

How supply chain professionals learn at work: an investigation of learning mechanisms

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Abstract

Purpose – Supply chain (SC) professionals and their competence play a key role in creating value and competitive advantage for companies. A considerable amount of this competence is developed at work, but little is known about how this takes place. Drawing on constructivist learning theory, the authors investigate how SC professionals develop their competence at work.

Design/methodology/approach – The study takes off from a theoretical framework of workplace learning mechanisms, followed by a series of in-depth interviews with an expertise panel of profoundly competent and experienced SC professionals.

Findings – The results provide detailed insights into the learning process of SC professionals. The key findings show that SC professionals use a wide range of learning mechanisms throughout their careers, and that the contribution and complexity of these mechanisms differ and change dynamically with seniority. The findings also show that learning mechanisms should not be viewed as isolated phenomena, but closely related to every-day SCM work as well as learning attitude.

Research limitations/implications – By conceptualizing learning as a process, and congregating the fragmented literature into a framework of workplace learning mechanisms, this research provides a theoretical reference point for future studies. The empirical findings bring a new level of detailed knowledge on how SC professionals learn at work.

Practical implications – The results can assist SC professionals, HR managers and academic program leaders in their quest to develop competence in the field of SCM.

Originality/value – This paper makes a unique contribution to the human aspects of SCM literature by presenting the first study that investigates in depth the crucial but complex process of how workplace learning takes place for SC professionals in practice.

Keywords Supply chain management, Workplace learning, Competence development, Professional learning, Interview study, Constructivist learning theory, Middle range theory

Paper type Research paper

Introduction

Supply chain (SC) excellence is a major source of value creation and competitive advantage (Slone, 2010). SC professionals play a key role in gaining such advantages. Yet human resources is one of the most under-researched areas in SCM (Wieland *et al.*, 2016; Thomas *et al.*, 2011). Flöthmann *et al.* (2018) demonstrate that the individual competence of SC professionals has a direct relationship with supply chain management (SCM) performance. This is not surprising, considering that the human dimension of SCM is increasingly

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acknowledged by scholars; “soft” issues like communication and the creation and management of relationships have been identified as fundamental aspects of the modern supply chain (Thomas, 2014; Wieland and Wallenburg, 2013; Stank *et al.*, 2011). However, due to new technology and increasing business complexity, SC professionals also need to develop their competence continuously to sustain and advance SC performance and competitive advantage (Song *et al.*, 2020; Essex *et al.*, 2016). Although competence development for SC professionals has been identified as a key ingredient for successful SCM since 2002 (Van Hoek *et al.*, 2002), its development is even more critical today due to the severe shortage of SC professionals (Gámez-Pérez Karla *et al.*, 2020; John, 2015; Cottrill, 2010).

Competence in SCM requires broad-ranging and high-level skills (Sweeney, 2013; Shub and Stonebraker, 2009), and so it is not surprising that a considerable amount of SC professionals’ competence development occurs while working (Mangan and Christopher, 2005; Gammelgaard and Larson, 2001). Conversely, studies have found that formal competence development often fails to develop the desired professional skill sets and competences in SCM (Flöthmann *et al.*, 2018; Hohenstein *et al.*, 2014). Although there is plenty of literature on workplace learning, much of it applies to generic learning in generic workplaces (Fenwick, 2006) and not specifically to how particular professionals learn at work. Since professions have different competence requirements, it is reasonable to assume that each profession also has its specific means of how to develop such competence. According to Flöthmann *et al.* (2018), SC professionals in particular require special attention regarding competence development due to the significance of personal experience in their volatile work. Although the literature consistently identifies competence in SCM as a key factor for superior performance (Ellinger *et al.*, 2012; Bowersox *et al.*, 2000), the manner of how such competence is acquired has received limited attention. The present study therefore sets out to investigate the means of how SC professionals develop their professional competence at work.

This research contributes to the literature in three ways. First, it is the first study to investigate in depth the learning process of SC professionals. By applying middle range theorizing, and by theoretically depicting learning as a constructive process, we focus on the mechanisms that cause learning to happen, and not the outcome of learning. Second, we tidy up the territory of workplace learning literature by gathering learning mechanisms into a theoretical framework, thus providing a theoretical reference point for this and future studies. Third, we highlight the role of learning in the SC profession, thereby adding to the human aspects of SCM literature as called for by Hohenstein *et al.* (2014) and Wieland *et al.* (2016). The findings provide detailed insights into how the identified learning mechanisms operate in practice for SC professionals, and how the relative contribution of each mechanism changes throughout one’s career. Our findings also show that learning mechanisms should not be viewed as isolated phenomena but coinciding with central parts of every-day SCM work, as well as related to a strong learning attitude.

The remainder of this paper is structured as follows. Section 2 introduces our view on learning as a constructive process as well as presents the theoretical framework of workplace learning mechanisms that has been developed and applied in this study. Section 3 describes the methodology in detail. The results are thereafter presented and discussed in two sections. Section 4 examines SC professionals’ usage of learning mechanisms in depth and the dynamic contribution over time, while Section 5 focuses on how the learning mechanisms interact with their surrounding context. In conclusion, Section 6 presents the theoretical contribution, managerial implications, limitations of the study, and suggestions for further research.

Theoretical background and framework

Constructivist learning theory

The present paper is based on a constructivist view of learning (Piaget, 1971), wherein the learner actively creates meaning by linking new information to prior knowledge based on interpretations and personal experience (Bednar *et al.*, 1991). Both the learner and

the environment are critical elements, as learning takes place in the interaction between the two (Ertmer and Newby, 2018). Constructivist learning also encompasses reinterpretations of acquired knowledge, considering that both the learner and the environment can change in the learning process. By challenging previous interpretations, a person's assumptions, expectations, values and beliefs may be affected and transformed, thereby leading to transformative learning for the individual (Mezirow, 2000). Learning from a constructivist point of view is thus not only about acquiring skills, but also development as a person.

Learning as a process

Scholars commonly distinguish between learning as a process (how individuals learn) and learning as an outcome (what is learned), where the former requires an in-depth understanding of the complex phenomena prior to learning outcomes (Noe *et al.*, 2017; Fenwick, 2006). The separation of learning as a process from outcome-oriented conceptions is of great importance from a theoretical as well as a practical point of view (Wielenga-Meijer, 2010), since the outcomes of learning depend on the quality of the learning process (Billett, 2004). By theoretically depicting learning as a constructive process, we deliberately focus on the elements that cause learning to happen, instead of examining what learning can provide. Figure 1 presents a conceptual model of learning as a process, in which we recognize learning activities as the starting point of the process, while learning mechanisms are what transfer learning activities into learning outcomes.

Learning activities consist of events and experiences related to the learning mechanisms, but unlike learning mechanisms, they are often tangible, though not always perceived as an activity for learning (Reich *et al.*, 2015; Berg and Chyung, 2008). Learning mechanisms are the enablers of learning (Armstrong and Foley, 2003), and characterized by underlying and explanatory features that explain how learning activities bring about change. For example, practice and repetition is a learning mechanism that encourage discovery through inexplicably, step by step, allowing for patterns to become apparent to the practitioner (Trninic, 2018). Such learning is triggered by learning activities such as rehearsing and doing the job itself. Another example is feedback that through debriefings, formal performance appraisal and other learning activities guides and supports the effective assimilation of new information into the learner's mental structure (Thompson *et al.*, 1992; Stepich and Newby, 1988). Mechanisms thus constitute a critical link in our research, and are also claimed to be a key in conducting scientific evaluation in social science (Pawson and Tilley, 1997). As not all activities necessarily lead to change, the study of mechanisms is essential to fully understand social phenomena, and they therefore represent the main element in our study of how learning takes place in practice. Learning outcome is the third and final element of the learning process above, and is the output generated by the mechanism initiated by the learning activity and refers to the "what is learned" question. Such outcomes may include task performance, awareness and understanding, personal development, academic knowledge and skills, role performance, teamwork, decision-making and problem-solving and judgment (Eraut, 2011). It is worth noting that although the conceptual model appears to be straightforward, learning is a complex web of interdependent processes (Billett, 2004). In practice, each learning mechanism may relate to one or several learning activities, just as one learning activity may relate to one or several learning mechanisms.

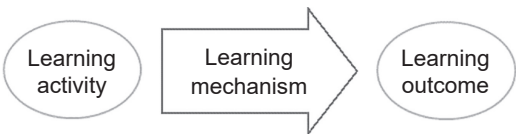


Figure 1.
A conceptual model of
learning as a process

Framework of workplace learning mechanisms

The landscape of workplace learning literature is fragmented and lacks a comprehensive view of how the learning process is manifested in practice (Fenwick, 2006). Nikolova *et al.* (2014) discuss learning in workplaces through reflection, experimentation, colleagues and supervisor, while Kyndt *et al.* (2009) discuss feedback and knowledge acquisition, communication tools, being coached, coaching others and information acquisition. Marsick and Watkins (2016) further address mentoring, coaching, networking and modeling, and Berg and Chyung (2008) mention reflection, talking, and trial and error. A pivotal empirical study by Cheetham and Chivers (2001) explicitly addresses professional learning and suggests a taxonomy of mechanisms. Merging their work with other relevant literature, we tidy the territory of workplace learning by developing an encompassing framework of learning mechanisms and related learning activities. To further structure the landscape, we categorized the learning mechanisms into three loci: interactional, actional and cognitive mechanisms. Learning from interactional mechanisms takes place through relational interaction with the social environment (Billett, 2004). Learning from actional mechanisms takes place through doing the job (Ellström, 2001), while learning from cognitive mechanisms takes place through individual reasoning and thinking (Tynjälä, 2008; Nikolova *et al.*, 2014). Table 1 presents the framework, which was used to guide our research on how SC professionals learn in practice.

Methodology

Middle range theorizing is increasingly used to investigate phenomena in SCM (Pellathy *et al.*, 2018; Stank *et al.*, 2017), and aims to “develop a deeper understanding of the degree to and conditions under which logistics phenomena impact outcomes as well as the mechanisms through which such outcomes are manifested” (Stank *et al.*, 2017). Following this path, the focus of the present study is to delve into the learning process of SC professionals and to describe in detail the mechanisms that link everyday learning activities and its outcomes. To provide such insight, we conducted an in-depth interview study with an expertise panel of profoundly competent and experienced SC professionals. Interview studies have been successfully used in previous logistics and SCM research on human behavior (Thornton *et al.*, 2013), and are recommended in qualitative research because they allow researchers to delve into the respondent’s mental world (McCracken, 1988). Drawing on a social constructivist approach, perceptions and interpretations were important components in the research (Stentoft and Halldorsson, 2002; Gephart, 2004). A cornerstone in the research was storytelling (New and Payne, 1995; Fawcett and Waller, 2014), which is vital in illuminating individual views and nuances of how SC professionals’ workplace learning occurs in practice.

The study took off from our theoretical framework, but also allowed for elaboration to capture a maximum amount of empirical data. The approach was both descriptive and heuristic, that is, we strived for both a comprehensive description of how SC professionals learn, and engagement in higher order interpretative work. We provide methodological clarity below by following Fawcett and Waller (2014) “trail guide” on qualitative research.

Sampling

Critical to the success of an in-depth interview study is the panel of respondents (Creswell, 2014). We applied theory-based purposeful sampling to secure knowledgeable respondents that covered the expected variation of the phenomenon in focus (Palinkas *et al.*, 2015). The sampling criterion was equivalent to the expertise selection in Delphi studies, where we focused on highly experienced SC professionals in chief positions recognized for profound competence in SCM. All respondents were employed by large international companies

Table 1.
Framework of
workplace learning
mechanisms, related
activities and loci

Locus	Learning mechanism	Related learning activities	References
Interactional	Collaboration	Communication and interaction with colleagues, other departments, clients, suppliers, participation in multiple communities of practice, work in (multi-disciplinary) teams	Illeris (2007), Kyndt <i>et al.</i> (2009), Tynjälä (2008), Eraut (2004), Nikolova <i>et al.</i> (2014), Ellström (2001)
	Feedback	Formal performance appraisal, debriefings, continuous verbal/non-verbal peer and supervisor feedback, 360-degree evaluation exercises	Ellström (2001), Kyndt <i>et al.</i> (2009), Nikolova <i>et al.</i> (2014), Bednall <i>et al.</i> (2014), Eraut (2004)
	Mentoring	Formal mentoring/coaching, counselling, peer-mentoring group meetings, buddy system, internship	Nikolova <i>et al.</i> (2014), Billett (2004), Kyndt <i>et al.</i> (2009), Jacobs and Park (2009), Bednall <i>et al.</i> (2014)
	Vocalizing	Teaching, instructing, share information to external persons in a comprehensive way, develop manuals, coach others	Eraut (2004), Kim (1998), Kyndt <i>et al.</i> (2009)
Actional	Practice and repetition	Doing the job itself, trial and error, practicing and refining skills, preparation and planning, rehearsing for future events	Noe <i>et al.</i> (2013), Nikolova <i>et al.</i> (2014), Tynjälä (2008), Jacobs and Park (2009), Coetzer (2007), Eraut (2004)
	Stretching activities	New or challenging tasks/problems, complex assignments, cathartic incidents, working above grade	Billett (2004), Eraut (2004), Tynjälä (2008), Kyndt <i>et al.</i> (2009), Christian <i>et al.</i> (2015), Coetzer (2007)
	Perspective switching	Job rotation/exchange, perspective-taking exercises, intervision, mental perspective switching, cross-cultural working	Edmondson and Saxberg (2017), Kyndt <i>et al.</i> (2009)
Cognitive	Extra-occupational transfer	Formal education, professional attachments, pre-entry experiences, out of work learning	Noe <i>et al.</i> (2013), Tynjälä (2008), Eraut (2004), Jacobs and Park (2009)
	Observation and copying	Job shadowing, imitation and use of a positive/negative role model, formal/informal observation of others	Bandura and Walters (1977), Eraut (2004), Coetzer (2007), Hoover <i>et al.</i> (2012), Jacobs and Park (2009)
	Reflection	Conscious or subconscious individual assessment/judgement, group discussion and review of past actions and events, reflection in action, self-analysis	Kim (1998), Tynjälä (2008), Nikolova <i>et al.</i> (2014), Noe <i>et al.</i> (2013), Griggs <i>et al.</i> (2015), Eraut (2004), Jacobs and Park (2009)
	Mental devices	Self-regulated learning, lateral thinking, use of mental models, simplification, use of graphical representation, positive thinking	Felder and Silverman (1988), Bandura and Walters (1977), Rau <i>et al.</i> (2015)
	Unconscious absorption	Working alongside more experienced colleagues, observing, listening, networking with experts and other professionals	Eraut (2004), Garvin (1993)

Source(s): Extended from: Cheetham and Chivers (2001)

acknowledged for their SC orientation. It is reasonable to assume that such professionals have, over time, developed the competence necessary to manage supply chains effectively

and efficiently. Thus, they can be expected to have valuable insights into how workplace learning has assisted in this development, and they are therefore highly qualified to provide information on this matter. The researchers ensured variation in the sample by taking into account participating companies' industry and supply chain position (supplier, manufacturer and/or retailer) in the selection process. Table 2 presents the profile of each respondent, including gender and tenure in supply chain positions.

Data collection

Empirical data collection consisted of one-to-one-interviews based on an interview protocol, which was developed iteratively based on the literature (that is, our theoretical framework) and two pilot interviews. Although the respondents had a great interest in learning, the pilot interviews revealed a limited awareness of how learning actually takes place in practice, or at least a limited ability to identify and speak freely about it in response to open unstructured questions. The final semi-structured protocol with learning mechanisms ensured that the necessary areas of discussion were covered and that the discussion could be opened up to incorporate new dimensions by allowing the respondents to both zoom in on details and zoom out to gain an overview of SC professionals' workplace learning (Kvale, 2007). At the end of the interview, each respondent was asked to rank each mechanism on a seven-point Likert scale from "Does not contribute at all" to "Contributes to an extremely high degree."

Respondent pseudonym	Company	Title	F/M	SC tenure (years)	Company's industry	Company's SC position
Adam	Axis Communications	Operations development manager	Male	23	High tech	Manufacturer
Eric	Ericsson	Business architect	Male	33	Telecom	Supplier/ manufacturer
Hannah	Hemocue	Director procurement and logistics	Female	30	Medicals	Manufacturer
Ian	ICA	Director replenishment	Male	14	Food and beverage	Retailer
Isaac	IKEA	Process development manager	Male	29	Consumer products	Retailer
Mike	Midsona	Supply chain director	Male	19	Food and beverage	Supplier/ manufacturer
Penny	Perstorp	VP planning and logistics	Female	13	Chemicals	Supplier
Stan	Scanfil	VP supply chain	Male	33	Electronics	Manufacturer
Simon	SKF	Purchasing manager	Male	24	Engineering	Manufacturer
Ted	Tetrapak	Global sourcing manager	Male	20	Packaging	Manufacturer
Victor	Volvo Cars	VP hardware procurement	Male	34	Automotive	Manufacturer
Yvette	Yves Rocher	Operations manager	Female	34	Beauty/ consumer products	Supplier/ retailer

Table 2.
Respondent profiles

This final request acted as comparative and reflective reasoning about the mechanisms and their relative contributions to becoming a successful SC professional.

Due to the protocol's semi-structured approach, as well as the respondents' backgrounds and experience, the interviews were highly focused and informative, and generated a rich body of empirical data. The interviews were digitally recorded to facilitate a focus on listening during the interview and to improve accuracy of transcription (Edwards and Holland, 2013). Each interview was professionally transcribed within two days of the interview. Follow-up questions were asked of a few respondents to confirm their standpoints. The empirical data were regularly evaluated, and new dimensions of learning were continuously identified. The series of interviews was stopped when the number of new dimensions heavily declined (Bryman and Bell, 2015). The number of respondents was thus based on the criterion of information saturation (Seidman, 2013).

Data analysis

The data were analyzed after each interview on both an individual and an aggregated level. The individual analyses aimed to establish consistency between the respondents' narratives and the final ranking for each mechanism. The aggregated data analyses encompassed all conducted interviews so far and included both à priori coding (Stemler, 2001) and open, axial and selective coding (Strauss and Corbin, 1998). A priori coding was conducted based on the learning mechanisms previously identified in the theoretical framework, that is, all empirical data were coded and placed proximally in nodes based on what learning mechanism they related to. The data included both narratives and the final ranking that was done at the end of each interview. Open coding of the empirical material in each node led to the emergence of sub-concepts for each learning mechanism, which helped to describe and understand in more detail the workplace learning of SC professionals. Continuing with open and axial coding of the entire empirical material, a range of patterns and relationships emerged, for example, the relative and dynamic contribution of learning mechanisms. As data collection and analysis continued, concepts and patterns were reviewed, and the empirical data were re-coded accordingly. Simultaneously, selective coding was applied to identify the core category of the empirical data. This provided insights into various integrative aspects of SC professionals' learning at work. Throughout the data analysis, NVivo 12 software helped to facilitate and structure the work.

Research quality

In accordance with Brinkmann and Kvale (2015), research quality was maintained continuously throughout all stages of this research. Due to the qualitative methodological approach, and to account for the multiple dimensions of research quality, the concept of trustworthiness described by Lincoln and Guba (1985) was used. Table 3 presents the steps taken to enhance research quality in this study.

SC professionals' workplace learning

The analysis of the empirical data provided in-depth insights into the multi-faceted phenomenon of how SC professionals learn at work. Below we present detailed descriptions of how such learning takes place based on the empirical findings for each learning mechanism.

Collaboration

Collaboration was frequently put forward by respondents as an effective learning mechanism for knowledge acquisition from both inside and outside the supply chain. Penny described

Table 3.
Steps to enhance
trustworthiness of the
research

Dimensions of trustworthiness	Design	Sampling	Data collection	Data analysis
<i>Credibility:</i> Extent to which the results appear to be acceptable representations of the data	Documentation of the process Design of process consistent with prior studies	Careful selection of respondents with expected adequate knowledge	Triangulation of respondents Interview protocol Recording, transcribing of verbatim N/A	Triangulation of interpretations from multiple investigators Check of tentative results by peer respondents
<i>Transferability:</i> Extent to which findings from one study in one context will apply to other contexts	Theoretical basis Information gathered from a diverse sample of respondents Request expectations rather than formal predictions (facilitates naturalistic generalization) Documenting the process of inquiry	Rich descriptions of respondent characteristics (facilitates analytical generalization)		Rich descriptions of contextual factors (facilitates analytical generalization)
<i>Dependability:</i> Extent to which the findings are enduring for their time and place; the stability or consistency of explanations		Detailed documentation of respondent selection	Use of semi-structured interview protocol	Multiple researchers conduct analysis in close cooperation Use of NVivo for structure and transparency
<i>Confirmability:</i> Extent to which interpretations are the result of the participants and the phenomenon as opposed to researcher biases	Theoretical grounding and pointed semi-structured questions in interview protocol (to keep focus on topic, reduce value-laden interpretations, but still allow for some elaboration)	N/A	Recording and transcribing of verbatim Triangulation (multiple respondents for the same questions)	Comparison between qualitative and quantitative data Triangulation (multiple investigators) Documentation of the process

how her organization lacked a common process for how to deal with product stock outs, and how involved stakeholders (such as sales, marketing, customer service, and planning departments) had their own, sometimes counter-productive, procedures to deal with the issue. After a cross-functional collaborative meeting, they learned about each other's requirements, and based on these developed a new way of working. Thus, by creating a broad network of people with different experiences and backgrounds, successful SC professionals obtain access to a wide range of functions and organizations, and their expertise. Hannah also suggested that the earlier you start to develop contacts, the more successful you will become. Furthermore, Isaac pointed out that collaboration improves learning by providing first-hand and up-to-date information on how things works in practice,

in comparison to potentially outdated process maps, if they exist, and other secondary (or tertiary) sources.

Although evidence provides strong support for the value of collaboration for both junior and senior SC professionals, the empirical data also reveal a large potential for improvement in learning from this mechanism. Simon acknowledged that his organization could obtain a large amount of knowledge from their suppliers, that are far better performing than his organization in many material areas. However, for an old successful company such as his, tradition may impose an attitude that "*We are the experts ourselves*," and learning may thus be hampered. Penny told of her previous company, where the supply chain department wanted to collaborate with sales and marketing to learn the best way to solve upcoming issues, but such requests were refused with the message: "*That is up to you in supply chain to solve*." A considerable amount of learning potential is obviously missed in such an example. However, a number of respondents reported that their organizations were structured to facilitate such cross-functional learning. Victor talked about a match-peer-structure at his company, meaning that most people had a peer to contact in other functions. Whenever needed, it was clear whom to contact in the relevant function, facilitating access to the desired knowledge and understanding. In line with the strong support found for collaboration as a learning mechanism in the study, we hereby propose the following:

- P1. Collaboration contributes to the creation and modification of knowledge for SC professionals at work.

Feedback

A number of respondents emphasized the importance of feedback for SC professionals' learning, not only from superiors and colleagues, but even more importantly from customers and suppliers. This is not strange considering the cross-functional and inter-organizational processes encompassed under the SC umbrella, but it is surprising that the respondents claimed that the latter feedback was very scarce. Mike elaborated on this and suggested that whereas, for example, sales and marketing departments have a natural forum for such feedback, supply chain departments do not. Feedback was further described to be culturally contingent; that is, in workplaces where feedback was openly requested and promoted, it was commonly perceived to be a learning mechanism, whereas in other workplaces it was only provided occasionally and was not as effectual. Hannah also highlighted the importance of evaluating feedback and understanding the reason behind it, since feedback is not always the absolute truth.

A number of respondents pointed out the two-way direction of feedback; that is, the possibility for learning not only in receiving feedback, but also in giving it. Eric spoke of an occasion when moderating an internal modeling workshop in the US that their largest customer worldwide was unexpectedly attending. Before the workshop, he asked his superior whether he was supposed to be polite or honest in communicating with the customer. As a result of being honest, the modeling workshop revealed a huge information gap that was related to a range of supply chain problems. During the session, participants learned about most of these problems, as well as their causes, and thereby also managed to solve most of them.

Many respondents identified a lack of positive feedback for SC professionals. Stan explained: "*The supply chain is a field where you get rather little attention for well performed tasks. A sales guy that landed a new customer will get a bonus and a cake on Friday to celebrate, while an SC professional only did his or her job when increasing the service level by 4% through process improvements*." Although put forward as essential throughout one's career, many respondents highlighted a decline in the provision of feedback over the years, with a high prevalence of it in the beginning of one's SC career ("*a boost to become more competent*", Mike), and only occasional feedback for senior SC professionals. Even so, we propose:

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- P2a. Feedback contributes to the creation and modification of knowledge for SC professionals at work.
- P2b. Lack of positive feedback restricts the creation and modification of knowledge for SC professionals at work.

Mentoring

The respondents emphasized two dimensions of mentoring as a learning mechanism; namely advising and training. The training dimension focuses on learning about the supply chain and how to perform within it, for which the mentor was commonly a senior manager in the same company. The advising dimension included exchange of ideas, other perspectives, good advice, and help to think, and the mentor could be almost anyone, although preferably an experienced person from outside the company, not even necessarily within the same industry. Only a few respondents recalled having had a formally appointed mentor, though the findings show that a mentor can have an informal relationship with the mentee. For example, Penny used her husband as a sounding board. In general, mentoring was considered by most respondents to be relevant to personal development, rather than specific SCM knowledge, with particular relevance to competence in leadership, which was highlighted as a prerequisite to become successful as an SC professional. As Adam put it: *"SCM is simply more about helping other people to manage in the supply chain, and less of inventory control and transport optimization."*

Evidence from the interviews further suggests that mentoring is more frequent in the early stages of an SC carrier than later on, with the purpose of giving insights into the broad career opportunities for SC professionals. In later years, the need for having a mentor seems to decrease, but also the opportunities to find a suitable candidate according to Hannah. However, respondents also highlight the benefits of being a mentor in senior age, and the learning outcomes from this. Mike explained: *"You actually get back quite a lot, not least if you take on a newly graduated person who is full of theories, and kind of sees the world in four-field-matrixes, it is actually beneficial to get this in return."* For senior SC professionals, mentoring is thus a way to refresh prior knowledge, and also to get insights into the latest technology and what new generations expect from future supply chain solutions. Still only two respondents claimed to have such experience. Based on the above findings, we therefore propose:

- P3. Lack of mentoring restricts the creation and modification of knowledge for SC professionals at work.

Vocalizing

Many of the respondents asserted that vocalizing, in the form of writing and giving presentations, forces SC professionals to understand the supply chain in a thorough and in-depth manner. According to some respondents, one even needs to understand more than is required to in order to vocalize successfully. Ian explained: *"Often you might think that you have understood, but you are a bit lazy, you cheat a little; but when you vocalize you cannot cheat, you must truly have understood, what is the kind of structure behind this, what is the core that I am supposed to convey."* In a supply chain context however, Isaac pointed out that one does not need to understand everything in detail, but rather must have a good overall conception of how things work in other places and be able to identify what will happen if something changes somewhere in the supply chain. A potential additional benefit of vocalizing is the triggering of questions and comments from other people, possibly from other parts of the supply chain, which in turn gives insights into

other perspectives, and thereby helps one to achieve an even better understanding of the supply chain.

Although the respondents identified a possible positive outcome from vocalizing, it was not considered to be an essential learning mechanism during a career, and none personally used it for learning purposes. In general, the most common forms of vocalizing discussed were informal instructions and explanations given to others and occasionally being a speaker at conferences. All in all, we propose the following:

- P4. Vocalizing through writing and giving presentations contributes to the creation and modification of knowledge for SC professionals at work.

Practice and repetition

The respondents strongly emphasized the importance of practice, as in “learning by doing,” for junior SC professionals to become successful. Penny even suggested practice (replenishment planning, for example) as a prerequisite for juniors to take the next step. Evidence from the interviews identified two major learning outcomes from such experience. First, respondents identified the benefits of an increased understanding of the supply chain generated by experiencing different tasks and how the supply chain works in practice. Isaac described an example: “*On the supply side, I do not play games when I register a plan in my system that shall be executed. There is a reality to relate to, what does that look like?*” Naturally, the more one knows about the supply chain, the better one’s plans will be. Second, respondents highlighted an increased ability to solve complex tasks in an impromptu manner. As Adam explained: “*As an SC professional, it is not often you get the luxury to sit and practice something before you actually are supposed to do it.*”

In contrast to practice, most respondents considered repetition less imperative for becoming a successful SC professional. Adam explained: “*Working with SCM, you seldom get the luxury to practice in advance, rather you need to adjust to new situations and synthesize those situations continuously.*” Moreover, Ted put forward risks associated with repetition: “*The more times you have been exposed to a situation, the more often you know what to do. But if you have been in business too long, you return to solutions that you know, even in situations where you should have gone out of your comfort zone.*” Learning from repetition may thus counter SC professionals’ work and development. A few respondents, however, pointed out the benefits of repetition for junior SC professionals, as a starting point before taking their next step. These respondents had experience of repetitive work themselves and found it valuable for their own careers. Penny described this learning as: “. . . *to be exposed to something many times, to be forced to do something and start to see patterns, but also to see variation and possibilities for improvement and to reflect about it.*” According to these findings, we propose:

- P5. Practice and repetition contribute to the creation and modification of knowledge for junior SC professionals at work.

Stretching activities

The respondents unanimously believed stretching activities to be a strong and effective driver for SC professionals’ learning. They described how such activities force them to stretch their mind and develop ideas and solutions to deal with upcoming challenges. Isaac used the following metaphor: “*When you are thrown into deep water, you are simply forced to find a way to get to land.*”

Evidence from the interviews suggests that successful SC professionals are often faced with challenges that require a radically different approach to what they already know and can do. Eric spoke of an assignment to close a warehouse in Australia and instead supply the

market from Sweden, half the world away. Acceptable maximum lead-time was set at 96 h. The project required Eric to rethink every step of the possible supply chain, and to learn about potential solutions along the way. Ian described a promotion to be in charge of 140 employees instead of 25, and the subsequent need to ignore details and delegate tasks. The process of making this transition was not always comfortable, but it was a rapid way to develop.

Notably, several respondents highlighted that many SC professionals get an “energy-kick” when being exposed to new activities that require them to stretch themselves and are different to what they have done before. Adam expressed this with the phrase: “*Life begins at the end of your comfort zone.*” Apart from their personal interest in stretching and exploring new horizons, there can also be strong external motivation to be involved in stretching activities. Victor spoke of an occasion when a supplier went bankrupt and his company decided to take over production instead. The obstacles were numerous, but most importantly, the consequences huge if the takeover failed, since their entire supply chain would stop. Being aware of this, the team assigned to the task was eager to learn how to solve the problems and to get the factory up and running. Isaac also pointed out that stretching activities contribute to humility and the will and/or need to bring in other peoples’ opinions and knowledge. Although one may be a competent and experienced SC professional, stretching activities will force you to open up and listen to others, and thereby enhance learning. Stretching activities may thus be considered an essential learning mechanism throughout an SC professional career, and we therefore propose:

- P6. Stretching activities contributes the creation and modification of knowledge for SC professionals at work.

Perspective switching

A significant number of respondents proposed perspective switching as an essential opportunity to understand the multifaced supply chain. Isaac explained it as follows: “*If you are supposed to operate as an SC professional, it is probably also quite good to try to put yourself in the various perspectives, to look at the common challenge and end up in some kind of co-design. In the end, it is the total that counts.*” This point was further emphasized by Yvette, who repeatedly returned to the importance of understanding the overall business for SC professionals. Simon recommended that future SC professionals should work a period close to design, sales, or operations to get practical insights into various perspectives, and thereby learn how to optimize the full supply chain, and not only parts of it. The contribution of perspective switching was considered high for both junior and senior SC professionals, although the possibilities to acquire such practical insights were assumed to be easier for junior professionals.

Further evidence shows examples of how perspective switching works in practice. Stan described how purchasers might take the seller’s perspective in a negotiation. By learning about the triggers that make the seller successful, and then returning to the purchaser’s perspective, it is possible to find win-win-solutions that were not previously known. Isaac spoke about the customer’s perspective: “*We often say, but from a customer perspective, what does that mean? Maybe a bit challenging, but we are all consumers. Right? So what do you think? And you? How fast does it have to go? Exactly how expensive is OK?*” In this way, he and his colleagues learned about possible supply chain requirements from a customer’s point of view, and by combining this with other organizational perspectives, they were then able to (re-) design a supply chain solution that fit the needs of both the customer and the extended supply chain.

There is no doubt that perspective switching is a powerful learning mechanism for SC professionals, with its essence being described by Adam as “*an ability to deal with a problem*

or a phenomenon in different ways, from different aspects, at different levels of abstraction, and to be able to switch between them, fast and simple.” Based on the above reasoning, we propose:

- P7. Perspective switching contributes to the creation and modification of knowledge for SC professionals at work.

Extra-occupational transfer

Evidence suggests that extra-occupational transfer has a moderate impact on SC professionals' learning, although all SC professionals have accumulated a great deal of life experience to get to their existing position. Stan explains: “*It is not a disadvantage to have seen various operations, to have understood how a gadget comes together, but the main objective for a successful SC professional is to understand the customer, to understand the market, and thereby to understand the dynamics in the supply chain.*” This was further emphasized by Isaac, who elaborated on the interplay between the supply chain and the external environment: “*It is difficult to form tomorrow's supply chain if you have not got an interest to understand the tendencies we see in the world around us. We have a supply chain, we transport things, at the same time there is a very broad and extensive debate on environment, etc. How does that connect, what does that mean?*” Such learning is not necessarily achieved via extra-occupational transfer, however. Interestingly, Eric argued that extra-occupational transfer is more useful for people changing job roles in the opposite direction, that is, people who advance from supply chain positions to other positions, such as human resources and marketing, benefit more from this learning mechanism than individuals moving into supply chain roles.

Evidence from the interviews further suggests that leadership and communication are valuable learning outcomes from extra-occupational transfer, and strongly connect to experiences such as football coaching, being chairperson in a housing society, and horse riding. Eric explains the latter: “*If you can get a bunch of horses to do what you want, you can also lead your co-workers. You learn to be clear, and if you are not, it gets physical, the horses will move elsewhere.*” Communication can furthermore be improved by the experience of meeting a variety of people. Penny told of how her experiences abroad had helped her to manage and communicate in today's workplace with a mix of cultures and social classes. Ted described how he drove a forklift in a warehouse for a summer and learned the jargon of blue-collar workers. Since working as an SC professional encompasses all parts of the business, this competence helps to get valuable information from the floor. Extra-occupational transfer was considered to be more essential in the beginning of an SC career – when formal education and other extra-occupational experiences make up a larger share of a person's know-how – than that from SC professional work. Senior SC professionals were considered to already have acquired a major share of such competence as juniors. Also, respondents considered that it was more difficult for senior SC professionals to transfer to other positions temporarily as their replacement could be problematic. Based on these results, we propose:

- P8. Extra-occupational transfer contributes to the creation and modification of knowledge for junior SC professionals at work.

Observation and copying

The respondents claimed that observation and copying had a restrained influence on SC professionals' learning, although it was put forward to be frequently used in the beginning of an SC career. The primary outcomes mentioned by the respondents were insights into how to execute work tasks, how to prioritize among the many tradeoff decisions that must be made in managing the supply chain, and how to meet and treat other people in various functions and organizations. Stan described a task undertaken when he was new at work to replace the

boss on a tour to Germany with a senior manager: “*Naturally, in the beginning I observed very much how he (the senior manager) behaved, what he did, what he did not do.*” Hannah pointed out the risk of copying, though. Since much of an SC professional’s job takes place inside his or her head, it is not always correct to judge from what is openly being said or done. To augment learning via observation and copying for SC professionals, respondents stressed the importance of being exposed to a wide range of people. Penny argued that management have a responsibility to mix people with different experiences and cultures, while Yvette put forward the benefits of a good workplace introduction program where new employees quickly can meet a variety of managers and specialists and get up to speed. Victor spoke of work shadowing as a useful way of acquiring knowledge of how things work in various departments, such as purchasing, marketing, and distribution, but also leadership skills.

Although mainly considered a beneficial learning mechanism for junior SC professionals, evidence from the interviews suggests that observation and copying in the form of benchmarking has a positive learning impact on all SC professionals. Benchmarking helps to identify new solutions and best practices for the supply chain through observing, comparing, and finally copying, and is thereby a source of inspiration and knowledge for SC professionals. The respondents exemplified this with implementations of pick-by-voice, SAP, and connected services, all areas which were new to the people involved, and for which they had used benchmarking as a means to learn about and implement new solutions. Moreover, Ted stressed how having seen others accomplish new ideas helps to develop outside-the-box thinking. However, observation and copying were considered to have a limited impact on experienced SC professionals in general. Mike stated that learning from observation and copying most likely declines over the years, while Isaac claimed that SC professionals need to lead in their own way, not on the basis of somebody else’s. We therefore propose the following:

- P9a. Observation and copying of senior SC professionals contribute to the creation and modification of knowledge for junior SC professionals at work.
- P9b. Observation and copying through benchmarking contribute to the creation and modification of knowledge for SC professionals at work.

Reflection

The respondents frequently stressed the value of reflection in developing as an SC professional. Adam explained this as follows: “*By reflecting on what happened and why, and evaluating your own role and what you could do differently next time, learning is ensured.*” Normally, reflection happens in conjunction with action and decision-making according to the respondents, where one seldom has all relevant information at hand. In such situations, SC professionals are forced to reflect on the potential consequences for all affected stakeholders, and thereby learn to balance decision-making and manage trade-offs. Due to the ongoing nature of business change, such reflection is prevalent for SC professionals. Isaac described a typical example of reflection in his work: “*Can we allow this kind of deviation from a behavior we have decided upon? Well, yeah, we shall deliver on time, but is it sometimes ok not to deliver on time?*” This example provides evidence for the continuous and strong need for both junior and senior SC professionals to reflect and revise previous decisions based on upcoming deviations and changing conditions that affect the SC.

Though Isaac wished for such reflection to be systematic, he and a number of other respondents stressed that unfortunately reflection is not something one can actively choose to do in the SC profession, due to the profession’s high tempo and limited availability of time. Instead, reflection is often forced upon SC professionals by upcoming deviations, errors, or mistakes. In contrast, things that do work well in the SC are not often attended to or reflected

upon. Some respondents argued that this is somewhat odd, when contrasted with the idea that SC professionals learn from good examples. Mike makes the following point: *"It's rather typical to look at the sales, and say oops, this product is not selling, and then the entire organization goes around asking 'why does not this product sell?' But if we had put that effort into the top sellers and asked ourselves why they sell so much, I believe we would have performed much better in the end."*

Several respondents argued that scheduled and collective reflection was an effective way of learning. Unfortunately, such reflections were normally only performed after very large projects, for example after the release of a new car model, or after a vital negotiation with key suppliers that involved multiple stakeholders from the company. A more prevalent form of collective reflection was the technique of having short recaps during meetings. Victor described that such recaps started with a summary of all the issues presented and agreed on thus far, and then progressed to reflection on the implications for various stakeholders. According to the reasoning put forward above, we propose:

P10a. Reflection contributes to the creation and modification of knowledge for SC professionals at work.

P10b. Lack of deliberate and scheduled reflection restrict the creation and modification of knowledge for SC professionals at work.

Mental devices

The respondents suggested a modest overall value of mental devices for an SC professional due to the individual use and consequently the individual benefits realized. However, three devices were indicated to be vital for SC professionals' learning. Firstly, positive thinking was consistently cited as prominent, in that it helps to manage common concerns for SC professionals *"by filtering out issues of lesser importance,"* and *"helping individuals to view upcoming problems as interesting challenges waiting to be solved."* Learning is thereby facilitated. Secondly, visualization was highlighted as beneficial for SC professionals' learning. According to many of the respondents, visualization helps to simplify and clarify complex supply chains, to find out if anything is missing, and to structure problems at hand. Adam explained: *"A picture will inexorably reveal whether or not you have thought everything through. You can write a rubbish text, but you cannot draw a rubbish picture, because it will blatantly reveal that you have not thought enough."* Finally, the ability to break down problems was said to be commonly used by SC professionals, and to be valuable for *"learning about the complex setups of the supply chain and understanding what depends on what."* Isaac even claimed the ability to simplify and break down complex processes into smaller pieces to be a prerequisite to work in SCM. Successful SC professionals simply need to learn to manage and understand the complexity of supply chains, otherwise they will just *"loop infinitely, get a shortcut in their brain, and end up at a mental institution."* No differences between junior and senior SC professionals were identified. In line with the reasoning above, we propose the following:

P11. Mental devices through positive thinking, visualization and ability to break down problems contribute to the creation and modification of knowledge for SC professionals at work.

Unconscious absorption

The respondents put forward unconscious absorption as a filter on top of all every-day learning, and as a way to acquire undefined but useful insights from various functions and situations in order to drive SC development. The empirical findings show that the level of

learning from unconscious absorption depends on both organizational and individual aspects, namely culture, commitment and experience.

First, evidence suggests that culture affects unconscious absorption by defining the level of what is accepted as good enough, for example through internal company slogans like “*passion for 100% first time right.*” Many of the respondents explained that such cultural expectations push one’s development; just as the people one surrounds oneself with might do. Some respondents argued that it is difficult to develop if you are the one that knows the most. These respondents also articulated that people tend to adopt the kind of behavior that exists within an organization, even though it may fall below their own capacity. However, Ted pointed out that in order to become successful as an SC professional, one should not stay in such a culture, but move to other fruitful learning environments. Second, many of the respondents suggested commitment as a prerequisite for unconscious absorption, since without commitment, the level of receptivity of unconscious absorption becomes low. Penny spoke of a forecasting project at her previous company, where she was forced to take the lead without feeling very confident: “*But since I knew that no one else in the company knew more about forecasting than me, I had to absorb more and more from the consultants, and then I became even more of an expert.*” Third, experience seems to affect unconscious absorption, because it is simply not possible to absorb all the things that an expert does or says when one is in the beginning of a career. For example, a junior SC professional might understand how, but not why. According to the respondents, the more experience is acquired, the more advanced information and concepts can be absorbed. One might also understand the reason for what somebody does and says, and most of all, may be able to read between the lines, learning from what they do not say or do. For an SC professional, all these insights are valuable in order to understand how the supply chain works with all its links, interactions, and synergies. Though the respondents emphasized that it is difficult to be aware of cognitive learning that happen unconsciously, they viewed this mechanism as a lifelong mechanism, with learning outcomes growing in complexity as experience is acquired. SC professionals may therefore continue to develop throughout their career, at least if they are motivated and position themselves in a learning culture. Still, unconscious absorption was not considered an essential mechanism to become successful as an SC professional. Based on the above reasoning, we propose:

- P12. A culture of excellence, commitment and experience drives SC professionals to learn through unconscious absorption.

Contribution of learning mechanisms over time

Zooming out and looking at the learning mechanisms from a top view perspective, additional findings of interest appear. The respondents argued that all mechanisms were valuable and contributed to the learning process. This may reflect the fact that a successful SC professional is expected to master a wide range of competences, and it is therefore natural that a wide range of mechanisms is required to obtain these competences. However, findings from the interviews with senior SC professionals also suggests that the relative contribution of particular learning mechanisms differs, and also may change dynamically with seniority. One set of learning mechanisms was constantly described as “fundamental” and “a prerequisite for becoming successful as an SC professional,” and was claimed to be of high importance for SC professionals’ learning throughout their entire career. These essential learning mechanisms included collaboration, stretching activities, perspective switching, feedback, and reflection. It should be noted, though, that they were also described to change form and complexity with seniority. For example, Adam stated: “*It is simply not probable that a fresh-out-of-school employee will become successful if his or her first challenge is to implement a global supply chain.*” Although the respondents posited that stretching

activities make up an effective learning mechanism, it needs to be used with care and with incremental increases in the level of a given challenge. In contrast, vocalizing and unconscious absorption were frequently described in less imperative terms by the respondents, suggesting a low relative contribution of these mechanisms throughout a career. Although these learning mechanisms, of course, also have learning effects, the respondents did not consider them to be of major importance for becoming successful as a SC professional. For example, to take full advantage of the unconscious absorption learning mechanism requires experience, but when you have gained that experience, the need for learning may have decreased.

Another set of learning mechanisms was considered to vary in contribution depending on seniority. Extra-occupational transfer, observation and copying, and practice and repetition were learning mechanisms of relatively high importance for junior SC professionals, but this importance decreased with time over one's career. Mike exemplified the maturity that arises in extra-occupational transfer: *"For every conference or external leadership course, more and more content and experiences overlap, and the additional value therefore tends to decrease for every time."* Finally, mentoring and mental devices were considered beneficial for SC professionals' learning, but not to the same degree as the most essential mechanisms. Words like "could" and "might" were frequent in the empirical data for these mechanisms, thereby illustrating a clear distinction compared to the former ones. Ted described how he himself benefited a lot from having a mentor to discuss a variety of issues with, but also highlighted the need for the right type of mentor to take full advantage of it. [Figure 2](#) is an attempt to present an overview of the relative contribution of the learning mechanisms for junior and senior SC professionals.

The majority of the most essential learning mechanisms belong to the actional and interactional learning loci, which are highlighted throughout the interviews as the categories into which almost all the work of SC professionals fall, and where SC professionals learn how to succeed in their jobs. In contrast, the respondents reported that it is in general difficult to find room for cognitive learning mechanisms. Though reflection was considered an essential learning mechanism, the respondents claimed limited opportunities to take advantage of it. The same applies to feedback, where respondents, though convinced of the great benefits from it for SC professionals, put forward a clear notion of restrictions in usage. Essential learning mechanisms are thus not automatically used in practice. The constraints for cognitive learning mechanisms might be due the hectic and fragmented character of managerial work ([Mintzberg, 2009](#)), where individual reasoning and thinking might be difficult to achieve. However, successful SC professionals probably use cognitive learning mechanisms to a larger extent than they are aware of, as they often take place unconsciously.

Discussion

The interview results show that learning mechanisms and SC professionals' learning should not be viewed as isolated phenomena, but as deeply integrated into the social system in which they exist. This section highlights learning as a central part of every-day SCM work and the influence of learning attitude on SC professionals' workplace learning.

Workplace learning in key SCM activities

Looking into the actual work of SC professionals, the results show that learning from three essential learning mechanisms coincide with a range of key SCM activities. While these learning mechanisms are a vital part of the learning process, they also connect to central parts of everyday SCM work. Corresponding to the SCM activities identified by [Mentzer et al.](#)

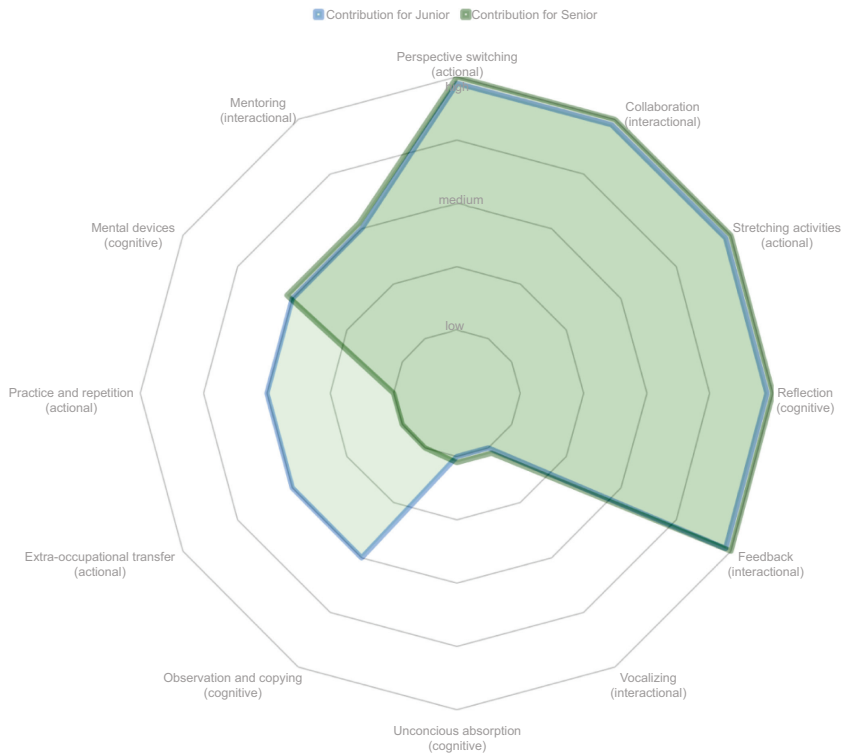


Figure 2.
Illustration of the
relative contribution of
learning mechanisms
for junior and senior SC
professionals

(2001), learning from perspective switching coincides with “mutual information sharing” and “risk and reward sharing”; learning from collaboration coincides with “cooperation” and “long-term working relationships”; and learning from stretching activities coincide with “integration of key processes and “inter-functional coordination.” In fact, respondents had difficulties differentiating between key SCM activities and the simultaneous learning from the mechanisms. Rather than explaining how these learning mechanisms contributed to learning, the respondents found themselves talking about how they improved supply chain performance, which further reinforces the connection between learning mechanisms and key SCM activities for SC professionals.

This connection between key SCM activities and essential learning mechanisms for SC professionals has two main consequences. First, much relevant learning is difficult to achieve outside the workplace since several learning mechanisms reside in the SCM work itself. This means that junior candidates necessarily need work experience in the workplace rather than formal training in order to become successful in the SC profession. Second, since SC professionals learn while managing the job at hand, they become flexible learners who may easily transfer to other assignments and positions. Such learning is not focused on specific learning outcomes, but rather on a continuous process at work. It is worth noting, however, that reflection and feedback, though cited as essential mechanisms, did not appear to overlap with SCM activities according to the empirical findings. On the contrary, these learning mechanisms were said to be difficult to find room for in everyday work, indicating that SC professionals need to work actively if they are to take advantage of them.

SC professionals' attitude to learning

Although learning activities and mechanisms are important components of the workplace learning process, it can be argued that they are necessary but not sufficient to fully explain how successful SC professionals learn at work. Evidence from the interviews consistently pointed out a strong learning attitude as a common denominator among successful SC professionals, who were unanimously described as open minded, enthusiastic, not overly concerned with prestige, and having a positive disposition. Such learning characteristics have previously been highlighted by [Kwon \(2017\)](#) who puts forward the concept of grit as important for understanding work and professional development, and [Noe et al. \(2017\)](#) who find zest to have a positive relationship with managers' informal learning. In accordance with the constructivist theory, learning is an active process requiring effort from the learner ([Palmer, 2005](#)), so it is not surprising that attitude is critical in how people engage in potential learning opportunities. Mike illustrated this strikingly: *"Learning is not something you get, learning is something you take."* This is also in line with Adam, who described a successful SC professional as one who *"seeks stretching activities, is curious about collaboration, interested in reflecting on his or her performance, and actively asks for feedback from others."* Comfort was put forward as the biggest enemy for learning, which is particularly risky for an SC professional. Ted shared an example: *"A colleague was assigned to bring in a new product, but he did not have the energy to go out and look for new suppliers, so he took an existing supplier that told him that they could do it, though they had not done it before. His attitude and subsequent decision ended up catastrophic."* A strong learning attitude is thus not only a means to become successful, but also to stay successful as an SC professional. Adam pointed out that such an attitude is important in potentially new SC professional recruits, where the candidates' personal attributes were considered of higher importance than their actual skills. He said: *"In our business, attitude wins 7 days a week."* This is also consistent with [Richey et al. \(2006\)](#), who find "need for achievement" to be a key feature for supply chain managers and superior logistics performance. Such an attitude was also described as something that does not only exist at work, but is part of the everyday being of successful SC professionals. Yvette explained: *"To run 5 kilometers, well, that I know I can do. Next time I want to run a little bit longer, or divide into intervals combined with stairs to challenge myself."* Successful SC professionals thereby seem to possess an attitude that distinctly differentiates them from their less successful peers. This attitude is also profoundly integrated in the learning process throughout their lives, both at work and elsewhere.

Conclusions

Based on a series of interviews with an expertise panel of profoundly competent and experienced SC professionals, along with our theoretical framework of workplace learning mechanisms, this study investigates how SC professionals take advantage of learning mechanisms to become successful at work. Key findings from the study show that SC professionals use a wide range of learning mechanisms throughout their career, and that the contribution and complexity of these mechanisms differ and change dynamically with seniority. In general, five mechanisms appear to be more essential for the learning of SC professionals, namely collaboration, stretching activities, perspective switching, feedback, and reflection. An interesting finding was that it is considered difficult to find room for reflection and feedback in everyday work practice, despite their perceived impact on learning. Another key finding is the notion that learning mechanisms should not be viewed as isolated phenomena, but as being deeply integrated in the social system, more precisely with key SCM activities and learning attitude. Key SCM activities such as collaboration, integration of key processes, and risk sharing are found to coincide with learning from essential learning mechanisms (that is, collaboration, stretching activities, and perspective switching), and in contrast to feedback and reflection, such learning mechanisms are found to be frequently used

and easy to find room for. Finally, a strong learning attitude is found to influence successful SC professionals in the process of building knowledge through active participation and interaction with the environment.

Theoretical contribution

Three major theoretical contributions for workplace learning and SCM can be gathered from this study. Firstly, it provides a theoretical reference point for future research on workplace learning by conceptualizing learning as a process and by congregating the fragmented literature into a framework of learning mechanisms, learning activities, and loci. The conceptualization of learning as a process is important because it illuminates important aspects of how professionals learn at work. While prior research stops short of identifying the full complexity of workplace learning, mainly addressing learning as an outcome (Fenwick, 2006), this study delves into the full range of contextual elements that affect SC professionals' workplace learning. Secondly, by investigating and describing the process of how SC professionals learn at work, this study incorporates a new level of specificity into the current research. This is important in order to fully understand the phenomenon, and at the same time not only respond to calls for genuine qualitative research in SCM (Gammelgaard and Flint, 2012), but add to new frontiers in the SCM field by applying middle-range theorizing in accordance with Stank *et al.* (2017) and Pellathy *et al.* (2018). More specifically, the study extends previous research that has identified necessary competences for SC professionals but has not explained how they should be achieved (Schulze *et al.*, 2019; Derwik *et al.*, 2016; Shou and Wang, 2015; Christopher, 2012; Murphy and Poist, 2006). The present study illuminates how SC professionals use different learning mechanisms to acquire such competences, but also suggest a need to differentiate such learning based on seniority. The study also complements research that has investigated the development of such competence, but focused on formal SCM education (Mangan and Christopher, 2005). Finally, the study uncovers the fundamental role of learning for SC professionals by displaying the strong overlap between key SCM activities and essential learning mechanisms, as well as by re-emphasizing the importance of a strong learning attitude for SC professionals (Richey *et al.*, 2006; Ellinger *et al.*, 2002). The SC profession is thus a learning profession. This understanding is important because it helps to explain why people in SCM offer a unique source of sustainable competitive advantage (Hohenstein *et al.*, 2014).

Managerial implications

The findings have implications for SC professionals, HR managers, and academic program leaders. For SC professionals, the findings provide detailed insights into how each learning mechanism contributes to learning that makes an SC professional successful. The findings thereby assist both junior and senior SC professionals to more easily identify and more effectively apply learning mechanisms to enhance their own workplace learning. This can, for example, mean accepting and embracing challenging or stretching activities, being aware that some of the best learning outcomes can come from these kinds of activities, or setting aside time for reflection, not only regarding deviations and mistakes, but also what has worked well. In this way, SC professionals can not only become successful, but also remain so. In addition, the findings suggest that much learning takes place in the workplace, which is why junior SC professionals in particular need the workplace as a context to speed up their transformation to successful SC professionals.

For HR managers and professional developers, the findings offer input into the design of both formal and informal training. Traditionally, formal professional training has focused on specific questions about what needs to be learned, and subsequent training has been designed to deliver such learning outcomes. Informal professional training by nature lacks

such specific questions, and therefore runs the risk of leaving learning outcomes to chance. This paper suggests a radically different approach to training, namely a “learning to learn” design strategy. Instead of trying to identify specific learning outcomes in the informal setting, or to design a formal learning strategy for such specific outcomes, we call on HR managers and professional developers to redirect the focus to the learning process itself. By providing exposure to a wide range of learning mechanisms in both formal and informal training, along with individual follow up to identify what works for each individual, SC professionals will turn into self-directed, autonomous learners. Considering the strong overlap that was identified between key SCM activities and essential learning mechanisms, we believe that learning how to learn, that is, developing learning skills, is a key to become successful as an SC professional.

Another implication for HR managers is in the recruitment of SC professionals. Considering the strong learning component in the SC profession, HR managers should elevate learning attitude in the requested profile at the expense of pure SCM skills. Such a strategy may also counteract the shortage of SC professionals by increasing the range of possible candidates. Finally, academic program leaders and developers should increasingly consider and highlight the learning dimension in the SC profession, and revise curriculum to better match and prepare students for future learning and work in SCM. By teaching learning skills and providing work experience, students will become better prepared to successfully manage key SCM activities.

Limitations and future research

Like all papers, this paper has limitations. First, though the sample was based on an expertise panel of successful SC professionals, the number of respondents were limited. However, the interviews were highly focused and extremely informative, and generated a very rich body of empirical data, with a good amount of overlap between the interviews. In practice, very few new dimensions appeared after the seventh interview. Second, the respondents all worked for large global companies and their native cultural basis was rooted in Northern Europe. Our results might therefore have limited application for SC professionals in small and medium-sized companies and in other cultures, although some of the respondents had such experiences. Third, the study is based on respondents' perceptions of learning, which may in some cases be erroneous, in combination with an interpretative form of data analysis. More importantly, the junior aspects are provided by senior professionals based on their knowledge and understanding from how junior SC professionals learn at work, including their experience from being a junior themselves. The purpose of the study is not, however, to generate ultimate verified knowledge, but rather to produce input for discussion and praxis in society.

Multiple avenues are identified for future research. First, cultural dimensions of workplace learning for SC professionals may be explored, going beyond this study's cultural context. Second, the highlighted importance of learning attitude raises questions on how such attitude can be promoted in practice, making ground for additional research. Third, as we did not explicitly consider the range of learning outcomes but focused on the mechanisms that cause learning to happen, future research might explore possible connections between mechanisms and specific learning outcomes. Future research may also delve deeper into the cognitive mechanisms and their partially ambiguous usage, providing even better understanding into the unconscious aspects of such mechanisms. Yet another avenue would be to develop the propositions in this paper into testable hypotheses and conduct quantitative studies. Future research may also quantitatively investigate the suggested relative contribution of each learning mechanism for junior and senior SC professionals, as suggested in [Figure 2](#). Finally, it would be of interest to

investigate how the individual learning of SC professionals can transfer to higher social levels such as teams and organizations. According to a systematic literature review by Schorsch *et al.* (2017), only a minority of the behavioral SCM literature spans the boundary between the individual and social levels of research.

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