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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 highlighted as a way to increase an organisation's competitiveness and innovativeness. While organisations increasingly require SDL from employees, less attention is paid to the situations and frames enabling it. This study examines *self-directed learning projects* (SDLPs), situations in which SDL is realised as an individual or collective phenomenon. Based on ethnographic research, this study's data consisted of field notes, field records and interviews. I used analysis of key incidents and ethnographic content analysis as 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 addition, 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

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 produce opportunities 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 conducive 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 im-

portance 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.

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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 (formal-informal) and the interaction and roles between people (speakers-listeners, active players–passive players). Thus, the analysis process proceeded from extensive description to a more detailed analysis and structuring (see Emerson 2004).

----PLEASE INSERT TABLE 2 HERE----

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.

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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 oc-

curred 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 web-sites, 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 SDLs. 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.

----PLEASE INSERT FIGURE 1 HERE----

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 organisa-

tion'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.

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Declaration of interests statement

No potential conflict of interests.

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Tables

Organisation	Technology (A)	IT and Consulting (B)
Number of employees	270	30
Business area	Information technology, electrical engineering, automation technology	Information technology, technological consulting
Job titles	Software developer, Electrical and automation engineers, Customer service employee, IT-expert, Project leader, HR manager, CEO, Manager	Software developer, Consultant, CEO, HR Manager, Project leader, 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

Table 1. Target organisations and collected data

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

Table 2. Analysis of the study

Type of SDLP	SDLP events	Explanation of SDLP	Individual or group opportunities for SDL
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Table 3. Types and Features of SDLPs in Technology Work Organisations

<i>Organisation-oriented</i>	<ul style="list-style-type: none"> • External certificate training and other courses and lectures • Internal training days and seminars • Formal discussions between supervisor and employee 	<ul style="list-style-type: none"> • Organisation-based goals • Designed by the managers or supervisors • Implemented to transfer information from managers to employees • Employees as listeners • Formal 	<ul style="list-style-type: none"> • 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
<i>Work community-oriented</i>	<ul style="list-style-type: none"> • 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 	<ul style="list-style-type: none"> • Work community-based goals • Enabled and scheduled by the employer but designed and implemented by employees • Employees as listeners and actors • Formal 	<ul style="list-style-type: none"> • 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
<i>Work task-oriented</i>	<ul style="list-style-type: none"> • 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 	<ul style="list-style-type: none"> • 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 	<ul style="list-style-type: none"> • 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
<i>Employee-oriented</i>	<ul style="list-style-type: none"> • Learning projects and exercises at home • Learning situations produced by the 'empty moments' that appear in everyday work 	<ul style="list-style-type: none"> • Employee-based goals • Designed and implemented fully by employees themselves • Employees as actors • Informal 	<ul style="list-style-type: none"> • Possibility to set own or group learning goals, choose learning methods and apply and evaluate learning ➔ Broad possibilities for individual or group SDL

Figures

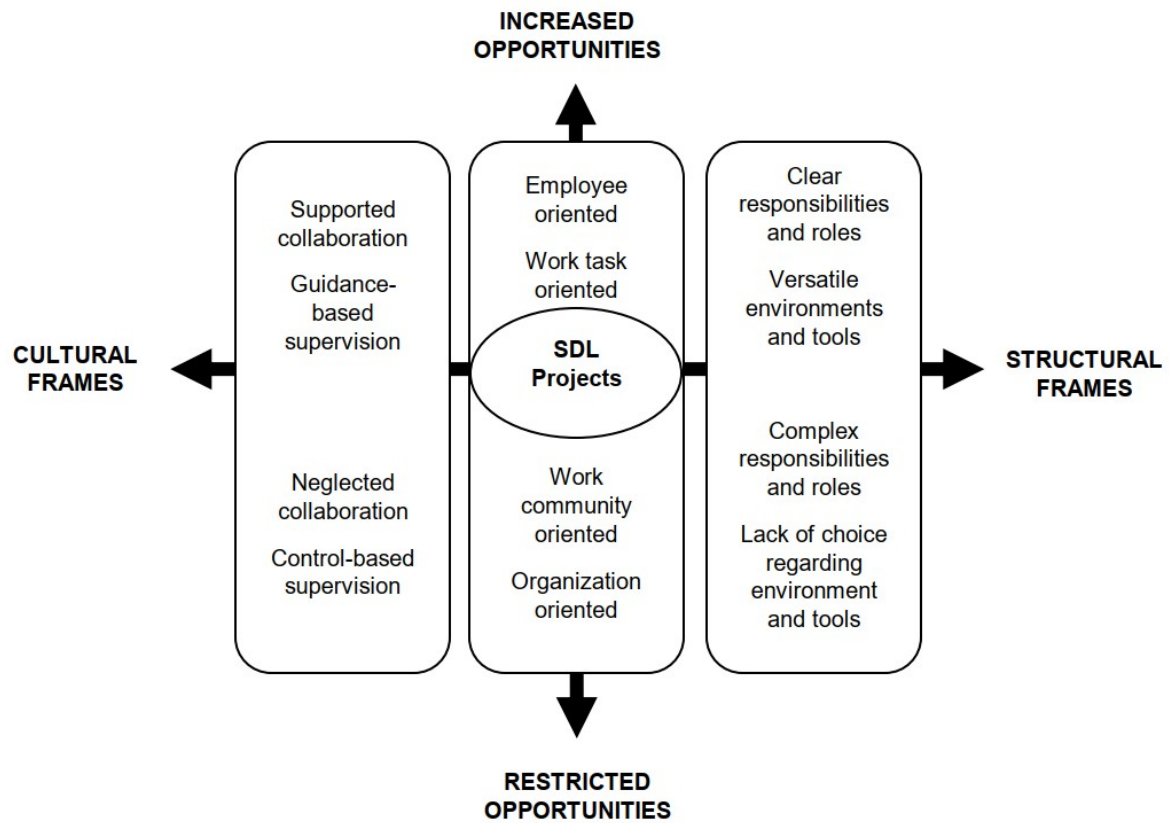


Figure 1. Projects and organisational frames affecting employee opportunities for self-directed learning.