the phenomena often in a specific target group and context (Heyl, 2001). Thus, the purpose of the study was not to produce a generalizable description of the phenomenon, and the transferability of the findings is limited to technology contexts such as the target organizations and everyday creative problem-solving situations. Therefore, it is not possible to argue that the findings would be transferable to any situation or context. This is also precisely because of the context-specific nature of the phenomenon at hand. It is also important to note that ethnographic research is a continuous interpretation that is influenced by both the researcher's own understanding and the observations made on the subject. The role of the researcher in ethnographic research must be carefully considered (Coffey, 1999). Therefore, from an ethical perspective, we tried to report every phase of the research accurately (Cohen et al., 2007). Nevertheless, it is possible that the repeatability of the research in a way that would produce exactly the same

findings may not be possible due to the significant role of the researcher in ethnographic research.

Because of the importance of creativity and learning in contemporary workplaces (e.g., Oddane, 2014), more information on creativity and SDL is still needed. In particular, it is important to elaborate on organizational structures and functions in order to develop practices that enable creativity and SDL at work. It is suggested that, in the context of creative activity, self-directedness in learning requires ready access to guidance and assistance in organizations. For instance, more experienced employees and project managers may play a greater role as guides and supervisors. Thus, leadership skills and the expertise of project managers and their understanding of the guidance of team members should be increased in work practices through such interventions as training or coaching.

References

- Amabile, T. M. (1996). Creativity in context. Boulder, CO: Westview.
- Amabile, T. M. (2017). In pursuit of everyday creativity. *The Journal of Creative Behavior*, 51(4), 335–337.
- Anderson, N., Potocnik, K., & Zhou, J. (2014). Innovation and creativity in organizations: A state-of-the-science review, prospective commentary, and guiding framework.

 Journal of Management, 40(5), 1297–1333.
- Bammens, Y. P. M. (2016). Employees' innovative behavior in social context: A closer examination of the role of organizational care. *The Journal of Product Innovation Management*, 33(3), 244–259.
- Banks, M. (2010). Autonomy guaranteed? Cultural work and the "art-commerce relation." Journal for Cultural Research, 14, 251–269.
- Baskett, H. K. M. (1993). Workplace factors which enhance self-directed learning. 7th

 International Symposium on Self-Directed Learning, West Palm Beach, FL (ED 359 354).
- Beghetto, R.A. (2016). Creative learning: A fresh look. *Journal of Cognitive Education and Psychology*, 25, 6–23.
- Bodgan, R. C., & Biklen, S. K. (1992). *Qualitative methods of education to theory and methods*. Boston: Allyn and Bacon
- Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research* in *Psychology*, 3(2), 77–101. Retrieved from https://doi.org/10.1191/1478088706qp063oa
- Brockett, R. G., & Hiemstra, R. (1991). Self-direction in adult learning: Perspectives on theory, research, and practice. London/New York: Routledge
- Candy, P. S. (1991). Self-direction for lifelong learning. San Francisco: Jossey-Bass.

- Coffey, A. (1999). The ethnographic self: Fieldwork and the representation of identity. Sage Publications Ltd.
- Cohen, L., Manion, L., & Morrison, K. (2007). Research methods in education. (6th ed.).

 London: Routledge
- Collin, K. (2006). Connecting work and learning—Design engineers' learning at work. *Journal of Workplace Learning 18*(7/8), 403–413.
- Collin, K., Lemmetty, S., Herranen, S., Paloniemi, S., Auvinen, T., & Riivari, E. (2017).

 Professional agency and creativity in information technology work. In M. Goller & S.

 Paloniemi (Eds.), *Agency at work—An agentic perspective on professional learning*and development (pp. 249–270). Dordrecht, the Netherlands: Springer.
- Cox, B. F. (2002). The relationship between creativity and self-directed learning among adult community college students. (Doctoral dissertation, Knoxville: University of Tennessee).
- Craft, A. (2008). Studying collaborative creativity: Implications for education. *Thinking Skills* and Creativity, 3(3), 241–245.
- Csikszentmihályi, M. (1996). Creativity: Flow and the psychology of discovery and invention. New York, NY: HarperCollins.
- Davies, C. A. (1999). *Reflexive ethnography. A guide to researching selves and others*. London: Routledge.
- Drazin, R., Glynn, M. A., & Kazanjian, R. K. (1999). Multilevel theorizing about creativity in organizations: A sensemaking perspective. *Academy of Management Review*, 24, 286–307.
- Edmondson, D. R., Boyer, S. L., & Artis, A. B. (2012). Self-directed learning: A metaanalytic review of adult learning constructs. *International Journal of Education Research*, 7(1), 40–48

- Edwards, A. (2010). Being an expert professional practitioner: The relational turn in expertise. Dordrecht: Springer.
- Ellinger, A. D. (2004). The concept of self-directed learning and its implications for human resource development. *Advances in Developing Human Resources*, 6(2), 158–177.
- Fetterman, D. M. (1998). Ethnography step by step. Thousand Oaks: Sage.
- Florida, R., & Goodnight, J. (2005). Managing for creativity. *Harvard Business Review*, 83(7/8), 124–131.
- Forsman, P. (2018). Creativity is just a small emerging moment: An ethnographic investigation of work practices in a changing human resource development. *Business Creativity and the Creative Economy, 3,* 17–30.
- Foucher, R. (1995). Enhancing self-directed learning in the workplace: A model and a research agenda. Montreal: Group for Interdisciplinary Research on Autonomy and Training, University of Quebec at Montreal.
- Gadja, A., Beghetto, R.A., & Karwowski, M. (2017). Exploring creative learning in the classroom: A multi-method approach. *Thinking skills and Creativity* 24, 250–267.
- Gijbels, D., Raemdonk, I., Vervecken, D., & van Herck, J. (2012). Understanding work-related learning: The case of ICT workers. *Journal of Workplace Learning*, 24(6), 416–429.
- Glăveanu, V. P. (2011). How are we creative together? Comparing sociocognitive and sociocultural answers. *Theory & Psychology*, 21(4), 473–492.
- Glaveanu, V. P. (2015). Creativity as a sociocultural act. *The Journal of Creative Behavior*, 49(3), 165–180. Retrieved from https://doi.org/10.1002/jocb.94
- Glaveanu, V. P. (2017). A culture-inclusive, socially engaged agenda for creativity research.

 The Journal of Creative Behavior, 51(4), 338–340.

- Glaveanu, V. P. (2018). Educating which creativity? *Thinking Skills and Creativity*, 27, 25–32.
- Gruys, M.L., Munshi, N. & Dewett, T.C. (2011). When antecedents diverge: Exploring novelty and value as dimensions of creativity. *Thinking skills and creativity* 6(2), 123 137.
- Guglielmino, L. (2008). Why self-directed learning? *International Journal of Self-Directed Learning*, *5*(1), 1–12.
- Ha, T. S. (2015). Learning stories from IT workers Development of professional expertise. *Studies in Continuing Education, 37*(1), 79–98. Retrieved from https://doi.org/10.1080/0158037X.2014.967347
- Hammersley, M., & Atkinson, P. (2007). *Ethnography: Principles in practice*. (3rd ed.). Routledge.
- Harteis, C. (2017). Machines, change and work: An educational view on the digitalization of work. In C. Harteis (Ed.), *The impact of digitalization in the workplace: An educational view* (pp. 1–12). Dotrecht: Springer.
- Havnes, A., & Smeby, J. C. (2014). Professional development and profession. In S. Billett, C.Harteis, & H. Gruber (Eds.), *International handbook of research in professional and practice-based learning* (pp. 915–986). Dordrecht: Springer.
- Heyl, B. S. (2001). Ethnographic interviewing. In P. Atkinson, A. Coffey, S. Delamont, J. Lofland, & L. Lofland (Eds.), *Handbook of ethnography* (pp. 369–383). London: Sage.
- Hmelo, C.E., & Lin, X. (2000). Becoming self-directed learners: strategy development in problem-based learning. In D. Evensen & C. E. Hmelo (Eds.), *Problem-based learning: A research perspective on learning interactions* (pp. 227–250). Mahwah: Erlbaum.

- Holbeche, L. (2015). *The agile organization: How to build an innovative, sustainable and resilient business*. London: Kogan Page.
- Knowles, M. (1975). Self-directed learning. Chicago: Follet.
- Kops, W. J. (1997). Managers as self-directed learners: Findings from public and private sector organizations. In H. B. Long & Associates (Eds.), *Expanding horizons in self-directed learning* (pp. 71–86). Norman, OK: College of Education, University of Oklahoma.
- Lee, M. Y., & Edmondson, A. C. (2017). Self-managing organizations: Exploring the limits of less-hierarchical organizing. *Research in Organizational Behavior*, *37*(1), 35–58. Retrieved from https://doi.org/10.1016/j.riob.2017.10.002
- Lemmetty, S., & Collin, K. (2019). Self-directed learning as a practice of workplace learning: interpretative repertoires of self-directed learning in ICT work. 10.1007/s12186-019-09228-x.
- Lindeman, E. (1926). The meaning of adult education. New York: New Republic Inc.
- Littleton, K., Taylor, S., & Eteläpelto, A. (2012). Special issue introduction: Creativity and creative work in contemporary working contexts. *Vocations and Learning Studies in Vocational and Professional Education*, *5*(1), 1–4.
- Lombardo, S., & Kvålshaugen, R. (2014). Constraint-shattering practices and creative action in organizations. *Organization Studies*, *35*(4), 587–611.
- Loyens, S., Magda, J., & Rikers, R. (2008). Self-directed learning in problem-based learning and its relationship with self-regulated learning. *Educational Psychology Review*, 20, 411–427.
- Lubart, T. (2001). Models of creative process: Past, present and future. *Creativity Research Journal*, 13(3–4), 295–308.

- Martins, E. C., & Terblanche, F. (2003). Building organizational culture that stimulates creativity and innovation. *European Journal of Innovation Management*, 6(1), 64–74.
- Merriam, S. (2001). Andragogy and self-directed learning: Pillars of adult learning theory.

 New Directions for Adult and Continuing Education, 89, 3–13.
- Merriam, S., & Caffarella, R. S. (1999). Learning in adulthood. San Francisco: Josey-Bass.
- Moe, N. B., Dingsoyr, T., & Dypa, T. (2008). Understanding self-organizing teams in agile software development. Paper presented at 19th Australian Conference on Software Engineering, IEEE (pp.76–85).
- Mumford, M. D., Medeiros, K. E., & Partlow, P. J. (2012). Creative thinking, processes, strategies and knowledge. *The Journal of Creative Behavior*, 46(1), 30–47.
- Nemiro, J. E. (2002). The creative process in virtual teams. *Creativity Research Journal*, 14(1), 69–83.
- Nerland, M. (2008). Knowledge cultures and the shaping of work-based learning: The case of computer engineering. *Vocations and Learning, 1*(1), 49–69. Retrieved from https://doi.org/10.1007/s12186-007-9002-x
- Nerur, S., & Balijepally, V. (2007). Theoretical reflections on agile development methodologies. *Communications of the ACM*, 50(3), 79–83. Retrieved from https://doi.org/10.1145/1226736.1226739
- Ness, I. J., & Soreide, G. E. (2014). The room of opportunity: Understanding phases of creative knowledge processes in innovation. *Journal of Workplace Learning*, 26(8), 545–560.
- Newell, A., & Simon, H. A. (1972). *Human problem solving*. Englewood Cliffs, NJ: Prentice Hall.
- Oddane, T. (2014). The collective creativity of academics and practitioners innovation projects. *International Journal of Managing Projects in Business*, 8(1), 33–57.

- Paloniemi, S., & Collin, K. (2012). Discursive power and creativity in inter-professional work. *Vocations and Learning*, *5*(1), 23–40.
- Pintrich, P. R. (2004). A conceptual framework for assessing motivation and self-regulated learning in college students. *Educational Psychology Review*, *16*(4), 385–407.
- Pole, C., & Morrison, M. (2003). Ethnography for education. Doing qualitative research in educational settings. Open University Press.
- Rigby, C. S., & Ryan, R. M. (2018). Self-determination theory in human resource development: New directions and practical consideration. *Advances of Developing Human Resources*, 20(2), 133–147.
- Rosso, B. (2014). Creativity and constraints: Exploring the role of constraints in the creative processes of research and development teams. *Organization Studies*, *35*(4), 551–585.
- Said-Metwaly, S., Kyndt, E., & den Noortgate, W. V. (2017). Methodological issues in measuring creativity: A systematic literature review. Creativity. *Theories—**Research—Applications, 4(2), 276–301.
- Sawyer, K. (2004). Creative teaching: Collaborative discussion as disciplined improvisation. *Educational Researcher*, 33(2), 12–20.
- Schein, E. H. (1990). Organizational culture. American Psychologist, 45(2), 109–119.
- Silverman, D. (2001). Interpreting qualitative data. London: Sage.
- Spradley, J. P. (1980). Participant observation. Holt, Rinehart and Winston.
- Stokes, P. D. (2014). Thinking inside the tool box: Creativity, constraints, and the colossal portraits of Chuck Close. *Journal of Creative Behavior* 48(4), 276–289
- Tough, A. (1971). The adult's teaming projects: A fresh approach to theory and practice in adult learning. Toronto: The Ontario Institute for Studies in Education.
- Ulrich, F., & Mengiste, S. A. (2014). The challenges of creativity in software organizations. In B. Bergvall-Kåreborn & P. A. Nielsen (Eds.), *Creating value for all through ITB*

- (pp. 16–34). Dordrecht, the Netherlands: Springer. Retrieved from https://doi.org/10.1007/978-3-662-43459-8 2
- Vygotsky, L. S. (1978). Mind in society. The development of higher psychological processes.M. Cole, V. John-Steiner, S. Scribner, & E. Souberman (Eds.). Cambridge: Harvard University Press.
- Yuan, F., & Woodman, R. W. (2010). Innovative behavior in the workplace: The role of performance and image outcome expectations. *Academy of Management Journal*, 53(2), 323–342.
- Zimmerman, B. (2008). Investigating self-regulation and motivation: Historical background, methodological developments, and future prospects. *American Educational Journal*, 45(1), 166–183.



III

EMPLOYEE OPPORTUNITIES FOR SELF-DIRECTED LEARNING IN TECHNOLOGY ORGANIZATIONS. FEATURES AND FRAMES OF SELF-DIRECTED LEARNING PROJECTS

by

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Published in Studies in Continuing Education, early online DOI:10.1080/0158037X.2020.1765758

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Employee opportunities for self-directed learning at technology organisations: features

and frames of self-directed learning projects

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Abstract

The importance of self-directed learning (SDL) in a business environment has been high-

lighted as a way to increase an organisation's competitiveness and innovativeness. While or-

ganisations increasingly require SDL from employees, less attention is paid to the situations

and frames enabling it. This study examines self-directed learning projects (SDLPs), situa-

tions in which SDL is realised as an individual or collective phenomenon. Based on ethno-

graphic research, this study's data consisted of field notes, field records and interviews. I

used analysis of key incidents and ethnographic content analysis as an analytical tools. Four

types of SDLPs were identified in the organisations studied: organisation-oriented, work

community-oriented, work task-oriented and employee-oriented. The projects differed in

terms of their learning goals and in the level of autonomy the employees exhibited. In addi-

tion, the study revealed that employee opportunities for SDL depend strongly on the cultural

and structural frames of the organisations.

Keywords: self-directed learning projects, self-directed learning, technology-based work,

ethnography

1

Introduction

Increasingly high competition and technological changes force the employees of technology organisations to continue learning during every day work (Harteis 2017; Author 2019; Ha 2015). Thus, courses and external training alone are no longer seen as sufficient to meet this challenge (Noe et al. 2014), but learning through work and practice (Billett 2014) seems to be more efficient (Ellinger 2004; Bell 2017). The concept of self-directed learning (SDL), which emphasizes learner's responsibility in his or her own learning (Knowles 1975), has been found as an important starting point for describing learning through work in modern times (Bell 2017; Yeo 2008; Author 2019) because the responsibility for work (Rigby and Ryan 2018) and learning has been increasingly transferred from organisations to employees (Ellinger 2004; Brown 2001; Noe et al. 2014).

SDL has been described as an informal activity (Wilson and Hartung 2015; Yeo 2008), which happens autonomously (Noe and Ellingson 2017) - without direction from supervisors, trainers or educators (Artis and Harris 2007). Previous studies on SDL have investigated individual factors (Guglielmino 2008; Merriam et al. 2007; Clardy 2000) and skills (Hase and Kenyon 2000; Blasche 2012), but the opportunities organisations offer to SDL have not been addressed (Baskett 1993). However, manifestation of SDL in working life is not only dependent on the desire or motivation of individuals but employees are also obliged by the organisation to learn in a self-directed way (Author 2019). In addition, the so-called 'informal' learning situations at work also contain many formal and collective elements (Billett 2001, 2014; Collin 2005). Thus, learning should also be approached by sociocultural starting point (Vygotsky, 1978) focusing on the informal context and situations (Collin 2005; Tynjälä 2013) as well as workplaces' formal affordances and frames for learning (Billett 2014; Bell 2017).

This study discovered certain situations and features of SDL in the context of work by using the theory of self-directed learning projects (SDLPs) (Tough 1971; Clardy 2000; Artis and Harris 2007). SDLPs were originally described as self-directed, deliberate and practical learning situations (Tough 1971) that include individuals' SDL practices and processes (Knowles 1975; Merriam 2001). SDLPs have been seen as a functional starting point for evaluating the opportunities for SDL in an organisation's formal training programs and also in on-the-job learning situations (Clardy 2000; Artis and Harris 2007). The aims of this study are to increase understanding of the sociocultural nature of SDL, and develop a theory of SDLPs by focusing on context and organisational frames for SDL.

Most SDL research is quantitative (e.g. Guglielmino 2008; Artis and Harris 2007), but qualitative (Artis and Harris 2007) and observation-based studies have also been suggested (Baskett 1993). Therefore, this study focused on the sociocultural nature of SDLPs by using an ethnographic research strategy with observational methods (Heyl 2001). The participants of the current study were employees working in the technology sector in Finland, which is one of the drivers of the current economic growth and increased employability.

Self-directed learning projects and organisational frames

SDLPs at work

Self-directed learning projects (SDLPs: Clardy 2000; Artis and Harris 2007; Tough 1971) can be described as situations in which learners themselves manage and take responsibility for their own learning practices or processes (Knowles 1975; Khiat 2017; Author 2019; Merriam 2001; Brockett and Hiemstra 1991). The major research topics in the previous studies in relation to SDLPs can be divided into three areas: *first*, the individual-driven factors, such as willingness to learn and prior knowledge, that contribute to the progress of the SDLP and how important these are in different learning projects (Clardy 2000; Artis and Harris

2007); *second*, the progress of SDL processes through different phases (Tough 1971) and learner-driven practices (see, e.g., Knowles 1975); and *third*, the length of the time frames of different learning projects. Thus, the sociocultural perspectives on learning, according to which learning emerges in interaction with the others and the environment (Vygotsky 1978), seemed to be partially overlooked by previous studies. For this reason, Clardy (2000) as well as Artis and Harris (2007) have developed the theory of SDLPs by examining the importance of individually experienced work conditions for allowing an individual to act in a self-directed way.

According to Clardy (2000), there are four types of SDLPs: *induce, synergistic, voluntary* and *scanning*. The first (induce) is a learning situation that is enabled on behalf of the company and refers to the situation where the role of the employer is to promote employees' understanding of where new information is found and reinforce what they learn, but employees themselves regulate their own learning (Artis and Harris 2007). Synergistic SDLPs refer to situations where learning materials are produced by the organisation, but the employees can choose whether to participate, and the learning is reinforced by the employees themselves. Voluntary SDLP refers to an employee-oriented learning situation where employees themselves assess what information they need and where and how they get it, but the demand for learning still comes from the organisation. The scanning SDLP is similar to the voluntary project but differs in that it has no externally defined outcomes or goals and is more of a continuous and daily learning process (Clardy 2000). These notions strengthen the understanding that organisations have many kinds of frames which affect the opportunities for SDL at work, but we still need more understanding of what organizational frames enable and produceop-portunities for SDL in working life (Clardy 2000; Bell 2017).

Organisational frames for SDL at work

In the early stages, SDL was seen as a strongly individual and autonomous form of adult learning (Knowles 1975; Lindeman 1926; see, e.g., Merriam 2001). Nowadays, SDL in the context of workplace learning (Author 2019) should be seen as a more context-based (Candy 1991; Schmit 2000) and situational (Bell 2017) learning process that the learner closely controls him- or herself (Knowles 1975; Tough 1971). Thus, SDL should be seen as a socio-cultural entity resulting from the interaction between individual action and environmental opportunities (see Vygotsky 1978; Billett 2001). For example, it has been argued that employee autonomy is a key factor for SDL (Candy 1991); however, many studies have shown that mere autonomy does not guarantee successful SDL (Bell 2017). In certain situations, autonomy has even become a negative factor that challenges learning; without control, learners may choose questionable ways of learning or omit important issues (Brown 2001; Tannebaum et al. 2010).

Studies have found that workplaces can influence the opportunities for employee learning (Ashton 2004; Billett 2001). In particular, technology-based workplaces have been proven to offer a large variety of both individual and collegial-based resources for learning (Billett 2001): collectivity (Billett 2001; Tynjälä 2013; Brown and Duguid 2001), shared experiences (Collin 2005), management support and feedback (Skule 2004; Eraut 2004) and opportunities for employees to engage in various activities and to be guided by colleagues, or simply to listen and observe the work environment (Billett 2001). According to previous studies, the organisational cultural factors (see Schein, 1990) that support SDL are a prudent atmosphere and high levels of appreciation (Baskett 1993), the acceptance of errors (Kops 1997) and adequate support, feedback and guidance (Bell 2017; Knowles et al. 2011; Candy 1991; Foucher 1995; Skule 2004). Therefore, support and guidance seem to be necessary to enable SDL, while at the same time there is a need for employees' freedom and autonomy.

The essential issue becomes the ideal mix of autonomy and support for an individual learner in any given situation (Bell 2017).

In addition, the organisational structural issues, such as hierarchy and roles (e.g. Skule 2004), have been found to be relevant for learning at work. However, the results, regarding, for example, the significance of organisational structures for learning, have either been contradictory (Bunderson and Boumgarden 2010; Burn 1995), or the nature of the factors that allow for SDL has not been sufficiently considered. It has been found that, even in self-directed teams, structure, hierarchy and job clarity (Bunderson and Boumgarden 2010) and managerial responsibilities (Skule 2004) promote learning. On the other hand, it is precisely the low level of hierarchy and organisational structure that have been emphasised in terms of enabling a structure conductive to learning (e.g. Burns 1995). Therefore, it is important to further determine which organisational frames support SDL at work (Bell 2017; Confessore and Kops 1998) and which frames increase or restrict employee opportunities for SDL (Baskett 1993; Clardy 2000).

Research formulation

Research aim and research questions

The aims of this study are to increase understanding of the sociocultural nature of SDL, and develop a theory of SDLPs. The purpose of the current study is to examine employee opportunities for SDL in different learning situations that are informed by the previous theory of SDLPs (see Clardy 2000; Artis and Harris 2007). The study explores employee opportunities for SDL based on the following two research questions:

1) What types of SDLPs occur in technology work and what are their features?

2) What organization-based frames can be detected in SDLPs and how do these frames increase or restrict employee opportunities for SDL?

Methodology

The implementation of the research is guided by an earlier theory-based understanding of learning as a sociocultural phenomenon: an interaction between the individual, the others and the environment (Vygotsky 1978; Billett 2002, 2004). Thus, the starting point of the study is that the relationship between the individual and the context is mutually embedded, but they can be viewed as analytically separate, with an emphasis on either the context, the individual or the interaction between them (see e.g. Collin, 2005). In the current study, the focus is mostly on the context and the externally perceptible factors surrounding an individual's activity as more studies on the contextual-, situational- and organisational-based perspectives on SDL have been recommended (Confessore and Kops 1998). An ethnographic research strategy (Atkinson and Hammershey 2007), based on observation and interviews (Davies 1999), has been chosen as the methodological strategy of the research because a) it help to reveal the sociocultural nature (Rumrill and Bellini 2017; Collin 2005; Atkinson and Hammershey 2007) of learning, concentrating on interactions and activities among individuals and groups and those contexts and cultures in which activities take place; b) versatile research methods in SDL research have been proposed (Pintrich 2004), especially the qualitative (Artis and Harris 2007) and observational methods, with the aim to produce a more complete picture of the phenomenon (Baskett 1993); and c) quantitative research methods have been used a great deal in SDL (see, e.g., Guglielmino 2008) and SDLP (Artis and Harris 2007) studies, and previous qualitative studies have mostly focused on interviews (e.g. Foucher 1995; Foucher and Brezot 1997; Kops 1997). Ethnographical assumptions basically emphasise the importance

and dense description of the context as well as the involvement and interpretation of the researcher when the research process is a continuous alternation between observations, interpretations, the views of the researchers and his or her own prior knowledge (Hammersley and Atkinson 2007). Thus, data collection, analysis and interpretations are always intertwined (Davies 1999).

Target organisations and collected data

The participants of the current study were employees from two organisations operating in the technology sector in Finland. Professionals in technology organisations are expected to produce high-quality products and services for their customers, and learning is promoted as a response to the increasing demands of technology work (Ha 2015). Finland is the target country because Finnish working life is rooted in the culture of autonomy and freedom (Ramsdalin and Skorstadin 2016), which is why self-directedness is strongly reflected in Finnish organisations. The structure of both target organisations is based on self-directed project teams where the responsibility for the implementation of each project is internal to the team (Moe, Dingsoyr and Dypa 2008). Indeed, organisations' structural change is moving from the hierarchical and bureaucratic towards the low-hierarchy 'self-directed organisations' (Lee and Edmondson 2017; Holbeche 2015) where the power, responsibility and opportunities for the decision-making of individuals and teams are greater (Moe et al. 2008; Deci and Ryan 2018). Therefore, the responsibility for the daily work and learning has been transferred from the organisation to the teams and, accordingly, to the individual employees (Ellinger 2004; Bell 2017). Table 1 describes the study's target organisations and the corresponding data.

Table 1. Target organisations and collected data

Organisation	Technology (A)	IT and Consulting (B)	
Number of employees	270	30	
Business area	Information technology, electrical en-	Information technology,	
	gineering, automation technology	technological consulting	
Job titles	Software developer, Electrical and au-	Software developer,	
	tomation engineers, Customer service	Consultant, CEO, HR	
	employee, IT-expert, Project leader,	Manager, Project leader,	
	HR manager, CEO, Manager	Manager	
Observational hours	105	28	
Field notes (pages)	40	4	
Field records (pages)	139	56	
Interviews	27	13	
Data collection dates	Spring and autumn 2017	Spring 2017	

The data of the study was collected through observations, field notes and field records from two technology organisations to improve the comprehensiveness of the dataset. In addition, the theme interviews (N=40) collected at the organisations were used as supporting data during analysis. The themes of these interviews were 'workplace learning and development', 'supervisory work' and 'organisational support'. Observations were taken from as many different organisational events as possible, such as educational and informational events, meetings, everyday work hours, coffee breaks, managerial discussions and formal and informal discussions. Interviews and field record data were transcribed prior to analysis.

Analysis

The process of an ethnographic analysis has been described as a 'funnel-shaped process' which proceeds from unclear foci to more detailed interpretations (Collin 2005; Davies 1999; Hammersley and Atkinson 2007). The analysis performed in this study consisted of two phases (Table 2). In the first phase, the aim was to observe interesting situations (Davies 1999), also termed key events (Fetterman 2008). Emerson's (2004) method for the analysis of key incidents was used, whereby SDL-related events were identified within the field notes and recorded data (Fetterman 2008). The purpose of the key incidents method is to locate, expose and depict the various events related to the subject being studied (Emerson 2004). Three factors have been identified as characteristics of key events: 1) they are not necessarily dramatic or profoundly relevant from the perspective of the examinees; 2) events are part of everyday life; and 3) the significance of the events is not necessarily clear right from the start of the analysis, but such events arouse the researcher's interest in examining the incidents more closely (Emerson 2004). In this study, the selection of key events was guided, in typical ethnography, by assumptions about learning based on previous theories, according to which learning takes place through work practices (e.g. Billett 2001; Collin 2005), through collective, interactive situations (Collin 2005), through participation (Billett 2001), through errors and problem situations (Tynjälä 2013) or through formal training situations (Collin 2005; Tynjälä 2013). The analysis proceeded by (a) identifying potential key events of learning (see descriptions of events in Table 3) in the target organisations and (b) classifying the observed situations based on previous SDLP theory (Clardy 2000; Artis and Harris 2007) by locating factors related to human activities and environments that provide information on the goals of the situation (organisational-oriented, employee-oriented), the nature of the situation (formalinformal) and the interaction and roles between people (speakers-listeners, active playerspassive players). Thus, the analysis process proceeded from extensive description to a more detailed analysis and structuring (see Emerson 2004).

Table 2. Analysis of the study

Phase	I		II		
Method	Analysis of key incidents		Categorisation of ethnographical		
				da	ta
Target	Key events		Environments and factors		
Data	Field notes and field records		Field notes, field records, interviews		
Analysis	Locate and categorise the types and features		Categorise structural and cultural frames		
	Event	Explanation	Employee	Increasing frames	Restricting
		(goals, roles, content)	opportunities for SDL	of SDL	frames of SDL
Basis	Informed by theory		Data-based		
Findings	SDLPs and the opportunities provided		Cultural and structural frames that in-		
	for employee SDL		crease or restrict employee opportuni-		
				ties for SDL	

The aim of the second phase of the analysis was to describe the frames identified in the projects that were related to the cultural or structural factors of the organisation which, according to interpretation, may promote or limit the opportunities for SDL. Interpretation was supported by employee interviews. The second phase was based on the idea that ethnographic observation parses social reality into different environments, such as the economic, social, cultural (e.g. leadership culture), semantic, human, learning and normative (Bodgan and Biklen 1992) environments, but also previous theoretical assumptions about cultural (informal) and structural (formal) organisational frames can affect to opportunities for learning (Billett 2002; Schein 1990; Bundersom and Boumgarden 2010).

Findings

Types and features of SDLPs in technology-based work

Under the guidance of an earlier SDLP theory (Clardy 2000), this study found four different types of SDLPs within the organisations researched. The observed projects partially differed from the descriptions by the previous SDLP theory. Therefore, in this study, projects were named differently based on data. Within the current study, the types of SDLPs observed were organisation-oriented, work community—oriented, work task—oriented and employee-oriented. Table 3 summarises the different SDLP types and their features.

Table 3. Types and Features of SDLPs in Technology Work Organisations

Type of SDLP	SDLP events	Explanation of SDLP	Individual or group opportunities for SDL
Organisa- tion -oriented	 External certificate training and other courses and lectures Internal training days and seminars Formal discussions between supervisor and employee 	 Organisation-based goals Designed by the managers or supervisors Implemented to transfer information from managers to employees Employees as listeners Formal 	Possibility of the individual or the group making decisions on how to apply the new knowledge in their own work or in a collective project → Minor possibilities for individual or group SDL
Work com- munity -oriented	 Information/discussion sessions focused on issues such as new technology, projects and ways of working Training days focused on competency development Informal discussions between team members or supervisors and employees 	 Work community-based goals Enabled and scheduled by the employer but designed and implemented by employees Employees as listeners and actors Formal 	 Possibility to make decisions on how to exploit the opportunities offered by the organisation, how to learn and how to apply learning The ability to plan and implement different learning situations within the work community Moderate possibilities for individual or group SDL
Work task –oriented	 Learning situations triggered by problem-solving tasks Learning situations are required to complete the tasks Learning situations triggered by the deficiencies and developmental needs of the organisation 	 Work task-based goals The need for learning emerges from a work task Designed and implemented by employees within the boundaries that guide it (client, schedule, budget) Employees as actors Informal 	The ability to detect learning needs and make decisions about how to learn new things, apply and evaluate learning Sufficient possibilities for individual or group SDL
Employee -oriented	 Learning projects and exercises at home Learning situations produced by the 'empty moments' that appear in everyday work 	 Employee-based goals Designed and implemented fully by employees themselves Employees as actors Informal 	Possibility to set own or group learning goals, choose learning methods and apply and evaluate learning Broad possibilities for individual or group SDL

Organisation-oriented SDLPs. Some projects founded could be categorised as organisation-oriented SDLPs because the goals that were associated with them (i.e. why the project was implemented) could be seen as primarily organisational-oriented (e.g. performance, business objectives or brand). Within each organisation-oriented SDLP, employees have only a

few opportunities for SDL. In these projects, managers or supervisors decided what and how information should be brought to the employees and how the project should be implemented. The field note from the seminar event, provided below, demonstrates how the managers bring information to their employees. It can be interpreted that, in the context of learning, the task of the employee is only to listen and, if necessary, ask for more information.

There were table groups in the big hall where the staff were sitting. The man is speaking in front of the hall; the other staff are sitting quietly and listening. When the speech is over, the HR manager informs the public that the topic may be asked about or discussed. There are two questions from the public, but the level of the actual debate is not progressing. Next, CEO and the senior manager of the other company speak at the event. The goal of the event is clearly to increase the staff's understanding of the entire organisation's operations, products and services. (Field note, Organisation A)

In organisation-oriented projects, individuals could only be self-directed when deciding how newly reported information would be applied in their own work or tasks. Collectivity occurred when the project allowed for a discussion with other listeners. In this case, the discussion enabled a shared reflection on how the new information could be applied to joint projects or in the organisation's development.

Work community-oriented SDLPs. Work community-based SDLPs aim to increase the sharing of information within the work community, which benefits both the development of the work community practices and the development of know-how at the community level. The learning goal was therefore primarily at the work community level.

Employees say that a couple times a month the organisation organises a meeting where anyone can present finished projects, problems encountered in the project

and solutions found there. They say that this practice is good for getting information about who knows what. (Field note, Organisation A)

In these projects, the employer's role appeared to be as a scheduler and facilitator, but it was up to the employees to make decisions regarding content and involvement. The following field journal excerpt illustrates an SDLP where 'Friday coffee event' is an opportunity for the employees to tell each other about their tasks and interesting projects:

I arrive at the room where the Friday coffee is arranged. One employee is talking during Friday coffee. The employee introduced the new service and preliminary information on its use. At the end of the presentation, others asked for more details. (Field note, Organisation B)

Work community—oriented SDLPs may also have included discussions between a supervisor and a subordinate on workplace development that did not follow a predetermined pattern but allowed employees to influence the progress of the discussion. Also, regular meetings focused on a specific time and topic, within a specific team or group of staff, often functioned as such SDLPs.

Work task—oriented SDLPs. There are many learning opportunities in the day-to-day activities of the technology industry. The goals of these opportunities are linked to work tasks, such as the need to develop something new or solve a problem. Work-related learning needs and problems are reflected by the project, organisation or customer. Therefore, their starting point is not employee-oriented. The following field record describes a work task—oriented SDLP where the role of the author in the learning situation is emphasised:

IT manager: I have my own way of thinking about it, what part of the reformed query will be made up, but I want to interview all the leaders so I still get feedback and then start creating the final model...

HR manager: In my opinion, it would be good to clarify that there are questions that can reasonably be inferred from the answers so that our strategy will be realised in that field. So, I would split it into two levels.

IT manager: I also think that splitting is good idea ..., based on these interviews, I'm going to recognise those important metrics as to what type of matter should be followed and go out. (Field record, Organisation A)

An individual's self-directedness is manifested during projects. It begins with the discovery of the need to learn something new and carries on through the making of the decision as to how the necessary information will be obtained, how new learning or knowledge will be developed and how that learning will be applied and evaluated.

After a long discussion between the two men, I move on to ask them what the problem was all about:

Researcher: What you were talking about recently?

Software developer: We talked about our software development area where we have the expertise and how to bring it into a client-friendly format. The challenge is that we are always expected to give a finished solution, but the customers' situations and needs are always so unique. (Field note and record, Organisation B)

In these SDLPs, collectivity emerged when a problem or work situation in everyday work was relevant to a wider group or team and needed to be solved together, as shown in the quotation above.

Employee-oriented SDLPs. Technology professionals use their leisure time to develop their own expertise. Many have projects at home that are based on a practical need in everyday life. In addition to meeting a practical need, home projects can also contribute to an individual's expertise in certain technologies. The following discussion shows how an employee has learned new technologies through their home project:

HR manager: Okay these all [list of software languages] are familiar?

Software developer: Yes, I have used these in so many home projects. (Field record, Organisation A)

The employee's orientation towards these projects is illustrated by the fact that the employee sets their learning goals independently and makes all learning decisions. This kind of learning does not have beginning and end points but appears to be continuous. Collectivity is only realised if the home project is done with someone else or if the 'empty moments' of everyday work life are filled with studying, such as through a discussion on a general website. Informal discussions at work can also be collectively self-directed if the speakers have a common learning goal that can be achieved in this way.

Organisational frames increasing or restricting employee opportunities for SDL

Four frame categories that were related to the four SDLPs described above were found by this study. The frame categories were *collaboration, supervisory work, roles and responsibilities* and *working environments and tools*. In addition, this study investigated whether the nature of these frames increased or restricted SDL opportunities for employees.

Collaboration appeared to be one of the most important frames for all SDLPs. Learning projects could, in principle, be collective, or they could begin as an independent, individual activity that eventually becomes collective. Organisations can also support different forms

of collaboration. For example, they can raise employee 'awareness of other's' skills and responsibilities. According to the employees, 'The most important thing would be to get to know your colleagues because you learn in the best way when working with someone and exchanging know-how' (Software developer, Organisation A). The following field note reflects an organisational approach to raising employee awareness of where to seek help and support:

It seems that the role of the HR manager, in this formal discussion, is to tell the people who have done what at work and to add information about who could help others with different problems. (Field note, Organisation A)

The organisations' cultures seemed to be the most important ways of supporting collaboration. The creation of a culture of dialogical values that are mutually respectful and foster development and cooperation creates, in turn, opportunities for SDL. According to one employee, 'The culture was such that, if I had problem, I could always turn to anyone and ask for their opinion' (Software developer, Organisation B). If the collaboration was not supported and, instead, was neglected, the opportunities for employee SDL became limited. The following quote describes a situation in which a new and inexperienced employee began work and experienced a lack of support: 'I'd rather get some kind of guidance, and on the first day of work I felt like I was just thrown into the deep end too quickly' (Software developer, Organisation B).

Supervisory work. Leadership-based and supervisory work seemed to frame all the SDLPs and situations that incorporated them. The following field record and field note describes the organisation's culture in terms of supervisory work: 'My role is not to control people, they are self-directed experts, my job is to ask and sometimes push forward' (HR

manager, Organisation A). Managers do not monitor or instruct their employees continuously. Instead, their employees have the freedom to work independently. This is a description of everyday work life and therefore corresponds to SDLPs.

Employees do their jobs; I don't see superiors. Where are all the bosses? At least they are not controlling employees. Otherwise, it seems that employees work pretty freely. (Field note, Organisation A)

Supervisory work seemed to support SDLPs when it was described as guidance-based, employee-motivating and helpful in nature. It is vital that the supervisor is reachable if the employee requires help. According to one employee, 'I have asked many questions of the supervisor, and yes, he always supports me' (Electrical engineer, Organisation A). Therefore, guidance-based supervision can also be an employee-centred approach, which means that employees' views are considered. In technology organisations, the guiding nature of supervisory work is also reflected in the fact that employees often referred to superiors as 'mentors' or 'coaches'. However, some more controlling supervisory work emerged in organisations, which seemed to restrict employee opportunities for SDL. If a manager is controlling, it means that they do not trust their employees – they issue commands and require their employees to perform tasks in the way they desire. The following field record demonstrates how an employee experiences a culture that does not allow for mistakes:

Software developer: I think we should allow for more mistakes, so people can learn and take responsibility for correcting their mistakes. Now, if you make a mistake, the project leader will immediately 'hold your hand'.

HR Manager: So you mean that it has pretty strong project management?

Software developer: Yes, and the project manager is pretty strong that it takes away my freedom to work on that project. (Field record, Organisation A).

Roles and responsibilities. When examining SDLPs, organisational structures, responsibilities and roles appear as a frame: 'Managers are named, but they don't go through the same things with all subordinates systematically in a certain way but in a free style' (Supervisor, Organisation B). In addition to their main job, employees often have a special responsibility to perform internal organisational development or teamwork. These responsibilities and roles appear in SDLPs, but they can be either supportive or restrictive. Clear and well-defined roles and responsibilities help contribute to SDLPs: 'It is usually enough that you have a named manager who is responsible for things, and if there is any problem, you know that this person is the one you can ask for help' (Software developer, Organisation A).

In a number of SDLPs, no one employee had a designated role for a given situation. This caused problems for the entire project. A SDLP may be better implemented if certain members of the work community are given clearly designated responsibilities to guide and encourage their employees to take advantage of different learning opportunities. This would also allow these employees to make better use of such opportunities.

Working environments and tools. Various physical environments may frame SDLPs. Based on descriptions from the field notes, the staff of some organisations walk freely through an open office while asking, directing, advising or just talking with colleagues. An open office space seems to be a particularly good frame for collective SDLPs. On the other hand, it can also interfere with the work of individuals. Therefore, it is essential that work environments are versatile and open to alternative solutions and that employees have the opportunity to work from home or use headphones or 'quiet rooms' if necessary. A lack of alternative options – in this case, being forced to work in an open office – can be a disruption: 'This open office is a problem; it is a restless state. I should work more at home to get peace because I really can't concentrate if it's too noisy' (Software developer, Organisation A).

Electronic communication tools, such as internet search engines, channels and websites, can be both working environments and tools in the technology field. These resources allow employees to learn collectively regardless of their physical location and decide for themselves when to reach out to others and when not to.

Consultant: New things are coming in all the time, so you get to know a lot and do some kind of research all the time.

Researcher: Where do you get the support for it?

Consultant: Mainly I ask those people who are working in the other city. They are the ones who do the same things as me. Pretty much we use Skype. (Interview with consultant, Organisation B)

In addition, the versatility of electronic systems enables real-time data sharing between organisations and employees and among the employees themselves. Versatile work environments and tools extend the possibilities for employee-oriented SDLPs. For example, an
employer can support an employee's home project by paying their licensing fees or offering
tools for them to use at home.

Discussion

This study developed the theory of SDLPs (see Clardy 2000; Artis and Harris 2007) by increasing sociocultural understanding of SDL and frames of SDLPs in the context of technology work. The study discovered that four types of SDLPs are being implemented in

organisations: organisation-oriented, work community-oriented, work task-oriented and employee-oriented. The biggest differences among these projects were their goals and the possibilities they provided for employees regarding SDL. Additionally, various organisational, cultural and structural frames were attached to these projects, which can be grouped into four categories: collaboration, supervisory work, responsibilities and roles and working environments and tools (Figure 1). The frames that seem to increase the opportunities for employees using SDL are collaboration supported by the organisation, guidance-based supervision, well-defined responsibilities and roles, a versatile work environment and access to versatile tools. On the other hand, neglected collaboration, control-based supervision, unclear responsibilities and roles and a lack of choice regarding the work environment or tools restricted employee opportunities within SDL. The purpose was not to compare the two target organisations, but it was found that the situations, projects, opportunities and frames for SDL seemed very similar in both organisations.

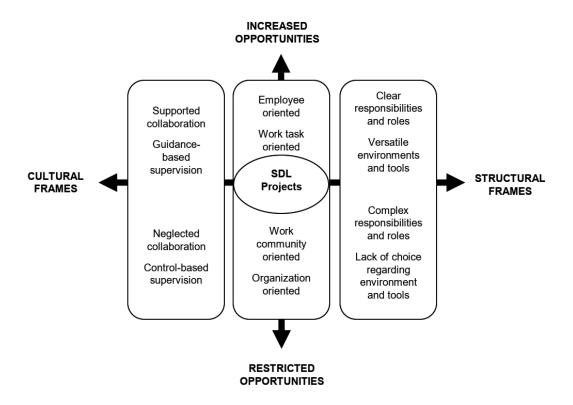


Figure 1. Projects and organisational frames affecting employee opportunities for self-directed learning.

In the current study, the first project, called organisation-oriented, included the same kind of elements as the 'induce' project identified by Clardy (2000) regarding the organisation's importance in the project. Nevertheless, this study found that the goal of an organisation-oriented project is not to accomplish an employee's current job (see Clardy 2000; Artis and Harris 2007) but rather to promote the performance of individuals and groups at the organisational level, focusing on the business objectives of the organisation. Contrary to Clardy's (2000) theory, this project also appeared to be heavily organisation-led, with very limited opportunities for individuals to engage in SDL. The work community—oriented project found in this study was partly reminiscent of Clardy's 'synergistic' projects. However, while synergistic projects have been described as contributing to employees' present and future work tasks, work community—oriented projects were seen more broadly as developing

the common skills of people within work teams or organisations as well as sharing information about the professional skills of different employees. In the work task—oriented projects, similarities were found with the two previously mentioned Clardy projects, induce and synergistic. The projects found by Clardy emphasise the importance of learning in relation to the worker's work tasks. This goal was also observed in the work task—oriented project found in the current study. Clardy's (2000) fourth project, voluntary, is described as a process-oriented, open-ended, ongoing search for relevant and useful information that does not have external prescribed results or aims. Thus, it is similar to the employee-oriented project identified by this study. This project offers employees the broadest opportunity for employee SDL, from setting goals to applying what they have learned. However, employee-oriented projects are often implemented in employees' leisure time or are not directly related to work. This reinforces the critique of the possibility for SDL to emerge as an ideal in working life and during working hours, as described in several studies (e.g. Knowles 1975; Merriam 2001).

The findings of this study confirm an understanding of SDL as a collective phenomenon (Author, forthcoming). SDL often appeared as an activity involving more than one person and was strongly framed by collaboration and supervisory work. This perspective also reveals a contradiction in SDL between the individual responsibility and the need for simultaneous collectivity. Self-directedness can also be collective by taking on and sharing group responsibility, or it can be implemented individual responsibility, but with the help from those around (Bell 2017).

In some previous studies and a modern organisations based on self-direction, organisational hierarchies and structures have been described as restrictive for self-directedness (Lee and Edmondson 2017) or learning (Burns 1995). Based on this research, however, clear structures, responsibilities and roles and guided supervision seem to promote individual opportunities for SDL (Bunderson and Boumgarden 2010). Thus, self-directedness is not only

dependent on individual-driven factors but that organisations also have a variety of structural and cultural features that either limit or enable self-directedness. For this reason, organisations' leaders should not expect individuals to be self-directed from situation to situation but rather to focus on creating structures and cultures where self-direction is possible. In this study, opportunities for SDL were found to be as best in 'employee-oriented' learning projects. The importance of leisure-time learning was emphasized, as technology workers often described working on home projects that also supported their tasks at work. This manifestation of SDL is challenging and contradictory, as it strongly reflects organisations' limited resources to support SDL during working hours. It also highlights the problem of equality: if learning extends outside working hours, how does can this be reconciled with family or leisure?

Taking into account the previous studies' findings related to the burdensome nature of SDL at technology work (Author 2019; DeRue and Wellman 2009), it should also be investigated in the future when self-direction is not appropriate or needed – that is, when it does not add value to the development of the individual or the organisation. When the framing factors vary by situation, time and organisation (see, e.g., Author 2019; Candy 1991; Bell 2017), it can also be questioned whether it is possible to actually develop individual self-direction as a property, or whether it is more necessary to develop the frames that enable self-direction. In any case, it is clear that mere learning to acquire skills (see 'Heutagogy' by Hase and Kenyon 2000; Canning 2010) is not enough if the environment does not allow for SDL. It would be beneficial in the future, to examine also other external frames, such as customer- or society-based frames and their effects on employee SDL.

Although certain frames could be described in this study as increasing or restricting learning opportunities, one must take into account the interpretative nature of ethnographic research and the limitations of the transferability of results - it is not possible to generalise

them to all contexts or sectors. On the other words, evaluating the nature of frames is difficult, both through field data and through interviews; someone can experience guidance-based supervision as support, another as control. Therefore, a simple generalisation cannot be derived from this study. The evaluation of ethnographic research must also take into account its starting points, such as the strong involvement of the researcher and the link between data collection, analysis and reporting and interpretability (Hammersley & Atkinson 2007). In this study, the trustworthiness of the study has been enhanced by describing the analysis and methodology as accurately as possible and by providing presuppositions.

Acknowledgments

This work was supported by the Finnish Work Environment Fund (project number 117300).

Declaration of interests statement

No potential conflict of interests.

References

Artis, A. B., and E. G. Harris. 2007. "Self-Directed Learning and Sales Force Performance:

An Integrated Framework." *Journal of Personal Selling and Sales Management* 27

(1): 9–24.

Ashton, D. 2004. "The Impact of Organisational Structure and Practices on Learning in the Workplace." *International Journal of Training and Development* 8 (1): 43–53.

- Baskett, H. K. M. 1993. "Workplace Factors Which Enhance Self-Directed Learning." *Proceedings from the 7th International Symposium on Self-Directed Learning*. West Palm Beach, FL.
- Bell, B. S. 2017. "Strategies for Supporting Self-Regulation during Self-Directed Learning in the Workplace." In *Autonomous Learning in the Workplace*, edited by R. A. Noe and J. E. Ellingson, 117–134. New York: Routledge.
- Billett, S. 2001. "Learning through Work: Workplace Affordances and Individual Engagement." *Journal of Workplace Learning* 13 (5): 209–214. https://doi.org/10.1108/EUM000000005548
- Billett, S. 2014. "Mimesis: Learning through Everyday Activities and Interactions at Work." Human Resource Development Review 13 (4): 462–482.
- Blaschke, L. M. 2012. "Heutagogy and Lifelong Learning: A Review of Heutagogical Practice and Self-Determined Learning." *The International Review of Research in Open and Distance Learning* 13 (1): 56–71.
- Bodgan, R. C., and S. K. Biklen. 1992. *Qualitative Methods of Education to Theory and Methods*. Boston: Allyn and Bacon.
- Brocket, R. G., and R. Hiemstra. 1991. *Self-Direction in Adult Learning: Perspectives on Theory, Research and Practice*. London: Routledge.
- Brown, J. S., and P. Duguid. 2001. "Knowledge and Organization: A Social-Practice Perspective." *Organization Science* 12 (2): 198–213. https://doi.org/10.1287/orsc.12.2.198.10116.
- Brown, K. G. 2001. "Using Computers to Deliver Training: Which Employees Learn and Why?" *Personnel Psychology* 54 (2): 271–296.

- Bunderson, J. S., and P. Boumgarden. 2010. "Structure and Learning in Self-Managed

 Teams: Why 'Bureaucratic' Teams Can Be Better Learners." *Organization Science* 21

 (3): 609–624.
- Burns, R. 1995. *The Adult Learner at Work, Business and Professional Publishing*. Sydney: Allen & Unwin.
- Candy, P. S. 1991. Self-Direction for Lifelong Learning. San Francisco: Jossey-Bass.
- Clardy, A. 2000. "Learning on Their Own: Vocationally Oriented Self-Directed Learning Projects." *Human Resource Development Quarterly* 11 (2): 104–125.
- Collin, K. 2005. "Experience and Shared Practice. Design Engineers' Learning at Work." Academic doctoral diss., Jyväskylä Studies in Education, Psychology and Social Research.
- Confessore, S. J., and W. J. Kops. 1998. "Self-Directed Learning and the Learning Organization: Examining the Connection between the Individual and the Learning Environment." *Human Resource Development Quarterly* 9 (4): 365–375.
- Davies, C. A. 1999. *Reflexive Ethnography: A Guide to Researching Selves and Others*. London: Routledge.
- Davis, D., and B. Daley. 2008. "The Learning Organization and Its Dimensions as Key Factors in Firms' Performance." *Human Resource Development International* 11 (1): 51–66. https://doi.org/10.1080/13678860701782352
- DeRue, D. S., and N. Wellman. 2009. "Developing Leaders via Experience: The Role of Developmental Challenge, Learning Orientation, and Feedback Availability." *Journal of Applied Psychology* 94 (4): 859–875. doi:10.1037/a0015317
- Ellinger, A. D. 2004. "The Concept of Self-Directed Learning and Its Implications for Human Resource Development." *Advances in Developing Human Resources* 6 (2): 158–177. doi:10.1177/1523422304263327

- Emerson, M. R. 2004. "Working with 'Key Incidents'." In *Qualitative Research Practice*, edited by C. Seal, G. Gobo, J. F. Gubrium, and D. Silverman, 457–472. Thousand Oaks: Sage.
- Eraut, M. 2004. "Informal Learning in the Workplace." *Studies in Continuing Education* 26 (2): 247–273.
- Fetterman, D. M. 1998. Ethnography Step by Step. Thousand Oaks: Sage.
- Foucher, R., and F. Brezot. 1997. "Self-Directed Learning in Health Care Institutions: An Analysis of Policies and Practices." In *Expanding Horizons in Self-Directed Learning*, edited by H.B. Long et al., 101–116. Norman, OK: University of Oklahoma.
- Foucher, R. 1995. Enhancing Self-Directed Learning in the Workplace: A Model and a Research Agenda. Montreal: Group for Interdisciplinary Research on Autonomy and Training, University of Quebec at Montreal.
- Guglielmino, L. 2008. "Why Self-Directed Learning?" *International Journal of Self-Directed Learning* 5 (1): 1–12.
- Ha, T. S. 2015. "Learning Stories from IT Workers—Development of Professional Expertise." Studies in Continuing Education 37 (1): 79–98.
 https://doi.org/10.1080/0158037X.2014.967347
- Hammersley, M., and P. Atkinson. (2007). *Ethnography: Principles in Practice*. 3rd ed. London: Routledge.
- Harteis, C. 2017. "Machines, Change and Work: An Educational View on the Digitalization of Work." In *The Impact of Digitalization in the Workplace: An Educational View*, edited by C. Harteis, 1–12. Dotrecht: Springer.
- Hase, S., and C. Kenyon. 2000. "From Andragogy to Heutagogy." ultiBASE In-Site, December. Published version available from http://pandora.nla.gov.au/nph-wb/20010220130000/http://ultibase.rmit.edu.au/New/newdec00.html

- Heyl, B. S. 2001. "Ethnographic Interviewing." In *Handbook of Ethnography*, edited by P. Atkinson, A. Coffey, S. Delamont, J. Lofland, and L. Lofland, 369–383. London: Sage.
- Holbeche, L. 2015. *The Agile Organization: How to Build an Innovative, Sustainable and Resilient Business*. London: Kogan Page.
- Khiat, H. 2017. "Academic Performance and the Practice of Self-Directed Learning: The Adult Student Perspective." *Journal of Further and Higher Education* 41 (1): 44–59. https://doi.org/10.1080/0309877X.2015.1062849.
- Knowles, M. 1975. Self-Directed Learning. Chicago: Follet.
- Knowles, M., E. F. Holton, and R. A. Swanson. 2012. *The Adult Learner: The Definitive Classic in Adult Education and Human Resource Development*. London: Routledge.
- Kops, W. J. 1997. "Managers as Self-Directed Learners: Findings from Public and Private
 Sector Organizations." In *Expanding Horizons in Self-Directed Learning*, edited by
 H. B. Long and Associates, 71–86. Norman, OK: College of Education, University of Oklahoma.
- Lee, M. Y., and A. C. Edmondson. 2017. "Self-Managing Organizations: Exploring the Limits of Less-Hierarchical Organizing." *Research in Organizational Behavior* 37: 35–58.
- Lemmetty, S. & K, Collin. 2019. "Self-directed learning as a practice of workplace learning.

 Interpretative repertoires of self-directed learning at ICT work". *Vocations and Learning*. https://doi.org/10.1007/s12186-019-09228-x
- Lemmetty, S. & K. Collin. 2020. "Self-directed learning in creative activity: ethnographic research from the field of technology." Accepted in *Journal of creative behavior*.
- Lindeman, E. 1926. The Meaning of Adult Education. New York: New Republic.

- Merriam, S. 2001. "Andragogy and Self-Directed Learning: Pillars of Adult Learning Theory." *New Directions for Adult and Continuing Education* 89: 3–13.
- Merriam, S., R. Caffarella, and L. Baumgartner. 2007. *Learning in Adulthood*. San Francisco: Jossey-Bass.
- Moe, N. B., T. Dingsoyr, and T. Dypa. 2008. "Understanding Self-Organizing Teams in Agile Software Development." 19th Australian Conference on Software Engineering: 76–85.
- Noe, R. A., and J. E. Ellingson. 2017. "Autonomous Learning in the Workplace: An Introduction." In *Autonomous Learning in the Workplace*, edited by J. E. Ellingson and R. A. Noe, 1–12. New York: Routledge.
- Noe, R. A., A. D. M. Clarke, and H. J. Klein. 2014. "Learning in the Twenty-First Century Workplace." *Annual Review of Organizational Psychology and Organizational Behavior* 1 (1): 245–275.
- Pintrich, P. R. 2004. "A Conceptual Framework for Assessing Motivation and Self-Regulated Learning in College Students." *Educational Psychology Review* 16 (4): 385–407.
- Ramsdalin, H., and E. J. Skorstadin. 2016. *Flexible Organizations and the New Working Life: A European Perspective*. New York: Routledge.
- Rigby, C. S., and R. M. Ryan. 2018. "Self-Determination Theory in Human Resource Development: New Directions and Practical Consideration." *Advances of Developing Human Resources* 20 (2): 133–147. https://doi.org/10.1177/1523422318756954
- Schein, E. H. 1990. "Organizational culture." American Psychologist, 45(2), 109–119.
- Schmidt, H. 2000. "Assumptions Underlying Self-Directed Learning May Be False." *Medical Education* 34 (4): 243–254.

- Skule, S. 2004. "Learning Conditions at Work: A Framework to Understand and Assess Informal Learning in the Workplace." *International Journal of Training and Development* 8 (1): 8–20.
- Tannenbaum, S. I., R. L. Beard, L. A. McNall, and E. Salas. 2010. "Informal Learning and Development in Organizations." In *Learning, Training, and Development in Organizations*, edited by S. W. J. Kozlowski and E. Salas, 303–332. New York: Routledge.
- Tough, A. 1971. *The Adults' Learning Projects*. Toronto: The Ontario Institute for Studies in Education.
- Tynjälä, P. 2013. "Toward a 3-P Model of Workplace Learning: A Literature Review." *Vocations and Learning* 6 (1): 11–36. https://doi.org/10.1007/s12186-012-9091-z
- Vygotsky, L. S. 1978. "Mind in society. The development of higher psychological processes." In *Mind in society* edited by M. Cole, V., S. John-Steiner, S. Scribner, & E. Souberman. Cambridge: Harvard University Press.
- Wilson, D., and K. J. Hartung. 2015. "Types of Informal Learning in Cross-Organizational Collegial Conversations." *Journal of Workplace Learning* 27: 596–610.
- Yeo, R. K. 2008. "How Does Learning (Not) Take Place in Problem-Based Learning

 Activities in Workplace Contexts?" *Human Resource Development International* 11 (3): 317–330.