Self-directed learning in self-directed teams in a healthcare organization

Master Thesis

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Abstract

Since the healthcare sector is a constantly changing environment, healthcare professionals are required to maintain competent by life-long learning to meet the ongoing changes. Self-directed learning (SDL) skills can enhance the iterative process of developing yourself. SDL skills can encourage better, more, intentionally and continuously learning with greater motivation. The work environment might be of vital importance in the extent to which employees are self-directed in their learning. Teamwork is an important characteristic of the work environment of a healthcare organization because no healthcare professional can deliver the complete healthcare process on its own. Particularly in the last decennia self-directed teamwork (SDTW) has grown. Apart from the fact that SDTW is used as a new way to organize work processes, it can also be used as a learning strategy. SDTW provides a good learning climate wherein collaboration, having relevant, authentic and meaningful work by the self-managing character leads to learning possibilities and motivation for learning. The presumption that the environment of SDTW stimulates learning raises the question whether SDTW is a perfect environment for encouraging SDL. Besides that SDTW creates a perfect environment for individual learning, learning and developing as a team is needed in order to create SDTW. Team learning behavior (TLB) is therefore very important and was added as independent variable to the study. By means of a survey this study has used multilevel analyses to measure the effect of SDTW and TLB on SDL and it also takes employee and team variables into account. It can be concluded that employee variables contribute to SDL when working in a team. Although, the main outcome is that the extent to which a team directs itself affects the extent to which the team members self-direct their learning processes. This confirms the theoretical assumption that SDTW can play a role in the professional development of healthcare professionals. Remarkable in this research is that the level of TLB is not associated with the extent in which team members are self-directed in their learning.

- And then I realized adventures are the best way to learn -

Preface (Dutch)

Eind februari 2013 begon mijn grote afstudeeravontuur. Een avontuur waarin ik heb ontdekt dat onderzoek doen zoveel leuker is dan ik had verwacht en dat het een grote maar leuke uitdaging is om praktijk en wetenschap te combineren. De belangrijkste ontdekking is misschien wel dat ik mij gedurende het proces realiseerde dat ik tot meer in staat ben dan ik zelf had gedacht. Het was ook een avontuur dat momenten kende van twijfel, onzekerheid, reflectie en soms zo'n wirwar aan gedachten en ideeën dat mijn hoofd er vol van zat. Bovendien was het een avontuur dat onderbroken werd door een geheel ander avontuur; een rondreis door Australië en Azië. Een tijd waarin ik heb mogen ervaren hoe mooi onze wereld is, een tijd waarin ik nieuwe culturen hebben leren kennen en heel veel verschillende mensen heb ontmoet. Het was dan ook even wennen om weer terug te zijn in Nederland en mij weer in het afstudeeravontuur te storten.

Beiden avonturen hebben voor een spannende, uitdagende, waardevolle maar met name leerzame tijd gezorgd. Dit avontuur had ik nooit kunnen volbrengen zonder de hulp en ondersteuning van anderen. Om die reden zou ik graag verschillende personen willen bedanken. Allereerst Maaike ontzettend bedankt voor jouw goede en fijne begeleiding! Jouw gedrevenheid, kritische houding, inhoudelijke kennis maar ook jouw enthousiasme hebben mij iedere keer weer gestimuleerd om het beste uit mijzelf te halen. Voor mij is dit zeker het bewijs dat leren beïnvloed kan worden door de omgeving in de vorm van een goede begeleider. Daarnaast de supervisie groep, in wisselende samenstelling, dank jullie wel voor de leuke discussies en jullie input. Medewerkers van Siza en SizaCollege, bedankt voor de mogelijkheid om mijn onderzoek uit te voeren binnen jullie organisatie maar ook voor de kans om een kijkje te nemen in de praktijk van het leren en ontwikkelen van zorg professionals. De vele inhoudelijke gesprekken en discussies hebben mijn kijk op het vak verruimd. Met name Sietske bedankt dat je mij zoveel vrijheid hebt gegeven om mijn onderzoek vorm te geven maar op de juiste momenten zeer waardevolle aanvullingen hebt gedaan.

Daarnaast wil ik graag mijn familie en vrienden bedanken voor jullie steun, hulp en interesse tijdens mijn studie. Mijn moeder en schoonmoeder voor de hulp bij het verwerken van alle 610 vragenlijsten. Een snel rekensommetje laat zien dat we samen meer dan 43000 Excel cellen hebben gevuld. Dat had ik niet graag in mijn eentje gedaan! Mijn vader voor het oplossen van de stress momenten die ontstonden wanneer mijn laptop kuren had en ik dacht dat al mijn bestanden verdwenen waren. Gelukkig toverde jij altijd weer ergens een back-up vandaan. Zusje, dank voor je nuchtere zussen gesprekken, deze werkten vaak als een goede oppepper. Vriendinnen, dank voor alle ontspannende en gezellige avonden, eindelijk is het laatste studentje van de groep bijna student af! Nienke bedankt voor al die keren dat je mijn stukken hebt nagelezen, je feedback hebt gegeven maar ook voor je humor dat lekker relativerend werkt. Lianne, dankjewel voor de gezellige koffiemomenten, dit waren fijne onderbrekingen op een drukke scriptie dag (en uiteraard dank voor het gebruik van je keuken als werkplek). Tot slot, Chef, dankjewel voor al die momenten dat ik mijn verhaal bij jou kwijt kon, het meedenken, je vertrouwen en je positiviteit. Maar vooral dank dat ik beide grote avonturen met jou heb kunnen delen.

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1. Introduction

Recently, several developments have affected the healthcare sector. Examples are: deregulation and privatization accompanied with market forces, competition, entrepreneurship and self-regulation of the society (Van der Grinten & Meurs, 2005). As a result, changes can be noticed in the care question and care need. Clients become more assertive and have specific wishes and preferences. In addition, there is an increased emphasis on encouraging the independency of clients where a large appeal is done on their self-reliance. More and more, clients need to regulate their own care process, as care is often organized in their own environment. Therefore, encouragement of self-management is important (Sociaal Economische Raad [SER], 2012).

For the healthcare professionals this means a changed work environment, wherein they need to work more question-based and client-centered (Berings, 2006). Work activities are becoming more diverse and varied because every situation with a client is different (van Dalen, 2012). To cope with this continuously changing work environment, it is essential that healthcare professionals maintain competent trough life-long learning. Self-directed learning skills can contribute to enhance lifelong learning (Bolhuis, 2003) and increase confidence, autonomy and motivation. People, who take initiative in learning, learn more, better, permanently, more purposefully and with greater motivation (Knowles, 1975). According to O'Shea (2003) healthcare professionals who are not capable to direct their own learning will not have the required skills to meet the ongoing changes in healthcare.

It seems difficult for organizations to enhance and foster self-directed learning (SDL) (Nenniger, 1999). A lot of previous research is aimed at the readiness for SDL. Hereby, the influences of personal and individual characteristics on SDL are the main research topics. For organizations it is difficult to influence those personal characteristics and traits. Since learning and therefore also SDL increasingly takes place in the work environment and is related to social environmental conditions (Straka, 2000; Eraut, 2004), there is more interest in specific workplace conditions that may have an influence on SDL. However there is lack of relevant research, and scholars' state that more research is needed to explore SDL in the context of the specific work environment (Confessore & Kops 1998; Ellinger, 2004; Merriam & Caffarella, 1999; Schunk, 2005).

The work environment of healthcare can be characterized by teamwork (Leggat, 2007). Sicotte, Pineault and Lambert (1993) state that teamwork is essential in providing healthcare, because no single healthcare practitioner can deliver the complete healthcare process on its own. Particularly in the last decennia self-directed teamwork (SDTW) has grown. SDTW are teams that have a common goal, shared responsibility and are self-directed in performing their tasks (Muthusamy, Wheeler & Simmons, 2005). New ways of organizing work are needed to respond to the external environment which is complex, uncertain and is continuously changing. SDTW possesses a variety of skills and is capable to respond to this external environment by its adaptability (Kozlowski & Ilgen, 2006).

Since learning is also a social activity (Billet, 2002; Candy, 1991; Wenger, 2000), in which the social environment is used to frame the knowledge transfer among individuals, multiple organizations use SDTW as a learning strategy (Brookfield, 1993; Confessore & Kops, 1998; Tjepkema, 2003). Wageman (1997) links SDTW and learning by stating that SDTW enhances learning because team members have the latitude to experiment with their work and develop strategies that are uniquely appropriate to tasks. Kessels (2004) adds to this, stating that SDTW creates relevant, authentic and meaning full work through the self-managing character which motivates employees for learning (Kessels, 2004).Those statements give the presumption that the work environment of SDTW stimulates individual learning and therefore SDL.

Thus, it is surprising that the link between SDTW and SDL currently is a relative unexplored topic. Only Confesorre and Kops (1998) make the transition from SDTW to SDL by noting that groups or teams play an integral part within SDL activities. Nevertheless, their report does not

recognize a clear link. Therefore, the purpose of this study was to get better insight into the relation between the level to which a team is self-directed in their work and SDL. This relation has been studied by also taking team learning behavior (TLB) into account. Besides that SDTW creates a perfect environment for individual learning, learning and developing as a team is needed in order to create SDTW (van Amelsvoort & Benders, 1996; Kommers and Dresen, 2010; Hitchcock and Willard, 1995; Tjepkema, 2003; Onstenk, 1996). TLB is the process in which the individual team member creates an individual mental model and introduces this into the team in order to develop a collective mental model. Therefore, every team member needs to take responsibility for their own learning process and bringing their own mental model into the team (Senge, 1992). A principle that is appropriate with the concept SDL. Finally, other employee and team variables are incorporated in this study as control variables.

2. Theoretical framework

This section will start with discussing the concepts SDL and SDTW. Subsequently, the control variables will be further defined. This section is concluded with the research questions and conceptual model for this study.

Self-directed learning

In the extensive body of literature on self-directed learning (SDL), several definitions can be found. In general two main perspectives can be distinguished: a personal and a process perspective. The personal perspective focuses at defining SDL as a personal characteristic. A lot of researches, wherein personal characteristics are the main factors studied, use the self-directed Learning Readiness Scale. This scale, developed by Guglielmino (1978), highlights personal characteristics regarding SDL processes. Guglielmino (1978) states that SDL is an ability which represents the voluntary, independent and continual learning habits of the individual learner. This assumption indicates that individual attributes predispose if a learner accepts one's thoughts and actions as a learner (Brockett & Hiemstra, 1991). From this point of view, SDL is a personal characteristic and trait of the learner.

The process perspective defines SDL as a learning process in which various steps need to be taken. These steps are taken on the initiative of the learner, with or without help of others. Knowles (1975) distinguishes different steps that are aimed at determining one's own learning needs, drafting learning objectives, defining resources for learning, selecting and implementing suitable learning strategies and lastly evaluating learning outcomes. From a process perspective, it is suggested that SDL can be seen as an instructional or learning method. This implies that the SDL process can be influenced by its environment. Therefore, it is relevant to determine to which extend the environment influences this process of SDL.

More recently, research acknowledges that both perspectives are relevant in defining SDL. Therefore, Brockett and Hiemstra (1991) propose to describe SDL as an overarching concept. This concept acknowledges the environmental factors, and that learners take responsibility in their learning process, as well as the personal characteristics that are needed to accept one's responsibility in learning. In addition, Raemdonck (2006) also refers to both aspects and appoints SDL as a characteristic and as an adaptation process. She defines SDL as an *adaptive characteristic* that supports the employee to deal with informal and formal work-related learning that result in the achievement of work-related goals, for example mastering new tasks and updating skills and knowledge (Raemdonck, Tillema, Grip, Valcke, & Segers, 2012). In this, characteristics refer to personal characteristics of the individual and adaptation refers to the response to the requirements and possibilities offered by the environment. Concluding, the organizational environment can be seen as a key determining factor of where, what, why and how anything is learned (Baskett, 1993) in which the individual brings his own personal traits, experiences and social world (Billet, 2002). Hence, both

perspectives formed a rational and therefore the definition of Raemdonck is used in the present study. This rational was also leading in the choice for the employee variables. The employee variables include variables related to individual characteristics and attributes, and variables related to the process view influenced by the possibilities and requirements offered by the environment.

Self-directed teamwork

In the literature, different definitions can be found of what constitutes a team. Most definitions emphasize the following aspects: group work, shared responsibility and a common purpose or team product (Hackman, 1987), which are all extremely general principles. A team can occur in different forms, sizes, contexts and can have different purposes. A lot of research is done on which team form will be the most effective. One form of teamwork, which is considered to be effective, is self-directed teamwork (SDTW) (Clifford & Sohal, 1998; Van Mierlo, Rutte, Vermunt, Kompier & Doorewaard, 2006). A self-directed team, also referred to as an autonomous team, a semi-autonomous team, a self-managing group or task group, is characterized by the fact that team members are self-directed in their work and are, to some extent, responsible for managing themselves and their tasks (Clifford & Sohal, 1998; Van Mierlo et al., 2006). Katzenbach and Smith (1993) subscribe the same characteristics in their definition of a team. In their opinion a team always has a mutual responsibility and shared leadership roles, otherwise it is a working group. In conclusion, the extent to which a team is responsible for their tasks and managing themselves can be seen as a distinguishing factor in team definitions.

It is stated that a team is not immediately self-directed or makes decision autonomously (Onstenk 1996; Tjepkema 2002). It can be seen as a development process in which teams continuously move through different phases to self-direction (Van Amelsvoort & Jaarsveld, 2000; Kommers & Dresen, 2010). In the first phase (a group individuals) you cannot speak of a team. The mutual bond with each other is not strong. Team members are aimed on their own personal interests. In the second phase (the group) the group is aware of their common goal and is the mutual bond stronger. Self-regulation and coordination gets more attention. In the third phase (the team) the focus is on collaboration and independently improvement. Team members see the team objective as their responsibility. The fourth phase (the self-directed team) is aimed at independently looking for opportunities for improvement. The team regulate themselves in service of the customer and the organization.

Hitchcock and Willard (1995) even assert that this development is an iterative process because teams always have something new to learn and new responsibility to adopt. Kasl, Marsick and Dechant (1997) mentioned this development in their phase's classification in which a SDTW in the end reaches a continuous team learning stage. Kommers and Dresen (2010) also assume that a team passes different stages but add a distinction in areas in which a self-directed team needs to develop. According to them SDTW need to be results oriented, independent, have a good alignment in tasks and roles and a high level of interrelationships.

From this perspective SDTW can be seen as a development process in the search for team autonomy, which makes it hard to define it. Therefore, in the present study the view of Tjepkema (2002) is the starting point. She states that the definition of SDTW needs to reflect the fact that there are different degrees of self-management or team autonomy. In conclusion, SDTW is seen as a process in where the team by moving through different phases develops to a higher level of self-managing or team autonomy.

Team learning behavior

Team learning behavior (TLB) is added as an independent variable to this study based on two reasons. The first reason is derived from the definition of SDTW. Like previously mentioned SDTW can be seen as a continuous process of developing (van Amelsvoort & Benders, 1996; Kommers and Dresen, 2010; Hitchcock and Willard, 1995; Onstenk, 1996; Tjepkema, 2003). Therefore, a team needs to develop a mutually shared understanding and integrate the different perspectives of every team member (Van den Bossche, Gijselaers, Segers & Kirschner, 2006). TLB is an important aspect that a team needs to show in the process to create a shared understanding or mental model. In addition, team learning is not only relevant for developing but also for teams to be more effective and creative, it enables growth of knowledge, and to enhance intellectual dialogue and better insight into crisis management (Edmondson, 1999; Senge, 1992).

The second reason is aimed at how team learning occurred. Team learning starts with individual learning. Every individual has their own mental model with personal experiences, learning activities and vision on the world. Each team member brings their own mental model into the team. Based on problems and concrete situations, team members engage in a dialogue and action (Senge, 1992). Therefore, every team member needs to take responsibility for their own learning process and bringing their own mental model into the team. A principle, that fits with the concept SDL.

Based on those two reasons in this study, TLB is seen as a process of creating mental models. Based on problems and concrete situations, team members engage in a dialogue and action, reflection, giving and receiving feedback and adaptation to improve (Edmondson, 1999). Van den Bossche et al. (2006) give a more specific explanation of this process. They define TLB as: "processes of construction and co-construction of meaning, with constructive conflict as a vehicle to enhance (co) construction". Both definitions emphasize the purpose to create a collective mental model or meaning.

Control variables influencing self-directed learning

In addition to the relationships that have not previously been explored, relationships, in the form of control variables are also included in this study. These control variables have been proved to influence SDL in previous studies. Two categories of control variables can be distinguished. The first category includes employee variables. This category covers variables that are measured at the individual employee level (Level 1). The individual employee level includes variables focused on individual characteristics and variables related to the process view, derived from the chosen definition of SDL. The second category includes team variables. The team variables are measured on team level (level 2). The influence of team variables on the extent to which SDL occurs is an unexplored topic, therefore previous studies that have indicated team variables that influence team effectiveness form the basis for this study.

Employee variables influencing self-directed learning

Regarding the individual characteristics, eight personal variables were selected that have been proven to be relevant for the extent in which individuals are self-directed in their learning. The *age* of subjects is added because previous research showed that younger people are more self-directed in their learning (Reio, 2004). Regarding *gender* of subjects, there are studies showing no relationship, but most studies that show a relationship, indicate that females are associated with a higher level of SDL than males (Stockdale, 2003). *Proactive attitude* is also included; having a proactive attitude influences SDL because this ensures personal initiative in many different activities and situations (Seibert, Kraimer, & Crant, 2001). There can be assumed that SDL and proactivity have a strong relationship. Raemdonck (2006) states that both constructs are goal directed, intentional and based on an active approach. From a theoretical and empirical point of view, four differences can be determined. First, proactive attitude is a broad construct and SDL is a more specific construct. Second,

the construct SDL has a dynamic and interactive characteristic and the proactive attitude construct is a more or less stable personal trait. Third, the proactive attitude construct has the purpose to affect environmental change and the construct SDL is more aimed at controlling. Fourth, proactive attitude affect proactive behavior which matches the organizational goals, SDL in learning has more a focus on the individual objectives.

In addition, research showed that there is a positive relationship between a higher *educational level* and to what extent people are self-directed learners (Stockdale, 2003). *Occupational categories* was also added to the study because, for example, research of Durr, Guglielmino and Guglielmino (1996) showed that there are differences in readiness for SDL between occupational categories. *Work experience* is also assumed to influence SDL. Obtaining more work experience gives employees more confidence in doing their work more independently (Raemdonck, 2006). In addition, *team experience* is included which refers to how long an employee works in a team. Sundstrom, de Meuse and Futrell (1990), state that the effectiveness of a team improves when a team exists and works together for a longer period of time. Finally, *employment* is added, expressed by how many hours employees work per week. Employees who work part-time are less connected to the organization and have less face to face contact which could have a negative impact on interpersonal relations, collaboration and loyalty (Hallowell, 1999).

With regard to the process view, three contextual variables related to the work environment were included. First, *task variety*, the more tasks vary the more employees have the possibility to choose their learning goals and content of the learning activities (Foucher, 1996). The second contextual variable was *receiving feedback* (Hackman & Oldham, 1975; Raemdonck, 2006). Positive feedback appears to strengthen perceived competence and foster intrinsic motivation, which gives more confidence in engaging in activity (Deci, Ryan & Williams, 1996). Finally, *autonomy in work* was added to this study. When persons feel they are in control of their own work, tasks and schedules, they are more likely to learn self-directed (Straka, 2000).

Team variables influencing SDL

Team variables include two team characteristics which are important to create an effective team. First we included *team composition*, because a good team composition increases the range of competencies within the team and it is easier for team members to stand in for each other (Sundstrom et al., 1990) Team composition encompasses two components heterogeneity and flexibility, in which heterogeneity refers to the extent in which team members differ in experiences and abilities, and flexibility refers to the extent in which team members can perform each other's jobs (Campion, Papper & Medsker, 1996). The second team level variable is *team size*. Research showed that larger teams were less effective because additional coordination requirements are needed which inhibit the team performance (Campion et al., 1996).

Research question

In the conceptual model (see Figure 1), the consistency between the different variables is shown. The variables shown above the dotted line will be measured at the team level (level 2) and the variables below the dotted line will be measured at the individual employee level (level 1). In order to guide the research, the following research question is posed:

What is the effect of self-directedness in teamwork and team learning behavior on self-directed learning of healthcare professionals, controlled by employee and team level variables?

In addition, the following hypotheses are formulated:

1. Self-directedness in teamwork (SDTW) has a positive influence on the extent to which healthcare professionals are self-directed in their learning.
2. Team learning behavior (TLB) has a positive influence on the extent to which healthcare professionals are self-directed in their learning.

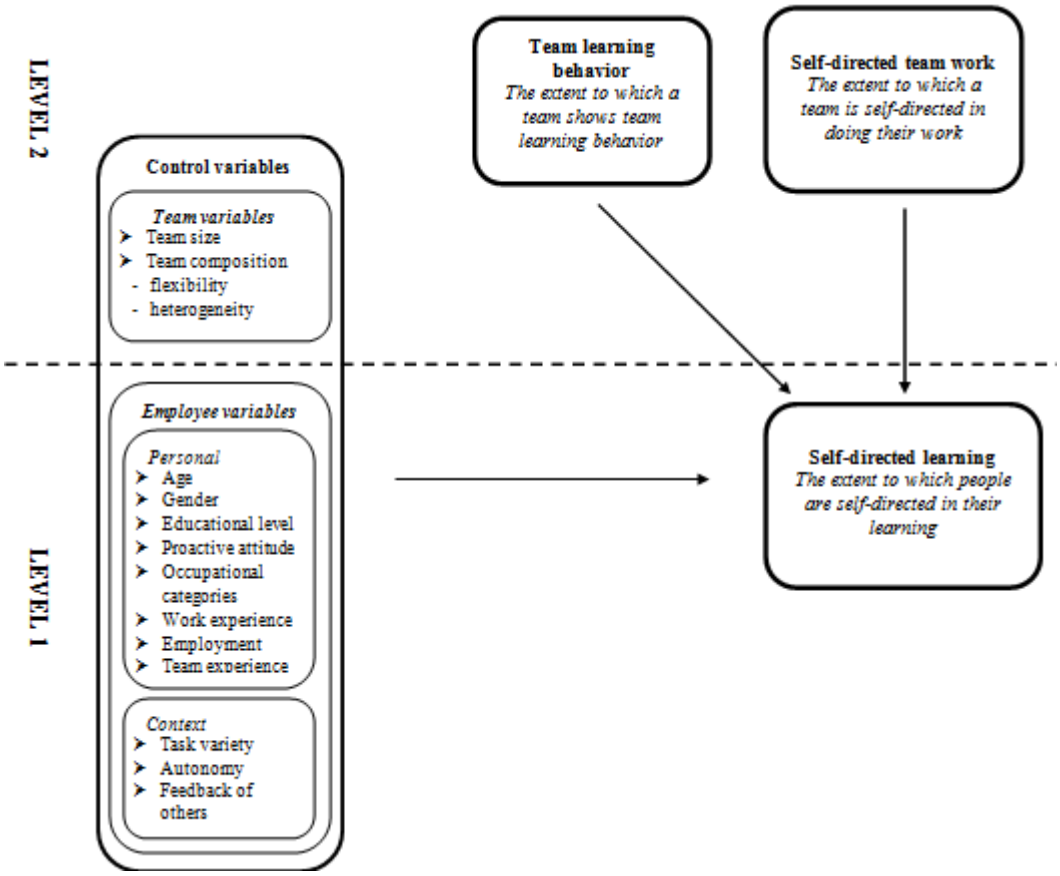

Figure 1. Schematic representation of the conceptual model

3. Method

Context

This study was carried out within the organization Siza. Siza is a healthcare organization aimed at providing support for people with mental and/or physical disabilities. Siza consists of approximately 2800 employees that deliver everyday personal and professional care and services. Siza wants to organize her care and support based on the question of the client, meaning that the client is in control. This also requires from the employees to take personal control in working and learning (SizaCollege Jaarplan, 2013). As a result, teams need to be more self-directed in their work and employees more self-directed in their learning.

Research methodology

This study is a cross sectional survey study as it is based on observations representing a single point in time. Surveys are an appropriate method to investigate attitudes and orientations of a large(r) population that cannot be observed directly (Babbie, 2010). In addition, data gathering with a survey makes it possible to make generalizations from the sample being studied to broader groups beyond the sample (Swanson & Holton III; 2005). Moreover, use of quantitative data makes observations more explicit and objective, which leads to more representative results (Babbie, 2010).

Procedure

In this study, a survey on paper was used. The main reason for this is that not every employee in the organization regularly uses a computer during their work and/or has no e-mail account. To promote the survey, managers were informed about the study and asked to inform their team leaders. Team leaders received the surveys and a letter with an explanation of the purpose and importance of the study and their instructions. Furthermore, they were asked to distribute the survey among their employees. Because the survey distribution depended on team leaders, there was a risk for non response. To minimize this risk, messages were placed on the intranet and e-mails were sent to the individual employee to inform them. After three weeks, a reminder was send by e-mail.

Sample

This study was aimed at data gathering on the employee and team level. On the employee level, every team member was selected, except the team leader, interns and temps. On team level, specific night shift teams were excluded and several teams on the basis of improper circumstances (e.g., changing of team leader, uncertainty about the ability to maintain jobs and problems between team members and or team leader). All the teams and employees from the organization that complied with the determined conditions were approached, in order to obtain results that were an accurate reflection of the entire organization. In total 1290 employees and 120 teams were approached for this study. The data collection resulted in 612 respondents (response rate = 47.4%) of 99 teams (response rate = 82.5%). In the first phase of the data processing, three respondents were excluded because of missing all the values on at least one scale. In total there remained 609 respondents in the starting dataset.

From the starting dataset the participating teams were selected (Level 2). This selection was based on three requirements. The first requirement was that it should be possible to appoint respondents to a team. In total, for three respondents it was not clear to which team they belonged, therefore they were excluded from further data analysis. The second requirement was aimed at the sample size on team level. In order to measure variables on team level the sample size on team level needed to be taken into account. When sample sizes increases at all levels, estimates and their standard errors become more accurate (Hox, 2010). To be able to use the collected data as much as possible and

still have enough team members in the teams, the response rate per team was set on 33%. The third requirement was in line with the second requirement. Teams that were included in the study needed to have a response of at least three team members. Based on these requirements in total 544 respondents (Level 1) of 80 teams (Level 2) were included in the study.

The teams in the final data set consisted of 3 to 18 employees, with an average of 6.8 (SD = 3.24). More woman than men work in healthcare and this is also reflected in the participating employees. In total 79 respondents were male (14.6%) and 461 were female (85.4%) with four missing values. The ages arranged from 20 to 65 and the average age can be determined at 41.67 (SD = 11.60, missing 79). In addition, the participating respondents have an average work experience of 17. 26 years (SD = 10.95, missing 10) and work on average 25.27 hours a week (SD = 5.97, missing 6). This means that relatively few employees work fulltime. Regarding the educational level of the participating respondents it can be concluded that almost half of the respondents have completed an intermediate vocational education level four or a HAVO or VWO diploma (49.1%). In addition, 26.8% of the respondents have a diploma of higher vocational education or university. In table 1 a complete overview of the descriptive statistics can be found.

Table 1. Overview descriptive statistics respondents

Variable	Mean	SD
Gender	Male: 14.6% Female: 85.4%	
Age (years)	41.67	11.60
Education	Lower secondary education (VMBO and MBO1): 6.4% Intermediate vocational education level 2 (MBO2): 3.7% Intermediate vocational education level 3 (MBO3): 13.2% Intermediate vocational education4/Havo/Vwo: 49.1% Higher education (professional level): 26.1% University: 0.7%	
Work experience in years	17.26	10.95
Working hours	25.27	5.97
Team size	6.8	3.24

Instrumentation

In this research, a survey was used to gather data aimed at determining the extent to which healthcare professionals are self-directed in their learning, data focused on the extent to which the teams are self-directed in their working, and data related to the personal, contextual and team factors. This survey is mainly based on existing, valid en reliable scales. In total, the survey consists of 74 items with a five-point Likert scale. The complete survey can be found in appendix 1.

Self-directed learning. To measure the extent to which individuals are self-directed in their learning, the scale "self-direction in learning processes" was used developed by Raemdonck (2006). In research among low qualified employees the scale turned out to be reliable and valid (Raemdonck, 2006). The scale includes 14 items, some typical Flemish expressions were adapted to the Dutch context.

Self-directed teamwork. For the variable SDTW the (self) diagnostic instrument of Kommers and Dresen (2010) was used. The validity and reliability of the instrument was not previously tested in other research. Still, this scale was used because it is based on the thought that SDTW is a development, wherein a team grows. The scale distinguished four components that encompass SDTW. Those components are based on the areas in which SDTW need to grow; results oriented independent, have a good alignment in tasks and roles and a high level of interrelationships. Every area consists of four items with four answer possibilities. The four answer descriptions reflect different development stages of SDTW. The most appropriate description for the team needs to be recognized. The items in

this scale were aimed at educational institutions; therefore some questions were rewritten with examples specific for healthcare organizations. The scale contains 16 items.

Team learning behavior. To measure TLB, the 9 item scale of Van den Bossche et al. (2006) was used. In research of Van den Bossche et al. (2006) these items showed a good reliability and validity. Also, for this scale use was made of back translation.

Employee variables (level 1: personal). The following personal variables were included in the current study; *gender, age, occupational categories, work experience, employment, educational level* and *proactive attitude*. For educational level, respondents could choose between six possible answers: secondary education, vocational education level two, three or four, professional higher education or university. The possible answers regarding occupational categories were varying: student, assistant attendant, attendant, employee household, assistant client care and art therapist. For both questions the answer possibility 'other namely:' was added. *Proactive attitude* was measured with a standardized scale from Raemdonck (2006). This scale in Dutch consists of 10 items; again small adaptations were made to the Flamisch expressions.

Employee variables (Level 1: context). In total, three contextual variables were measured in this study. The first two variables *autonomy in work* and *task variety* was measured by the scale of (Raemdonck, 2006). Both scales proved reliability (2006). The factor *feedback of others* was measured by a reliable and valid scale of Morgeson and Humphrey (2006). This English scale contains three items, which were translated via the translation-back translation method. Translation of items can have an influence on the reliability and validity of the scale, especially for a scale with only three items. Therefore, the self-developed item 4 (see appendix A, scale feedback of others) was added to the scale.

Team variables (level 2). There are two team variables measured. *Team composition* consists of two components; *flexibility* and *heterogeneity*. Both components were measured by using the scale of Campion et al. (1996) which turned out in his study to be reliable and valid. The variable *team size* was measured by using the latest information of the organization about the number of team members per team.

Factor analysis

In this study, validity and reliability of the instrument was ensured by factor analysis and reliability analysis. The purpose of a factor analysis is to define the underlying structure among variables and determining the construct validity (Field, 2009). In this study, data has been gathered based on 74 items, measuring constructs that cannot directly be measured. Therefore, it is helpful to know whether the different items really reflect a single variable. Subsequently, the Cronbach's alpha (α) was calculated, which is the most common measure of scale reliability. Reliability means that measures should reflect the construct that it is measuring (Field, 2009). The factor and reliability analyzes has been performed with the basic dataset of 609 respondents. Therefore, use was made of five principal axis factoring (PAF) analyzes. First a factor analysis was done for the items of SDL and proactive attitude, second for the employee variables (context), third for the items of the variable team composition (team variables), fourth for the items that measuring TLB and finally for the items of SDTW.

For all the five factor analyses the same steps were followed. First, for each factor analysis the data set was assessed for suitability by considering the sample size, factorability of the correlation matrix and outliners among cases (Pallant, 2013). The suitability of the data was confirmed for four factor analyzes. For the factor analysis regarding the team variables the correlations matrix showed only one item with correlations below .3 (Field, 2009; Pallant, 2013), therefore this item was removed from the analysis en the factor analysis was repeated.

Secondly, adequacies for factor analysis were verified and the presence of the number of components was determined by Kaiser's criterion, Bartlett’s test of Sphericity and the scree test. For

all the five factor analysis the Kaisers's criterion and Bartlett's test of Sphericity verified the adequacy for factor analysis (See appendix B). Subsequently, initial analyzes were done for the five PAF analyzes to obtain eigenvalues for each component in the data. Based on the scree test (Catell as cited in Field, 2009) a two component solution was performed for SDL and proactive attitude and showed an explanation of 30.50% of the total variance. The factor analysis for contextual variables showed in total 3 components with eigenvalues over Kaiser's criterion of 1 and in combination they explain 46.62% of the variance. Regarding team characteristics, one component had eigenvalues over Kaiser's criterion of 1 which explains 31.61% of the variance. The factor analysis for TLB showed also one component that had eigenvalues over Kaiser's criterion of 1 which explains 45.29% of the variance. The additional analysis for SDTW showed 2 components that had eigenvalues over Kaiser's criterion of 1 and in combined they explained 36.19% of the variance.

Third, the oblimin rotation was performed to aid in the interpretation of the number of components. The pattern matrix was used for interpretation of the factor loadings of the items. In appendix B, for each factor analysis the factor loadings can be found after rotation. To select which items fitted the best within the found model use was made of the removal criteria of Worthington and Whittaker (2006). The removal criteria used are: Items with factor loadings less than .32; items with a factor loading that has less than 0.15 difference with the item's highest factor loading and the items with factor loadings higher than 0.32 on two or more variables. Based on those removal criteria on the employee level (context), team level and TLB no items were removed. For the factor analysis on the *SDL* and *proactive attitude* items, three items were removed and for the factor analysis of *SDTW* two items were removed.

For the factor analysis on the *SDL* and *Proactive attitude* items, the items that cluster on component 1 represent *self-directed learning* and the items that cluster on component 2 represent *proactive attitude*. In comparison with the original developed scales of Raemdonck (2006) there are two items which originally belong to the scale proactive attitude that load higher on the SDL scale. This can be explained with the theoretical background. Both items are aimed at changing which can be seen as a relevant aspect of the learning process (Bolhuis & Simons, 2001). The *self-directed learning* scale has a Cronbach's alpha of .85 and for the *proactive attitude* scale a Cronbach's alpha of .756 was measured. Like previously stated, both concepts could have a strong relationship. To ascertain discriminant validity the correlation between both constructs should not be too high ($r \leq .50$). By using the Spearmans' rho (ρ) the relationship between self-directedness in learning and proactive attitude was investigated. There was a positive relationship between the two variables, $r = .484$, $n = 541$, $p < .001$. But the relationship is not higher than 0.5, therefore it can be concluded that the correlation between both construct is not too high and thus acceptable.

The factor analysis regarding the *employee variables (Level 1: context)* showed 3 components. The items that cluster on component 1 represent *autonomy in work*, the items that cluster on component 2 represent *feedback of others* and the items that cluster on component 3 are representing *task variation*. All the three scales show a good internal reliability with respectively a Cronbach's alpha of .74, .80 and .66.

For the factor analysis concerning the variable *team composition* (level 2: team) it can be concluded that the items of the separate original scales; *heterogeneity* and *flexibility* can tap into a general construct that can be defined as *team complementarity*. Also, the internal consistency was acceptable with a Cronbach's alpha of .67. *Team complementarity* refers to the extent in which team members complement each other in background and experiences and show willingness and capability of being complement to each other.

The factor analysis for *TLB* showed one component, all items represent TLB as suggested by the scale authors (Van den Bosche et al,). In addition, the TLB scale has a good internal consistency, Cronbach's alpha of .86.

The factor analysis of *SDTW* showed two components. Component 1 represents *collaborative teamwork* and component 2 represents the *self-managing process*. The current differentiation into two components does not correspondent with the original four components, although the two components can be explained by the theory. Although the original authors; Kommers and Dresen (2010), expected four components the dichotomy corresponds with the vision of Kirkman and Shapiro (1997). They assume that primarily, *SDTW* consist of two dynamic components: *the process of self-management* and *collaborative teamwork*. In which *the process of self-management* refers to the team's own responsibility (Wellins et al., 1990), team's independency, planning and scheduling attributes (Hackman, 1976), and managing themselves (Cannon-Bowers, Oser and Flanagan, 1992). The component *collaborative teamwork* refers to assigning jobs to members, taking action on problems (Wellins et al., 1990), receiving group compensation and performance feedback (Hackman,1976), sharing control and power (Appelbaum, Abdullah & Shapiro,1999) and having a group primary task (Muthusamy, Weeler and Simmons, 2005). Both, the component *process of self-managing* as *collaborative teamwork* show a good internal consistency, respectively a Cronbach's alpha of .74 and α =.82. An overview of the Cronbach alpha's of the final scales are given in table 2 and 3.

Table 2. Mean, Standard Deviation, Spearman's Correlation Coefficient and Cronbach's Alphas for the individual-level variables

Variable	Mean	SD	1	2	3	4	5	6	7	8	9	
Individual level												
1.Employment	25.28	5.97	1.00									
2.Work experience (years)	17.26	10.91	-.09*	1.00								
3.Team experience (years)	5.84	4.83	-.07	.46**	1.00							
4.Age	41.67	11.60	-.13**	.73**	.40**	1.00						
5.Self-directed learning	3.85	.42	**.10***	**-.22****	**-.19****	**-.17****	1.00	**.85**				
6.Proactive attitude	3.41	.44	.02	.01	-.03	**-.02**	.48**	1.00	**.76**			
7.Autonomy in work	3.89	.48	.07	-.03	-.06	**.013**	.33**	.23**	1.00	**.74**		
8.Feedback of others	3.33	.61	-.05	-.08	-.06	**-.01**	.22**	.17**	.37**	1.00	**.80**	
9.Task variation	3.79	.71	.08	.11**	.03	**.13****	.19**	.04	.38**	.18**	1.00	**.66**

*. Correlation is significant at the 0.05 level (2-tailed)
**. Correlation is significant at the 0.01 level (2-tailed)

Table 3. Mean, Standard Deviation, Spearman's Correlation Coefficient and Cronbach's Alphas for the team-level variables

Variable	Answer options	Mean	SD	1	2	3	4	5
1.Team complementarity	5	3.69	.48	1.00	**.67**			
2.Team learning behavior	5	3.59	.49	.57**	1.00	**.86**		
3. SDTW- Collaborative teamwork	4	2.48	.56	.48**	.63**	1.00	**.82**	
4. SDTW- Process of selfmanagement	4	2.36	.52	.30**	.37**	.53**	1.00	**.74**
5. Team size	-	6.8	3.24	-.01	-.01	.05	-0.7	1.00

*. Correlation is significant at the 0.05 level (2-tailed)
**. Correlation is significant at the 0.01 level (2-tailed)

Data analysis

Data preparation

Prior to the analysis, the variables were checked on multicollineairity. Multicollinearity could be a problem because it may affect the standard errors of the independent variables, which are the predictors. This applies in particular for regression analysis with multiple predictors. When there is high level multicollinearity between predictors, it becomes impossible to obtain unique estimates, because there are more number of combinations that would work well (Field, 2009). Regarding the

factor analysis this can lead to difficulties in determining the unique contribution to a factor of the variables that are highly correlated.

First, correlation analysis was performed to ascertain the level moderation between variables. This was done by using Spearman's Rho (ρ) since it is more resistant to input errors and the questionnaire had a Likert scale which indicates that measurements are taken from ordinal scales. Because variables measured at employee level (level 1) cannot be compared with variables measured at team level (level 2), two different analyzes were performed. In table 3 and 4 the correlations between the different variables is shown. It is very clear that there were a lot of highly significant correlations ($p < .01$ and $p < .05$). However, there were no correlations above .80. This indicates that there is probably no multicollinearity.

In order to gain more certainty, the variance inflation factor (VIF) and the tolerance statics were checked. This was done by performing a regression analysis for every variable, whereby the collinearity diagnostics option was selected. The results did not indicate the presence of multicollinearity. The VIF should not be higher than 10 (Myers, 1990), for the variables on employee level (level 1) the highest found value is 3.756 and for the variables on team level (level 2) 2.238. The tolerance statistics should not be below 0.2, the lowest found value on employee level is 0.27 and on team level 0.45.

In addition, to check multicollinearity, empirical evidence was also needed to validate aggregation of employee level data (Kozlowski & Klein, 2000). Variable measuring team complementarity, TLB, process of self-management and collaborative teamwork are conceptually meaningful at the team level (level 2). Therefore, the individual gathered data from individual team members needed to be aggregated at the team level (Hox, 2010). To determine if aggregation was allowed, the intermember reliability was calculated (ICC1 and ICC2). The intraclass correlation 1 (ICC1) provides an estimate of the proportion of variance of a measure that is explained by unit membership. It also can be interpreted as an estimate of the extents to which raters are interchangeable. The ICC1 was calculated by using the intercept only model of the multilevel regression model. The intraclass correlation 2 (ICC2) indicates how reliable the group means are within a sample (Kozlowski & Klein, 2000). The ICC2 is a variation of the ICC1. If one knows the ICC1 and the average size of the group one can use the Spearman-Brown formula to estimate ICC2 (Bliese, 2000).

The ICC1 can be interpreted as an effect size; values of .01, .10, and .25 illustrate a small, medium and or large effect (Bliese, 2000). Table 5 showed that all the variables have an intraclass correlation coefficient 1 (ICC (1)) ranging from 0.10 to 0.26 which indicate that a medium to large part of the variance can be explained by unit membership. Regarding the ICC2, four variables had a higher value than 0.50 which provided evidence for reliable group means (Bliese, 2000). Therefore, it is allowed to aggregate the data. The ICC2 value for team complementarity was just below 0.50, but the group mean is relative small (6.8). Group means based on many people per group are more reliable than group means based on fewer people per group (Klein and Kozlowski, 200). In combination with the ICC1 results for team complementarity, the aggregation on team level was allowed. Supported by these findings all the team related variables were aggregated to the team level by using the group mean.

Table 5. Values of ICC (1) and ICC (2)

Variable	Intercept	Residual	Mean Team Size	ICC1	ICC2
Team complementarity	.023	.207	6.8	0.101	0.430
Team learning behavior	.044	.196	6.8	0.184	0.605
SDTW - The process of self-managing	.077	.244	6.8	0.241	0.683
SDTW - Collaborative teamwork	.071	.202	6.8	0.261	0.706

Finally, the correlation analysis was used to determine the degree of relationship between the level 1 variables and SDL. This was only done for the variables at the individual level. In table 3 and 4 the output of the Spearman rho analysis can be found. Concerning the correlations, the significance values of .05 and .01 were used (two-tailed).

Looking at table 2, it can be noted that there were a lot of highly significant correlations ($p <$ .01). However, relationships between the independent variables and the dependent variable SDL were of importance. These correlations are represented in bold. It can be noted that most of the expected relationships derived from the literature can be significantly confirmed. Only for work experience ($r =$ -.22, $p =$ < .01) and team experience ($r =$ -.19, p = < .01) the output showed an opposite relation as expected, based on the literature. But looking at the effect size of work experience and team experience it can be stated that there was a presence of a relative small effect size. In general most of the effect sizes are not very large. Autonomy in work and a proactive attitude were the two larger effect sizes with respectively $r = .33$, $p =$ < .01and $r = .48$, $p =$ < .01.

Based on this information it can be concluded that all the expected relationships with SDL were significant correlated. The effect sizes are relatively small and show an opposite relationship for work experience and team experience; still most of the expected relationships had at least a significant association with SDL. This strengthens the basis for using the level 1 variables as control variables in the further analysis. Nevertheless, a correlation analysis does not provide insight in the dependence of one variable on another.

Multilevel analysis

The multilevel analysis is based on the perspective that a more integrated understanding is needed of phenomena that evolved across levels in organizations (Kozlowski & Klein, 2000). Group and organizational factors are contexts for individual's perceptions, behavior and attitude. Therefore, it is important to take into account the contextual effects on lower -level phenomena (Kozlowski & Klein, 2000). Those levels can be classified as hierarchical levels and variables may be defined at each level (Hox, 2010). In this study, hierarchical modeling (HLM) has been used. This analysis is appropriate because a normal regression analysis cannot give good results with hierarchical data (Verboon, 2012). In hierarchical data some variables are clustered or nested in other variables (Field, 2009). As a result intercepts and or coefficients could fluctuate over groups and simple regression cannot cope with that. HLM models can explicitly model this variability in regression slopes. In this analysis SDTW (process of self-management and collaborative teamwork), TLB and the employee and team variables are the independent variables and SDL is the dependent variable.

The categorical variable occupational categories were excluded from the study. From the data collection it became clear that many different function names were used and employees had combined functions. This made it impossible to classify the respondents in concrete and clear categories. The other two categorical variables: gender (male = 0, female = 1) and educational level were included as factors. Educational level was included on two categories, high educated employees and low educated employees (High = 1, Low = 0). High educated employees are employees that finished at least MBO 4 or higher and low educated employees had finished not more than MBO 3 education.

To test for the main effects of the independent variable on SDL by the HLM model, use was made of the Linear Mixed Models in statistical software SPSS v21. In addition, the method was set to maximum likelihood (ML) and covariance type to variance components. The data was centered by grand mean centering because multilevel models with centered data is tend to be more stable, and estimates can be treated more or less independent of each other (Hofmann, Griffin & Gavin, 2000).

The first step in building the HLM model is running an intercept only model. This model, also called the null-model, does not contain the independent variables but only the dependent variable

SDL. In table 6 the results of the null model can be found. The ICC for SDL was .48 ($p = 0.015$), this indicates that 48% of the variance in SDL occurred between teams.

The HLM model was further developed by adding variables step by step. If the added variables improved the model significantly the variables were retained in the model. To what extent the model was improved was measured with the χ^2 *change.* First, the variables at the employee level (level 1) were added to the model, this was done in three steps. In the first step the demographic variables; gender, age and educational level were added (Model 1). In the second step, employment, work experience and years in current team were added (Model 2). In the third step, proactive attitude was added to the model (Model 3). Subsequently the contextual variables, autonomy in work, feedback of others and task variety were added to the model (Model 4) and finally the variables measured at team level (level 2) were also added (Model 5). For all variables fixed effects were studied. In Model 6, also the random effect of the proactive attitude was included. Multilevel modeling has the advantage that it can estimate the degree to which the effect, in this case proactive attitude, differs across the individuals.

4. Results

HLM Model

In table 6 the development of the HLM model is shown. In model 1 the variables age, gender and educational level were added this provides a significant better model (X^2 *change* (6) = 74.535, $p < 0.01$) with respect to the null-model. In model 2 the variables employment, work experience and proactive attitude were added also resulting in a significant better model (X^2 *change* (3) = 22.854, $p < 0.01$). In model 3 the variable proactive attitude was added as fixed effect. This improved the model significantly (X^2 *change* (2) =176.008, $p < 0.01$).In model 4 the variables on the employee level (context), autonomy in work, feedback of others and task variation were added and again the model improved significantly (X^2 *change* (3) =24.35, $p < 0.01$). In model 5 variables measured at team level (level 2); team size, TLB, team complementarity, process of self-management and collaborative teamwork were added to the model. Again this provided a significant better model (X^2 *change* (5) =14.267, $p < 0.05$). Finally, in model 6, proactive attitude was added to the model as random effect. This model was also found to provide a significant better model, therefore model 6 was retained (X^2 *change* (1) = 12.389, $p < 0.01$).

Considering model 6, it can be noted that regarding the employee variables (personal) there was a significant relationship between gender (Est. = -.121, $p < 0.050$) and SDL. Namely, females were more self-directed in their learning than males. Educational level also showed a significant relationship with SDL (Est. = -.112, $p < 0.01$). Namely, lower educated persons were found to be less self-directed in their learning than people who were higher educated. However, there was only a relative small effect. The relationship between age and SDL did not prove to be significant (Est. = .001, $p > 0.05$). There is no difference in the extent in which younger employees are self-directed in their learning compared to the older employees. There is also no significant relationship between employment (Est. = .004, $p > 0.05$) and SDL. Employees who work less hours appeared not less self-directed in their learning compared to employees who work more hours. The variables work experience (Est. = -.007, $p < 0.01$) and years in current team (Est. = -.009, $p < 0.05$) have a significant negative relationship with SDL. This declared that when employees have more work experience and when employees longer work in a team, employees are less self-directed in their learning.

In addition, the variables proactive attitude (Est. = .478, $p < 0.01$) as fixed effect showed a significance relationship with SDL. This fixed effect indicated that employees with a more proactive attitude will be more self-directed in their learning. Proactive attitude (Est. = .05, $p < 0.05$) as random

effect also proved to be significant in relation to SDL. This means that there are significant individual differences between the extent of the effect of proactive attitude on SDL across the employees.

The variables on the employee level (context); feedback of others (Est. = .069, $p < 0.05$) and task variation (Est. = .056, $p < 0.05$) yielded a significant relationship with the extent in which employees are self-directed in their learning. This indicated that employees that regularly receive feedback of colleagues and/or supervisors are more self-directed in their learning than employees who do not receive feedback regularly. This also applied for task variation. Employees that experience variation in their tasks were found to be more self-directed in their learning than employees who do not have that experience. The contextual variable autonomy in work proved not to have a significant relationship with SDL (Est. = .060, $p > 0.05$). Having autonomy in your work seemed not to influence the extent in which employees were self-directed in their learning.

Regarding the team variables, team complementarity provided no significant relationship with SDL (Est. = .062, $p > 0.05$). This means that a team with a high extent of team complementarity provided not more self-direction in learning of individual employees. For the variable team size (Est. = .000, $p > 0.05$) no significant relationship was found with SDL. This gives the impression that how large or small a team is has no influence on the extent to which an individual is self-directed in his or her learning

Team learning behavior (Est. = -.150, $p > 0.05$) proved not to have a significant relationship with SDL. This states that when teams showed TLB it did not provide more self-direction in learning for the individual employee. Self-directed teamwork variable collaborative teamwork (Est. = -.057, $p > 0.05$) yielded no significant relationship with SDL. This suggests that teams that have high scores on collaborative teamwork do not consist of employees that are significantly more self-directed in their learning compared with teams that have low scores on collaborative teamwork. In contrast, the variable process of self-management (Est. = .246, $p < 0.01$) did show a positive significant relationship with SDL. This indicates that teams that significantly score high on the process of self-management consist of employees that are more self-directed in their learning then teams that scored lower.

Table 6. Results for the Hierarchical Linear Modeling analyses for predicting self-directed learning

Parameters	Null-model		Model 1		Model 2		Model 3		Model 4		Model 5		Model 6	
	Est.	**S.E.**	**Est.**	**S.E.**	**Est.**	**S.E.**	**Est.**	**S.E.**	**Est.**	**S.E.**	**Est.**	**S.E.**	**Est.**	**S.E.**
Regression coefficients (fixed effects)														
Intercept	.003	0.22	0.034	.029	.038	0.29	.037	.023	.039	.023	.038	.021	.045*	.020
Level 1 Individual employee (personal)														
Gender (male)			-.019	.064	-.051	.066	-.124*	.055	-0.126*	.053	-.119*	.053	-.121*	.051
Age (years)			-.005**	.002	.001	.003	.000	.002	-.000	.002	.000	.002	.001	.002
Education (low)			-.137**	.048	-.150**	.050	-.095*	.041	-0.09*	.040	-.104*	.041	-.112**	.040
Employment in hours					.005	.004	.004	.003	.002	.003	.003	.003	.004	.003
Work experience (years)					-.007*	.003	-.006**	.002	-.005*	.002	-.007**	.002	-.007**	.002
Team experience (years)					-0.12**	.005	-.009*	.004	-.009*	.004	-.009*	.004	-.009*	.004
Proactive attitude							.54**	.037	.510**	.037	.492**	.037	.478**	.047
Level 1 Individual employee (context)														
Autonomy in work									.057	.039	.053	.039	.060	.038
Feedback of others									.074**	.028	.076**	.028	.069*	.028
Task variation									.053*	.025	.059*	.025	.056*	.024
Level 2 Team level variables														
Team Learning behavior											-.153	.127	-.150	0.124
SDTW - Process of self-management											.263**	.075	.246**	.073
SDTW - Collaborative teamwork											-.055	.104	-.057	.101
Team complementarity											.059	.105	.062	.104
Team size											-.000	.003	.000	.003
Variance components (random effects)														
Residual	.160 **	.011	.16**	.012	.16**	.012	.109**	.008	.105**	.008	.104**	.008	.093**	.007
Intercept	.015 *	.007	.023**	.009	.022*	.009	.005	.056	.007	.005	.004	.004	.004	.004
Random Slope variance proactive attitude													.05*	.02
Model summary														
-2*Log likelihood	581.667		507.132		484.278		308.265		283.915		269.648		257.259	
X^2 change (df)			74.535(3)**		22.854(3)**		176.005(1)**		24.35(3)**		14.267(5)*		12.389(1)**	
Number of parameters	3		6		9		10		13		18		19	

Note. Est = estimate, S.E. = Standard error, df = Degrees of freedom for X^2 change
Significance (two-tailed): * $p < .05$. ** $p < .01$.

5. Discussion

The main goal of this study was to answer the research question: *What is the effect of self-directedness in teamwork and team learning behavior on self-directed learning of healthcare professionals, controlled by employee and team level variables?* The main outcome is that the extent to which a team directs itself affects the extent to which the team members self-direct their learning processes. This confirms the theoretical assumption that SDTW can play a role in the professional development of healthcare professionals. Notable is the result that in this study the level of TLB is not associated with the extent in which team members are self-directed in their learning.

In this section the conclusion and discussion will be further appointed. There will be discussed what the findings might mean in relation to what other studies found. First, the findings regarding the control variables will be discussed. Second, the findings related to the two hypotheses will be specified. Subsequently, this is followed by a reflection on possible limitations of the study and finally implications and recommendations for future research will be given.

Control variables influencing self-directed learning

Starting with the personal employee variables, it became clear that there were three variables that showed a significant influence on SDL. Regarding *gender* this research showed that women are more self-directed in their learning then men. Stockdale (2003) already indicate that in most studies that show a relationship between gender and SDL, females are associated with a higher level of SDL than males. For *educational level*, employees with a higher educational level are more self-directed in their learning. However, only a small effect can be noticed, which is also confirmed in previous research of Raemdonck (2006). In addition, having a *proactive attitude* has a significant positive influence on SDL. Raemdonck (2006) already showed that there is a positive relation between a proactive attitude and self-directedness in learning processes.

The variables *work experience* and *team experience* both showed a negative significant relationship with SDL, whereas a positive relationship was expected. An explanation for the negative relationship between team experience and SDL is that when a team is together for too long they become too comfortable with one another, discussion and consultation remains off and the team becomes blind for their strengths and weaknesses (Slotegraaf & Atuahene-Gima, 2011). Edmondson, Bohmer & Pisano (2001) even states that a team necessarily needs to expand or change. A possible reason for a negative relationship between work experience and SDL can be found in specific developments in the healthcare sector. Traditionally, healthcare professionals are used to work according established procedures and processes, which is contrary to taking initiative and being proactive what is expected within SDL. Nowadays they need to work more question-based and client-centered (Berings, 2010). Employees with many years of work experience are more used to the old way of working which can be hard to change. Besides, to cope with this change in medical education problem-based learning is implemented, employees who learn in this way develop better self-directed learning skills (Loyens, Magda & Rikers, 2008; O'Shea, 2002; Williams, 2001). Thus, also employees with less work experience in healthcare can be more self-directed in their learning.

The variables *age* and *employment* did not show a significant relationship with SDL. Although, previous research showed that younger employees are more self-directed in their learning than older employees (Reio, 2004). The absence of a positive significant relationship between age and SDL can also be related to the implementation of problem-based learning in medical education, which stimulated the development of self-directed learning skills. Therefore, as older employees might learn self-directedness by maturing and due to larger intellectual demands (Knowles, 1975; Schooler, Mulatu & Oates, 2004) and younger employees by problem-based learning, no significant relationship can be found between age and SDL. In addition, Stockdale (2003) found that most studies that showed

a significant relationship between age and SDL utilized undergraduate students and not older adults. For the variable employment it was expected that it would have a positive effect on SDL from the thought that employees who work more hours are more connected to the organization and their profession (Hallowell, 1999). However, checking the work hours is only a quantitative way of measuring connection to the organization and profession, so this could be a limited assumption.

Regarding the contextual employee variables this study was aimed at three variables related to the workplace. Two variables yielded a significant positive effect on SDL. Namely, *task variety* and *feedback of others*. In previous research, positive effects were confirmed for both factors (Deci, Ryan & Williams, 1996; Hackman & Oldham, 1975; Raemdonck, 2006). The third variable, *autonomy* in work, provides in our study no significant effect on SDL. This is in contrast to the expectation that when employees feel they are in control of their own work, tasks and schedules they are more likely to learn self-directed (Straka, 2000). A reason for this could be that too much autonomy can result in too much stimulation, which has a negative influence on SDL, especially for low-qualified employees (Chung-Yan & Butler, 2011). Since in this study less high educated (vocational education) employees participated, this could be an appropriate explanation.

The two team variables, team size and team complementarity, did not show a significant relationship with SDL. For both variables applies that they have not been investigated in relation to self-directedness in learning. A reason for no significant relationship between team size and SDL is because SDL is aimed at learning at the employee level and not at team level with others. Regarding team complementarity not showing a positive relationship with SDL, this could be due to the lack of diversity in the sample. Most of the respondents are female and relatively a large part of the respondents had the same educational level.

Relation self-directedness in teamwork and self-directed learning

The first hypothesis was aimed at the relation between self-directed teamwork and self-directed learning: *Self-directedness in teamwork (SDTW) has a positive influence on the extent to which healthcare professionals are self-directed in their learning.* First, from the factor analysis, it became clear that SDTW can be described as two elements which have to be established within a team based on the vision of Kirkman and Shapiro (1997). The first element is collaborative teamwork. This refers to assigning jobs to members, taking action on problems (Wellins et al., 1990), receiving group compensation and performance feedback (Hackman,1976), sharing control and power (Appelbaum, Abdullah & Shapiro,1999) and having a group primary task (Muthusamy, Weeler & Simmons, 2005). The second element is the process of self-management which refers to a team's own responsibility (Wellins et al., 1990), team's independency, planning and scheduling attributes (Hackman, 1976), and managing themselves (Cannon-Bowers, Oser and Flanagan, 1992).

A positive and significant relation between the *process of self-management* and SDL has been established. This supports the assumption that the self-managing character of SDTW motivates employees for self-direction in their learning. Within SDTW employees have the latitude and the opportunity to experiment with their work and develop strategies (Wageman, 1997). In contrast, the result of this study showed that *collaborative teamwork* did not have a significant effect on SDTW. With caution, a small trend toward a negative relationship with SDL can be determined. This contradicts the theoretical expectations, because previous research showed that learning is also a social activity (Candy, 1991; Wenger, 2000) in which the social environment is used to frame the knowledge transfer among individuals (Brookfield, 1993; Confessore & Kops, 1998). Research of Hutchins (1995) even showed that learning is an inherent part of collaboration.

The absence of a relation between collaborative teamwork and SDL raises the question were the relation between SDTW and SDL is based on. The results tend that the relation between SDTW and SDL is based on stimulating the competence self-direction. According to Endedijk (2010), one of

the conditions that are necessary to change towards more self-directedness in learning is that learners must feel the will or need to regulate their own learning. It is possible that in a SDTW with a high level of collaborative teamwork the focus is more on doing things to together and the shared responsibility for performing the tasks than on the individual and their own role in performing. Team members are more focused on collaboration on team level than on performing on the individual level, therefore the will and need for regulating their own learning has a lower priority and fades to the background.

Relation team learning behavior and self-directed learning

The second hypothesis was focused on the relation between team learning behavior and self-directed learning: *Team learning behavior (TLB) has a positive influence on the extent to which healthcare professionals are self-directed in their learning.* TLB consists of the aspects construction, co-construction and constructive conflict (Van den Bossche et al., 2006). This study showed that there is no evidence for a relationship between the concepts TLB and SDL. However, there was a negative direction identified in which TLB has a negative influence on SDL. This cannot be established with certainty but it is very notable and therefore we interpreted this finding as a trend.

This trend is very notable because team learning is a process in which a team creates a collective mental model together. Therefore, every individual contributes their own mental model (consisting of personal experiences, learning activities and vision on the world) to the team (Senge, 1992). Van den Bossche et al. (2006) calls this process construction of meaning. One of the team members inserts meaning by describing a problem or situation and how to deal with this. It is apparent that a team learns through its individual team members and, therefore it is affected direct or indirect by individual learning.

In line with the result for collaborative teamwork, where we gave the explanation that the focus is more at the team level than at the employee level, this argument could also apply for TLB. The perspective from which learning can be considered could be of influence. SDL is seen from the individual perspective in which the individual needs to develop and needs to take specific steps. The emphasis is on the individual. TLB can be a part of stimulation and supporting this way of individual learning, but it should not be the goal itself. Perhaps when TLB becomes a predominant aspect in teams the emphasis is increasingly placed on team learning instead of individual learning. As a result self-directedness is replaced by team-directedness which can be a reason why there is an absence of a relation and even a trend to a negative relation between TLB and SDL. In addition, team learning is for the individual learning in a 'safe' environment in which there is a focus on shared responsibility and doing things together instead of doing things independently. An environment where the focus is more on doing things together, could dominate the individual autonomy. Research of Van Mierlo et al. (2006) showed that a work environment with moderate level of support appears to be most effective in stimulating team members to individual autonomy but an environment that is too supportive can miss its purpose regarding the level of individual autonomy.

General conclusion

In general, it can be stated that this study showed that both personal employee variables as contextual employee variables contribute to SDL when working in a team. Although, the main outcome is that the extent to which a team directs itself affects the extent to which the team members self-direct their learning processes. This confirms the theoretical assumption that SDTW can play a role in the professional development of healthcare professionals. However, the exact nature of the relation between SDL and SDTW can be questioned. The relation can be based on the fact that the environment of a self-directed team, challenges an individual to learn, and as a result doing this learning self-directed. On the other side, the relation can be based on the self-directed learning skills of an employee which can support and stimulate creating effective SDTW. Besides, it is certainly possible that there is a mutual influence in which both concepts; self-directed teamwork and self-directed learning positively influencing each other.

Remarkable in this research is that the level of TLB is not associated with the extent in which team members are self-directed in their learning. In addition, the component collaborative teamwork (SDTW) also showed no relationship with SDL. For both components a trend toward a negative relationship with SDL can be determined. It is not surprising that both components showed about the same results considering the relative high correlation between collaborative teamwork and TLB (.63, see Table 3). Collaboration and learning are aspects that are intertwined, whereby learning is an inherent part of collaboration (Hutchins, 1995). Kommers and Dresen (2001) even state that team working and team learning are connected and that team learning cannot function without team working and the other way around. The fact that both components are not associated with SDL and even show a trend to a negative relationship with SDL give the assumption that they are two contradictory forces. On the one hand, the focus is on the team level: team learning behavior and collaborative teamwork and on the other hand the focus is on the individual, self-directed learning. The dynamics of both ways of working and learning will interact with each other. When there is more individual learning there is less team learning or working and the other way around.

Limitations and implications for further research

There are still some more interesting fields to explore and limitations of this study which give guidelines for improvement. This study is restricted to one organization in the healthcare sector. This could be a limitation for the external validity, therefore results might not hold over variations in persons, settings, treatments and outcomes (Shadish, Cook & Campbell, 2002). Generalization of the results to other similar organizations is difficult. Due time constraints it was impossible to make use of a broader research scope.

In this study use was made of only a survey method and a cross-sectional study. Using only a survey method limited the study to only self-reported data based on experiences and personal views. In further research it is recommended to also use other data gathering methods. Besides, using a cross-sectional study gives the opportunity to only measures at a single point in time. Conducting a longitudinal study can measure changes over time which provides more powerful results in contrast to cross-sectional studies (Babbie, 2010). Especially longitudinal study is needed to analyze in more depth whether there is a reciprocal relationship between SDTW and SDL and how the level of SDL in the context of SDTW with interventions can be developed.

A non validated scale was used to measure SDTW. In this study this scale proved to be valid and reliable. However this study only distinguished two components instead of the expected four components considering the theoretical implications. More research is needed to improve this scale in order to distinguish the four different components. However, as described earlier it was not possible due the given time to improve this scale during this study. There are also other variables that were not included in the study for example; leadership and culture aspects. Besides, in this study team variables

were investigated in relation to SDTW for the first time. It is recommended to include more and other factors and especially team variables in further studies in order to get more insight in the relationship between the team environment and SDL.

Regarding the conclusions that the aspect collaborative teamwork of SDTW has no influence on SDL, more research is recommended to get more insight into the relationship between collaboration and learning. If learning is inherent part of collaboration, then better understanding of the individual learning process in group work may be of an added value. It could be especially valuable to do more in depth research at the concept self-direction learning and collaboration, because it is clear that SDTW has stimulating influence on SDL, but how it interacts with collaboration is not clear. In addition to the previous, more in depth research is needed on the two contradictory forces; team learning and individual self-directed learning. Previous research confirmed that both are important in being effective and performing well as team and individual (Bolhuis, 2003; Edmondson, 1999; Knowles, 1975; O'Shea, 2003; Senge, 1992). More research can give insight in how these two forces interrelate with each other and how it can be improved in practice.

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Appendix A: Survey items

Below, the in this research used scales and corresponding items are represent. All items had a 5-point Likert scale, in which 1 = completely disagree and 5 = completely agree. The items regarding the scale self-directed teamwork consist of a 4 point scale. Every item exists of four descriptions in which the most appropriate description for the team needs to be recognized.

General questions

- Wat is je geslacht?
- Wat is je geboortejaar?
- Wat is je hoogst *afgeronde* opleiding?
- Binnen welke categorie valt je functie bij Siza?
- Wat is je dienstverband qua aantal uren per week?
- Hoeveel jaren werkervaring in de zorg heb je?
- In welk jaar ben je bij Siza in dienst gekomen?
- Hoeveel jaar ben je werkzaam in je huidige team?

Self-directed learning

1. Leren vind ik een belangrijk aspect in mijn arbeidsleven.
2. Het afgelopen jaar leerde ik voor mijn werk veel nieuwe dingen op eigen initiatief.
3. Ik zal nooit te oud zijn om nieuwe dingen te leren voor mijn werk.
4. Ik onderneem graag leeractiviteiten op eigen houtje.
5. Ik wil graag betrokken zijn bij projecten op het werk omdat deze mij kansen bieden tot leren.
6. Ik voel zelf aan wanneer het tijd wordt om bij te leren voor mijn werk.
7. Ik weet welke stappen ik moet ondernemen als ik iets nieuw wil leren.
8. Ik test mezelf om te weten of ik iets grondig heb geleerd.
9. Ik streef naar uitwisseling van ervaringen met mensen die gemotiveerd zijn in hun werk.
10. Ik zoek vaak informatie op om meer te weten over onderwerpen in mijn vakgebied waarin ik geïnteresseerd ben.
11. Wanneer ik leer, begrijp ik meer van de wereld om me heen.
12. Ik geef niet op wanneer ik iets moeilijks aan het leren ben.
13. Ik vind altijd wel tijd als ik iets wil leren.
14. Wanneer ik iets nieuws wil leren wat nuttig kan zijn voor mijn werk, onderneem ik een initiatief.

Proactieve houding

1. Ik ben voortdurend op zoek naar nieuwe manieren om mijn leven te verbeteren.
2. Als ik in een idee geloof, zal geen hindernis mij weerhouden het uit te voeren.
3. Ongeacht de kansen: als ik in iets geloof, maak ik het waar.
4. Als ik iets zie waar ik niet van hou dan grijp ik in.
5. In welke situatie ik ook was, ik was er een sterke kracht tot positieve veranderingen.
6. Ik munt uit in het opmerken van kansen.
7. Niets is meer plezierig dan mijn ideeën werkelijkheid te zien worden.
8. Ik ben altijd op zoek naar betere manieren op dingen te doen.
9. Ik hou er van voor mijn ideeën op te komen zelfs als anderen tegen zijn.
10. Ik merk een goede kans op, lang voor anderen dat doen.

Feedback of others

1. Andere mensen binnen Siza, zoals mijn teamleider/manager en teamleden laten mij weten of ik mijn werk effectief uitvoer.
2. Ik ontvang veel informatie over mijn prestaties op het werk van mijn teamleider/manager en teamleden.
3. Ik ontvang van andere mensen feedback over hoe ik mijn werk uitvoer.
4. Mijn teamleider of teamleden laten mij vaak weten hoe goed zij denken dat ik mijn werk uitvoer.

Autonomy in work

1. In mijn werk krijg ik voldoende kansen om zelf te bepalen hoe ik mijn werk doe.
2. Ik kan mee beslissen over de inhoud van mijn werk.
3. Mijn werk laat het toe dat ik vaak zelf beslissingen kan nemen.
4. In mijn werk is er geen enkele kans voor persoonlijk initiatief of oordeel bij het uitvoeren van het werk.

Task variation

1. Mijn werk is vrij eenvoudig en vaak hetzelfde.
2. In mijn werk krijg ik de kans om verschillende dingen te doen.
3. Ik heb veel afwisseling in mijn werk.

Team complementarity

1. De leden van mijn team verschillen sterk in hun expertises en specialisaties.
2. Het is makkelijk voor mijn teamleden om elkaars werkzaamheden over te nemen.
3. De leden van mijn team hebben vaardigheden en capaciteiten die elkaar aanvullen.
4. De meeste leden van mijn team zijn op de hoogte van elkaars werk.
5. In mijn team is er sprake van variatie in verschillende achtergronden en ervaringen van teamleden.
6. Mijn team is zeer flexibel als er wijzigingen optreden in de samenstelling van het team.

Team learning behavior

1. In mijn team luisteren wij zorgvuldig naar elkaar.
2. In mijn team worden conclusies getrokken uit de ideeën die worden besproken.
3. In mijn team gaan wij verder in op elkaars informatie en ideeën.
4. In mijn team, deel ik alle relevante informatie en ideeën die ik heb.
5. Mijn team gaat om met meningsverschillen door ze direct te bespreken.
6. Als iets onduidelijk is, vragen wij dit aan elkaar.
7. In mijn team wordt informatie van teamleden aangevuld met informatie van andere teamleden.
8. In mijn team worden reacties van teamleden op ideeën meegenomen.
9. In mijn team worden meningen en ideeën van teamleden gecheckt door elkaar kritische vragen te stellen.

Self-directed teamwork

Results oriented

1. Doelacceptatie
    - Teamleden zijn overwegend op hun eigen werk gericht. Team doelen leven nog niet echt.
    - Teamleden ervaren dat ze afhankelijk zijn van elkaar en het team meerwaarde heeft voor het realiseren van de teamdoelen.
    - De teamleden voelen zich gezamenlijk verantwoordelijk voor de team doelen. Teambelang staat voor eigen belang.
    - Het team voelt zich mede verantwoordelijk voor het algemeen belang van de organisatie. Organisatie belang gaat voor teambelang

2. Analyseren en verbeteren resultaten
    - De teamleider/manager stuurt de individuele teamleden op de resultaten. Teamresultaten zijn nog geen onderwerp van gesprek in het team.
    - De resultaten worden samen met de teamleider/manager geanalyseerd en dit is een prikkel voor reflectie en verbetering.
    - Het team weet hoe het de resultaten kan beïnvloeden en haalt de doelen.
    - Het team verhoogt uit eigen ambitie het niveau van de doelen, afgestemd op de behoeften van cliënten.

3. Invloed bij het opstellen van teamdoelen
    - Teamdoelen worden door de teamleider/manager bepaald.
    - Teamdoelen worden door teamleider/manager bepaald, na overleg met het team.
    - Teamdoelen worden door het team bepaald, in afstemming met de teamleider/manager.
    - Team stelt in samenspraak met alle relevante omgevingspartijen zelf de nieuwe doelen vast.

4. Resultaatsturing
    - Het team heeft een duidelijk teamdoel (missie) en dat is bij de teamleden bekend.
    - Er zijn concrete (meetbare) doelen geformuleerd die gaan over de uitkomsten van het zorg en dienstverlening proces (IOP, kwaliteit, cliëntentoetsing ed.) resultaten worden teruggekoppeld.
    - Bespreken van de resultaten is vast punt op het teamoverleg en wordt door het team zelfstandig opgepakt.
    - Over de teamresultaten wordt verantwoording afgelegd aan de teamleider/manager en andere relevante omgevingspartijen om als team te leren. Verantwoording is wederzijds.

Tasks and Roles

1. Effectieve verdeling van taken en rollen
    - De taak- en rolverdeling sluit aan bij wat men gewend is.
    - Binnen het team wordt voor elkaar ingesprongen (Bijv. om verzuim te voorkomen). De teamleden helpen elkaar en springen zo nodig voor elkaar in.
    - Er is goed inzicht in elkaars kwaliteiten en er wordt optimaal gebruik van gemaakt om tot het beste resultaat te komen.
    - Er wordt optimaal (effectief en efficiënt) gebruik gemaakt van de verschillende kwaliteiten in en buiten het team.

2. Duidelijkheid over verwachtingen bij taken en rollen
   - Iedereen kent zijn eigen taak en kan die los van de anderen uitvoeren. Er is beperkt inzicht in de taken van de anderen.
   - Teamleden kennen elkaars taken en rollen. De verwachtingen bij deze taken en rollen worden met elkaar besproken.
   - Het team bespreekt en bepaalt welke competenties nodig zijn bij het uitvoeren van de taken en rollen.
   - Zodat de teamdoelen kunnen worden behaald en het team optimaal kan functioneren.
   - Het team heeft inzicht in wat er nodig is aan (toekomstige) competenties gezien de ontwikkelingen in de omgeving.

3. Leren
   - Leren is een individuele aangelegenheid.
   - Teamleden wisselen actief kennis en ervaring uit en de persoonlijke ontwikkeling wordt op elkaar afgestemd.
   - Het team ontwikkelt een gezamenlijke visie op leren. Leren gebeurt van elkaar en in interactie met elkaar.
   - Het leren is een continu proces, waardoor het team en de teamleden zich voortdurend kunnen aanpassen op de nieuwe eisen uit de omgeving.

4. Zelfstandigheid bij rol en taak verdeling
   - De taken worden door de teamleider/manager verdeeld. De teamleider/manager is coach van de individuele teamleden.
   - De taken worden door het team in overleg met de teamleider/manager verdeeld.
   - Het team verdeelt geheel zelfstandig taken en rollen. Teamleden coachen elkaar. Verschillen in kwaliteiten worden openlijk besproken.
   - Het team stemt zelf ook af met de andere teams over optimale inzet van teamleden.

Methods/ Independence

1. Teamoverleg
   - De teamleider/manager zorgt voor regelmatig teamoverleg (plannen, voorzitten en notuleren).
   - Het overleg gaat over onderwerpen die door de teamleden worden aangedragen. Teamleden bereiden zich voor op het overleg.
   - Teamleden bereiden de onderwerpen van het overleg voor en regelen het teamoverleg zelf (agenda, voorzitten en notuleren).
   - Het team regelt, evalueert en verbetert het teamoverleg zelf. Het overleg is zinvol, efficiënt en doet recht aan de verschillen binnen het team.

2. Besluitvorming
   - De teamleider/manager heeft een centrale rol in de besluitvorming. Hij heeft een belangrijke inhoudelijke bijdrage en hakt knopen door.
   - De teamleider/manager begeleidt het proces van besluitvorming en helpt het team tot besluiten te komen. De besluitvorming is duidelijk.
   - De besluitvorming procedure is helder en geaccepteerd en wordt door het team zelf geregeld, teamleden hebben allen inbreng en besluiten hebben draagvlak.
   - De besluitvorming is effectief en efficiënt. Teamleden nemen op basis van onderling vertrouwen besluiten met verantwoording achteraf.

3. Coördinatie/ planning

- Coördinatie/planning van de dagelijkse zaken gebeurt vooral door de teamleider/manager.
- Meerdere teamleden nemen coördinatie/planning taken met betrekking tot de dagelijkse gang van zaken op zich.
- Voor de coördinatie- taken is het hele team verantwoordelijk,dus verdeeld over de teamleden. De verdeling sluit aan bij de kwaliteiten van de teamleden.
- Het team is mede verantwoordelijk en zorgt zelf voor een goede coördinatie op teamniveau, ook voor de niet dagelijkse zaken, zoals beleidszaken e.d.

4. Zelfstandigheid

- De teamleden zijn zelfstandig in hun primaire taak, in de uitvoering van het zorg en dienstverlening proces.
- Het team regelt grotendeels (meer dan 80%) zelf de dagelijks voorkomende regeltaken, zoals dagelijkse planning, medicatie enz.
- Het team is verantwoordelijk en heeft een werkwijze voor: het verbeteren van het zorg en dienstverlening proces.
- Het team is verantwoordelijk en heeft een werkwijze voor: het zorg en dienstverleningsproces, de kwaliteit, eigen ontwikkeling, planning, deelbudgetten, werving en selectie en het netwerk.

Interrelationships

1. Omgaan met meningsverschillen of conflicten

- Meningsverschillen en of conflicten zijn er schijnbaar niet en worden uit de weg gegaan.
- De teamleider/manager zorgt dat meningsverschillen of conflicten worden opgelost. Hij/zij is hierbij vooral bemiddelaar.
- Conflicten of meningsverschillen worden door de teamleden onderling en op volwassen wijze opgelost.
- De teamleden gaan confrontaties niet uit de weg, conflicten en meningsverschillen worden benut om van te leren.

2. Aanspreken op gedrag

- Aanspreken op gedrag gebeurt beperkt door de teamleider/manager.
- Teamleden spreken elkaar af en toe aan op het gedrag, maar vinden het nog wel moeilijk.
- Teamleden spreken elkaar op een volwassen en respectvolle manier aan op het gedrag.
- Het team spreekt ook anderen buiten het team op een volwassen en respectvolle manier aan op het gedrag.

3. Openheid

- Op verschillende zaken rust nog een taboe (bijvoorbeeld je zwakte laten zien, persoonlijke onderwerpen enzovoort). Verschillen worden nauwelijks besproken.
- Er is beginnende openheid. Zaken die moeilijk bespreekbaar zijn worden aangekaart, zij het nog onhandig of voorzichtig.
- Er is respect voor verschillen. De sfeer in het team is veilig. Iedereen kan en durft alles te bespreken dat van belang is voor het team functioneren.
- Verschillen worden besproken en benut. De sfeer in het team is open en ook tussen het eigen team en andere teams zijn alle zaken goed bespreekbaar. Ook verschillen met anderen buiten het team worden besproken en benut.

4. Sociale steun
    - In principe is iedereen op zichzelf aangewezen. Je moet je eigen boontjes doppen.
    - Er is oog voor elkaar (zowel in werk als in privésfeer), maar als er meer inspanning gevraagd wordt (bijvoorbeeld taken overnemen), dan gebeurt dat niet vanzelfsprekend.
    - Binnen het team heeft iedereen oog voor elkaar (zowel in werk als privésfeer) en helpt elkaar actief door lastige periodes heen (bijvoorbeeld taken overnemen).
    - Zowel binnen als buiten het team is elkaar helpen in lastige periodes vanzelfsprekend.

Appendix B: Results factor analysis

Pattern and Structure Matrix for PAF analysis with Oblimin Rotation of Two Factor Solution of Self-directed in learning and proactive attitude items		
	Pattern coëfficiënt	
Items	**Component 1 Self-directed learning**	**Component 2 Proactive attitude**
SDL1 - Leren vind ik een belangrijk aspect in mijn arbeidsleven.	**.724**	-.169
SDL1 - Ik zal nooit te oud zijn om nieuwe dingen te leren voor mijn werk.	**.639**	-.088
SDL1 - Ik wil graag betrokken zijn bij projecten op het werk omdat deze mij kansen bieden tot leren.	**.610**	.013
SDL1 - Ik zoek vaak informatie op om meer te weten over onderwerpen in mijn vakgebied waarin ik geïnteresseerd ben.	**.588**	.033
SDL1 - Het afgelopen jaar leerde ik voor mijn werk veel nieuwe dingen op eigen initiatief.	**.556**	-.024
ProAct2 - Ik ben voortdurend op zoek naar nieuwe manieren om mijn leven te verbeteren.	**.552**	.066
SDL1 - Wanneer ik leer, begrijp ik meer van de wereld om me heen.	**.538**	-.076
SDL1 - Wanneer ik iets nieuws wil leren wat nuttig kan zijn voor mijn werk, onderneem ik een initiatief.	**.490**	.122
SDL1 - Ik streef naar uitwisseling van ervaringen met mensen die gemotiveerd zijn in hun werk.	**.429**	.085
ProAct2 - Ik ben altijd op zoek naar betere manieren op dingen te doen.	**.420**	.224
SDL1 - Ik onderneem graag leeractiviteiten op eigen houtje.	**.416**	.179
SDL1 - Ik voel zelf aan wanneer het tijd wordt om bij te leren voor mijn werk.	**.402**	.134
SDL1 - Ik weet welke stappen ik moet ondernemen als ik iets nieuw wil leren.	**.389**	.133
SDL1 - Ik geef niet op wanneer ik iets moeilijks aan het leren ben.	**.375**	.215
ProAct2 - Als ik in een idee geloof, zal geen hindernis mij weerhouden het uit te voeren.	-.041	**.652**
ProAct2 - Ongeacht de kansen: als ik in iets geloof, maak ik het waar.	-.068	**.631**
ProAct2 - Ik merk een goede kans op, lang voor anderen dat doen.	.062	**.571**
ProAct2 - Ik munt uit in het opmerken van kansen.	.126	**.556**
ProAct2 - Ik hou er van voor mijn ideeën op te komen zelfs als anderen tegen zijn.	.040	**.504**
ProAct2 - In welke situatie ik ook was, ik was er een sterke kracht tot positieve veranderingen.	.078	**.487**
ProAct2 - Als ik iets zie waar ik niet van hou dan grijp ik in.	.015	**.300**

Pattern and Structure Matrix for PAF analysis with Oblimin Rotation of Three Factor Solution of the work characteristics items			
	Pattern coëfficiënt		
Items	**Component 1 Autonomy in work**	**Component 2 Feedback of others**	**Component 3 Task variety**
Aut4 - Mijn werk laat het toe dat ik vaak zelf beslissingen kan nemen.	**.732**	.010	-.061
Aut4 - In mijn werk krijg ik voldoende kansen om zelf te bepalen hoe ik mijn werk doe.	**.626**	.005	-.053
Aut4 - Ik kan mee beslissen over de inhoud van mijn werk.	**.597**	-.121	-.049
TaskVar5 - In mijn werk krijg ik de kans om verschillende dingen te doen.	**.587**	-.013	.200
HercAut4 - In mijn werk is er geen enkele kans voor persoonlijk initiatief of oordeel bij het uitvoeren van het werk.	**.386**	.025	.184
FeOth3 - Mijn teamleider of teamleden laten mij vaak weten hoe goed zij denken dat ik mijn werk uitvoer.	-.055	**-.761**	.002
FeOth3 - Ik ontvang veel informatie over mijn prestaties op het werk van mijn teamleider/manager en teamleden.	.014	**-.756**	.011
FeOth3 - Ik ontvang van andere mensen feedback over hoe ik mijn werk uitvoer.	-.042	**-.664**	.077
FeOth1 - Andere mensen binnen Siza, zoals mijn teamleider/manager en teamleden laten mij weten of ik mijn werk effectief uitvoer.	.135	**-.610**	-.092
HercTasVar5 - Mijn werk is vrij eenvoudig en vaak hetzelfde.	-.054	.009	**.709**
TaskVar5 - Ik heb veel afwisseling in mijn werk.	.209	-.102	**.674**

Pattern and Structure Matrix for PAF analysis with Oblimin Rotation of One Factor Solution of team characteristics items	
	Pattern coëfficiënt
Items	**Component 1**
Het6 - De leden van mijn team hebben vaardigheden en capaciteiten die elkaar aanvullen.	.735
Flex7 - De meeste leden van mijn team zijn op de hoogte van elkaars werk.	.607
Flex7 - Het is makkelijk voor mijn teamleden om elkaars werkzaamheden over te nemen.	.523
Flex7 - Mijn team is zeer flexibel als er wijzigingen optreden in de samenstelling van het team.	.454
Het6 - In mijn team is er sprake van variatie in verschillende achtergronden en ervaringen van teamleden.	.439
Het6 - De leden van mijn team hebben vaardigheden en capaciteiten die elkaar aanvullen.	.735

Pattern and Structure Matrix for PAF analysis with Oblimin Rotation of One Factor Solution of team learning behavior	
	Pattern coëfficiënt
Items	**Component 1**
TLB8 - In mijn team gaan wij verder in op elkaars informatie en ideeën.	.763
TLB8 - In mijn team luisteren wij zorgvuldig naar elkaar.	.762
TLB8 - Als iets onduidelijk is, vragen wij dit aan elkaar.	.699
TLB8 - Mijn team gaat om met meningsverschillen door ze direct te bespreken.	.695
TLB8 - In mijn team worden reacties van teamleden op ideeën meegenomen.	.671
TLB8 - In mijn team worden meningen en ideeën van teamleden gecheckt door elkaar kritische vragen te stellen.	.633
TLB8 - In mijn team worden conclusies getrokken uit de ideeën die worden besproken.	.598
TLB8 - In mijn team wordt informatie van teamleden aangevuld met informatie van andere teamleden.	.528
TLB8 - In mijn team, deel ik alle relevante informatie en ideeën die ik heb.	.302

Pattern and Structure Matrix for PAF analysis with Oblimin Rotation of Two Factor Solution of Self-directed Teamwork items		
	Pattern coëfficiënt	
Items	**Component 1 Collaborative teamwork**	**Component 2 Process of self-management**
OnRel11 - Openheid	**.802**	-.127
OnRel11 - Aanspreken op gedrag	**.678**	.004
OnRel11 - Omgaan met menings- verschillen of conflicten	**.639**	-.070
T&R10 - Leren	**.527**	.075
OnRel11 - Sociale steun	**.511**	.143
T&R10 - Duidelijkheid over verwachtingen bij taken en rollen	**.510**	.081
T&R10 - Effectieve verdeling van taken en rollen	**.483**	.206
Res9 - Doelacceptatie	**.466**	.065
WerZelf12 - Zelfstandigheid	-.086	**.669**
WerZelf12 - Teamoverleg	.004	**.536**
T&R10 - Zelfstandigheid bij rol en taak verdeling	.094	**.532**
WerZelf12 - Besluitvorming	.198	**.507**
Res9 - Resultaatsturing	-.003	**.488**
WerZelf12 - Coördinatie/ planning	.193	**.399**