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Ensuring sustainability in supply chains: A competence model for purchasing professionals

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Acknowledgements

A line is a dot that went for a walk (Paul Klee, Artist, 1879 - 1940)

This research endeavour started with a lot of single dots, some of them were quite big and clear cut from the beginning, others were small and rather vague. A range of people helped me to connect the dots, guided me during the walk and finally helped in making them a line.

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Finally, I would just like to mention how lucky and grateful I am to have such a great family that always stood by me and believed in me, and to have friends who always supported me morally and emotionally during the last three years.

All this is why the dots are now connected.

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Abstract

Implementing sustainability into global supply chains remains a challenge for companies. Purchasing and Supply Management (PSM) interacts closely with supply network actors, thus influencing how the firm's value creation is delivered. While previous sustainable PSM (SPSM) research has shed light on how to manage sustainability on an organisational level, the role and impact of individual purchasing professionals on SPSM is less well understood. Their contribution to SPSM depends on both: they must be qualified, and they must be allowed to integrate sustainability in their daily work. Models from organisational psychology consider individual competence as one determinant for behaviour in organisations, together with motivational factors and enablers through the organisation. Transferred to the SPSM context, competences of purchasing professionals contribute to sustainable behaviour in the organisation. This thesis set out to understand individual SPSM competences, with the aim to foster their integration in the daily work of purchasing professionals, finally contributing to the implementation of sustainability in supply chains. It strived for an answer to the central research question: "Which individual competences of PSM professionals are required to implement SPSM?", with the objectives to develop a SPSM competence model and to design a SPSM training module.

A multi-method approach rarely applied so far in the PSM field was used to gather SPSM competences. First, a systematic literature review (SLR) determined the current research coverage of SPSM competences. Second, a Delphi study was conducted with 16 experts in the field of PSM and sustainability, applying the critical incident technique (CIT). A systematic qualitative data analysis led to a set of 26 SPSM competences. These were consolidated in a competence model, highlighting functional, cognition-oriented, social and meta-oriented competences. Familiar denominations of competences were corroborated with specific descriptions in terms of their application in the specific SPSM context. Third, the SPSM competences were transferred into a training module, which was tested in an action research approach with students and purchasing professionals.

The findings of this research help companies to better cope with the implementation of sustainability in global supply chains, as individual SPSM competences, being one major determinant of SPSM behaviour, are now much more transparent. Firms may use the competence model and the training module as blueprints and adapt them to the individual organisational context.

For Higher Education, the thesis offers inspiration how to integrate sustainability into PSM curricula by focusing on the most important competence areas. In addition, by applying models from educational sciences and organisational psychology in the PSM context, the research intends to foster an interdisciplinary debate on SPSM competences. Finally, future research might look for answers to the hypothesis that SPSM competences point towards a general competence profile for PSM professionals that is necessary to be able to cope with future challenges in the field.

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Bals, L., Schulze, H., Kelly, S. and Stek, K. (second revision ongoing; minor revision) Purchasing and Supply Management (PSM) Competencies: Current and future requirements; submitted to the 25th anniversary special issue "Looking back and looking forward" of the *Journal of Purchasing and Supply Management.*

Schulze, H. and Bals, L. (first revision ongoing; major revision) Implementing sustainable purchasing and supply management (SPSM): A Delphi study on skills and competences needed by purchasing and supply management professionals, selected for the IPSERA conference special issue of the *Journal of Purchasing and Supply Management*.

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White Paper: Bals, L., Schulze, H., Kelly, S. and Berger, L. (2017) Current and Future Purchasing & Supply Management Competences: Insights from Practice, Available from: http://www.perfect.lfo.tu-dortmund.de/the-project-perfect-intellectual-output-2-white-paper.

Conference papers: Schulze, H. and Bals, L. (2019) Implementing sustainable purchasing and supply management (SPSM): A Delphi study on skills and competences needed by purchasing and supply management professionals, competitive paper, in: *IPSERA conference*, Milano, 14-17 April 2019.

Schulze, H. and Bals, L. (2018) Implementing sustainable purchasing and supply management (SPSM): A Delphi study on skills and competences needed by purchasing and supply management professionals, full paper, in: *International Conference on Sustainability and Responsibility*, Cologne, 14 November 2019.

Bals, L., Kelly, S., Schulze, H. and Stek, K. (2018) Purchasing and Supply Management (PSM) competencies today and in future: Taking stock and moving forward, competitive paper, in: *IPSERA conference*, Athens, 26-28 April 2018. Athens.

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Schulze, H. and Bals, L. (2017) Ensuring sustainability in global value chains: A systematic literature review of current and future buyer competencies, in: *European Decision Sciences Institute (EDSI) Conference*, Granada, 29 May-01 June 2017.

Bals, L., Kelly, S., Schulze, H. and Stek, K. (2017) The role of explicit and tacit knowledge in Purchasing and Supply Management (PSM) today and in future, working paper, in: *IPSERA conference*, Budapest, 09-12 April 2017.

Schulze, H. and Bals, L. (2017) Ensuring sustainability in global value chains: A systematic literature review of current and future buyer competencies, working paper, in: *IPSERA conference*, Budapest, 09-12 April 2017.

Schulze, H. and Bals, L. (2016) Implementing sustainable supply chain management: Which skills and competencies do we need for Purchasing and Supply Management?, in: *International Conference on Corporate Sustainability and Responsibility*, Berlin at Humboldt-University Berlin, 14-16 September 2016.

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Abbreviations

CAQDAS	Computer-Assisted Qualitative Data Analysis Software Package
CEO	Chief Executive Officer
CI	Critical Incidents
CIT	Critical Incident Technique
CPO	Chief Procurement Officer
CSR	Corporate Social Responsibility
GRI	Global Reporting Initiative
HE	Higher Education
HR	Human Resources
ILO	International Labour Organization
IT	Information Technology
KBV	Knowledge-Based View
KPI	Key Performance Indicator
NGO	Non-Governmental Organization
NRBV	Natural Resource-Based View
OECD	Organization for Economic Co-Operation and Development
PISA	Programme for International Student Assessment
PRME	Principles for Responsible Management Education
PSM	Purchasing and Supply Management
RBV	Resource-Based View
ROT	Resource Orchestration Theory
SCM	Supply Chain Management
SDG	Social Development Goals
SLR	Systematic Literature Review
SME	Small and Medium Enterprises
SPSM	Sustainable Purchasing and Supply Management
SRBV	Social Resource-Based View
SRM	Supplier Relationship Management
SSCM	Sustainable Supply Chain Management
TBL	Triple Bottom Line
UNGC	United Nations Global Compact
WBCSD	World Business Council for Sustainable Development

1 Introduction

1.1 Research aim

Recent developments very prominently put the focus on environmental and social issues on earth. With the FridaysForFuture movement, students all over the world protest against the lack of action on the climate crisis, accusing governments, legislation and businesses to be unassertive to stop global warming. Many adults meanwhile joined the movement, which for example resulted in initiatives like ScientistsForFuture or LecturersForFuture. The elections for the European Parliament made the Group of the Greens/European Free Alliance being the fourth largest group in terms of number of seats in the European Parliament (European Parliament, 2019). Meanwhile, big companies, for example in the automotive sector, publicly announced net zero emission targets. At the same time, regulatory activities to combat social issues in value chains increase, such as the EU conflict minerals law (European Commission, 2017) or the launch of a central registry for modern slavery supply chain statements (Chartered Institute of Procurement & Supply (CIPS), 2019). The United Nations Sustainable Development Goals (SDG) build the leading framework for civil society and for companies, clearly outlining the importance that businesses need to focus on their entire value chains: "The greatest social and environmental impact that your company has on the Sustainable Development Goals (SDG) may be beyond the scope of the assets it owns or controls, with the greatest business opportunities being potentially further upstream or downstream in the value chain" (GRI, UNGC and WBCSD, 2015, p. 12).

These developments outline the call of the international community towards businesses to take on responsibility and to contribute to sustainable development when managing their global supply chains. According to the United Nations Global Compact (UNGC) office (UNGC, 2017), sustainable supply chains have a major impact on fostering human rights, fair labour practices, environmental progress and anti-corruption policies. Potentially, a large multinational company's supplier code of conduct can be a more powerful and convincing mechanism for driving sustainability than local laws and regulations (Fair Labour Association, 2010).

The business case to follow responsible business practices for companies is manifold. First, growing legal regulations as mentioned above have to be met. Also, responsible practices prevent reputational risk and increase stakeholder support for business decisions. Being aware of environmental challenges allows businesses to monitor the availability of scarce resources, and eventually the timely research on alternative materials. Adequate working conditions ensure a productive workforce, and make companies attractive for future talents. Responsible management of resources, in an ecological or social sense, can save cost and enhance product quality. Finally, the contribution of businesses to the challenges that the international community faces today, may result in innovative products and

services that provide value in a broader sense – for companies, for the environment and for societies. Even though these arguments appear to be evident, the implementation of responsible business practices is slow, especially regarding supply chains. For example, this can be due to trade-offs between short term economic goals and sustainability criteria (e.g. Goebel et al., 2018), as well as due to a lack in embedding sustainability aspects into business purpose and processes (e.g. Harms et al., 2012; Aguinis and Glavas, 2013; Bocken et al., 2014). Therefore, organisations face increased scrutiny by a diverse range of stakeholders to ensure that internationally accepted standards of social and environmental criteria are also met by their suppliers (Haddock-Fraser and Tourelle, 2010; Reuter et al., 2012). Sustainability issues within global supply chains still occur and purchasing organisations struggle to cope with stakeholder requirements. At the same time, companies still rank sustainable supply network practices to foster human rights, fair labour practices, environmental progress and anti-corruption policies as the biggest challenge (UNGC, 2017).

Looking at the responsibility to implement social and environmental standards in an organisational setting, the function purchasing and supply management (PSM) stands out due to its critical role in managing the external supply base of the firm. Up to 60-80% of the total costs of a modern firm are for sourcing goods and services from suppliers (Monczka et al., 2010; Van Weele and Van Raaij, 2014) that are typically managed by PSM. In this context, PSM traditionally was rewarded for creating financial value in managing the supply base, and the handling of social or environmental issues was an additional task (Caniato et al., 2012). With stakeholder expectations and growing regulations as described above, PSM thus not only has to manage traditional targets such as cost, time, quality and flexibility, but is also faced with the requirement to manage innovation and sustainability (Caniato et al., 2012) within supply chains. The definition of sustainable purchasing and supply management (SPSM) in previous research reflects the entire scope, for example defining SPSM as "the consideration of environmental, social, ethical and economic issues in the management of the organization's external resources in such a way that the supply of all goods, services, capabilities and knowledge that are necessary for running, maintaining and managing the organization's primary and support activities provide value not only to the organization but also to society and the economy" (Miemczyk et al., 2012, p. 489).

How SPSM is implemented first of all depends on the sustainability strategy and approach of an organisation. Many companies tend to handle sustainability issues with a risk-oriented approach or even on an ad-hoc base when issues occur (Harms et al., 2013). They put a lot of effort in managing currently unsustainable supply chains in a more compliant matter, rather than with an innovative approach (Pagell and Shevchenko, 2014). Others, being already more mature, include the sustainable management of their supply chain in their overall business approach and/or already follow the idea of a circular economy. In these regards, particularly promising examples are Benefit Corporations ("B Corps"; Pullman et al., 2018) as well as social businesses (e.g. Tate and Bals, 2016; Bals and

Tate, 2018). The latter, in some cases already by design of their supply chains, aim for positive environmental, social, and economic outputs and outcomes (Bals and Tate, 2018).

Besides the organisational context, the implementation of SPSM also depends on the understanding and knowledge of individual PSM professionals to act in accordance with sustainability criteria. Staff and management of purchasing departments need to bring SPSM in their daily jobs. In doing so, they can either foster the sustainability performance of a PSM organisation, or they hinder success, being overburdened with the antagonism of being responsible and awarded for low cost and prompt delivery and handling social and ecological issues at the same time (Fayezi et al., 2018). The latter indicates that it is necessary to recognise that SPSM is not a mere add-on activity, but requires an organisational framework (e.g. Aguinis and Glavas, 2013; Goebel et al., 2017) as well as purchasing talents with dedicated SPSM competences.

The above suggests to have a closer look from the individual perspective and shed light on the role, the responsibility and impact of purchasing professionals on SPSM. The importance of employee qualification and adequate training was already discussed in a few studies in the sustainability field. For instance, Wolf (2013) evaluated the relation between employee qualification in sustainability and firm performance, or Sarkis et al. (2010) examined the impact of training on environmental practices in a firm. The study conducted by Wolf (2013, p. 104) resulted in the following finding: "Among the four variables analysed, only employee qualification seemed to significantly influence firm performance. As a consequence, managers should invest resources into the development of employees to furnish them with the knowledge and skills necessary for sustainability."

Therefore, this thesis aims to understand which competences purchasing professionals need to have to be able to bring SPSM into action in their day-to-day work, to finally overcome a mere reactive, incidental and compliance based SPSM approach. One the one hand, this includes investigating what competences purchasing professionals need to have for SPSM. One the other hand, after having clarified the competence set, it is considered how to educate and train current and future talents, so they are able to apply those actively in their professional context.

1.2 Research gap and research questions

While there is a rich history of research on supply chain competences (e.g. Hohenstein et al., 2014; Flöthmann et al., 2018) and PSM competences that are needed to manage in accordance with the more traditional targets like cost or delivery (e.g. Giunipero and Pearcy, 2000; Giunipero, Handfield and Eltantawy, 2006), much less is known about the individual competences required to successfully manage sustainability aspects. Furthermore, closely related to the latter, there is a lack of understanding how to train individual sustainability competences in a HE or professional context.

Therefore, this study intends to contribute to research on individual SPSM competences by focusing on two major intended outcomes. First, by gathering a set of specific SPSM competences that serves as a competence model framework. Second, using a training module to incorporate SPSM competences in higher education (HE) and professional education. The leading research question for this endeavour is the following: "Which individual competences of PSM professionals are required to implement SPSM?". Table 1.1 shows how the leading research question is broken down into sub-questions that are mainly addressed by different research strategies.

Which individual competences of PSM professionals are required to implement SPSM?	
SLR	Which SPSM competences are described in current research?
Delphi	What is successful and unsuccessful behaviour shown in SPSM practice? Which competences can be derived from this?
Action research	How can SPSM competences be trained? How is the developed training module perceived by students and practitioners? Does the training have an impact on SPSM competences?

Table 1.1: Research methods and research questions

The implications of the findings of this research are manifold. By applying models from HR and organisational psychology in the PSM context, the research intends to foster an interdisciplinary debate on the competences required for implementing sustainability into supply networks and to develop a SPSM competence model. For responsible education, the findings will enable HE institutions to integrate sustainability into PSM curricula by focusing on the most important knowledge and competence areas. Finally, the research also aims to support companies and other organisations to develop competence profiles for SPSM. Competence profiles support the recruiting of future PSM professionals and the development of corporate training on SPSM.

1.3 Structure of the thesis

The thesis is organised as follows: First, in chapter two, the conceptual background for the research is described, clarifying the unit of analysis, providing definitions and the conceptual framework. It is discussed how organisational settings impact the application of individual SPSM competences and thereof behaviour.

Chapter three shows the research methodology, including the philosophical and strategic assumptions of this research. It explains the decisions that were taken in terms of the selection of the research methods as well as the data analysis approach, and includes how quality assurance measures were applied. Additionally, the applied methods, a systematic literature review (SLR), a Delphi study and action research, are introduced and their application in this research is described.

Chapter four covers the results of the systematic literature review, the Delphi study and the action research, including the data evaluation and its limitations.

Then, chapter five shows how the consolidated results led to the development of a competence model framework.

Finally, chapter six closes with conclusions, theoretical, educational and managerial implications, and suggestions for future research.

Figure 1.1 provides an overview of the structure. The beginning of each chapter will refer to the relevant element of this overview.

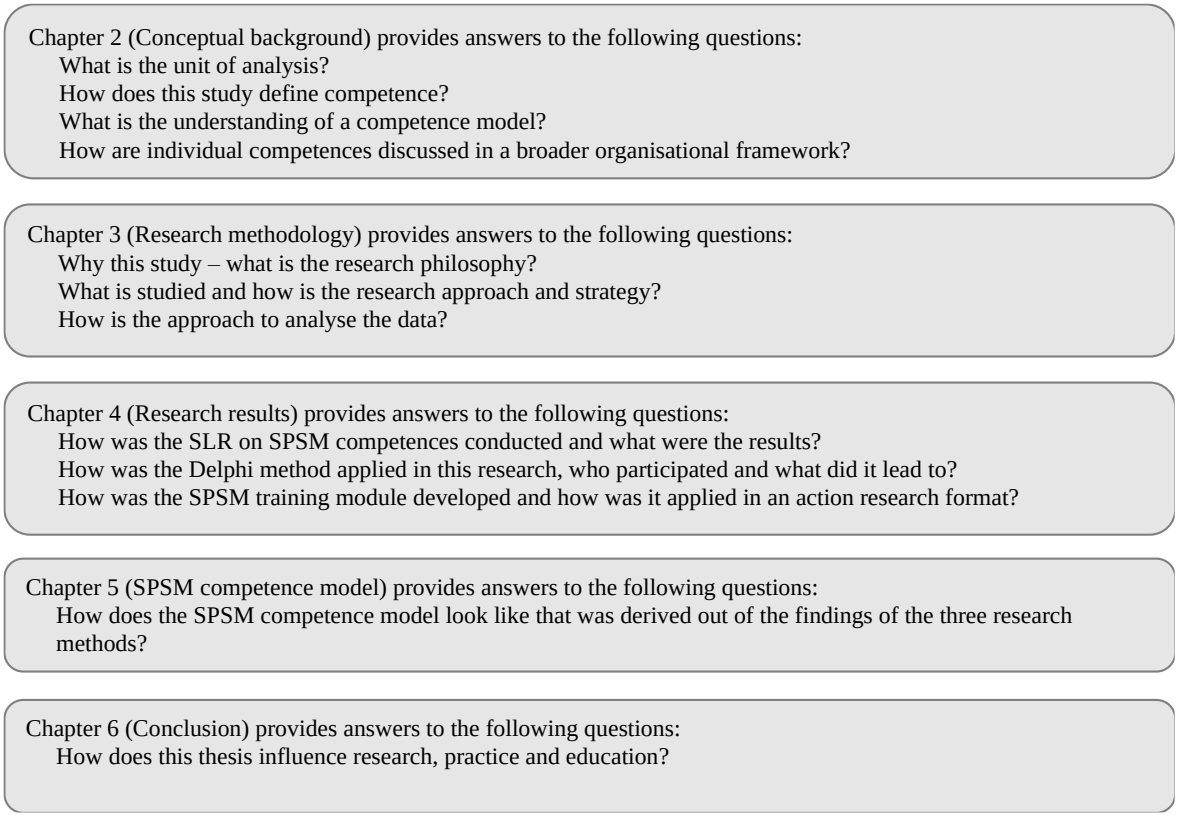


Figure 1.1: Structure of the thesis

2 Individual and Organisational Competences – Conceptual Background

As outlined below in Figure 2.1, this chapter clarifies the unit of analysis and introduces underlaying definitions and concepts. It positions individual competences in a broader framework from organisational psychology, taking into consideration organisational as well as individual influences on behaviour.

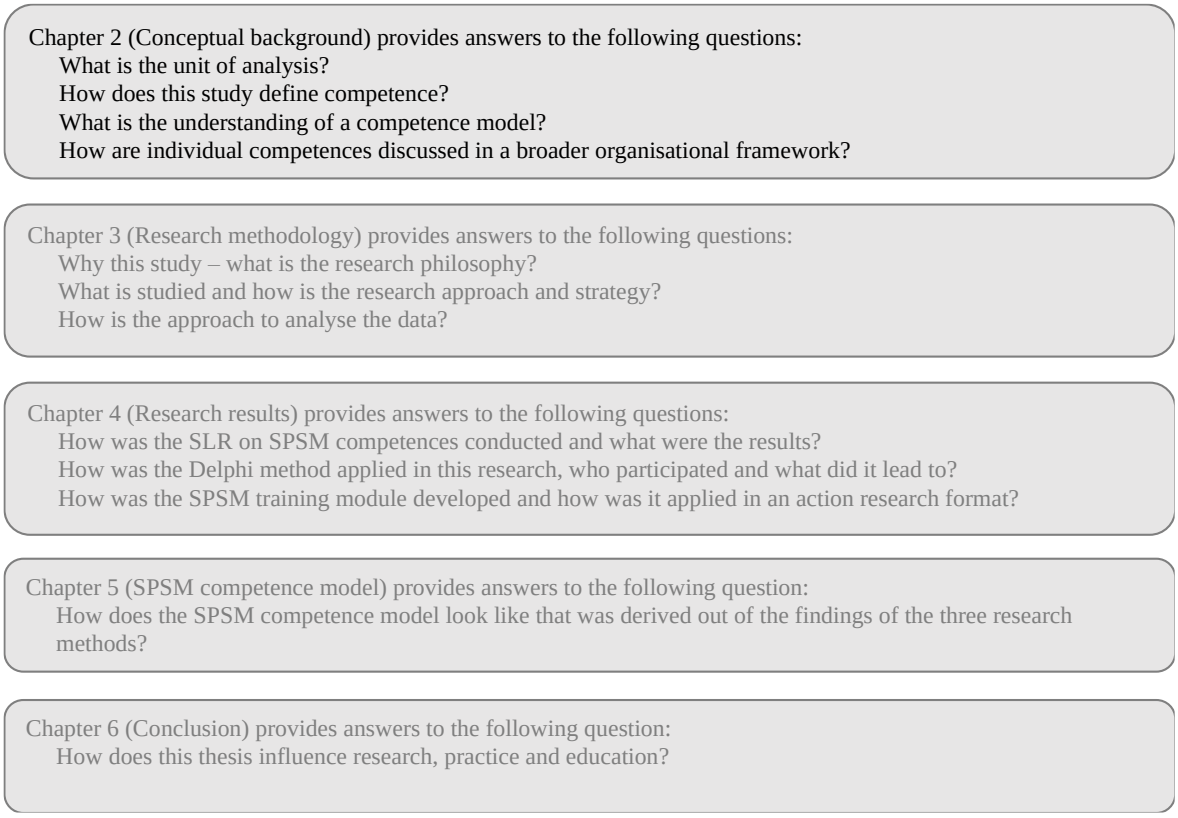


Figure 2.1: Contribution of chapter 2 in reference to the structure of the thesis

2.1 Unit of analysis: PSM stakeholder scope and processes

Following for example Ellram and Cooper (2014) or Durach et al. (2017), research in the field of Supply Chain Management should clearly define which aspect of the supply chain it is focusing on, as the field "[…] may vary greatly, involving anything from a single dyadic linkage between a manufacturer and a retailer to all upstream and downstream actors […]" (Durach et al., 2017, p. 5). Therefore, the scope of this study is defined as follows. The research on SPSM competences refers to the PSM discipline, with the focus on the upstream supply network. When positioning PSM in the broader supply chain management (SCM) context, it follows the so-called unionist perspective,

viewing PSM as a sub-area within SCM as shown in Figure 2.2 (Larson and Larson and Halldorsson, 2002; Spina et al., 2013). This is important to clarify, as this perspective considers PSM as a stand-alone discipline which is embedded in the broader SCM frame, but focuses on the upstream supply network. Therefore, the SPSM competence model does not consider competences that are required for production, distribution or logistics.

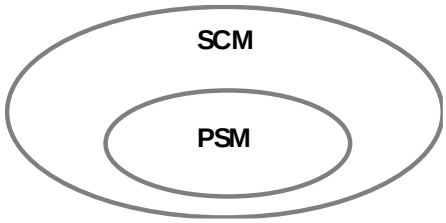


Figure 2.2: Unionist perspective about PSM and SCM. (Adopted from Larson and Haldorsson, 2002; Spina et al., 2013, p. 1203)

PSM as a function in public and private organisations can be defined as "the discipline that is concerned with the management of external sources – goods, services, capabilities, and knowledge – that are necessary for running, maintaining and managing the primary and secondary support processes of a firm at the most favourable conditions" (van Weele, 2010, p. 8). Moreover, PSM has an increasing role in managing the broader external, as well as the internal, stakeholder network (e.g. van Weele and van Raaij, 2014). The role of the PSM function as a boundary-spanner between the external supply network and internal stakeholders is visualised in Figure 2.3 below.
Moreover, to provide an overview of typical PSM processes and create a conceptual foundation in the research design, it is necessary to clarify which exact tasks are required in order to achieve SPSM. The overall PSM tasks are shown in a schematic procurement process overview in Figure 2.4.

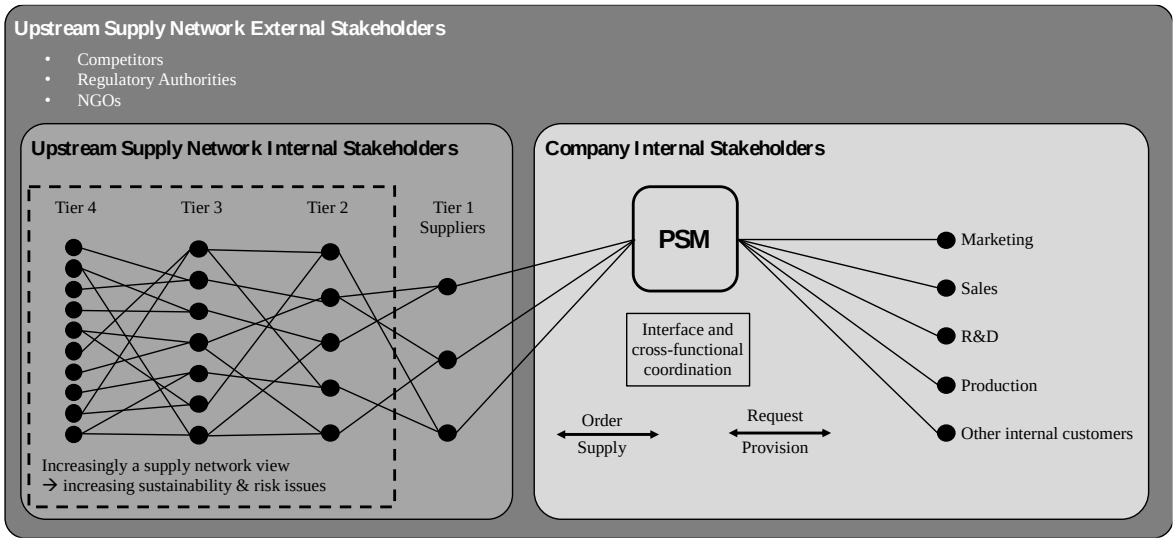


Figure 2.3: PSM as the interface between the company internal and upstream supply network actors (adapted from: Schneider and Wallenburg, 2012; Kummer et al., 2013)

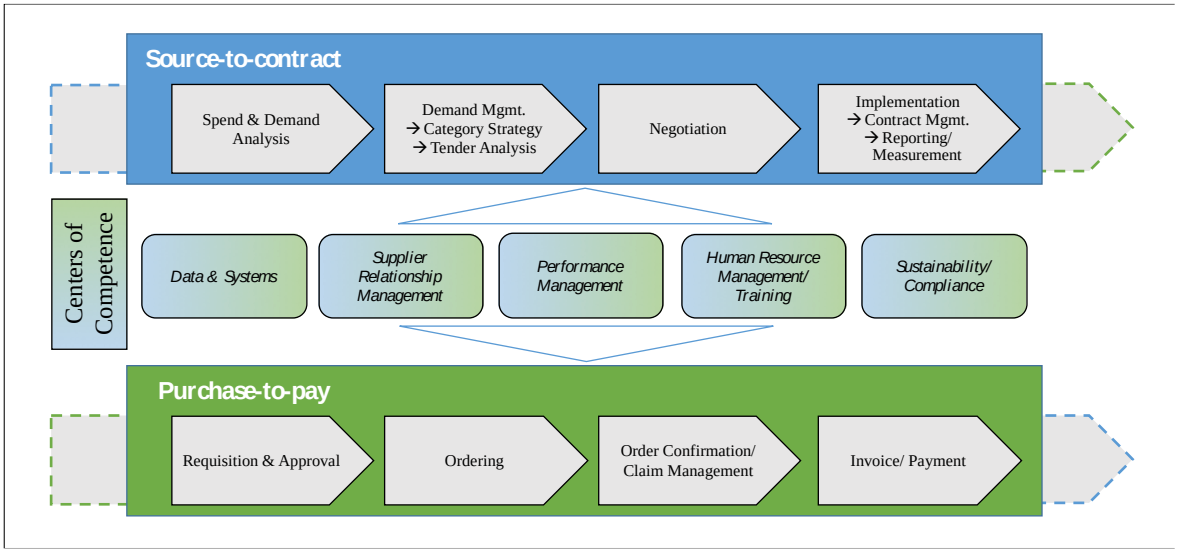


Figure 2.4: Purchasing and Supply Management processes (adapted from van Weele, 2014; Monczka et al., 2016)

Source-to-contract describes the strategic sourcing process from demand analysis to contracting management, whereas purchase-to-pay includes all transactional tasks covering ordering, claim management and payment (e.g. Monczka et al., 2016). The processes with the headline centres of competence (also sometimes referred to as centres of excellence) shown in the middle of the figure refer to processes that are often performed in an overarching manner for the whole PSM function (e.g. O'Marah, 2015; Bals et al., 2017), such as the management of data and systems, the monitoring and adaptation of regulations or training for PSM professionals. If organised as such, centres of competence also typically develop tools for supplier relationship management (SRM), such as supplier databases or supplier communication channels and performance management (e.g. key performance indicators (KPIs)).

In terms of who is performing the processes, the term "PSM professionals" is used here in the sense of individuals operating with different responsibilities within a PSM function. The PSM professionals work in one or more steps of the source-to-contract, purchase-to-pay, or centre of competence processes shown in Figure 2.4.

2.2 Competences – Definitions, typologies and positioning in the PSM context

There is a conceptual ambiguity around the definition of the term 'competence' in academic research and literature (e.g. Shippmann et al., 2000; Delamare-Le Deist and Winterton, 2005; Grote et al., 2012; Krumm, Mertin and Dries, 2012; Derwik and Hellström, 2017; Erpenbeck et al., 2017). The following paragraphs provide a selective insight of what is discussed in academia with regard to the

term ‘competence’, considering also selected contributions in PSM and SCM research to the topic. Referring to the academic discussion, the application of the term ‘competence’ and the decision for a competence classification approach in this research is described.

In general, definitions of competence differ regarding their levels of analysis. In a SLR on competences in SCM, Derwik and Hellström (2017) identified three dimensions for the application of the term. First, they found papers that deal with competences related to individuals, for example knowledge of supply chain professionals. The other two dimensions that they derived from literature consider the organisational level, with one focussing on the intra-organisational level, describing competences of different functions within an organisation. These are for instance knowledge requirements for a human resources (HR) or a production department within a company. The other organisational dimension of the term competence that the authors found in literature focuses on competences at an inter-organisational level, for instance industry-specific competences. Taking the three dimensions into consideration when positioning the usage of competence in this research, it clearly refers to the individual dimension of competence.

Looking at the individual dimension, the terminology and the understanding of competence is different depending for example on the cultural and linguistic context (Delamare-Le Deist and Winterton, 2005; Grote et al., 2012). For instance, the German usage of ‘Kompetenz’ is mainly discussed in a broader, more holistic view as the general ability to act successfully in professional situations in a self-organised manner (e.g. Arnold, 1991; Delamare-Le Deist and Winterton, 2005; Erpenbeck, 2013). Closely connected to this understanding is the clustering of competences in the four domains of professional competence (‘Fachkompetenz’), social competence (‘Sozial-kompetenz’), methodological (‘Methodenkompetenz’), and self-competence (‘Selbstkompetenz’) (e.g. Arnold, 1991; Delamare-Le Deist and Winterton, 2005; Grote et al., 2012). Furthermore, being developed in the context of the German dual system of vocational training and education, the so-called ‘key qualifications’ (‘Schlüsselqualifikationen’) need to be mentioned in this context. ‘Key qualifications’ are knowledge, skills and abilities that can be transferred to solve a broad range of professional situations (Arnold et al., 2010, Delamare-Le Deist & Winterton, 2005). Transferability depends on structural commonalities of situations, as well as on formal competences like practical skills, social competences or cognitive abilities (Arnold et al., 2010). Instead of learning a technical skill to master a trade, like to weld a metal part, apprentices learn a broader set of transferable competences, like the understanding of the process how to construct an automotive component, applying still the skill ‘welding a metal part’, but also applying social and methodological competences, subsumed in term ‘action competence’ (‘Handlungskompetenz’). Grounded in the concept of ‘key qualifications’, member countries of the Organisation for Economic Co-operation and Development (OECD) launched the Programme for International Student Assessment (PISA), aiming for a set of competences that enables students to participate successfully in society and in the professional context (Rychen and Salganik, 2003). The competences are supposed to be applicable

in different professional settings, for example ‘the ability to manage and resolve conflicts’ or ‘the ability to use technology interactively’.

In the Anglo-Saxon region, a rather behavioural approach was initially followed by McClelland (1976), who introduced competence assessments as opposed to intelligence testing in the context of job performance (McClelland, 1976; McClelland, 1998; Delamare-Le Deist and Winterton, 2005). Based on this tradition, the combination of knowledge, skills and abilities is commonly used to describe competences in the format of job descriptions and competence models (Spencer and Spencer, 1993; Mirabile, 1997; Grote et al., 2012). But, even within the English family of languages, the application of the terms ‘competence’, ‘knowledge’ and ‘skills’ varies. Spencer and Spencer (1993) defined five types of underlying characteristics which are included in their definition of competence, including motives, traits, self-concept, knowledge and skills. The latter two are described as being ‘surface competences’, whereas self-concept, motives and traits are called ‘core personality’ (Spencer and Spencer, p. 11). In a similar manner, Boyatzis (1982) for example defined competence as “an underlying characteristic of an employee (i.e., a motive, trait, skill, aspect of one’s self-image, social role, or a body of knowledge) which results in superior performance” (Boyatzis, 1982, p. 21). For both definitions, the one from Spencer and Spencer (1993) and the one from Boyatzis (1982), the term ‘knowledge’ is an integral element of the competence definition. Therefore, the author looked for a definition of knowledge. Bollinger and Smith (2001) say that knowledge is “the understanding, awareness, or familiarity acquired through study, investigation, observation, or experience over the course of time. Knowledge is about an individual's interpretation of information based on personal experiences, skills, and competencies” (Bollinger and Smith, 2001, p. 9). Spencer and Spencer defined knowledge as being the “information that a person has in specific content areas” (Spencer and Spencer, 1993, p. 10), specifying that “[…] knowledge is a complex competency” (Spencer and Spencer, 1993, p. 10). The cross-referencing of terms makes it somewhat complicated to clearly derive different meaning or to bring the terms in a hierarchical order. Moreover, skills would need to be assigned in this context, too. For instance, compared to ‘knowledge’, some researchers define skills as a talent to manage a particular task, for example giving a presentation (Spencer and Spencer, 1993; Mirabile, 1997, Krumm et al., 2012).

This research does not aim for an in-depth analysis of the terminology, however, it intends to be clear and consistent in this case. With regard to the research aim to gather SPSM competences of individuals in a professional environment that enable successful SPSM, it was decided to rely on Krumm et al. (2012), who define a competence as “a set of abilities, skills and other attributes and characteristics that enable a person to manage complex situations effectively; this set can be developed through learning and experience” (Krumm et al., 2012, p. 3, translated by the author). The definition includes the focus on complex situations. Complex situations are characterised as being situations that can´t be solved by standard types of solutions (Krumm et al., 2012). The critical incidents (CIs) that were applied in this research on SPSM competences (see Table 4.7) reflect

complex situations. No textbook or operating manual can provide solutions to successfully solve the CI situations, however, an appropriate set of competences helps individuals to cope with the incidents. The definition provided by Krumm et al. also includes that competences can be acquired through learning and experiencing. This notion goes in line with the research philosophy, and the personal values and beliefs of the researcher, as it is further outlined in 3.2. Moreover, to entirely cover all implications of the underlying competence definition of this study, the definition includes that competences are a prerequisite for performance, but do not necessarily lead to performance. The application of competences, resulting in performance, depends on other moderating factors like individual motivations and values, as well as on organisational enablers. Section 2.4 elaborates on the impact of the organisational context.

Next, after having outlined the level of analysis and the underlying definition of 'competence' for this research, the applied competence typology will be described. Literature in the field of HR, in personnel or in organisational psychology provides a broad range of varieties to classify competences. Some classification types are bipartite. For example, competences can be differentiated being either related to professional expertise in a technical sense, or related to leadership requirements, such as people development, disturbance handling or political skills (Mintzberg, 1973; Katz, 1974). Leadership competences are discussed in the context of management education (e.g. Mintzberg, 1973; Mintzberg, 2004), or become relevant when diagnostic assessment methods for managers are developed and discussed (e.g. Spencer and Spencer, 1993; Neubauer, 2005). Another way to differentiate competences is whether they encompass knowledge being rather explicit 'know-what' or more tacit 'know-how' (Nonaka and Takeuchi, 1995; Smith, 2002). Tacit knowledge is multidimensional, context-specific, and while it is often embedded within organisational routines (Kothari et al., 2012) it can only be observed through its application and acquired through practice. This means its transfer between people is slow, costly, and uncertain (Kogut and Zander, 1992). Conversely, explicit knowledge is that which can be articulated in formal language, like manuals, mathematical expressions, copyright and patents (Smith, 2001), and can be shared more easily between people (Grant, 1996).

Other approaches classify competences in more than two clusters. For example, as mentioned above, the combination of methodological competences, social competences, and self-competences was applied as a structural basis for competence models (e.g. Kauffeld, 2006; Grote et al., 2012). In a similar manner, Erpenbeck et al. (2017) proposed personal competences, activity-related or results-oriented competences, methodological and social-communicative competences (Erpenbeck et al., 2017). Boyatzis (2007) referred to emotional, social and cognitive intelligence competences which impact performance, and which therefore should be addressed in adult education in the professional environment. A generic set of competences related to workplace performance, the so-called 'great eight competency model' was defined and empirically validated by Bartram et al. (2002). The set includes the competence titles 'leading and deciding', 'supporting and cooperating', 'interacting and

presenting', 'analysing and interpreting', 'creating and conceptualising', 'organising and executing', 'adapting and coping' as well as 'enterprising and performing'. The Kode©x model operates on a more aggregated level. Being developed by Erpenbeck and Heyse (Heyse, 2017) as a model for individual and group competence diagnosis and development, it describes four main categories: Personal competences, activity and action competences, socio-communicative competences as well as methods and professional competences. Besides, Delamare-Le Deist and Winterton (2005) provided another aggregated, comprehensive framework. Their typology differentiates cognitive, social, functional, and meta competences that are necessary for performing professional tasks. Cognitive competences are defined as general knowledge and understanding, social competences are focused on individual behaviour, and functional competences cover applied skills and knowledge in a professional context. Meta competences are described as being "(…) concerned with facilitating the acquisition of the other substantive competences" (Delamare-Le Deist and Winterton, 2005, p. 39). The latter meta competence was also included by Anderson et al. (2014) in their structure of what they call 'knowledge dimensions'. Aiming for a taxonomy for learning outcomes based on Bloom's taxonomy (Bloom, 1956), they clustered four major types of knowledge dimensions. The 'metacognitive' type is one type, being described as "knowledge of cognition in general as well as awareness and knowledge of one's own cognition" (Anderson et al., 2014, p. 46). The other three types are 'factual', 'conceptual' and 'procedural knowledge'.

A number of papers in the area of SCM and PSM (e.g. Giunipero, 2000; Tassabehji and Moorehouse, 2008; Prajogo and Sohal, 2013; Knight et al., 2014; Derwik and Hellström, 2017; Flöthmann et al., 2018) refer to definitions and typologies of competences. Derwik and Hellström for instance describe four elements, based on the findings of their SLR: "[First,] functional competence deals with competence directly related to existing SCM business functions and company processes […]. Functional competence can be studied on the operational, tactic and strategic level. [Second,] relational competence deals with relational competences between all possible stakeholders […], [third,] managerial competence, [and finally] behavioural competence […]" (Derwik and Hellström, 2017, p. 206). On a rather practice-oriented level in PSM, Giunipero (2000) grouped skills required for a world-class purchaser into strategic, behavioural, process management, negotiation, team, decision making, and quantitative. Giunipero's classification scheme fed into the development of purchasing skills by Tassabehji and Moorehouse in 2008, listing technical skills, interpersonal skills, internal enterprise skills, external enterprise skills and strategic business skills (Tassabehji and Moorehouse, 2008; Bals et al., 2018). Based on an empirical study with supply chain professionals, Prajogo and Sohal (2013) sorted required competences for SCM professionals in the areas 'communication and teamwork', 'technology skills', 'initiative and enterprise skills' as well as 'compliance and legal knowledge' (Prajogo and Sohal, 2013, p. 1541).

After having evaluated the various ways to classify competences, the author decided to use the competence typology according to Delamare-Le Deist and Winterton (2005) for this dissertation.

The reasons for this decision were the following. First, the multi-dimensional character of the model seemed to be appropriate for a topic as broad as SPSM competences. As of Delamare-Le Deist and Winterton, "[…] a holistic typology is useful in understanding the combination of knowledge, skills and social competences that are necessary for particular occupations" (Delamare-Le Deist and Winterton, 2005, p. 39). The combination of competences is reflected in the structure of the typology. The four clusters include conceptual and operational competence requirements as shown in Table 2.1. Both, conceptual and operational requirements, are relevant for competences associated to a specific occupation, which is reflected in the cognitive and functional competence clusters. Also, competences related to individual effectiveness are both, conceptual (meta competences) and operational (social competences). Therefore, the typology includes and reflects the main different cultural and occupational approaches to cluster competences that were described above, providing a comprehensive structure for the SPSM model development.

	Occupational	*Personal*
Conceptual	Cognitive competence	Meta competence
Operational	Functional competence	Social competence

Table 2.1: Typology of competences (Delamare-Le Deist and Winterton, 2005, p. 39)

The second motivation why the author decided to apply the model of Delamare-Le Deist and Winterton is grounded in the findings of the SLR. The model was also applied by recent research on corporate social responsibility (CSR) officer competences (Osagie et al., 2014). The paper from Osagie et al. (2014) inspired this research, and their findings contributed to the development of the SPSM competence model development. Therefore, using the same competence classification was supposed to yield interesting results for PSM professionals, as well. At the same time, the application of the typology in the research of Osagie et al. (2014) indicated a fit for clustering competences in an occupational sustainability context.

The four competence clusters as defined by Delamare-Le Deist and Winterton (2205) were slightly adapted to the SPSM context. Figure 2.5 shows the clusters and the underlying definition for this research.

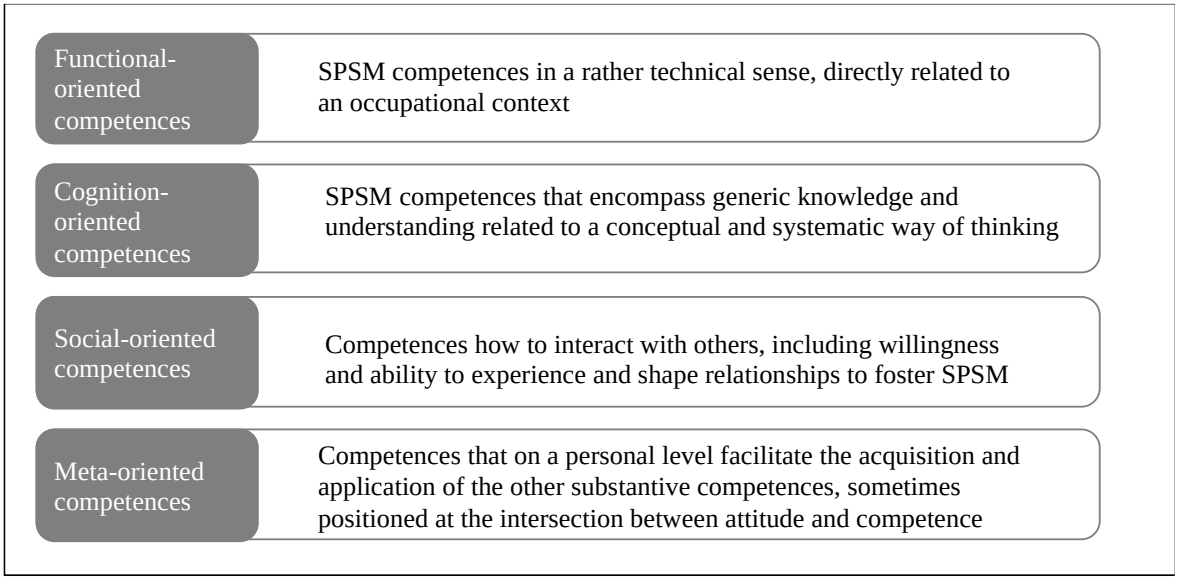


Figure 2.5: Competence cluster definitions for SPSM competence model (based on Delamare-Le Deist and Winterton, 2005, p. 27-46)

To summarise, this study refers to the competence definition of Krumm et al. (2012) as mentioned above, focusing on individual competences as the level of analysis. It uses the term and notation 'competence' (singular) and 'competences' (plural) through the work. The classification of SPSM competences for purchasing professionals builds on the framework proposed by Delamare-Le Deist and Winterton (2005).

2.3 Competence models – Framework for this research

The previous section 2.2 outlined the underlying definition of competence in this research, as well as the competence classification model that was used. Next, the conceptual framework for the SPSM model development will be explained.

The aim of this research was to deliver a SPSM competence model for purchasing professionals (see chapter 5). Therefore, it is necessary to specifically describe the character of a competence model as such, and to position the SPSM competence model of this research in the context of different forms of competence models. There has been some disagreement in literature whether it is legitimate to apply the term 'model', as most competence models are rather lists of competences than models. They do not elaborate on structures, competence hierarchies or interrelations (Dalton, 1997; Krumm et al., 2012). Thus, the following two definitions of competence models represent a comprehensive view of its main characteristics: "A competency model is a detailed, behaviourally specific description of the skills and traits that employees need to be effective in a job" (Mansfield, 1996, p. 7), and "A competency model depicts […] motives, traits, and so forth as a set of desired job

behaviours for a particular job position or level. A competency model also implies that such behaviours are predictive of who is likely to be successful in a position or role" (Dalton, 1997, p. 48). When looking at these two descriptions, a competence model is supposed to describe competences that are required for a job or a position. Individuals who act based on competences which are described in a competence model should be more successful compared to others in solving complex situations in a professional context within an organisation (Spencer and Spencer, 1993; Krumm et al., 2012). Competence models inherently include a future perspective, aiming for competences that are relevant to achieve certain organisational goals (Dalton, 1997; Briscoe and Hall, 1999; Krumm et al., 2012). Organisations use competence models for multiple occasions in the application of HR instruments. For instance, to select new employees, to evaluate performance, to develop training and development plans or to build HR systems (Spencer and Spencer, 1993; Mansfield, 1996; McClelland, 1998; Shippmann et al., 2000; Campion et al., 2011; Krumm et al., 2012).

Typically, competence models describe competences based on a certain structure including different levels, for example a competence cluster, the competence description and observable behaviour (e.g. Spencer and Spencer, 1993; Campion et al., 2011; Krumm et al., 2012). Figure 2.6 shows how the structure is applied for the SPSM competence model.

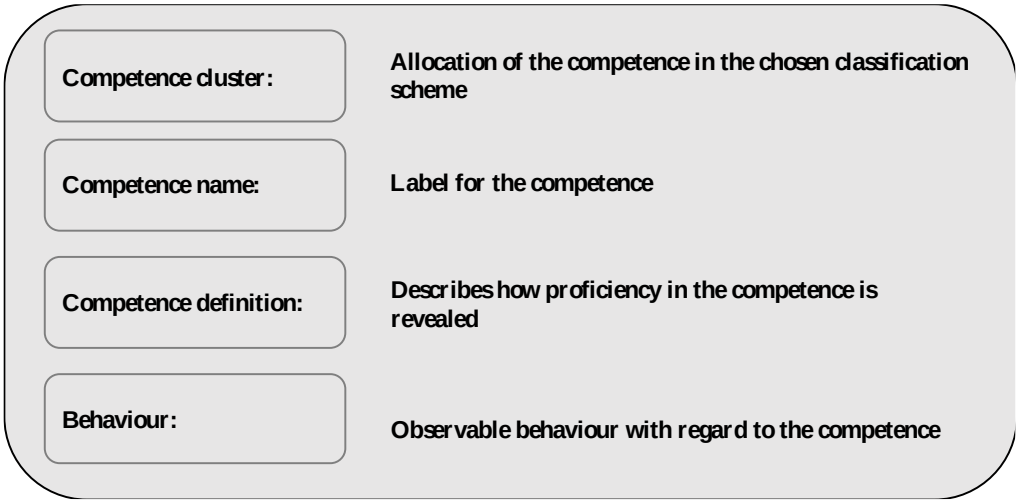


Figure 2.6: Levels applied for the SPSM competence model (based on Campion et al., 2011, p. 240; Krumm et al., 2012, p. 12)

When it comes to the design of a competence model, literature suggests the following research-based, systematic approach (Spencer and Spencer, 1993; Dalton, 1997; McClelland, 1998; Briscoe and Hall, 1999). First, current and future challenges as well as performance criteria for the specific job area or position would need to be defined. Then, critical incident interviews should be conducted to gather successful and unsuccessful behaviour. Consequently, the documented interviews should be evaluated by conducting a content analysis to gather the relevant competences that populate the final

competence model, including descriptions of behaviour for each competence. Then the newly developed competence model should be validated in practice (e.g. Dalton, 1997). Complementing this research-based approach, Campion et al. (2011, p. 230) defined three main steps as best practice in competence modelling: 'analysing competence information (identifying competences)', 'organising and presenting competence information', and 'using competence information' (Campion et al., 2011, p. 230). For each step, a list of recommendations is provided. For instance, in the first step when 'analysing competence information', it is recommended to consider the organisational context and match the competence model to organisational goals and objectives (Campion et al., 2011). Additionally, rigorous methods should be applied to analyse competences while considering current and future job requirements. Then, when 'organising and presenting competence information', it is recommended for example to define competences in an applicable level of granularity and to communicate it using appropriate organisational language. Finally, when 'using the competence information', Campion et al. (2011) emphasised the alignment with HR processes and systems.

Briscoe and Hall (1999) critically discuss in their research on leadership competences whether the research-based approach is rather focused on the past and not so much on competences required in future. Therefore, the development of the SPSM competence model in this dissertation followed the research-based approach as outlined above (Schulze and Bals, 2018; Schulze and Bals, 2019), taking into consideration some of the recommendations by Campion et al. (2011), and making sure that when identifying competences, the future aspect was included. This was ensured in the Delphi study in the critical incident interviews, where participants were given the opportunity to add own situations that they found relevant (section 4.2.1). Although, as the SPSM competence model was not developed for a specific organisation, the suggestions from Campion et al. (2011) were applied mainly for the first two steps of their approach. Nevertheless, the organisational perspective and the impact on a SPSM competence model is discussed in section 2.4. Chapter three describes the details of the research methodology and approach.

The scope of competence models can be manifold. For instance, Mansfield (1996) differs between single-job competence models, one-size-fits-all models, and multiple-job competence models. Single-job models describe competences that are required for a specific function within an organisation, for example that of a buyer for automotive parts. One-size-fits-all models define a set of competences for a broad range of jobs, like all managerial jobs in an organisation (Mansfield, 1996). The main character of multiple-job competence models is that they provide generic competence modules and descriptions that can be customised for different functions. As of Mansfield (1996, p. 11) "The first requirement of this approach is that different models be built from a common set of building block competencies […]". To consider the latter in a PSM context, an organisation might develop a multiple-job competence model that includes customer orientation, which then needs to customise customer orientation to the PSM context. Another way to classify competence

models is to differentiate between a focus on desired characteristics of an individual and a focus on job elements (Krumm et al., 2012). Competence models that describe required individual characteristics might for example include a competence like 'flexibility', whereas others that are related to a job list 'negotiation with suppliers'. When positioning the SPSM competence model in terms of its scope, it can be described as being a multiple-job model, including individual and job related competences.

At this point it is useful to differentiate between job descriptions or job analysis and competence models, while acknowledging that research does not provides unique and consistent differentiation criteria. Shippmann et al. (2000), for example, evaluated the differences based on a level of rigour scale, including ten different variables, like the method of investigation, link to business goals and strategies or the detail of descriptor content (Shippmann et al., 2000, p. 716 - 720). In a rather condensed overview, their findings indicate that job analysis is related to a specific job requirement whereas competence models have a broader focus. Also, competence models tend to relate more to strategic requirements, compared to job analyses (Shippmann et al., 2000; Krumm et al., 2012). Campion et al. (2011) found ten criteria to describe competence models compared to job analysis (Campion et al., 2011, p. 227). Some of them are in line with the variables of Shippmann et al. (2000), like competence models being linked to business objectives and strategies, or the way how competence models describe the individual competences. Other criteria that are mentioned by Campion et al. (2011) relate to the impact of competence models on organisational change, or to the visibility for executives.

To summarise, the SPSM competence model was developed using a research-based approach, resulting in a generic, multiple-job type of model. The description of the individual competences within the SPSM model framework follows the structure as shown in Figure 2.6.

2.4 The organisational perspective – Individual behaviour in organisations

Having defined the unit of analysis of this research, its underlying definition of competence and the nature of the competence model, the following section discusses the interplay between individual competences and the organisational setting. After all, it needs to be clarified why it is even beneficial to develop a SPSM competence model, and why the focus on the individual perspective is reasonable. Also, circumstances that foster the application of individual competences need to be clarified. To provide a comprehensive answer to this question, a model from organisational psychology is applied here. From an organisational psychology perspective, individual variables and organisational variables both can be seen as moderating factors on behaviour (e.g. Caldwell and O'Reilly, 1990; Von Rosenstiel, 2011). The model developed by Von Rosenstiel (2011) includes four determinants or 'conditions of behaviour' (Von Rosenstiel, 2011, p. 347): "When differentiating the causes of

human behaviour a bit further, yet staying in a relatively general level, we can distinguish between 'volition' and 'ability' for the person, 'empowerment' and 'obligation' for the situation, as well as 'situational enabling'." The model draws from a history of psychological research approaches on the determinants of individual behaviour, including the theory of topological psychology by Kurt Lewin (1936). Figure 2.7 shows the model adapted to the SPSM context. The model highlights on the right that competences ('individual skills – abilities and skills') influence human behaviour, but moreover, that this behaviour is also influenced by individual motivation ('individual desire – motivation and values'). On the left hand side of Figure 2.7, the organisational determinants that influence behaviour are shown: 'empowerment and obligation' and 'situational enabling'. All four components are mutually connected, and their interplay impacts the sustainability performance of a firm. As indicated in Figure 2.10, they are influenced by drivers outside the PSM organisation, like the competitive strategy or stakeholder requirements.

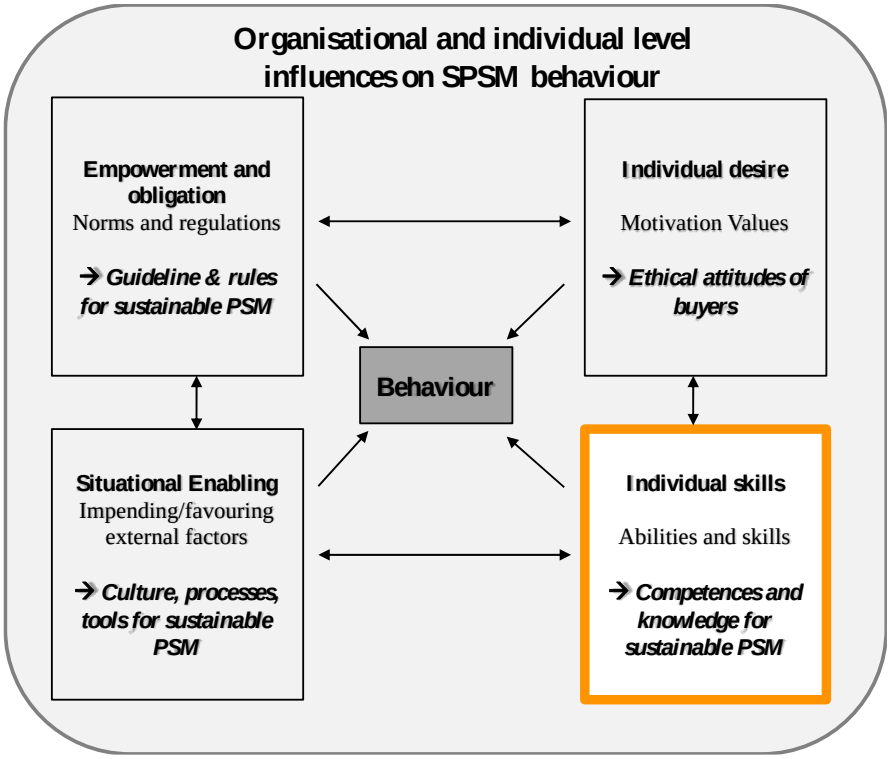


Figure 2.7: Organisational and individual level influences on behaviour (adapted from Von Rosenstiel and Koch, 2003, p. 200; Von Rosenstiel, 2010, p. 348)

In accordance with the framework from organisational psychology, very recently in the context of SCM competences, Flöthmann et al. (2018) have highlighted that both individual SCM competences and organisational SCM competence influence SCM performance to a similar magnitude.

Based on Von Rosenstiel's model, this research focuses on the determinant 'individual skills' for behaviour, as highlighted at the bottom of the right-hand side of the graph. When looking in more detail as to how organisations gather individual competences, it becomes evident why a competence model is beneficial. Driven by performance goals, organisations usually describe a set of tasks that

need to be fulfilled in a specific function. To ensure that these tasks are performed in the expected manner, detailed requirements are defined in terms of what needs to be done in which way, probably in the format of a job description. Consequently, the requirements lead to competences that are necessary to fulfil the tasks and meet the expected performance goals. As for example Caldwell and O' Reilly (1990) evaluated in their study, the better the fit between the requirements of a job and the competences of the job holder, the higher the job performance will be (Caldwell and O'Reilly, 1990; Spencer and Spencer, 1993). Competence models consolidate and provide evidence of the whole range of competences that are required for a certain task. Therefore, they contribute to the 'individual skills' moderating factor, being one of the four components as outlined above that drive behaviour, finally leading to performance of an organisation.

At this point, it is important to also briefly consider theory on organisational learning. Argyris and Schön (1978) define two categories of learning: single-loop and double-loop learning. In single-loop learning, "[m]embers of the organization respond to changes in the internal or external environments of the organization by detecting errors which they then correct so as to maintain the central features of organizational theory-in-use" (Argyris and Schön, 1978, p. 18). Hence, single-loop learning can be described as learning by correcting errors to carry on with existing procedures or policies. For example, in reaction to sustainability incidents in the supply network and to mitigate future sustainability risk, PSM professionals can learn how to conduct audits. But organisational change is only initiated by double-loop learning: "[…] sorts of organizational inquiry which resolve incompatible organizational norms by setting new priorities and weightings of norms, or by restructuring the norms themselves together with associated strategies and assumptions" (Argyris and Schön, 1978, p. 20). For double-loop learning on the organisational level, individual single-loop learning effects need to be incorporated into organisational norms, values and strategies. For example, the individual knowledge on sustainability risk and its mitigation tools influence how the organisation defines performance indicators for PSM professionals, resulting in changing strategic goals and company norms. Therefore, the quality of the application of individual knowledge and competences depends on the extent to which an organisation allows or enables not only single-loop but also double-loop learning. This might be an important prerequisite when regarding SPSM competences and their impact on the sustainability performance of a company. Thus, individual and organisational learning processes influence how an organisation evolves in this context (Argyris and Schön, 1987).

Also in this regard, the model developed by Von Rosenstiel (2010) helps to position the relevance of a competence model in the broader context. First, the motivational aspect of individuals needs to be taken into consideration when evaluating competences and their impact on performance. In line with this, Walker et al. (2012, p. 203) have suggested that for sustainable procurement, "[u]nderstanding how individual values influence sustainability would be helpful, along with research from behavioural and psychological perspectives." Second, Figure 2.7 clearly indicates that

individual competences do not become relevant for success until the system wherein an individual is embedded provides a framework for action (e.g. Argyris and Schön, 1978; Comelli and Von Rosenstiel, 2003; Von Rosenstiel and Koch, 2003; Von Rosenstiel, 2011; Aguinis and Glavas, 2013). For example, the individual competence to conduct a sustainability audit might be part of a general SPSM competence model, but will only have a positive impact if the organisation has a strategy to monitor and develop suppliers towards improving sustainability performance. Also highlighting the importance of such organisational level factors, recently obedience to authority has been highlighted as important for whether PSM professionals are willing to pay more for sustainability or not (Goebel et al., 2018).

Therefore, the interdependency of organisational goals and objectives and the application of individual competences and knowledge needs to be taken into consideration when seeking to conceptualise sustainability competences for PSM professionals. Therefore, as already described in the previous section, competence models need to refer to an organisational context to become applicable (Spencer and Spencer, 1993; Campion et al., 2011; Krumm et al., 2012). Referring to the work of Campion et al. (2011), Figure 2.8 outlines a guiding framework of how to embed a competence model in an organisational context. The figure shows the impact of an organisation's vision, values and strategy on individual competences and behaviour, resulting in measurable performance and metrics. The authors here chose a clustering by technical and leadership competences.

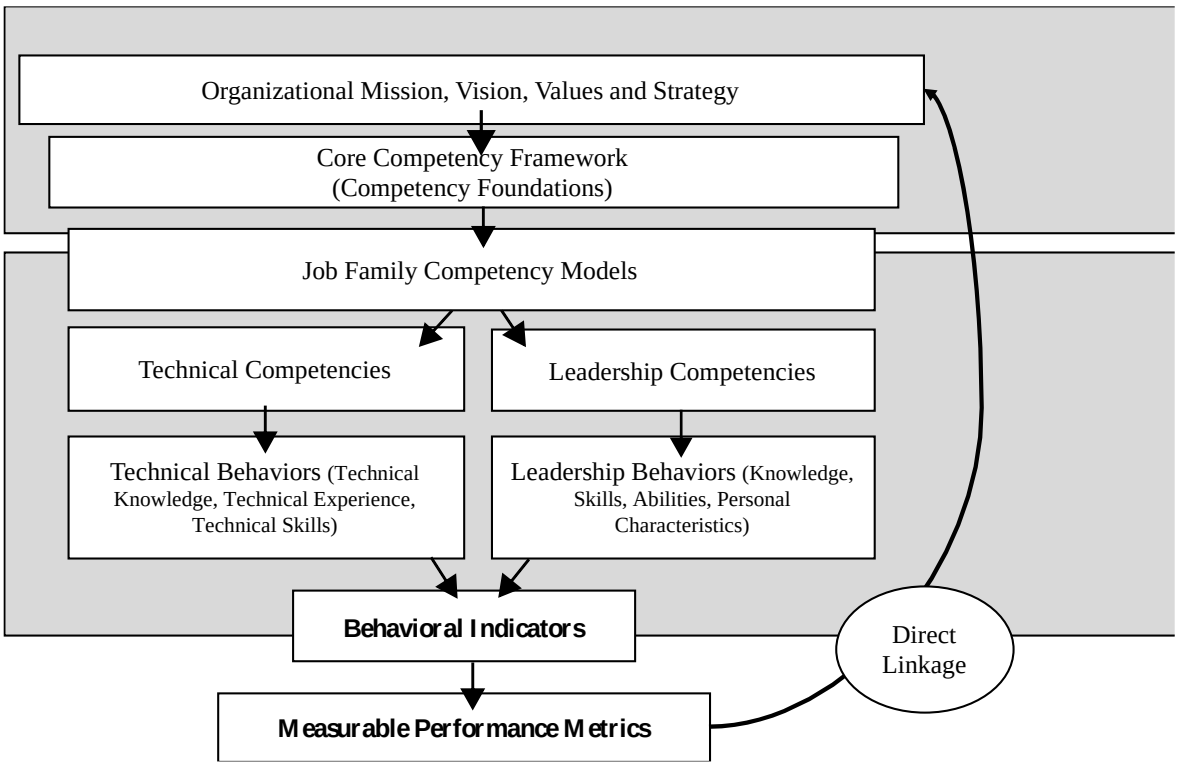


Figure 2.8: A Framework for Competencies (Campion et al., 2011, p. 232)

Providing an adaptation of the framework developed by Campion et al. (201) to this research, Figure 2.9 shows the interplay between the organisational level and competences as a framework for change. Organisational strategy determines activities that are required to achieve strategic goals. Activities follow processes and are structurally organised. Strategy, activities, processes and structure determine the competences that are needed to act successfully in the defined setting. Training modules support the learning of the required set of competences. The boxes highlighted in yellow show the focus of this dissertation. As the development of the SPSM competence model was generic and not specific for an organisation, its positioning in the framework had to be done in a more general context. The general SPSM definition provided in chapter one provided the strategic, normative basis. The CIs applied in this research reflect the activity level. The SPSM competences refer to the CIs. Finally, the SPSM training module provides a framework for acquiring SPSM competences.

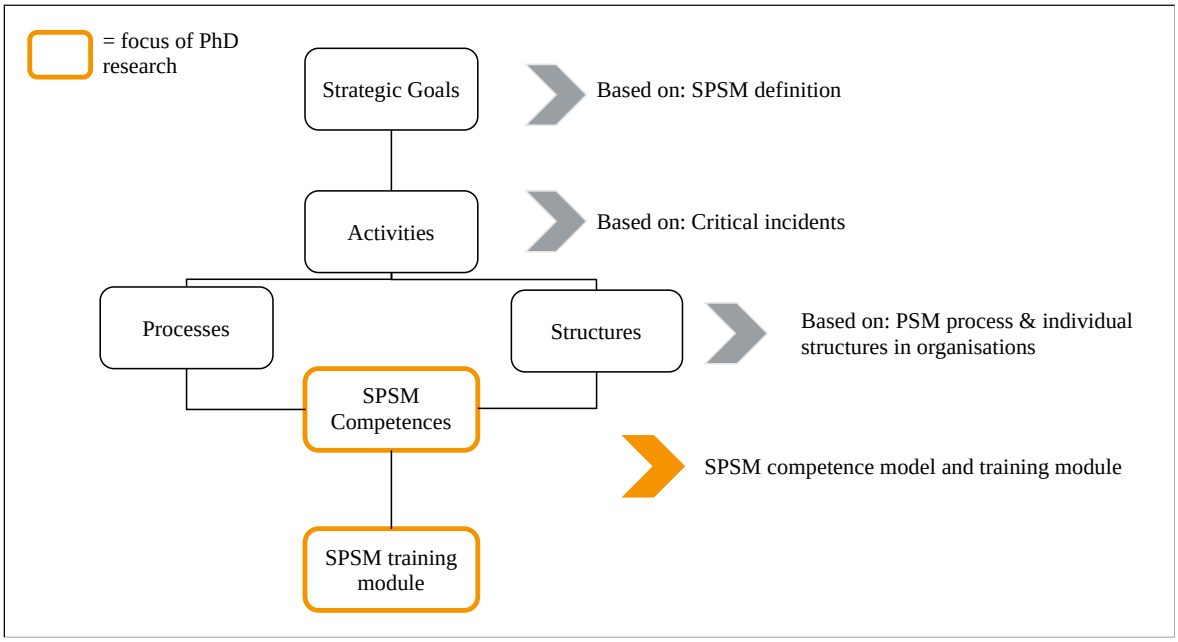


Figure 2.9: Model of SPSM integration – Framework for change

Figure 2.10 positions the research on SPSM competences in the broad, holistic context as described above. At the same time, it clearly indicates the sphere of control here. The organisational level, shown in all the areas marked in grey in Figure 2.10, is outside of the control of this research, but determines how SPSM competences and the SPSM training module, marked in yellow, are positioned. The key elements of the illustrated SPSM management approach can be described as follows. First, starting from the left hand side of Figure 2.10, a range of motives and drivers might initiate a SPSM management process, indicating a SPSM gap for an organisation. For example, customers might ask for products that are produced in accordance to social standards, legislation might require sustainability data throughout supply chains, or the scarcity of certain raw materials might lead to cautious environmental practices. Additionally, value driven leaders might also ask for

SPSM practices. As soon as a gap is identified, the framework for change, as already described above, then needs to be designed in the individual organisation, followed by the organisational implementation. The SPSM competence model and the SPSM training module contribute at this stage of SPSM. Referring to the work of Comelli and Von Rosenstiel (2003), Von Rosenstiel and Koch (2003) and Von Rosenstiel (2011) as shown in Figure 2.7, these two intended outcomes of this thesis, the SPSM competence model and the SPSM training module, reflect the area of 'individual skills' in the context of influences on SPSM behaviour. Nevertheless, the three other conditional factors on behaviour besides 'individual skills' also need to be considered as moderating factors for behaviour in organisations.

Next, following the overall SPSM management process in Figure 2.10, monitoring and feedback mechanisms need to be installed. For example, Markman and Krause (2016) propose to measure sustainable practices of a firm based on two principles: "(1) They must enhance ecological health, follow ethical standards to advance social justice, and improve economic vitality; and (2) they must prioritize the environment first, society second, and economics third." (Markman and Krause, 2016, p. 9). This can be broken down for SPSM accordingly. Finally, feedback and measurement feed into a loop of adaptions and continuous direction towards long-term SPSM.

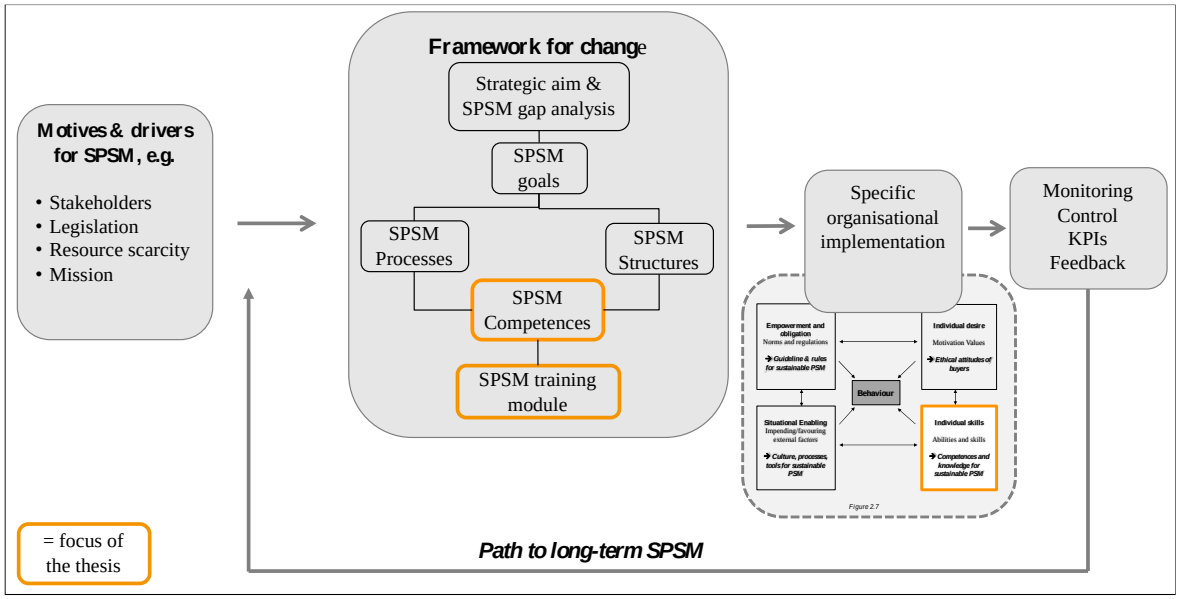


Figure 2.10: SPSM management and positioning of the research

The framework shows that the SPSM competence model which was developed in this research was converted into a SPSM training approach. Both the SPSM competence model and the training are a blueprint, which needs to be adapted to an individual organisational context. Only in a coherent interplay of individual and organisational factors will purchasing professionals be able to show sustainable behaviour and therefore bring a competence model to fruition.

3 Research Methodology

After having outlined the conceptual foundation of the research on SPSM competences in chapter 2, it is now described how it was intended to conduct the research from a methodological perspective. Therefore, the next layer in the overall structure of the thesis is addressed in what follows, as summarised in Figure 3.1.

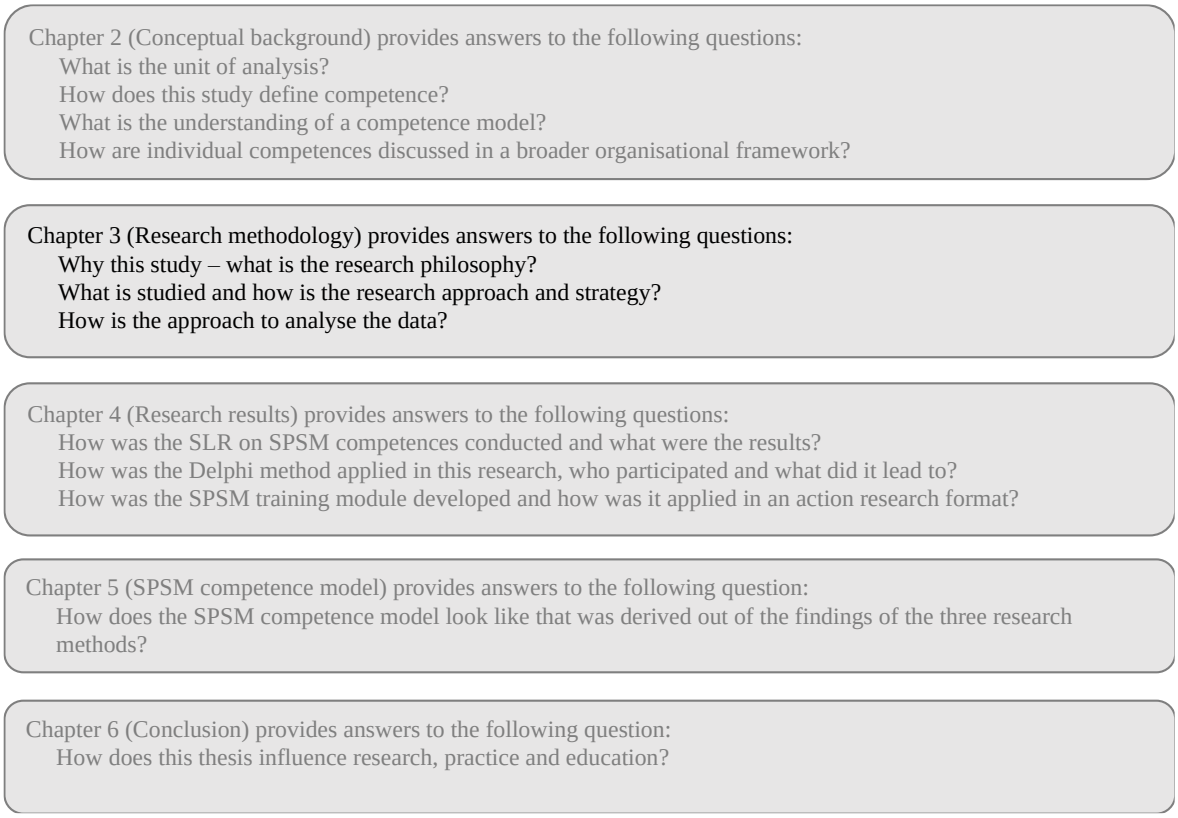


Figure 3.1: Contribution of chapter 3 in reference to the structure of the thesis

The way how to describe the research methodology in this work was inspired by checklist questions, published by Pratt (2008). Pratt (2008) evaluated success factors for the publication of qualitative research in top-tier North American journals. On page 503, he proposes to address four main leading questions in method sections of qualitative research. Table 3.1 lists the questions and indicates the sections in this document that provide answers to them. The table aims to provide an overview of what is described in the following paragraphs and sections, and might be consulted when reading about the methodology of this research.

Leading question	Sub-questions	Chapters/sections where addressed in this study
Why this study?	Why are qualitative methods appropriate? Am I building, elaborating, or testing theory?	3, 3.2, 3.3, 3.4.1 3.1, 3.3
Why study here?	What is the nature of the context I am examining? What was my rationale for choosing this context?	3.1, 3.2 3.2, 3.3
What am I studying and why?	Am I sampling events, cases, people, etc.? What is my sampling strategy?	4.1.1, 4.2.1, 4.3.1 3.4.3, 3.4.4, 3.4.5
How did I study these things?	How did I analyse the data? How did I link the data with theory/ findings?	3.5, 4.1.2, 4.2.1, 4.3.1 5, 5.1

Table 3.1: Checklist of questions to be addressed in qualitative methods sections (adapted from Pratt, 2008, p. 503)

Why this study and why study here (Pratt, 2008)? Overall, the study and the research methodology that was chosen was highly impacted by the character of sustainability issues. The general understanding and definition of sustainability is strongly related to ethics and values that depend on the individual, situational and organisational context. The World Commission of Environment and Development defined sustainability as a "development that meets the needs of the present without compromising the ability of future generations to meet their own needs" (WCED, 1987). This definition already implies the assumption that mankind has a responsibility for future generations, and it postulates that relevant needs of future generations can be defined and agreed upon. Although, depending on the values and propositions of individuals, of cultural entities and of societies, the understanding of responsibility and of what constitutes sustainability and the needs of mankind might strongly differ.

Hence, answers to the research questions in this study (see sections 1.2 and 3.1) heavily depend on individual or socially constructed definitions of sustainability and ethical paradigms in general, as well as in terms of an understanding of sustainable and responsible business practices. The term paradigm applied here is defined following Lincoln and Guba (1994, p. 107), who describe a paradigm being a “basic set of beliefs that guides action, based on different ontological, epistemological and methodological assumptions”. Differences occur when looking at what is considered to be the overall goal of SPSM. For example, one might define the objective of SPSM be the reduction of social or environmental risk in a supply chain in order to meet economic goals, whereas another expects SPSM to support the implementation of a business model that contributes to social welfare of a community and protects the environment. Both targets inherent to these definitions require a different set of competences. The understanding of what SPSM means does furthermore impact the definition of successful behaviour of a purchasing professional in different situations, the notion of ‘right’ and ‘wrong’.

The interdependency between ethical paradigms and the definition of sustainability and SPSM, as well as the individual view and attitude of the researcher led to the philosophical assumptions and design for this research. The philosophical assumptions dictated how the research questions were answered, and they yielded in the research design, the methodology, and the way that the data was collected and analysed.

Based on the systematic approach to relate philosophies, approaches, research methods and procedures as outlined e.g. in Saunders (2009), Lincoln et al. (2011) and Myers (2013), the following paragraphs describe the research philosophy and the systematic approach for this research project. It is outlined how the study's objective to build facts on SPSM competences is reflected in the research question, leading to the decisions that were taken regarding the research philosophy, the research approach and strategy as well as the research methods. Figure 3.2 provides an overview framework that relates the basic assumptions to the research design and methodology that was adapted in this study.

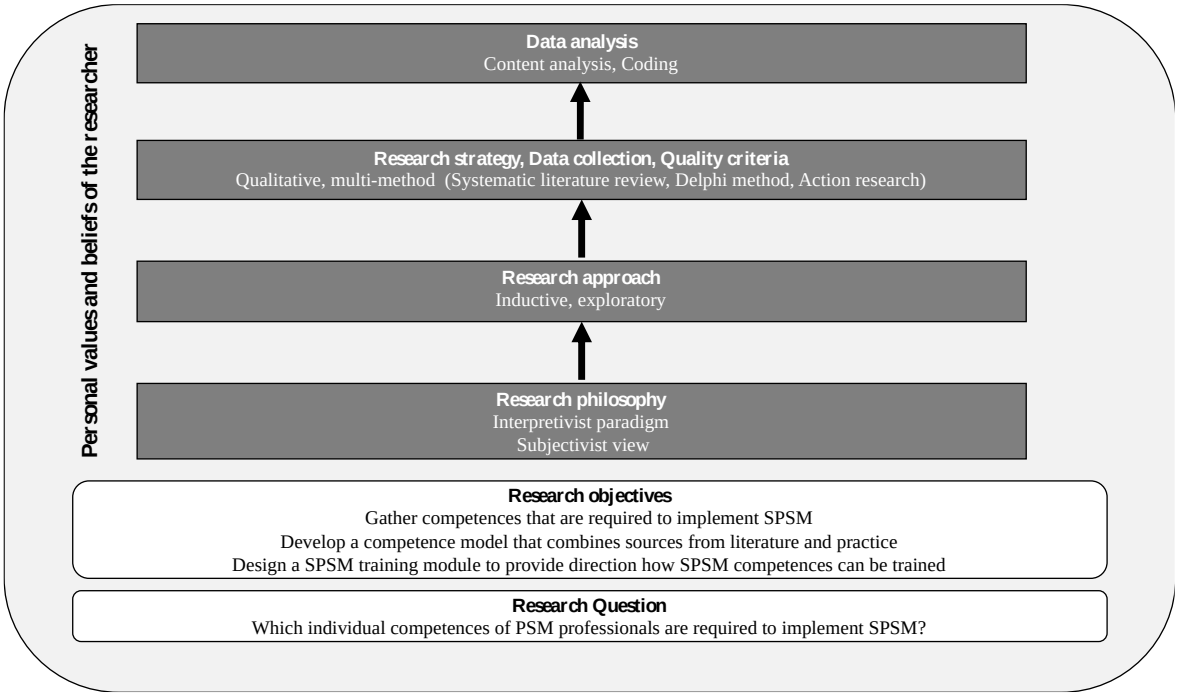


Figure 3.2: Research philosophy and approach of the study (adapted from Myers, 2013, p. 27)

3.1 Objective and research question

Starting at the bottom of Figure 3.2, the purpose of this research was to bring SPSM to action in the work of purchasing professionals and to understand which competences and knowledge are needed for purchasing professionals to implement SPSM. Therefore, it strived for answers to the following leading research question: *Which individual competences for PSM professionals are required to*

implement SPSM? It was intended to evaluate how competences and knowledge are operationalised and how they are revealed in individual behaviour. Patterns and competence clusters were to be identified and to be consolidated in a SPSM competence model. Therefore, the leading research question was further specified into "Which SPSM competences are described in current research?", "What is successful and unsuccessful behaviour shown in SPSM practice?" and "Which competences can be derived from this?" (see also section 1.2). Based on the patterns and clusters that were expected to be identified, the research strove to indicate which competences and knowledge are relevant for either higher education and/or for professional training, leading to appropriate curricula and training methods. This endeavour was reflected in the following sub-questions: "How can SPSM competences be trained?", "How is the developed training module perceived by students and practitioners?", and "Does training have an impact on SPSM competences?". Inherent to the research question was the aim to consider individual competences and their impact on behaviour in an organisational setting.

The research objectives describe actions that are needed to find answers to the research questions. The author planned to gather SPSM competences, bring them in the format of a SPSM competence model, and to develop an approach for training the competences. Thus, she intended to fulfil the research aim: Bring SPSM to action, shed light on the role, responsibility and impact of purchasing professionals on SPSM, understand the competences that they need to have, and finally position individual competences in the broader context of organisational behaviour. Referring to Boer et al. (2014), this work was rather a fact-building than a theory-building research, with the aim to contribute to an issue with practical relevance. It intends to foster future theory building on the impact of individual competences of PSM professionals on sustainable performance of firms, following Boer et al. (2014), p. 1238, who state "Discovery is a prelude to theory, and just as important". The exploratory approach was designed to consistently combine ontological and epistemological assumptions with appropriate methodologies that related to the overarching research objectives. The following sections describe the framework for the design of the research approach.

3.2 Research philosophy

The previous section outlined the objective of this research and the research question. As already indicated above, individual assumptions as well as the research topic itself led to the decisions in terms of the approach and methods applied to find appropriate answers. This section elaborates on the choices that were taken and shows the underlying motivations and reasons.

3.2.1 Personal values and beliefs of the researcher

Why did the researcher decide to conduct this study? What is the researcher's paradigm? This work was grounded in the individual motivation, values and preferences of the researcher. From an axiological viewpoint, in this study, the researcher's individual values and subjective view impacted the research at every stage. Following the interpretivist paradigm, the researcher was part of what was being researched and therefore influenced the results to a great extend (e.g. Lincoln and Guba, 1994; Easterby-Smith et al., 2008). This different stance, compared for example to a positivist axiology that considers the researcher being independent of the data and undertake a value-free investigation, needs to be clearly addressed for this study. Therefore, it is considered to be important to briefly describe the individual understanding and motivating factors of the researcher, as for example proposed by Saunders (2009). The selection of the research topic and its condensation in the research question, the adopted research approach, the access to the data as well as the analysis of the data reflects the individual value position and the experience of the researcher. Figure 3.2 thus positions the research question, the research philosophy, the approach and strategy, as well as data collection and analysis in the framework of personal values and beliefs of the researcher.

The selection and wording of the research question already reveals certain individual beliefs. When asking "Which individual competences and knowledge for PSM professionals are required for sustainable PSM?", this implies several assumptions of the researcher. First, sustainable PSM is considered to be a valid goal. Second, sustainable PSM is considered to be a certain type of PSM. Third, asking 'which competences' instead of, for example, asking "Are individual competences and knowledge for PSM professionals required for sustainable PSM?" includes the notion that individual competences have an influence on sustainable PSM. Finally, the research question implies that gathering competences is a first step towards SPSM education – otherwise it would not be worthwhile to investigate.

With regard to the assumptions mentioned above, the researcher is convinced that a switch to a more sustainable behaviour of mankind is necessary to allow future generations a comparable or even better way of living. She is open towards new theories and paradigms, e.g. the discussion around the end of growth (e.g. Meadows et al., 1972; Heinberg, 2001; Randers, 2012) or the principle of circular economy (e.g. McDonough and Braungart, 2010; Bocken et al., 2016; Geissdoerfer et al., 2017). Also, the researcher believes that businesses, and PSM as a function within business organisations, can contribute to sustainability in creating new products, implementing new business practices and operating towards new goals. This is based on her own education and her professional experience. Thus, inherent to the research question, the researcher follows the task of a critical research approach as defined by Myers (2013): "Rather than simply describing current knowledge and beliefs […], the idea is to challenge those prevailing beliefs, values and assumptions that might be taken for granted by the subjects themselves" (Myers, 2013, p. 43).

At the same time, referring to the beginning of chapter 3 and the statement that the definition of sustainability itself depends on individual values and constructions of how human mankind is supposed to act, the researcher is convinced that the answer to the research question will always be an individual interpretation of reality. Though, relying on Gioia et al. (2013), she is convinced that the research endeavour nevertheless provides transferable findings to advance the subject of SPSM as such (Gioia et al., 2013). Also, the researcher values information given in an interview higher than for example data collected by standardised questionnaires. Therefore, as it will be explained in the following sections, an interpretative, qualitative research approach was chosen to be the most appropriate. This viewpoint influenced the research philosophy, the approach as well as the decision for a purely qualitative approach when collecting the data.

On the one hand, as outlined above, the author believes that there is no objective answer to be found to the research question. Although, on the other hand, she is convinced that current business practices need to be challenged towards new sustainability paradigms. She believes that education can lead to a change towards new paradigms, even without exactly knowing what is wrong or what is right. The SPSM competence model is intended to serve as a framework for higher education as well as for training in the professional context. The training method is supposed to be interactive, based on typical CIs that are discussed and reflected in the individual and organisational context of the training participants. It is the researcher's hope and conviction that education is a key to foster new paradigms and the implementation of sustainability, in the means of improving social and environmental conditions in global supply networks.

In summary, the reader may wish to take into account two main commitments of the researcher in judging the study and its results. First, the ontological and the epistemological view of reality being a social and subjective construct following an interpretivist paradigm. Second, the personal commitment of the researcher to education and its contribution to sustainable development in the sense of new business paradigms as outlined above.

3.2.2 Research philosophy – Interpretivist paradigm and subjectivist view

After having outlined the personal values of the researcher that led to the research objective and the research question, the following paragraph elaborates on the philosophical grounding, referring to the next layer in Figure 3.2.

The research topic is grounded in the academic discipline of social sciences. Considering the broad discussion on frameworks and paradigms in social science (e.g. Popper, 1963; Blumer, 1969; Giddens, 1974; Gadamer, 1975; Burrell and Morgan, 1979), the positioning of this research is the basis for the applied approach and methodology. The next section applies the framework developed by Burrell and Morgan (1979), who present four paradigms for research in social sciences: The functionalist, the interpretive, the radical humanist and the radical structuralist paradigm (Table 3.2).

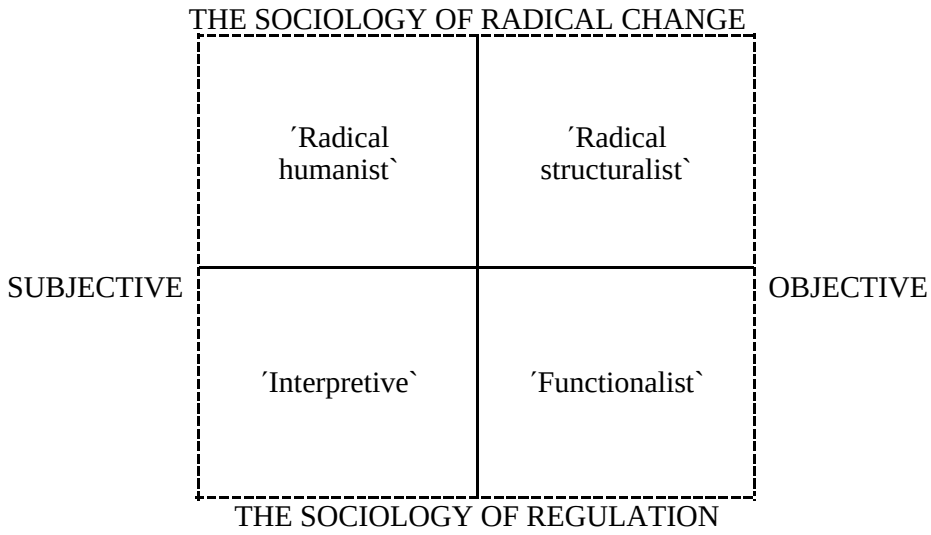


Table 3.2: Four paradigms for the analysis of social theory (Burrell and Morgan, 1997, p. 22)

As of the authors, "The four paradigms thus define four views of the social world based upon different meta-theoretical assumptions with regard to the nature of science and of society" (Burrell and Morgan, 1979, p. 24): The four dimensions are clustered based on their character regarding two major dimensions. The first one encompasses the subjective versus objective dimension, whereas the second one considers radical change versus regulation. Ontological and epistemological assumptions lead to the positioning of a research endeavour on the subjective-objective scale, whereas radical change and regulation represent […] alternative models for the analysis of social processes" (Burrell and Morgan, 1979, p. 18).

The radical humanist paradigm as well as the radical structuralist paradigm are both located in the radical change dimension, taking over a critical position toward organisational or societal structures. But they are different regarding an objective or subjective viewpoint. Radical humanists consider societal influences on behaviour and consciousness of human subjects and vice versa, with a stance to change social patterns to allow a better social living. In the history of this school of thought, changing society towards a better stage has often been closely connected to philosophical societal or political directions. In contrast, radical structuralists focus on structural differences and structural conflicts as well as power relationships in organisations and society as being the sources for societal disruptions and enablers for societal change. Therefore, they share the critique of basic societal structures with the radical humanists, but do not consider human subjective consciousness to be the driver for change.

The functionalist paradigm as well as the interpretive paradigm are both grounded in the regulative dimension of the framework (Burrell and Morgan, 1979). Both of them aim to explain the status quo and focus on what holds society together, rather than concerning conflict, disruptions and societal

change. The functionalist paradigm considers social structures to be given in an objective manner, therefore such structures can be described by the application of methodological rules and logics. In the sense of a technical description of societal reality, research contributes to knowledge generation and learning, and therefore it fosters the development of societies or organisations (e.g. Burrell and Morgan, 1979; Saunders, 2013).

The interpretive paradigm is also positioned in the regulative dimension, but is distinguished from the functionalist paradigm mainly by its ontological definition of social reality. According to the interpretivist view, social reality is created by individual subjective interpretation only. Therefore, the meaning of social constructs is defined by individual actors. In terms of the role of the researcher, this paradigm denies the existence of any objective social reality that can be described by using methodologies compared to natural sciences. In contrast, the researcher can describe subjective explanations of social phenomena and study their contribution to explain the reality.

When mapping the research on SPSM competences to the framework, its ontological and epistemological assumptions were leading towards a positioning in the interpretive paradigm. The objective as outlined in the research question is to gather individual competences for SPSM. The research question includes the aim to transfer those in a training concept to support the application in a PSM professional context. The organisational setting is considered to be a relevant moderating factor on behaviour. Therefore, it is about human interaction within an organisation. Hence, the interpretivist paradigm and its implications on methodology was considered to be the most appropriate to explore, also relying on established research methodology in business and management research: “Some would argue that an interpretivist perspective is highly appropriate in the case of business and management research, particularly in such fields as organisational behaviour, marketing and human resource management. Not only are business situations complex, they are also unique. They are a function of a particular set of circumstances and individuals coming together at a specific time” (Saunders, 2009, p. 116).

Additionally, the application of SPSM competences depends on the organisational context as outlined in section 2.3 in this work, which adds another subjective moderating factor to the topic, following Gioia et al. (2013): “In addition to the basic assumption that the organizational world is socially constructed, we employ another crucial and actionable assumption as well: that the people constructing their organizational realities are ‘‘knowledgeable agents’’, namely, that people in organizations know what they are trying to do and can explain their thoughts, intentions, and actions” (Gioia et al, 2013, p. 17). Taking this into consideration, the research follows a subjectivist view. Competences that result in successful behaviour of purchasing professionals in SPSM situations are considered to be a human construct, highly dependent on how the individual defines the competences as well as how individuals are situated in an organisational context. The underlying ontological definition of reality can be described as follows: “Realities exist in the form of multiple mental constructions, socially and experientially based, local and specific, dependent for their form and

content on the persons who hold them" (Guba, 1990, p. 27). For the process to find answers to the research questions and consequently to develop a SPSM competence model, this implies that knowledge in this research project can only be created in gathering the experience and knowledge of different individuals in an interactive manner, reflecting their view of reality. Knowledge "consists of those constructions about which there is relative consensus […] among those competent […] to interpret the substance of the construction" (Lincoln and Guba, 1994, p. 113). Therefore, the participants were given an extended voice especially in the Delphi study.

In the researcher's view, SPSM competences cannot be explained by applying models and rules from natural sciences in the research process, as would be suggested by a functional paradigm. This viewpoint impacts the anticipated role of the researcher being involved in the interactive research process as a participant and a facilitator (e.g. Lincoln and Guba, 1994).

Regarding the scale of being focused on radical change or regulation, the research is considered to stabilise and empower organisations to implement SPSM (see also sections 1.1 and 2.3) rather than asking for a radical change in the entire organisational system. Therefore, it is not positioned in the radical humanist paradigm. Nevertheless, it has to be taken into consideration that the researcher's individual values and believes, as described above, looking for a change in economic paradigms like the end of growth or the ecologically dominant logic, might involve some stances of radical humanism.

3.3 Research approach

"What am I studying and why and how did I study these things" (Pratt, 2008, p. 503)? As outlined in chapter two, the study is based on established theories regarding organisational and individual learning and behaviour (e.g. Argyris and Schön, 1978; Comelli and Von Rosenstiel, 2003; Von Rosenstiel and Koch, 2003; Von Rosenstiel, 2011), as well as on concepts regarding competence model development and competence classifications (e.g. Boyatzis, 1982; Mirabile, 1997; Campion et al., 2011; Krumm et al., 2012). Nevertheless, this research follows an inductive approach with the aim to develop a SPSM competence model based on empirical data in an exploratory manner (see e.g. Myers, 2013). An exploratory approach seemed to be appropriate due to its broad focus and flexibility to shed light on a rather new topic (Saunders, 2009). As outlined in section 3.1, the aim was to gather facts and contribute to future theory building. Therefore, the choice for the research approach was driven by this general research objective.

The question of whether to use deductive or inductive reasoning for this study was answered based on two moderating factors. At first, the philosophical assumptions that were outlined in the previous section yielded an inductive research approach. The subjectivist view, following the interpretivist paradigm, suggested to build theory based on the data that was gathered rather than testing any

predefined hypotheses. Second, the small extent of existing knowledge fed into the decision to follow an exploratory approach. The SLR did not reveal any sufficient theoretical framework for SPSM competences that could have served as a source for testing hypotheses. Therefore, the researcher started bottom-up by evaluating all the data, looking for patterns and eventually combining them to a final model, in this case the SPSM competence model.

3.4 Research strategy

Figure 3.2 shows how the research philosophy and the research approach fed into the decision for a research strategy. In this step of the study design it was discussed whether to apply a quantitative or qualitative inquiry approach. Consequently, the researcher selected the appropriate research methods. Whether the quantitative and qualitative research approach are in contrast or moreover complement each other is broadly discussed in the field of research methodologies (e.g. Bryman, 2009, Saunders, 2009; Denzin and Lincoln, 2011, Kumar, 2011). Generally speaking, for example referring to Kumar (2011), quantitative research designs measure and explain the magnitude of variations in the information that was gathered in the research process. The main objective of qualitative research, in contrast, is "[…] to understand, explain, explore, discover and clarify situations, feelings, perceptions, attitudes, values, beliefs and experiences of a group of people" (Kumar, 2011, p. 304). Both directions require different settings for example in terms of sample sizes, data collection, and data analysis. Quantitative research usually deals with large sample sizes to ensure reliability and objectivity, applies methods for data collection that allow for large sample sizes treated in a standardised manner, and analyses the data by statistical procedures. Qualitative research in contrast considers smaller sample sizes, applies more flexible and unstructured data collection methods, and analyses data for example by describing patterns or themes.

As outlined for example by Denzin and Lincoln (2011), the decision whether to apply quantitative or qualitative research depends on the philosophical assumptions of the research – and the researcher. Taking this into consideration, the research strategy in this study is qualitative in nature. The decision to apply qualitative research methods evolved from the decisions that were taken regarding the research philosophy and the research approach as described in the previous sections. Following an interpretivist paradigm with a subjectivist view, and applying an inductive research approach suggested a qualitative research strategy. "[…] Qualitative research involves an interpretive, naturalistic approach to the world. This means that qualitative researchers study things in their natural settings, attempting to make sense of or interpret phenomena in terms of the meanings people bring to them." (Denzin and Lincoln, 2011, p. 3). The personal values and beliefs of the researcher also yielded to a qualitative approach.

The research philosophy and the research approach as described above consequently also led to the data collection strategies and methods (Saunders, 2009; Denzin and Lincoln, 2011; Kumar, 2011). Table 3.3 provides a list of selected research strategies.

Selected research strategies
Case Study
Ethnography, Participant observation
Grounded theory
Historical method
Action and applied research
Experiment
Focus groups
Delphi method
Expert interviews
Survey
Archival research
Literature research

Table 3.3: Overview of research strategies (own overview, based on Kumar, 2001; Saunders, 2009; Denzin and Lincoln, 2011)

The research strategies that are listed in Table 3.3 have different roots in either natural or social sciences. Some are only applicable for quantitative research designs, for example surveys, some of them are dedicated qualitative research strategies, such as focus groups or participant observation. Though, quite a few of them fit for either quantitative or qualitative research. Experiments can be conducted either in a strong quantitative setting, measuring facts by numbers, or in a qualitative setting. The Delphi method can either be applied for quantitative research, using survey technique, as well as for qualitative research (Häder, 2014).

The following paragraph explains the research strategies that were chosen for this study, and it describes why they were considered to be suitable to answer the research question.

3.4.1 Justification of research strategies

As outlined in the beginning of this chapter, the research philosophy, the research approach and the personal values and beliefs of the researcher guided the decision on how to find answers to the research question. The interpretivist paradigm and the subjectivist view led to an inductive, exploratory approach, with the aim to gather facts to a rather new research topic. Therefore, as a first step in building the research strategy, the researcher decided on a qualitative approach. A quantitative data collection approach, for example in the format of a survey or an experiment, would not have

been in line with the research philosophy and approach as was pointed out in the previous sections of this chapter. Besides, quantitative parameters to be measured appropriately with survey technique were not available yet in the SPSM competence context. In a second step, regarding the aim to collect as much data as possible in the rather new research area, it was decided to apply a multi-method qualitative approach rather than a mono-method study (Saunders, 2009). Consequently, in the third step, the researcher looked for suitable research strategies, allowing the broadest view when being combined. She decided to combine literature research by conducting a SLR, with a Delphi study in a purely qualitative application, and action research. These methods were considered to be appropriate to find answers to the research questions and to deliver the desired type of result, namely a newly built SPSM competence model. Also, they were considered to be compatible in terms of their cohesive application, which led to an improved result for the research purpose. The following paragraph justifies why the three methods were selected, compared to others listed in Table 3.3.

The SLR provided an overview of the existing body of knowledge in the research topic. It was intended to get a deeper understanding of the problem and to specify the final research approach. Literature research as such, as well as archival research and the historical method, is retrospective in nature. Those study designs "[…] focus on past trends in a phenomenon and study it into the future" (Kumar, 2001, p. 111). Nevertheless, as a dedicated focus on past trends was not the objective of this research, archival research and the historical method were not taken into consideration.

When looking at the range of qualitative methods, the Delphi method in a purely qualitative format (see Häder, 2014, and section 3.4.4 in this study) was chosen based on a set of criteria that indicate the appropriateness of the Delphi method for a research endeavour, defined by Linstone and Turoff (1975). The following three criteria mentioned by the authors particularly influenced the decision to apply the Delphi method in this study: First, "The problem does not lend itself to precise analytical techniques but can benefit from subjective judgments on a collective basis", second, "The individuals needed to contribute to the examination of a broad or a complex problem have no history of adequate communication and may represent diverse backgrounds with respect to experience or expertise", and third, "The heterogeneity of the participants must be preserved to assure validity of the results, i.e., avoidance of domination by quantity or by strength of personality ("bandwagon effect")" (Linstone and Turoff, 1975, p. 4). The researcher did not consider any of the other empirical methods listed in Table 3.3 to be equally powerful with regard to these criteria. In-depth case study research was not considered to fit with the criteria defined by Linstone and Turoff (1975), because it would have only allowed to gather data from a single case, instead of collecting input from sources with a diverse background and expertise. Considering the aim to build facts in terms of SPSM competences, the input of a broad range of Delphi experts from different organisations and industries was considered to lead to a richer result at this stage of the SPSM competence model development. Also with regard to practical considerations, for example the resources that were available to conduct this research (Yin, 2009), the Delphi approach was expected to be more applicable than for example conducting

several in-depth case studies. Besides, a case study would not have initiated the iterative process of knowledge generation and knowledge sharing between a diverse set of experts, which was accomplished by the two iterative Delphi rounds. The latter argument did also influence the decision against conducting a focus group or expert interviews or participant observation, although these methods would have been applicable for the research aim and research. Neither focus groups nor expert interviews or observations foster an iterative process of knowledge generation, as they are gathering data on a one-time basis without sharing and discussing it again with the participants after data evaluation (Häder, 2014). A focus group was also not considered to be the appropriate method for data collection since it would be difficult to avoid the influence of group dynamics and coercion on the outcome of the answer to the research question, as mentioned above as the third selection criteria based on Linstone and Turoff (1975) ("bandwagon effect", see Linstone and Turoff, 1975, p. 4).

Finally, action research was chosen to complement the research strategy for this study. The research question and its assumption that SPSM competences can change professional practice (see section 3.2), combined with the researcher's individual motivation and values, led to the decision to conduct action research. As pointed out for example by Waterman et al. (2001) and Barbour (2014), a desire to change and to solve problems, as well as to educate and to empower social actors are inherent to action research. Also, the iterative nature of action research, gathering knowledge in the action research circles, contributed to the facts-building character of this study. A one-time experience in practice, being rather in the format of an experiment, would for instance not have led to the changes in the training approach in the course of the five training sessions that were conducted (see section 4.3). Besides, the flexibility of action research to be combined with other research strategies (Waterman et al., 2001; Saunders, 2009; Robson, 2011; Barbour, 2014) drove the decision to include it in the set of research strategies of the multi-method approach. The SLR and the Delphi study were to underpin the action research approach by providing the prototype of a SPSM competence model.

Referencing to the research strategies listed in Table 3.3, grounded theory was not considered to be the appropriate for this research, although grounded theory is applicable for an explorative and inductive research approach. Thus, as outlined in the research objective and the description of the research question, the contribution of this study was meant to be rather fact-building than theory-building, in a strong sense of providing results that can be translated back to practice.

The combination of the three data collection methods – SLR, Delphi study and action research – was used to ensure a broad contribution to building facts, to verify the data and to contribute to the research quality of this study. Figure 3.3 shows how the methods were used for setting the problem and developing and validating the model.

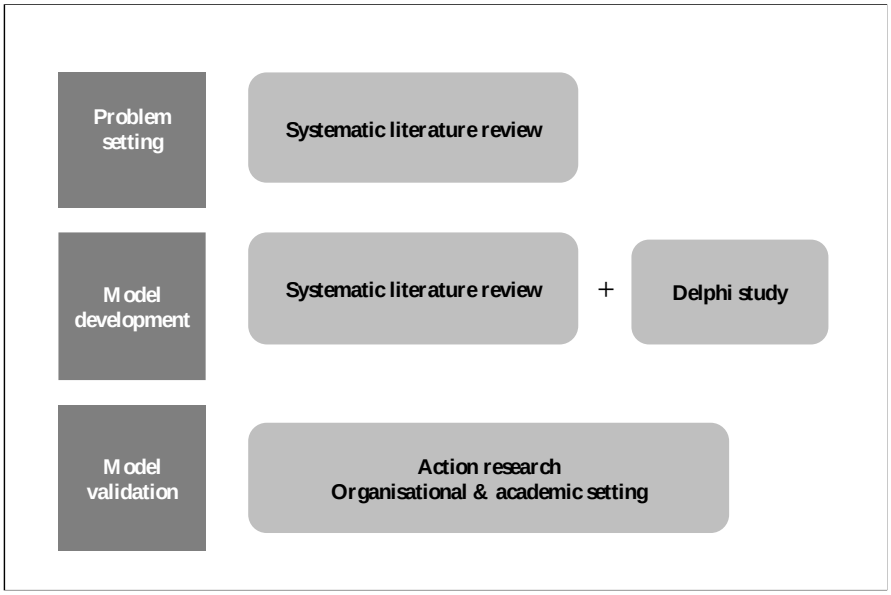


Figure 3.3: Multi-method research approach – Overview

Figure 3.4 outlines how the multi-method approach contributed to the development of the SPSM competence model (see also chapter 5).

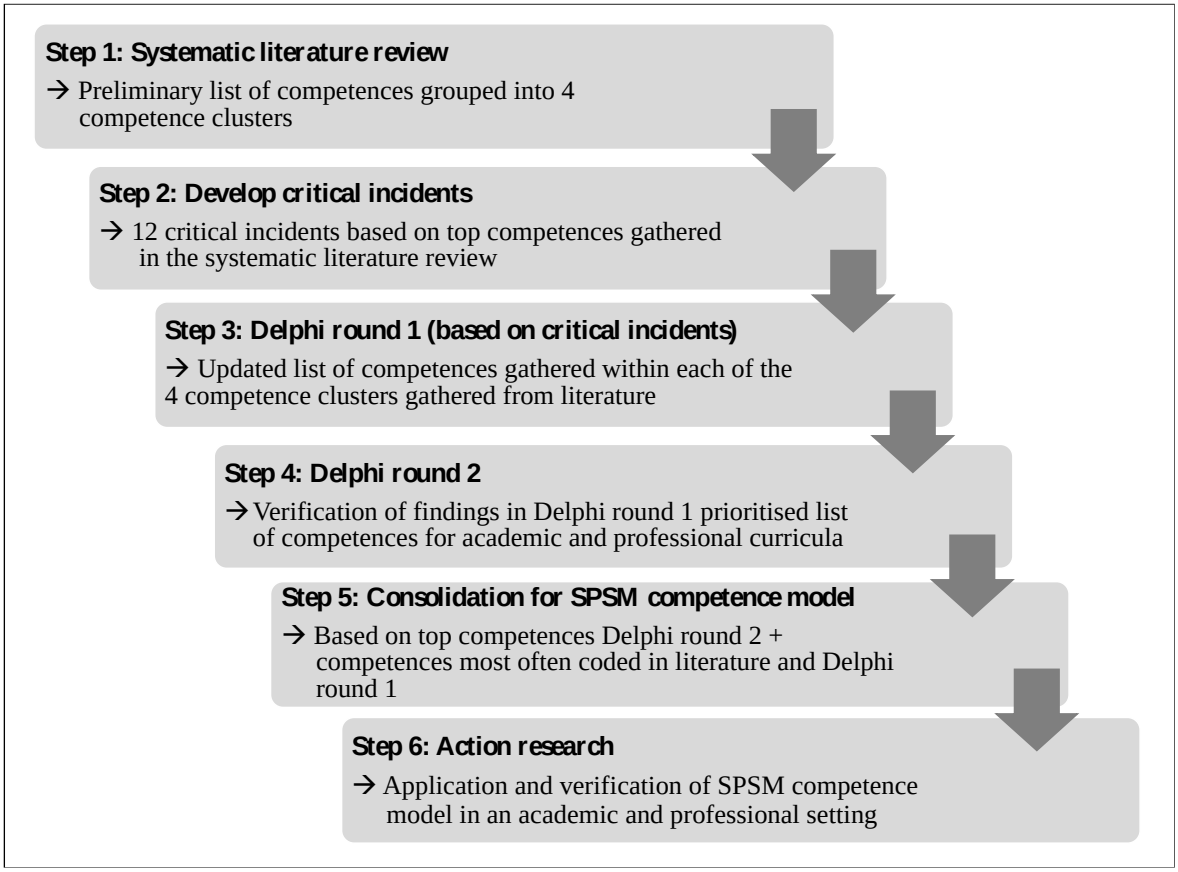


Figure 3.4: Development of competence model

To summarise, the selection and application of the qualitative multi-method research strategy, combining a SLR, a Delphi study, and action research, was found to be the most appropriate to find answers to the research question, taking into consideration the research philosophy as outlined in Figure 3.2. A case study would not have allowed gathering of data from diverse sources and would have resulted in a rather narrow, specified and single-case focused SPSM competence model. Expert interviews would have only allowed a one-time data collection, whereas the Delphi method ensured the iterative development of data over consecutive rounds. In this research, the second Delphi round for example led to the consolidation of competences and to prioritisations for the SPSM training. The researcher did not choose a focus group, as she wanted to avoid coercion, and therefore the loss of valuable information and input for the SPSM competence model. This section described the reasons for the selection of these three methods, and explained how they were combined in the research process. In addition to the description above, it is considered to be noteworthy that also the individual background of the researcher fits to the selected methods. Being an experienced professional in the SPSM and educational context, she was adequately skilled to apply the Delphi study and action research in the field.

For future research on SPSM competences, it might be beneficial to apply or combine other research strategies to complement the findings of the multi-method approach outlined above.

3.4.2 Quality assurance in this research

With this research being purely qualitative in nature, it needed to be considered which measures to apply to assure and document research quality. This section describes the general decisions and approach for quality assurance. They were applied for each of the three research strategies, namely the SLR, the Delphi study, and action research. A detailed overview of the measures for each research method is provided in the respective sections 3.4.3, 3.4.4 and 3.4.5.

Literature explains different approaches for applying criteria for rigor and robustness in qualitative research and how to make findings trustworthy (e.g. Spöhring, 1989; Mayring, 1993; Guba and Lincoln, 1994; Morse, 1994, Sinkovics et al., 2008, Lamnek, 2010). Researchers have different positions on whether qualitative research requires different criteria and measures for quality assurance than quantitative research or if the same standards should be applied. Considering the traditional quality criteria developed in natural sciences, like validity, reliability, objectivity and generalisability, it needs to be discussed how the premises of qualitative research and an inductive approach go in line with these traditional quantitative quality measures (e.g. Spöhring, 1989, Lamnek, 2010). In particular, statistical validation is opposed to the basic understanding of the way to create knowledge in qualitative research. For example, with regard to reliability in terms of the replicability of results, a qualitative study following the interpretive paradigm with a subjectivist view will never lead to the same results when repeated. Instead, this could be interpreted to show that this research is not valid.

In general, the discourse about applicable quality criteria for qualitative research can be condensed to two major positions in the social sciences research community. A first group of researchers states that the value of qualitative research needs to be evaluated in a different manner than quantitative research (e.g. Lincoln and Guba, 1984; Mayring, 1993; Denzin and Lincoln, 1994; Coghlan and Brannick, 2010). Mayring (1993) for example proposes to apply the following criteria instead: Documentation of the research process ('Verfahrensdokumentation'), argumentative validation of data interpretation ('Argumentative Interpretationsabsicherung'), application of systematic research procedures ('Regelgeleitetheit'), proximity to the research objects ('Nähe zum Forschungsgegenstand'), validation by communication ('Kommunikative Validierung'), and triangulation.

The second group of researchers suggests that qualitative research should consider the same quality criteria as quantitative research, otherwise qualitative studies will not be considered as of the same value as quantitative ones (e.g. Flick, 2007; Maxwell and Chmiel, 2014; Lewis et al., 2014). Robson (2011) for instance proposes to stick to reliability and validity as main criteria also for qualitative research, but to re-define them accordingly so they fit to qualitative parameters. As outlined by Lewis et al. (2003, p. 354), "While reliability and validity are perhaps imperfect terms and open to misinterpretation, when taken in their broadest sense as referring to the 'stability' of findings and how authentic and credible they are, both concepts remain relevant for qualitative research."

For this study, the researcher decided to follow a consolidated approach for quality assurance, with the aim to provide information to the audience based on quality criteria that reflect the qualitative, explorative character of the research project and its interpretive paradigm. At the same time, the criteria were supposed to provide valid information about the value and generalisability of the findings. Therefore, the researcher decided to combine traditional criteria for quality assurance with others dedicated for qualitative research. The quality assurance was ensured by four main quality assurance categories. For the entire steps in the research process, measures were described to ensure validity, reliability, confirmability/objectivity, and transferability. Table 3.4 provides a general overview, Table 3.5 lists measures for quality assurance in the SLR, Table 3.7 shows how quality criteria were applied in all steps of the Delphi study. Finally, Table 3.8 lists measures according to the action research. The four categories were defined as follows. This study understands reliability in the sense of stability of the findings, proven by providing as much information as possible about the research process and how the findings were generated and the conclusions were drawn (e.g. Ritchie et al., 2014). Validity is defined in the sense of the extent to which a finding is well-founded and reflects the phenomenon being studied. Measures to ensure validity include communicative validation and peer auditing (see Table 3.4). Confirmability/ Objectivity includes transparency and rigor in the research process, following a set of clear rules. Finally, the results of this research are measured against their transferability in the meaning of generalising from the context of the study to other settings or contexts, also called inferential generalisation (Ritchie et al., 2014, p. 351). Measures that were reported in this regard are for example the extraction of clusters out of individual

inputs in the SLR or the Delphi study that are transferable to other contexts (Gioia et al., 2013), as well as the evaluation of the SPSM competence model in the settings of the action research.

In combination with the four main categories, the following principles were followed to ensure the quality of the research. First, it was the intention of the researcher to provide evidence that others can reconstruct the process that led to the research results. This was done by a thorough documentation of the conceptual and empirical steps in the research process (Mayring, 1993; Morse, 1994). For instance, for the data analysis all coding instructions and decisions were documented, to allow replication by other coders (Krippendorff, 2013). Second, following Mayring (1993) as outlined above, the researcher defined a systematic research approach, including sequential steps in the research process, and rigorously followed those steps. Third, communicative validation of research results (e.g. Mayring, 1993; Morse, 1994) was applied in all steps of the research process to enhance the validity of interpretations. And fourth, the researcher involved her supervisors (Morse, 1994; Bryman, 2016) whenever possible in the research process to verify if there is a common understanding of defined categories and interpretations. Also, the author and her supervisors, who advised on coding, were able to prove the appropriate qualification for this research in terms of their academic and professional expertise (Krippendorff, 2013).

Table 3.4 shows how the criteria and principles were consistently applied in the research strategy.

Validity	Reliability	Confirmability/ Objectivity	Transferability
• Multi-method approach: Applying different research methods to gather findings; Inter-connect the findings of each method to the others applied in a later stage of the research process	• Detailed description about the decisions and how conclusions were drawn in the research process • Discuss research approach and findings with peers	• Systematic and rigorous research approach	• Extraction of categories and clusters that are applicable in other contexts than the research participants
• Communicative validation of research findings: Member checks; peer-reviewed publication of research results	• Pre-tests and codings with multiple raters	• Transparency in describing how decisions were taken and conclusions were drawn • Researcher was familiar with the research phenomenon based on her academic and professional expertise	• Evaluation of findings in the filed by applying action research in different settings • Discuss results with peers and with research participants to ensure terms and descriptions are intelligible
• Evaluation of results based on research question and defined coding approach		• Cross-reference of the findings resulting from the different research methods	

Table 3.4: SPSM competence model development – Overview Quality Assurance (adapted from Lincoln and Guba, 1985; Mayring, 1993; Strauss and Corbin, 1994; Maxwell, 1997; Sinkovics et al., 2005; Ritchie et al., 2014)

3.4.3 Systematic Literature Review (SLR)

As shown in Figure 3.4, a SLR was used to start the process to develop the SPSM competence model. Conducting an SLR served to get an overview of current research in the field, looking for answers to the respective research question: "Which SPSM competences are described in current research?" The following section describes the application of the SLR as well as the quality criteria that were considered. The findings of the systematic literature review can be found in section 4.1.

The motivation to conduct a systematic rather than a traditional narrative literature review was driven by a desire to gain a thorough and rigorous analysis of the field and gather an evidence-based overview of the current discussion in academic publications. With the research being explorative in nature, the literature review should contribute to the following objectives, described by Boer et al. (2014), p. 1245: "The goal of the literature review for exploratory papers should be to show: (1) that the issue is of practical importance; (2) what we do know about this or similar phenomena; and (3) that what we presently know cannot explain the phenomena and hence we need new facts/theories". The discussion of the results in section 4.1 outlines how the three objectives were met and how they were integrated in the further research approach.

Regarding the methodology for the SLR, it was planned to implement a structured process, based on the definition by Tranfield et al. (2003): 1) literature search and selection 2) literature coding and analysis and 3) reporting the findings. The first stage is based on the research question, and includes the definition of the search criteria, the data sources and the search concept. Next, selection and reading of the matching studies is done, followed in the third step by evaluating and discussing the results. Following these process steps should ensure the study be replicable and transparent. Although the researcher conducted the systematic review in September 2016, this process is also broadly consistent with the approach suggested by Durach et al. (2017) in their recent publication of guidelines for conducting SLRs in supply chain management. First, the authors propose to define the research question, second they recommend "determining the required characteristics of primary studies" (Durach et a., 20017, p. 9), followed by an examination of the sample of potentially relevant literature. Finally, in the next steps, they recommend to select and synthesise the relevant literature, and finally to report the results. Section 4.1 outlines how the process steps for the SLR were applied in this research.

Referring to the quality assurance approach for this research as outlined in section 3.4.2, Table 3.5 shows the measures to assure research quality for the SLR for the three phases literature search and selection, literature coding and analysis, and reporting. In the first phase, following Durach et al. (2017), the main biases to take into consideration are the sampling bias and the selection bias. Durach et al. (2017) specify the sampling bias by the sub-categories retrieval and publication bias. They define the retrieval bias as "sampled articles are based on inadequate or incomplete research", and publication bias as "study findings that challenge or change existing knowledge are more likely to

be published in leading journals" (Durach et al., 2017, Table 2, p. 35) For this research, especially the retrieval bias needed to be taken into consideration. Remedy measures were for example the testing of keyword combinations as well as the involvement of experts in the field. The publication bias impact was considered to be lower, as there was no restriction to a defined set of journals for the SLR.

The selection bias, either by inaccurate design of the selection criteria or by the subjective inclusion of studies based on the researcher's individual view (Durach et al., 2017, Table 2, p. 35), was addressed by pre-testing the selection process and discussing the approach and the results of the pre-test with librarians as well as with peer researchers.

To avoid or at least minimise the within-study bias in the means of avoiding variability in the coding, Table 3.5 shows how this was addressed for the SLR on SPSM competences. One of the main mitigation measures was the coding protocol that provided a transparent guideline for coding.

Finally, in the last step of the SLR, when analysing the papers and providing the results, the so-called expectancy-bias needed to be observed. "Synthesis of studies is influenced by the researchers' conscious/ unconscious expectations about the results" is the definition that is provided by Durach et al. (2017, Table 2, p. 35). Based on the ontological and epistemological assumptions for this research as described in chapter 3, this bias is probably one that needs to be accepted as a fact. Nevertheless, the discussion of the results at conferences and even the publication of the results of the SLR in a book chapter and, in combination with additional results, in a peer-reviewed journal at least ensures that the findings and the evaluation was comprehensive (Schulze and Bals, 2016; Schulze and Bals, 2017; Schulze et al., 2019).

Phase	Validity	Reliability	Confirmability/ Objectivity	Transferability
Literature search & selection *Key words, search terms, data sources, search and selection process* → Avoid sampling and selection bias	• Keywords derived from research question • Various tests with different sets of keywords • Selection based on coverage of keywords and clustering in corresponding research areas	• Search in two different databases • Review of search terms with a set of experts in the field	• Systematic and rigorous approach	• Pre-testing of selection process • Peer discussion of pre-test and final results
Literature coding & analysis *Coding scheme, coding approach* → Avoid within-study bias	• Definition of nodes based on literature or exemplary codings	• Coding of two papers by two researchers to ensure the quality and inter-rater reliability	• Data collection and analysis in alternating sequences -> new nodes defined during coding discussed with peer researchers	• Coding protocol to assure documentation of coding decisions • Coding protocol to ensure that coding was based on same definitions • Coding and nodes in NVivo
Reporting *Analysis of papers* → Avoid expectancy-bias	• Evaluation of results based on research question and defined coding approach	• Reference to the research question and the objectives of the systematic literature review • Feedback in research community (conference paper, peer-reviewed paper, book chapter)	• Publication of results, going through a peer-reviewed publication process	• Evaluation based on coding and nodes in NVivo • Documentation in NVivo

Table 3.5: Systematic literature review – Quality Assurance (adapted from Lincoln and Guba, 1985; Strauss und Corbin, 1994; Maxwell, 1997; Salzberger et al., 1999; Welch et al.,2002; Sinkovics et al., 2005; Yin, 2014; Durach et al., 2017)

3.4.4 Delphi method

As a second step in the research approach (Figure 3.4), following the SLR as previously described, a Delphi study was planned. The Delphi study complemented the findings from literature with input from experts from academia and practice for the SPSM competence model. It was based on the research questions "What is successful and unsuccessful behaviour shown in SPSM practice" and "Which competences can be derived from this?". The following paragraphs provide a brief overview on the Delphi method as such and explain its application in this research. The results of the Delphi study are presented in section 4.2.

In its continuous development as a technique for qualitative and quantitative research, the definitions and the applications of Delphi in research projects were manifold (e.g. Linstone and Turoff, 2002; Häder, 2014). Gordon and Helmer (1964), the pioneers of the Delphi technique with their publication of the "Report on a Long-Range Forecasting Study", defined Delphi as a technique for forecasting, making controlled use of intuitive individual expertise. They described their methodological approach as follows: "This technique replaces direct debate by a carefully designed program of sequential individual interrogations (best conducted by questionnaires) interspersed with information and opinion feedback derived by computed consensus from the earlier parts of the program" (Gordon and Helmer, 1964, p. 5). While still referring to the element of controlled communication in the early description of the Delphi method by Gordon and Helmer (1964), Linstone and Turoff provided a definition with a broader focus on human interaction when dealing with problems: "Delphi may be characterized as a method for structuring a group communication process so that the process is effective in allowing a group of individuals, as a whole, to deal with a complex problem" (Linstone and Turoff, 1975, p. 3). This dissertation follows the definition of Linstone and Turoff (1975). The development of a set of SPSM competences with only a limited base in current research is considered to be the 'complex problem'.

In its application, the Delphi method has undergone a development from its original scope to predict the future to a broader range of research objectives. As the name 'Delphi' itself indicates, it refers to the oracle based in Delphi, Greece, dated back to the 6th and 5th century before Christ. As of Greek mythology, the oracle in the shape of its priest Pythia was able to predict the future. The oracle followed a certain ritual process that included the formulation of questions and the communication of feedback, which influenced the Delphi method as such. The first applications of the Delphi method in modern times are rooted in this historical understanding of Delphi being a method to shed light on future developments.

As one of the most prominent first Delphi studies in modern times, the Rand Corporation published a Delphi study in 1964 called a "Report on a Long-Range Forecasting Study" (Gordon and Helmer, 1964). The aim of their study was to forecast technical and scientific developments in the following 10 to 15 years (Gordon and Helmer, 1964; Linstone and Turoff, 2002; Häder, 2014). Nowadays,

forecasting of future developments is still the focus of many studies that apply the Delphi method (e.g. Goluchowitz and Blind, 2011). However, other application types of the Delphi technique emerged over time. For instance, Okoli and Pawlowski (2004) point out not only forecasting, but also framework development as the two main versions of Delphi applications. Table 3.6 provides an overview of 4 types of Delphi studies as proposed by Häder (2014), categorised by their goal, method, degree of determination and type of questions that are used (Häder, 2014).

	Accumulation of ideas (Type 1)	**Prediction/fact finding of an issue (Type 2)**	**Feedback from experts to an issue (Type 3)**	**Consensus (Type 4)**
Goal	Aggregation of ideas to find a solution for a problem	Optimise forecasting	Collect and compare expert knowledge	Reach consensus within Delphi participants
Method	Qualitative only	Qualitative & quantitative	Qualitative & quantitative	Quantitative
Degree of determination	Less operationalized	Definition of the issue as exact as possible	Definition of the issue as exact as possible	Strong definition of the issue
Questions	Open questions	Closed and open questions	Closed and open questions	Closed, standardised questions

Table 3.6: Types of Delphi studies, based on Häder, 2014, p. 37

Type 1 Delphi studies aim to collect the input of experts to generate and aggregate ideas to find solutions for a new and complex research question or problem (Häder, 2014). For instance, Jürgen Hasse (1999) in his study on the impact of wind generators on rural landscape, applies the Delphi technique to discuss with a range of stakeholders the new phenomenon back then that an increasing number of wind generators was supposed to add to the energy supply in Germany, resulting in a massive change in the appearance of some rural areas of the country. The experts were supposed to add their knowledge on the impact of such a change on various factors, like environment, people, climate, and others. The author explicitly states that his research is qualitative only, based on a research philosophy grounded in a hermeneutic understanding. Delphi studies of this type are less operationalised and use open questions.

Research that applies the Delphi method in the context of forecasting represents type two of the classification (Table 3.6). As stated above, historically this is the original application area for Delphi studies (Gordon and Helmer, 1964). Delphi studies of this type apply either quantitative or qualitative methods, using closed as well as open questions to evaluate a rather clearly defined research issue. Goluchowitz and Blind (2011), for example, used the Delphi method to investigate on future fields of technical standardisations. They combined a quantitative survey approach with qualitative expert interviews. Type 3 Delphi studies collect and compare expert feedback to a specific issue which, compared to type 2, are not necessarily focused on future developments (Häder, 2014). In terms of the method, the degree of determination and the character of the questions, type 3 Delphi studies are similar to studies in the range of Delphi type 2. They try to define the research issue for Delphi as exactly as possible, applying quantitative as well as qualitative methods, using closed or open questions. For instance, the study of Seuring and Müller (2008) within the sustainable supply chain management field of research represents a type 3 Delphi study application. Overall, Delphi types 1 to 3 encompass expert knowledge input aggregation (type 1) and comparison (type 3), as well as expert usage for forecasting (type 2). Not necessarily focused on the expert as the subject of interest are studies in the category of type 4. They apply the Delphi technique to reach consensus between a group of individuals, which can be experts, stakeholders or interested citizens (Häder, 2014). Research that applies the type 4 Delphi studies is usually quantitative, applying a set of closed questions (Häder, 2014). Apparently, research in the health sector often uses the Delphi method to reach consensus between experts (e.g. Mokkink et al., 2010; Rodriguez-Manas et al., 2013). Kerr et al. (2016) applied a Delphi study focused on consensus for an investigation in the area of advertising.

Based on this classification, the Delphi study that was considered to be appropriate for this research can be categorized as a type 1 application. It was chosen because it was considered to fit with the explorative character of the thesis, aiming to aggregate ideas on SPSM competences into a competence model. With the research topic being rather new, the purely qualitative character of a type 1 Delphi study, being less operationalised compared to the other Delphi formats, was expected to gather as much input as possible. Nevertheless, although less operationalised, the author wanted to follow a structured approach to gather input from the Delphi experts. It should also be closely connected to the findings of the SLR. Therefore, she planned to adapt the Delphi type 1 character as described by Häder (2014) by including the CIT in the design of the Delphi study. It is shown in in section 4.2.1 how the interviews with Delphi experts were set up and conducted applying the CIT.
Table 3.6 helped to display the notional reference and the application type of the Delphi study in this research. In terms of the research quality, the framework of this study that was developed in section 3.4.2 was applied. The measures to ensure validity, reliability, confirmability and transferability for each step in the Delphi process are provided in Table 3.7.

To summarise, the main procedures for quality assurance were a clear cross-reference to the findings of the SLR, pre-testing of the approach, peer discussions and the presentation of the approach at conferences, and communication with Delphi participants as well as a structured Delphi approach that was documented in a transparent manner. In a broader sense of quality assurance, the theoretical underpinning of the Delphi method as such might be worthwhile to be considered. With this study being a Delphi application to collect ideas and input to a rather new research topic, following an interpretivist paradigm, it was not relevant to apply a research methodology that verifies or provides evidence in an exact scientific manner. Although, as described by Häder (2014, p. 39), it has to be clarified which arguments lead to the assumption that an iterative process of asking experts anonymously to deliver their input to a rather new or unclear problem enhances the quality of the results. Häder (2014) systematically investigated findings from cognition psychology to find answers to this question and relied for instance on theories of mental models or individual paradigms of information processing and learning (Häder and Häder, 2000; Häder, 2014). Nevertheless, they state opportunities for future research on the theoretical underpinning of the Delphi method.

Phase	Validity	Reliability	Confirmability/ Objectivity	Transferability
Delphi step 1: Definition of CIs	• CI derived from findings in systematic literature review	• Pre-test to gather feedback from experts in practice and academia whether CIs were comprehensible and relevant	• CIs described based on examples published in academic papers, text books and case studies (see Table 4.7) • To avoid confirmation bias using the 12 pre-defined CIs, Delphi participants were given the opportunity to define own situations or skip CIs that they considered not to be applicable	• CIs also applied for action research
Delphi step 2: Selection & invitation of experts	• Criteria for expert selection clearly defined and described (see sections 3.4.4, 4.2.1)	• Refer to other Delphi studies with comparable sampling strategies	• Structured approach for sampling, followed Delbeqc et al., 1975/ Okoli & Pawlowski, 2003	• Sampling discussed with supervisors and research peers
Delphi step 3: Expert interviews	• Transcripts provided to experts just after the interviews to allow for corrections and additions	• Pre-test of the interview design with two experts from professional practice and one expert from academia • CIs permuted to avoid bias	• Written documentation of all interviews	

Delphi step 4: Evaluation of step 3	• Coding applied the node structure from systematic literature review • Communicative validation by a conference presentation (Schulze and Bals, 2018)	• Coding decisions discussed with supervisors	• Coding with CAQDAS (NVivo 11) • Documentation of all coding decisions in a coding protocol	• Extraction of categories for Delphi round 2
Delphi step 5: second Delphi round	• Development of written template based on findings of Delphi round 1	• Discussed with supervisors whether to split the group of experts and decided not to do so	• All experts were informed how the written template was developed	• Not apply CIs again in this stage of the research to enlarge scope • Include contextual factors
Delphi step 6: Evaluation second Delphi round & final consolidation	• Compared the competences gathered in round 2 with those from round 1 and documented them in Table 4.12 • Competitive conference paper on Delphi study (Schulze and Bals, 2019)	• Discussed and decided with supervisors and research peers the appropriate level of saturation	• Written communication to all experts to inform them about the Delphi results • Compare to findings in literature review • Document how the SPSM competence model was developed based on findings of systematic literature review and Delphi (see Figure 5.3)	• Aggregate findings to prepare curriculum for action research

Table 3.7: Delphi study – Quality assurance (adapted from Lincoln and Guba, 1985; Mayring, 1993; Strauss and Corbin, 1994; Maxwell, 1997; Sinkovics et al., 2005; Ritchie et al., 2014)

To conclude, the Delphi study in this research intended to gather input from experts for a SPSM competence model and its application in a HE and professional context. It can be considered a type 1 application in the classification provided in Table 3.6. Several measures were undertaken to enhance the validity, reliability, confirmability and the transferability of the Delphi study (Table 3.7).

3.4.5 Action Research

The previous sections described the application for the SLR as well as the Delphi study. Action research is the third method in the research design. The objectives were to develop a SPSM training module and test it in a HE and professional setting. The characteristics of the methodology as well as the intended application of the latter are now outlined in the following paragraphs. The action research addresses three coherent research questions: "How can SPSM competences be trained?", "How is the developed training module perceived by students and practitioners?" and "Does training have an impact on SPSM competences?". The data collection approach and the results are described in section 4.3.

Literature and handbooks on qualitative research methods describe various sources and definitions of action research, applied in very different academic disciplines like education, nursery or business. Overall, literature consistently refers to the social psychologist Kurt Lewin as being the one who established the term action research in the academic field (e.g. Reason and Bradbury, 2008; Erickson, F., 2011; Barbour, 2014;). Lewin's publication "Action research and minority problems" (Lewin, 1946), driven by the author's personal experience and his observation of group dynamics in World War II, is a cornerstone study being one of the first to combine empirical research with field interventions (Hard and Bond, 1995). Additionally, Lewin introduced the iterative character of action research projects, describing an action research cycle or spiral of diagnosing, planning, taking action and evaluating the findings (Spöhring, 1989; Saunders, 2009). Another major influence on the development of action research with a strong participatory stance that various handbooks refer to was driven by the pedagogical movement around Paulo Freire in Brazil in the 1960s. He promoted a democratic research process and emphasised the development of critical consciousness in education in order to achieve societal change (Reason and Bradbury, 2008; Zeller-Berkmann, 2014). Finally, the research that was undertaken at the Tavistock Institute in London, UK, from the 1940s onwards contributed to the establishment of action research (Hard and Bond, 1995; Reason and Bradbury, 2008; Barbour, 2014). Being aware that there are other influencing theories and movements on action research, the three pillars that were mentioned here are being considered as relevant for the development of the action research approach, thus they are different in their character and their motivation. Kurt Lewin was driven by the notion of how experimental research can contribute to solve issues and conflicts in society. Paulo Freire's educational concept intended to empower

mankind against suppression, to fight for social justice and economic and political emancipation. And finally, the researchers at the Tavistock institute, referring to psychoanalysis and social psychology (Hard and Bond, 1995; Barbour, 2014), established a consultancy model that followed the logic of a therapeutic process to overcome conflicts in organisations. Still, the approaches have a common stance: research should address real world issues, involve those that are faced with these issues, and finally research should contribute to improve conditions in the real world.

Considering this common stance, the author chose a definition for action research that she found most convincing and appropriate also to her own project. Reason and Bradbury, the authors of the SAGE Handbook of action research, say "action research is a participatory process concerned with developing practical knowing in the pursuit of worthwhile human purposes. It seeks to bring together action and reflection, theory and practice, in participation with others, in the pursuit of practical solutions to issues of pressing concern to people, and more generally the flourishing of individual persons and their communities" (Reason and Bradbury, 2008, p. 4). In other words, and therefore being the antipode to the positivist paradigm in social sciences, action researchers get involved and intend to improve and change conditions with and in favour of those who experience issues. The researcher is part of the research process, driven by the aim to foster human interests (Easterby-Smith et al., 2008).

Derived and further adapted from this definition is Figure 3.5. It shows the main characteristics of action research and how they are reflected in this work, indicated in italics.

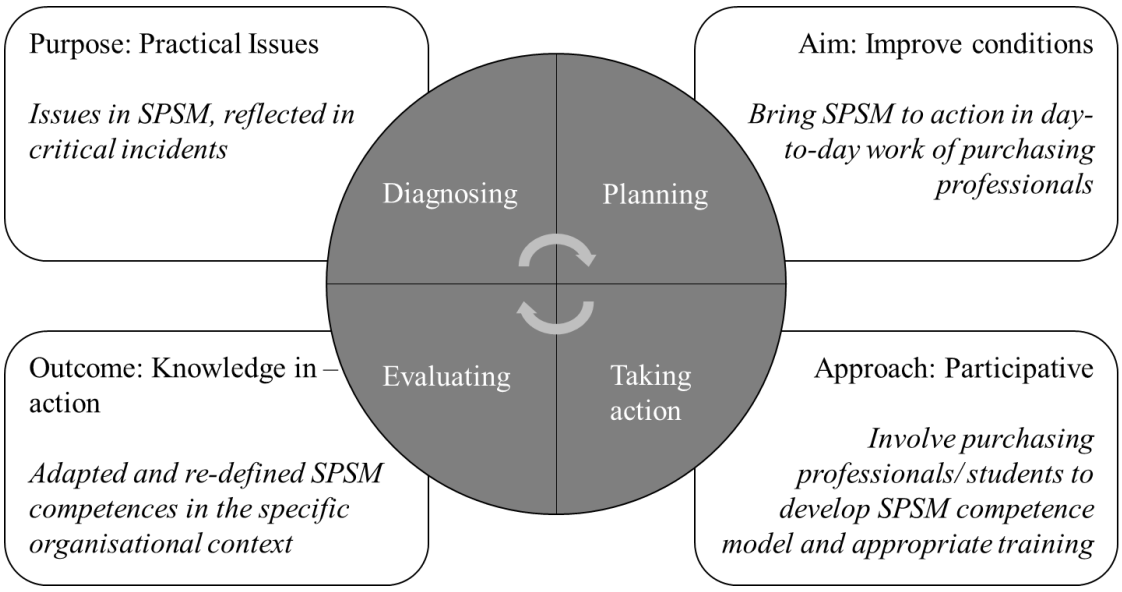


Figure 3.5: Components of action research, and application in this research (adapted from Reason and Bradbury, 2008; Saunders, 2009; Coghlan and Brannick, 2010)

For the development of a SPSM training module, the action research cycle can be described as follows. The diagnosing stems from the two previous steps in the research, the SLR and the Delphi study, leading to the competence model and the CIs. Planning should include the selection of the

sample and the communication with the stakeholders to set up the training. Taking action should be the SPSM training, and the evaluation. The findings might lead to changes in the training plan, the CIs and the competence model.

When complementing the definition of Reason and Bradbury (2008) with the description of Waterman et al. (2001) and Barbour (2014), the components can be described as follows, starting at the upper left hand corner of Figure 3.5. First, action research considers practical issues. It "is problem-focused, context-specific and future-oriented" (Waterman et al., 2001; Barbour, 2015). SPSM issues are the purpose in this research. Considering the roots of action research that were drafted above, action researchers are interested in real world issues. This leads to the second characteristic that Reason and Bradbury (2008) call human flourishing in the sense of the aim to increase well-being of human persons and communities, or, as of Waterman et al. (2001) and Barbour (2015), action research seeks to explain social situations while implementing change and empowering. For the particular case of the study on SPSM competences, the intention was to develop a competence model and derive a training concept, with the aim to bring SPSM to action in the day-to-day work of purchasing professionals, or to prepare future talents accordingly. Third, the best attitude to undergo action research in this sense is considered to be democratic and participative, engaging the relevant stakeholders in the research process. The research presented in this work included experts from practice already in the Delphi study. For the development of an appropriate training design in the action research part, the intention was to clearly involve the target groups, these being students and purchasing professionals in the private as well as in the public sector. Input from the training participants was gathered and discussed during and after the training, resulting in adaptations made either in the running of a training session or after it was finished. Finally, the resulting concept of knowledge in action research is fluid, knowledge evolves and changes in the course of the action research process. Reason and Bradbury suggest the following definition of knowledge for action research: "[…] knowledge may be defined as what we've learned in a context of action and that is the result of the transformation of our experience in conversation with both self and others that allows us consistently to create useful actions that leave us and our co-inquirers stronger" (Reason and Bradbury, 2008, p. 6). The latter point is not easy to tackle here, as the objective of the work was to develop a competence model, with the notion that competences can be pre-defined and listed and described. Nevertheless, even with the competence model as a basic structure, the individual definitions and interpretations became transparent and relevant in the course of the action research in different organisational and educational settings. In addition to the four main components of action research, Figure 3.5 shows the iterative character of the method. Referring to the roots defined by Kurt Lewin, action research in theory emerges and develops over time in an iterative manner, with a circular interlinkage of diagnosing and problem identification, planning, action and evaluation. When examined in practice, as Waterman et al. (2001) point out, the iterative

steps of an action research project might interfere with each other. For example, evaluation might occur already during implementation and might not be necessarily formally documented.

Considering the rather broad definition and main characteristics of action research, there are however different application types. Although, the author found it difficult to find an appropriate typology that allowed her to position her own action research project. For instance, some handbooks refer to the model introduced by Hart and Bond (1995), who propose four variations of action research – experimental, organisational, professionalising and empowering, which differ by their adherence to an either consensus or conflict-oriented model of society. Depending on the variation, certain key aspects like the role of the researcher in the research process or the envisaged change of the research project differ. Moser (2015) for example lists four types of what he calls in German 'Praxisforschung' – practical research: Design-based research, practice research, evaluation studies, participative action research. The four types differ in terms of their analytical or action-based character, as well as the degree of the involvement of all stakeholders. Gill and Johnson (2002) provide a comparison of action research with true and quasi-experiments, as well as with consultancy and other 'basic research', as they call it. For example, they compare validity, control parameters, evaluation and the attitude towards research participants between the different methods. There are differences, as for instance the control of external variables is higher in experiments than in action research, or the contracting of a consultant entails control of the consultant over the client, whereas the action researcher participates as an expert, but does not dominate or control the setting. But at the same time, boundaries between the different methods are permeable. This inherent flexibility of the method, as well as its iterative character, allows the reasonable combination with other research (Waterman et al., 2001; Saunders, 2009; Robson, 2011; Barbour, 2014).

Hence, when making the attempt to position this research, the author would argue that action research here was considered to be rather design-based. A prototype of the SPSM training was tested in 'action' (Moser, 2012; Barbour 2014), with the aim to increase competences of practitioners (de Treville et al., 2006). In the format of compressed action research, training was planned to be conducted in three different settings, in academia, in the private and the public procurement context, measuring the understanding of SPSM competences before and after the training with questionnaires. Following the typology provided by Hart and Bond (1995), the researcher proposes to allocate the work as being a type with organisational as well as professional key aspects. It fits to the professional variant, as for example the research question was problem-led and emerged from professional practice. It was not defined by a client. Therefore, the role of the author was being a researcher, with an understanding of practice, instead of being perceived as a consultant. In terms of the intended outcome, or the purpose of the research, the work probably fits to both variants. It provides support for practitioners, but also in a broader sense initiates change in an organisation to allow successful SPSM (Figure 2.10).

In this context it needs to be stated that literature often emphasises the role and the qualification of the researchers. As outlined already above, the researcher might be perceived as being a consultant or as an expert researcher in the field – both roles imply a different relationship between the researcher and the clients in action research. Also, action research requires dedicated qualifications of the researcher, such as methodological and theoretical knowledge, practical experience in the field, flexibility and self-awareness (Spöhring, 1989, Gill and Johnsen, 2002, Saunders, 2009).

To summarise, the overview above showed that, while there are common grounds, the variants of action research are manifold. Thus, literature proposes to apply criteria for quality and rigour in action research. For example, the description of the approach and of the decisions that were taken in the cycle process contributes to transparency and increases the research quality, following Barbour who states the "[…] interrelatedness of personal, professional and political values, ethics, and convictions in the making of research design choices in the action research arena" (Barbour, 2014, p. 238). Reason (2006) considers four dimensions to assess action research, which were further developed by Coghlan and Brannick (2010). The criteria include that action research should address worthwhile practical issues, while being based on theory. Also, action research processes should be participative and democratic, which is one of the key elements of the action research theory already described above. Finally, action research projects should allow knowledge to evolve over time during the research process, with the researcher being open to involve feedback and re-think own assumptions. Waterman et al. provide a list of 20 questions to assess action research projects, including the practical relevance of the research aim, the involvement and responsiveness towards the research participants, transparency in terms of decisions and steps in the research process as well as rigour in the application of the method. Finally, Moser (2015) explains transparency, coherence, adequacy and transferability to be quality criteria for action research. The description of the sampling and data collection in section 4.3.1 will show in detail how the quality criteria were applied. Additionally, Table 3.8 summarises the measures that were taken to ensure and enhance the quality of the action research process.

Phase	Validity	Reliability	Confirmability/ Objectivity	Transferability
Diagnosing	• Theory-based approach, referring to current knowledge gathered in the systematic literature review and the Delphi study • Addressing of practical relevant issues was ensured by relying on the input of the Delphi participants as well as on the professional experience of the researcher	• The aim of the action research process fit to the research philosophy and also to the individual values of the researcher regarding the need for change in terms of sustainable business strategies and the empowerment of individuals to impact organisational behaviour (see section 2.4)		
Planning	• Training approach based on the most relevant CIs identified in Delphi round 2. • Criteria of sample selection discussed with supervisors, reflecting the same criteria as for Delphi study (academic, private and public sector)	• Pre-test of the training conducted and evaluated with a peer researcher • Participative development of the individual action research steps with the participants from practice, e.g. adapt CIs to practical setting of public procurement	• Transparent information of all stakeholders on the aim of the research and the steps of the research process	• Sampling discussed with supervisors and research peers

Taking action	• Training sessions were grounded in theory and in the input of the practitioners in the planning phase • Adaptation of the process during the training to accommodate the needs of the participants, in terms of topics discussed and timing	• Discuss educational impact with the participants during the action research process	• Written documentation of feedback (questionnaires and notes of the researcher) • Researcher involved as an expert, not as a consultant or member of the organisation	• Researcher qualification was based on professional experience and theoretical expertise
Evaluation	• Include participant feedback in training design, already during action phase • Evaluation of results refers to findings in systematic literature review and Delphi study	• Evaluation discussed with supervisors and with participants.	• Description of the findings and how the results were gathered • Information to research participants	• Transfer the findings from one action research setting and circle to another round in another setting • Benefit from lessons learned in terms of the training concept, the description of the competence model

Table 3.8: Action research – Quality Assurance (adapted from Lincoln and Guba, 1985; Strauss and Corbin, 1994; Maxwell, 1997; Waterman et al., 2001; Sinkovics et al., 2005; Reason and Bradbury, 2008; Coghlan and Brannick, 2010; Moser, 2015)

The author applied the template and the four criteria validity, reliability, confirmability/ objectivity, and transferability as outlined in section 3.4.2 in this work. She decided to cluster the measures according to the steps of an action research cycle, diagnosing, planning, taking action and evaluating, based on Figure 3.5 .The measures listed in Table 3.8 are allocated to one of the action research cycle phases, as well as to one of the four quality criteria. All in all, it became apparent that some measures fit to several phases or criteria, as the process steps merged into one another. Therefore, there might be valid arguments, like for example presented by Coghlan and Brannick (2010) or Moser (2015), not to apply such a quality assurance structure. Although, Table 3.8 still demonstrates that the action research in this study followed a structured approach, and that the author was concerned about quality in all its aspects. Providing the same overview format also for the systematic literature review and the Delphi study contributed to the rigor of the entire thesis.

3.5 Data analysis

The following section provides answers to the fourth question of Pratt's checklist (Pratt, 2008) that was introduced in the beginning of the research strategy chapter of this work: "How did I study these things and how did I analyse the data" (Pratt, 2008, p. 503). Several approaches for data analysis are discussed, concluding in the ones that were finally chosen for this research.

Strategies for data collection and approaches for data analysis are not distinct but interfere and are closely connected. As described by Myers (2013), "[…] from a hermeneutic perspective, it is assumed that the researcher's presuppositions will affect the gathering of data. The questions posed to informants will largely determine the answers you get. The analysis will affect the data, and the data will affect the analysis in significant ways" (Myers, 2013, p. 165). Or, as outlined by Denzin and Lincoln (2011) in their introductory chapter for the SAGE handbook of qualitative research: "The choice of which interpretive practices to employ is not necessarily set in advance. The "choice of research practices depends upon the questions that are asked, and the questions depend on their context" (Nelson et al., 1992, p. 2), what is available in the context, and what the researcher can do in that setting" (Denzin and Lincoln, 2011, p. 4). Therefore, some methods for data analysis are at the same time also methods for data collection. For example, hermeneutics or grounded theory can be considered as data collection approaches and as well as methods to analyse and interpret data gathered in qualitative research.

Taking this interference of data collection methods and data analysis into consideration, the approach of data analysis for this research was developed in a structured manner. It was based on three core questions, which are partially adapted from Myers (2013). First, it was discussed if the approach is consistent with the research philosophy. Second, it was considered whether the approach is also

consistent with the research method. Finally, third, the researcher referred back to the aim of this research, reflecting how data analysis can provide answers to the research questions, taking into consideration the character of the data in terms of quality, quantity and format.

Several data analysis methods were considered. In general, literature on qualitative research describes a broad variety of approaches to analyse qualitative data (e.g. Denzin and Lincoln, 2011; Robson, 2011, Myers, 2013; Mayring, 2016). When looking at handbooks and textbooks for qualitative research, there seems to be no consistent way to cluster those. Some of them (e.g. Mayring, 2016) refer to either interpretive or descriptive approaches, others focus on hermeneutics, semiotic and narrative data analysis concepts (e.g. Myers, 2013). Flick (2014a, 2014b) clusters approaches to analysing data based on either their aim either to reduce and condense data, or the objective to rather expand data by providing interpretations. Additionally, some research on qualitative data analysis also describes politically or socially motivated concepts, like feminist qualitative research (e.g. Olesen, 2011; McHugh, 2014) or cultural studies (e.g. Giardina and Newman, 2011; Evans et al., 2014), or computer-assisted models (e.g. Davidson and di Gregorio, 2011). The following paragraph briefly describes selected methods for qualitative data analysis (see Table 3.9) and concludes with the decision for those that were finally applied. The selection of methodologies for Table 3.9 is far from being comprehensive but lists some of the most frequently applied and most recent ones.

Selected methodologies for qualitative data analysis
Grounded theory
Phenomenological approaches
Hermeneutic data analysis
Conversation analysis
Psychoanalytical text analysis
Qualitative content analysis
Coding
CAQDAS

Table 3.9: Overview of selected methodologies for qualitative data analysis (own overview, based on Flick, 2014b; Spencer et al., 2014; Mayring, 1993/ 2016)

Grounded theory, as developed by Glaser and Strauss (1969), aims to inductively develop theory during a research process, with the research being simultaneously involved in data collection and data analysis (Charmaz, 2006; Flick, 2014b; Mayring, 2016). It was originally predominantly applied for participatory observation in the field, and the researcher is supposed to find and build theory during observation, and adapt the further steps of data collection according to the newly developed

theory in the process. Data collection and analysis is only finished when no further development of theory is expected. Therefore, Mayring (2016) considers grounded theory not to be appropriate for research that collects data once, like interview-based studies, and then analyses transcribed texts after data collection is finalised. Nevertheless, grounded theory influenced multiple other research strategies and approaches to analyse qualitative data, especially in the context of coding (Charmaz, 2006; Robson, 2011).

Phenomenological approaches for data analysis are grounded in the phenomenological philosophical tradition first developed by the philosopher Edmund Husserl (1859-1938). Research in this context is focused on the human subject and its subjective interpretation of phenomena, with the aim to describe the individual explications of phenomena in a thorough and in-depth manner. Based on the descriptions, interpretations of phenomena are derived and synthesized to find a broader understanding. "The research methodology informed by what is often called interpretive phenomenology seeks to reveal and convey deep insight and understanding of the concealed meanings of everyday life experiences" (Robson, 2011, p. 151). Phenomenological analysis might be applied in various research contexts to provide critical, descriptive and innovative findings (Mayring, 2016).

Hermeneutic data analysis seeks to gather understanding by reading, interpreting, paraphrasing and discussing texts, taking into consideration the individual, historical or any other context in which the text was produced. A deeper understanding of the text is achieved by an iterative interpretation process, the hermeneutic circle, grounded in Heidegger's phenomenological philosophical approach (Gadamer, 1975). The aim is to increase the understanding by constantly switching back and forth from a specific part of a text to the bigger context the text is embedded in. "The hermeneutic circle refers to the dialectic between the understanding of the text as a whole and the interpretation of its parts, in which descriptions are guided by anticipatory explanations" (Gadamer, 1975, translation found in Myers, 2013, p. 171). The researcher is involved as an interpreter (Gadamer, 1975; Wernet, 2014). As of for example Flick (2014b) and Mayring (2016), hermeneutic data analysis methodology is considered to be useful for the evaluation of all sorts of texts, but rather not appropriate for less structured material.

Conversation analysis focusses on the investigation of patterns and structure of interaction and sequences in conversations (Flick, 2014b, Spencer et al., 2014). Therefore, it is applicable to analyse documented forms of conversations, and reveals for example linguistic systems in defined contexts.

With a very different notion and strongly related to the theoretical concept of psychoanalysis is the psychoanalytic textual interpretation approach. For example, researchers who apply psychoanalytical textual interpretation look out for inconsistencies or contradictions in the text and investigate if these might be indicators for suppressed motivations. Prerequisite to adapt this approach to analyse qualitative data is a strong commitment to the theoretical background of psychoanalysis. To gather meaningful results, a comprehensive amount of text or data gathered is required (Mayring, 2016).

Finally, content analysis is a methodology to analyse communication, mostly documented as a text, in a systematic manner, following defined rules and led by theory (Mayring, 2016). Krippendorff defines content analysis as "[…] a research technique for making replicable and valid inferences from texts (or other meaningful matter) to the contexts of their use" (Krippendorff, 2013, p. 24). Quantitative content analysis measures figures and mathematical relations, qualitative content analysis, applying coding, is a way to assign pieces of text with a certain meaning to defined categories. When mentioning coding, it must be pointed out that there is a range of different definitions for coding used in qualitative research methods handbooks (e.g. Flick, 2014b, Spencer et al., 2014). For instance, Flick (2014b) developed thematic coding as a separate method for qualitative data analysis, whereas Krippendorff (2013) characterises coding in the sense of a technique to analyse and interpret data in a systematic way. In this study, the term coding is used to refer to a technique for analysing, categorising and interpreting data. Thus, it can be concluded that qualitative content analysis and the application of the coding technique is an approach to systematically analyse and structure qualitative data, using defined categories (Myers, 2013; Mayring, 2016). As of Mayring (2016), qualitative analysis is predominantly recommended for example for theory building, pilot studies, in-depth studies to follow-up on results of quantitative studies and classifications. Qualitative content analysis and systematic coding can be combined with quantitative measures, by counting the number of codings by category and therefore identifying patterns or priorities.

Just like coding, computer-assisted qualitative data analysis software packages (CAQDAS) are listed in qualitative research manuals as a methodology (e.g. Flick, 2014a) as well as a procedure or technique (e.g. Saunders, 2009; Spencer et al., 2014). This research uses the term in the sense of a technique that supports coders in the processing of collected data. The main benefits can be summarised as follows: CAQDAS increase the speed in handling big data amounts, they contribute to research quality and rigor by providing a consistent, transparent and documentary framework for analytic procedure, and they facilitate communication and common decision making in research teams (Krippendorff, 2013; Flick, 2014b, Spencer et al., 2014).

Next, after having briefly described selected methodologies for data analysis, the approach for this research will be outlined.

As indicated in the beginning of the methodology section, the decision how to analyse the data was closely related to the underlying philosophical paradigms, the research approach and naturally also the research aim that resulted in the research questions and objectives. Additionally, also the expected character of the data led to the final choice. With this study having decided for a multi-method approach, it was furthermore considered whether the applied methods require different data analysis methodologies, based on the character of the data that was gathered (e.g. Flick, 2014a). These moderating factors resulted in the following approach.

The SLR, as well as the Delphi study in its first round, were both expected to provide text-based data, either in the format of academic papers or as transcribed expert interviews. Therefore, for those

two, the researcher planned to apply qualitative content analysis with coding, assisted by NVivo as software for CAQDAS. The second round in the Delphi study and also the action research provide data based on written templates, training feedback questionnaires and field notes. The author intended to evaluate the templates and field notes manually, using Excel sheets. For the training feedback questionnaires, it was considered to run a paired sample t-test.

Overall, the interpretivist paradigm and the inductive research approach, applied in a qualitative research strategy, required a data analysis approach that allowed to rather gather facts and contribute to build theory, and then to test theory. The research strategy was considered to include the experience and knowledge of different individuals, reflecting their view of reality. At the same time, the research objective to develop a competence model for SPSM and to find priorities for SPSM education led to a focus on gathering, clustering and prioritising data for model development. It was for example not meant to study any biographical, historical or political context, which would probably have required another way of data analysis. According to the research objective, the character of the data was expected to be predominantly content-focused, being either scientific papers resulting from the SLR or transcribed lists of successful and unsuccessful behaviour delivered by experts in the Delphi study. Qualitative content analysis and coding therefore was considered to be the most appropriate approach for data analysis, being focused on structuring and clustering qualitative material to come up with accumulated categories.

In the application of qualitative content analysis and coding technique, this research intended to follow the approach developed by Mayring (1993, 2015). Mayring outlines three basic forms applied in qualitative content analysis. Table 3.10 provides an overview of the forms and the specific data analysis techniques for each form. The first technique to analyse qualitative data is summarising, in the sense of reducing data to its essential meanings. If the scope of summarising is not to reduce the entire content, but to focus on certain elements of the textual data, categories are developed in an inductive manner. Second, explanation is a technique to understand the data by referring to an explanatory context. In a narrow sense, the context is restricted to the text itself. A broad context analysis allows to include other sources. Finally, the third technique that is mentioned by Mayring (2015) is structuring. Following Mayring (2015), data can be structured in terms of its formal structure or based on its content. Other structuring approaches cluster types of data or build scales. Structuring means to filter certain aspects from data and cluster it to categories, following defined criteria.

Basic forms	Data analysis techniques
Summarising	Summarising Inductive development of categories
Explication	Narrow context analysis Broad context analysis
Structuring	Formal structuring Content-based structuring
	Typecast structuring
	Scale-based structuring

Table 3.10: Qualitative content analysis – Basic forms and techniques for data analysis (based on Mayring, 2015, p. 68, translated by the author)

The approach that was aimed for in this research combines summarising and an inductive development of categories with content-based structuring. The latter is described as being a deductive approach. "The goal of content-wise structuring is to filter and combine specific topics, content and aspects from the material, applying theory-based categories" (Mayring, 1993, p. 83; translated by the author). Typically, structuring of content includes the definition of clusters or categories and exemplary text passages, as well as dedicated coding rules (Krippendorff, 2013; Mayring, 2016). In contrast, summarising by inductive development of categories follows a structured approach in paraphrasing, reducing and finally deriving categories from textual data. Both approaches were considered to be applicable for the data analysis in this research. Therefore, the author decided to combine both forms and slightly adapt Mayring's approach. Being an exploratory study, the methodology should follow a bottom-up approach, with a certain degree of ex-ante defined schemes for analysing the data (e.g. Myers, 2013). For example, some of the nodes used for coding were planned to be pre-defined, according to a standard PSM process (see Figure 2.4). The reason for this was the assumption that purchasing professionals have to perform their tasks in a way that embeds sustainability, therefore the PSM process was chosen as first lens of analysis. Additionally, it was expected that new nodes and their definition were to be created during the data analysis and to evolve over the coding process in the various research steps. New nodes should be created until saturation was reached in terms of the potential to create new categories out of the data.

The data analysis was conducted in a consistent manner throughout the entire research process. Figure 3.6 shows the steps that were planned for data analysis. The process is based on the proposed methodology by Mayring, and includes adaptations as outlined above.

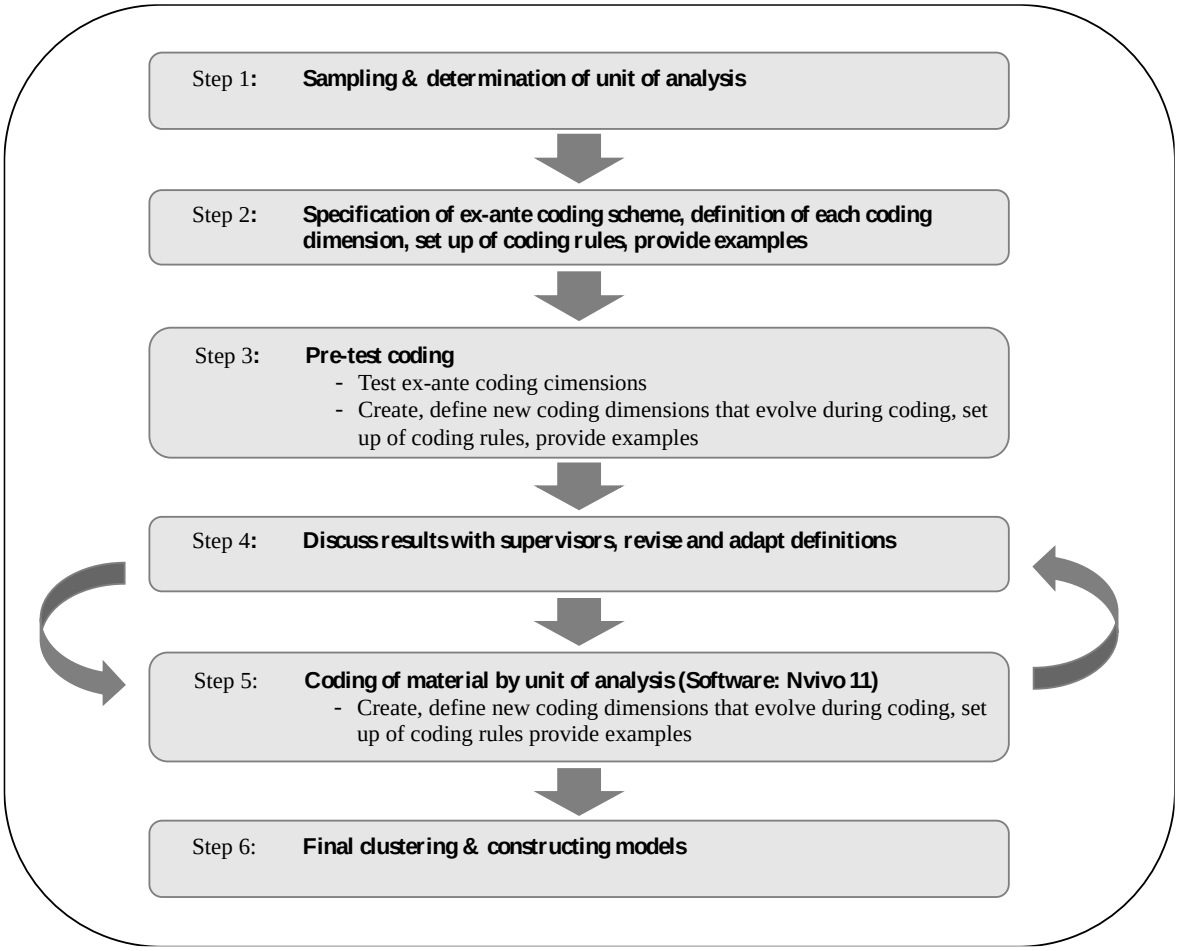


Figure 3.6: Structured approach for content analysis (based on Mayring, 1993; Myers, 2013)

In general, Figure 3.6 shows that the process starts with thorough planning and specification, followed by testing and ongoing verification and reflection during coding, finally leading to a final clustering. Table 3.11 specifies how the steps were finally reflected in the SLR and in the Delphi study, summarising the details that are described in sections 4.1.2.

	Systematic literature review	Delphi study (round 1)
Step 1: Sampling	Definition of keywords and search terms that led to a sample of 22 papers (see Figure 4.2, Table 4.2 and Appendix A)	Selection of 16 experts (see step 2 in Figure 4.6 and Table 4.8), resulting in 150 pages of interview transcripts
Step 2: Coding scheme & coding rules	Pre-defined coding scheme based on PSM process Selection of coding software NVivo 11 Documentation of coding rules in a coding protocol	Adoption of coding scheme and coding protocol from systematic literature review Uploading of interview transcripts in NVivo 11
Step 3: Pre-test coding	Coding of 2 papers by 2 researchers and discussion of inter-rater deviations Adaptation of coding protocol, e.g. by documenting proof quotes (see Figure 4.5)	Pre-test interview was coded, findings relevant to coding were documented in coding protocol
Steps 4 + 5: Coding & ongoing discussion of results	Coding of 22 papers, ongoing reporting in research panel and adaptation of approach if required Documentation of adaptations in coding protocol	Coding of 150 pages of interview transcripts (see step 4 in Figure 4.6), ongoing reporting in research panel and adaptation of approach if required (e.g. development of new sub-categories)
Step 6: Final clustering	Documentation of final node structure (see Figure 4.4) Reporting of findings	Final set of nodes, compared to SLR (see Table 4.9) Reporting of findings

Table 3.11: Content analysis applied for SLR and Delphi study round 1

The usage of the CAQDAS software NVivo 11 for the data analysis supported the process in various stages. First, the pre-defined nodes according to the PSM process (Figure 2.4) were implemented in the NVivo node structure. Second, when running the pre-test coding in the system, inter-coder differences were documented. The documentation was used to discuss the differences and adapt the future coding approach. It also served to adapt the coding protocol, which was consistently used during the coding of the SLR (SLR) and the Delphi expert interviews. Coding instructions, decisions and examples were documented in the coding protocol (Appendix B). Third, during coding, data was screened, marked and assigned to either existing or new nodes. New nodes were implemented in the NVivo system. Changes in the node structure, for example the implementation of sub-nodes, were documented in the system. It allowed to reconstruct where the data came from, when it was coded and by which coder. Finally, the coding tree in NVivo served as the basis for the final clustering and model development. The system provided numbers in terms of the most often coded competences that impacted the decision which ones to include in the CIs or the SPSM competence model (see section 4.2.1 and chapter 5). Therefore, one can say that the benefit of applying CAQDAS was merely in achieving transparency, consistency and documentation during the data analysis.

Additionally, it offered the possibility to add a quantitative stance to the data analysis approach by providing the possibility to count the number of codings for each node. The latter helped to set priorities for the particular next step in the research process and finally the development of the SPSM competence model.

The qualitative content analysis was not applied for the second round in the Delphi study, as well as for the evaluation of the action research. Both methodologies resulted in data that was merely quantitative. Written templates were used to gather feedback from experts in the second Delphi round, and training feedback questionnaires asked for participant feedback in action research (see sections 4.2.1 and 4.3.1). Nevertheless, open questions and comment fields allowed respondents to add text. Additionally, text was created in the field notes from the researcher. Given the character of this study that used both, the second Delphi round as well as action research, in a confirmatory manner for the SPSM competence model development, comments and field notes contributed to the checkmark feedback, but were not the data source per se to gather SPSM competences. Therefore, the analysis of the data was done as follows. The feedback in the written templates for the second Delphi round was documented in Excel, resulting in numbers of checkmarks per item (Appendix G). Qualitative feedback in the format of comments or field notes was captured in the same Excel files. Both, data resulting from the written templates as well as comments, were manually evaluated and integrated in the research results. The number of checkmarks for each competence was counted, and the ones with the highest number of checkmarks were listed. Feedback questionnaires applied in the action research part were also documented in Excel files (Appendix P). The evaluation data was then tested to see if the training resulted in perceived learning about the SPSM competences by running a paired sample t-test. Sections 4.1 and 4.3 provide detailed information.

4 Research Results

In the preceding chapter, the author described the research philosophy and approach, the research strategy and the concept for data analysis. In what follows, the implementation of the latter for the selected research methods is described: the sampling and data collection, data analysis and the results of the SLR, the Delphi study and the action research part. Figure 4.1.shows how the chapter is linked to the overall structure of the thesis.

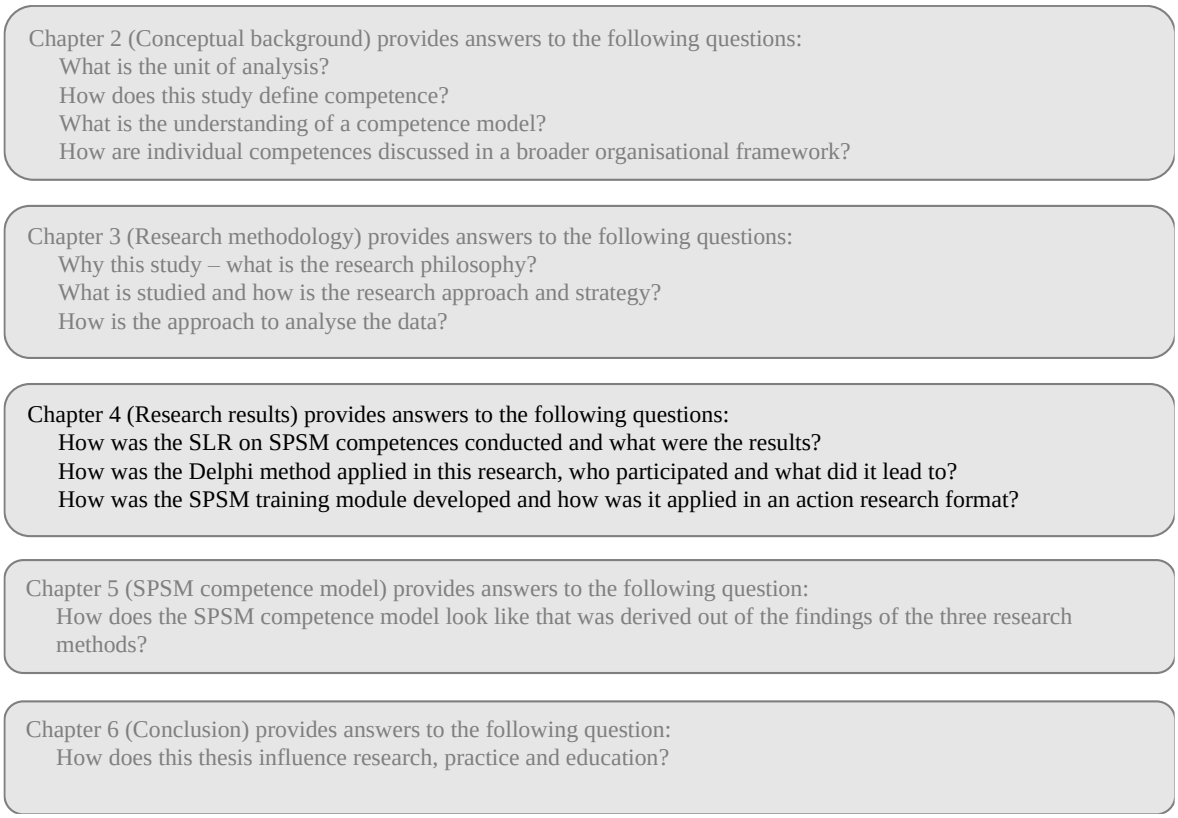


Figure 4.1: Contribution of chapter 4 in reference to the structure of the thesis

4.1 Systematic literature review

In the first step of the multi-method approach in this research, the author conducted a systematic literature review to gather input on SPSM competences from academic literature. The systematic literature review followed a structured process, including the literature search and selection, the coding and analysis followed by the reporting of the results (Tranfield et al., 2003; Durach et al., 2017). The SLR first provided an overview of the existing knowledge in the field of SPSM competences. Second, the SLR resulted in a preliminary framework for a SPSM competence model. The content analysis and coding of the papers yielded a data evaluation structure that was applied throughout the entire research process. Competences were identified by a coding process of the

relevant papers and allocated to the four competence areas defined by Delamare-Le Deist and Winterton (2005), as described in Table 2.1 and chapter 5 in this study. The approach and the results were published in a peer reviewed journal (Schulze et al., 2019).

4.1.1 Literature search and selection

The overall keywords and search terms for the SLR were derived from the guiding research question, based on the identified research gap in terms of sustainability competences and respective training, leading to three major search terms: 'sustainability', 'competence and knowledge' and 'purchasing and supply management'. The three concepts investigated are frequently discussed in research and practice and are associated with a range of different synonyms that are used to examine the same or very similar concepts. Therefore, the researcher identified relevant synonyms based on literature, common linguistic usage and her individual experience in the field of SPSM. For instance, 'ethic*' or 'corporate social responsib*' complemented the obvious 'sustaina*', while search terms like 'competenc*', 'knowledge' or 'skill' covered the competence dimension. Combined with for example 'qualification' or 'capabil*', related training literature was targeted (see Table 4.2, search block 1). Finally, 'buy*' or 'supply network' were chosen to add to the 'purchasing and supply management' dimension. Furthermore, the keywords and search terms were discussed with a panel of experts to ensure the quality. Both supervisors were part of the panel. Also, the two researchers Steve Kelly and John Israilidis were included because of their expertise in research on knowledge and competences (e.g. Israilidis et al., 2013; O'Connor and Kelly, 2017; Bals et al., 2017). Finally, Joe Miemczyk was contacted, being an expert for SSCM (e.g. Howard and Miemczyk, 2014). After the first set of keywords was identified, a test search run was conducted. This revealed a few search terms to be too generic (e.g. value chain, environmental, social), resulting in a very high number of unrelated hits. These keywords were subsequently removed from the final set as shown in Table 4.1. Papers related to the topic of investigation in this study very likely were included via the remaining search terms. For example, the keyword 'sustainability' and its search terms as outlined in Table 4.1 comprise the three elements of the triple bottom line (TBL; Elkington, 1998). The scope of the study excludes economic competences and knowledge, and focuses on ethical, social and environmental sustainability aspects.

Keywords	Search terms
Sustainability	Sustaina* OR responsib* OR ethic* OR green OR "corporate social responsib*" OR CSR OR "triple bottom line" OR TBL
Competence and knowledge	competenc* OR knowledge OR skill* OR capabil* OR abilit* OR know-how OR qualification OR attitud* OR behavio* OR belief* OR attribute OR "intellectual capital" OR maturity
Purchasing and supply management	Purchas* OR Sourcing OR Procurement OR "Supply Chain Management" OR Buy* OR "supply network"

Table 4.1: Keywords and search terms

The search process followed an iterative process. The first search was conducted using the Web of Science database. This specific database was selected because it is a well-established source of data in business and management and covers a broad range of academic disciplines (e.g. Osagie et al., 2014; Johnsen et al., 2017). A second search was made to verify and complement the results, applying exactly the same search criteria using the EBSCO databases on business and education research. Various tests with defined sets of keywords and search terms yielded a significant portion of results that covered other research areas, including consumer behaviour, economic development and medical sciences, as some of the search terms still were too generic and used in the context of multiple research areas (e.g. 'capabil*'). Therefore, the author decided to conduct a block search to further narrow down the literature review (see e.g. Casimir and Tobi, 2011; Osagie et al., 2014). In applying the block search strategy, keywords were combined with different search areas in the databases. The three main keywords derived out of the research question were searched in the search field option 'title', combined with the other search terms in the search field option 'topic'/'subject term' (see Table 4.2 with details on the keyword combinations and number of search results).

<table>
<tr><th>Block search
Key word combination</th><th>Refinement criteria</th><th>Database and search date</th><th># of results</th></tr>
<tr><td rowspan="2">Search block 1:
<u>Focus:</u> competenc* OR knowledge OR skill*+ capabil* OR abilit* OR know-how OR qualification
<u>Attributes:</u> Sustaina* OR responsib* OR ethic* OR green OR “corporate social responsib*” OR CSR OR “triple bottom line” OR TBL
<u>Demarcation:</u> Purchas* OR Sourcing OR Procurement OR “Supply Chain Management” OR Buy* OR “supply network”</td><td rowspan="4"><u>Languages:</u> English and German
<u>Publication source types:</u> Academic articles
<u>Subject area:</u> Exclude research areas like consumer behaviour, media sciences and other</td><td>Web of Science, September 27, 2016</td><td>352 results - 20 articles selected</td></tr>
<tr><td>EBSCO Host; September 29, 2016</td><td>563 results – 51 articles selected</td></tr>
<tr><td>Search block 2:
<u>Focus:</u> attitud* OR behaviour OR belief* OR attribute OR “intellectual capital” OR maturity
<u>Attributes:</u> Sustaina* OR responsib* OR ethic* OR green OR “corporate social responsib*” OR CSR OR “triple bottom line” OR TBL
<u>Demarcation:</u> Purchas* OR Sourcing OR Procurement OR “Supply Chain Management” OR Buy* OR “supply network”</td><td>Web of Science, September 29, 2016</td><td>341 results – 11 selected</td></tr>
<tr><td>EBSCO Host, October 3, 2016</td><td>862 results – 20 articles selected</td></tr>
</table>

Table 4.2: Systematic literature review – Search approach, refinement and results

In applying this approach, the portion of relevant findings was increased. Early searches indicated that a relatively low number of articles matched with the research question. Therefore, it was decided not to limit searches in terms of publication date or journals, thereby widening the net as much as possible.

Articles were selected through a filtering process in three steps, as outlined in Figure 4.2. First, the title, abstract and keywords of all 2118 journal articles that resulted from the keyword search were screened, removing any papers that were obviously out of scope. For example, papers with a non-relevant subject matter to the research questions were excluded (e.g. consumer behaviour, sustainable food supply, open source in information technology) as were papers concerning sustainability in the

general sense of ‘enduring’. Also, articles that focused on organisational and not on individual competences for sustainable PSM were removed, together with papers that covered other meanings of one or more of the keywords (e.g. ‘buy’ in terms of ‘consume’). Consequently, only 102 articles resulted out of this first step. The second filter process involved reading abstracts and conclusions of all 102 papers, reducing the list to 39 papers. Finally, in step three, the remaining 39 papers were read in full, selecting only those that focused specifically on individual competences for sustainability. The researcher divided the remaining 22 papers into two research areas as shown in Figure 4.3. Research Area 1 included all papers covering ‘competences/knowledge’ and ‘sustainability’ in the context of PSM (thus referring directly to the research question), research area 2 included papers on ‘competences/knowledge’ and ‘sustainability’ in a broader, non-PSM related context (a full list of the papers in the two research areas is shown in Appendix A). The clustering into the two research areas shows which papers directly concern the research questions and which stem from a different research context outside PSM.

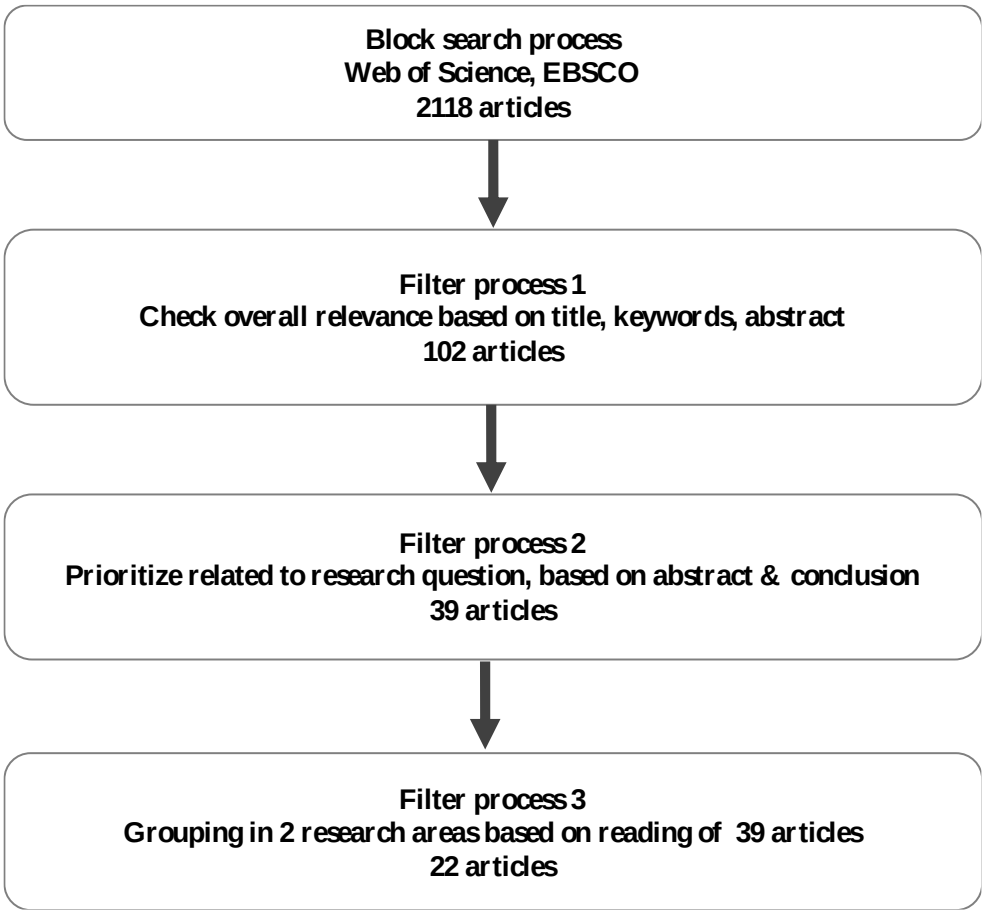


Figure 4.2: Systematic literature review process overview

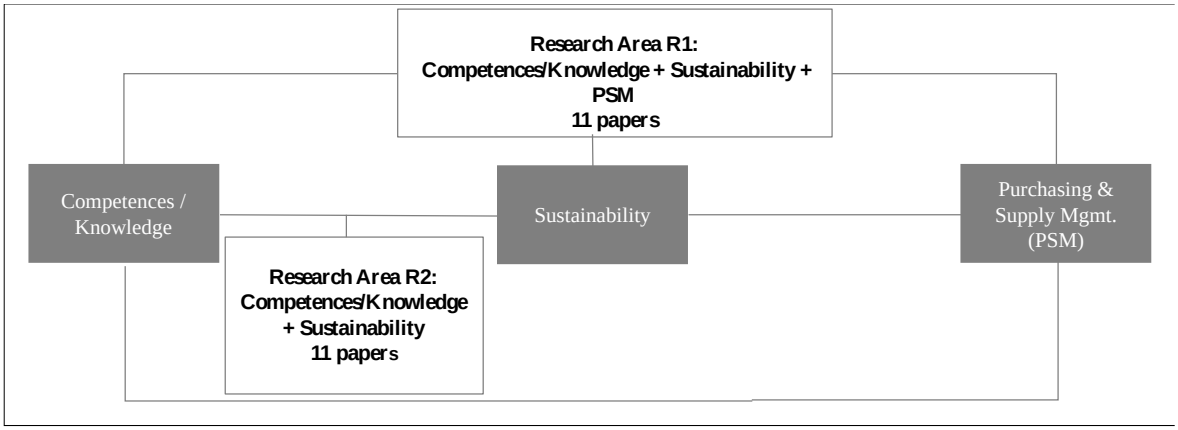


Figure 4.3: Basic keyword combinations and research areas identified

4.1.2 Coding Approach and Analysis

The researcher developed a coding scheme based on the main steps of the procurement process (see Figure 2.4). She chose the process as a first lens of analysis, with the core assumption that PSM professionals have to perform their tasks in ways that embed sustainability aspects or criteria in their daily work. In addition to the ex-ante coding tree, new nodes were defined during coding as additional competences, independent of functional process steps and tasks, became evident. The final nodes structure after coding all papers is shown in Figure 4.4. The left hand side shows all pre-defined nodes reflecting the procurement process, the right hand side lists the ones that were added during the coding of all papers. Some of the pre-defined nodes did not receive any codings, which is described further down in the description of the results. All coding was performed with the qualitative data analysis software NVivo 11.

After development of the ex-ante coding tree, two papers were coded by the author and one of her supervisors to ensure the quality and inter-rater reliability of the coding by comparing, discussing and clarifying individual differences (e.g. initially interpreting the scope of SRM differently). For example, when comparing inter-rater deviations after coding the first two papers, one coder assumed collecting supplier sustainability data was part of category strategy and the other interpreted this as part of SRM in the middle of the process scheme in Figure 2.4. The two coders then agreed to allocate the ongoing collection of supplier sustainability data in SRM, and only in category strategy when part of new supplier selection. This was done for all deviations. For this coding comparison, the researchers chose one paper out of research area 1 (Grandia, 2016), and one paper from research area 2 (Osagie et al., 2014). After discussing such similarities and differences in the coding, the results of these discussions were summarised and documented in a coding protocol and the remaining coding ensued.

Figure 4.4: Node structure after coding of SLR, including all pre-defined and newly added nodes

The coding protocol (Appendix B) also served to ensure that coding was done based on the same definition of each process step, so key tasks and activities were described for each of the steps, based on academic literature (Johnsen et al., 2014; van Weele, 2014; Monczka et al., 2016). Hence, descriptions of required actions to cope with sustainability challenges, as well as explicitly mentioned competences, abilities, skills or knowledge related to sustainability were coded under the respective PSM process step. To illustrate how that was done, Figure 4.5 provides exemplary proof quotes (Pratt, 2008) for the coding of the process step 'Supplier Relationship Management'.

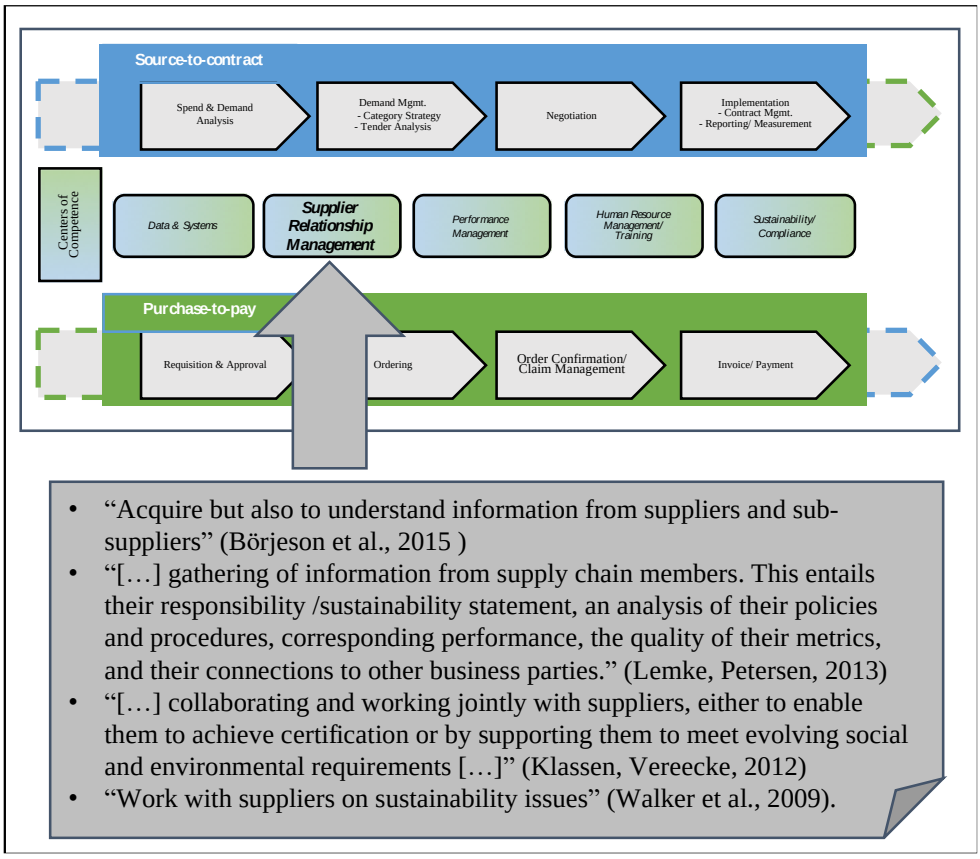


Figure 4.5: Proof quotes for Supplier Relationship Management

4.1.3 Results

The systematic literature review provided a relatively limited number of studies on individual sustainability competences for PSM professionals. Generally, referring to the conceptual model of organisational and individual influences on behaviour as adapted from Von Rosenstiel (2011, Figure 2.2), many studies (e.g. Preuss, 2009; Giunipero et al., 2012) deal with sustainable PSM at the organisational level. General knowledge and competences in the context of PSM and organisational performance were identified as another pertinent research focus, but only very few studies with such a focus included sustainability as a specific topic in the scope of their PSM skill profiles. The following section provides an overview of the most frequently coded competences. Although the author focuses on the most frequently coded competences here, for the further steps in developing the competence model, the whole list of competences was taken into consideration and was accomplished with the findings in the Delphi study.

Findings in research area 1: Competences/knowledge about sustainability in PSM

The search resulted in 11 papers that cover 'competences/knowledge', 'sustainability' and 'PSM' (R1 in Figure 4.3), with some of them showing a special focus on one aspect either regarding PSM or sustainability. One recent paper by Grandia (2016), for example, encompasses sustainable public procurement. Other papers covered only one dimension of the triple bottom line (e.g. Bowen et al., 2001), or focused on the sustainability knowledge specifically needed for certain products (e.g. Börjeson et al., 2015). All papers are published between 2001 and 2016. The following section provides an overview of the most often coded competences, listed in Table 4.3.

Table 4.3 shows the most frequently coded nodes across all papers in research area 1. Early on in the coding, the researcher together with her supervisors decided that she would not necessarily code every instance of a competence multiple times in an article. Only if the coded text yielded an additional insight on what was behind a certain competence, it was coded to a node. A mere repetition of a certain word (e.g. communication) was not coded at every instance. This process was followed because the qualitative research approach only has limited power to make very precise inferences from frequencies to importance. Instead, the complexity of the phenomenon and here the breadth of competences was the focus of this research.

Nodes	# of codings across papers	Papers
Supplier relationship management (Application of tools)	26 codings from 9 papers	1, 2, 4, 6, 7, 8,9,10,11
Demand management – Category strategy	23 codings from 8 papers	1, 2, 3, 6, 7, 8, 10, 11
Sustainability/ compliance	22 codings from 6 papers	1, 5, 6, 7, 8, 11
Commitment to change	21 codings from 8 papers	1, 3, 5, 6, 7, 8, 10, 11
Basic individual knowledge on PSM	14 codings from 4 papers	2, 3, 6, 7
Basic sustainability knowledge	14 codings from 5 papers	1, 2, 4, 8, 9
Systems thinking competence	14 codings from 7 papers	1, 2, 3, 4, 7, 8, 9
Supplier relationship management (Communication)	13 codings from 6 papers	1, 2, 4, 7, 10, 11

Table 4.3: Main Nodes Research area 1 (Competences/Knowledge+Sustainability+PSM)

'Supplier Relationship management (Application of tools)' as an explicit knowledge area encompasses the competence to collect and understand sustainability data from suppliers (e.g. Bowen et al., 2001; Börjeson et al., 2015), the ability to identify and handle risk in the supply network (e.g. Klassen and Vereecke, 2012), as well as the skill to apply tools to monitor and evaluate suppliers and manage how these adhere to sustainability practices (e.g. Park, 2005; Klassen and Vereecke, 2012; Eriksson and Svensson, 2015).

'Demand management – Category strategy' refers to the ability to explore supply networks and the development of new market opportunities, and the integration of sustainability criteria in sourcing decisions (e.g. Klassen and Vereecke, 2012; Eltantawy, 2016; Swaim et al., 2016). It includes situational awareness, coping with ambidexterity and the ability to balance environmental with economic goals (e.g. Bowen et al., 2011; Klassen and Vereecke, 2012; Eltantawy, 2016).

'Sustainability/Compliance' includes general expertise in sustainability, knowledge to develop and implement sustainability policies, legislation and procedures (e.g. Walker et al., 2009; Klassen and Vereecke, 2012; Grandia, 2016), as well as the competence to partner with organisations that engage in specific ethical practices (e.g. Lemke and Petersen, 2013).

'Commitment to change' has a very tacit character. For example, Eltantawy (2016), Grandia (2016), and Walker et al. (2009) describe the competence and capacity to adapt to changing purchasing practices and organisational routines. Moreover, a positive commitment to sustainability, a leadership mind set and willingness to implement sustainable procurement (e.g. Walker et al., 2009; Grandia et al., 2015; Grandia, 2016; Swaim et al., 2016) were identified as part of this competence type.

Knowledge of PSM and sustainability is explicit knowledge, although 'Systems thinking competence' is predominantly tacit knowledge. Interestingly, 'Supplier Relationship management (Communication)' complements the dominant 'Supplier Relationship management (Application of tools)' node with the tacit aspects of networking and relationship management.

Findings in research area 2: Competences/knowledge about sustainability in general

The systematic literature review led to 11 papers that concerned 'competences/knowledge' and 'sustainability' (R2 in Figure 4.3), published between 1999 and 2014. In sum, Table 4.4 shows the most often coded competences, with the top two clearly appearing most frequently. The high number of codings in this research area is heavily influenced by Osagie et al. (2014), as their paper describes a very broad range of competences. Overall, the variety of codings is broader, compared to the outcome of the coding in Research area 1.

Nodes	# of codings across papers	Papers
Demand management – Category strategy	38 codings from 7 papers	3, 4, 6, 7, 9, 10, 11
Sustainability/ compliance	37 codings from 6 papers	3, 4, 6, 7, 8, 11
Commitment to change	21 codings from 7 papers	1, 4, 6, 7, 9, 10, 11
Systems thinking competence	26 codings from 5 papers	2, 5, 6, 7, 11
Communication skills	18 codings from 6 papers	1, 2, 3, 7, 9, 11
Basic sustainability knowledge	16 codings from 8 papers	1, 2, 3, 4, 6, 8, 9, 10
Cross-functional teamworking	15 codings from 7 papers	1, 3, 4, 5, 6, 7, 11
Supplier relationship management (Communication)	15 codings from 6 papers	2, 4, 7, 8, 9, 11
Self-reflection	14 codings from 4 papers	5, 7, 9, 11
Stakeholder management (Communication)	14 codings from 5 papers	1, 5, 6, 9, 11

Table 4.4: Main Nodes in Research area 2 (Competences/Knowledge+Sustainability)

'Demand management – Category strategy' clearly emphasizes two knowledge areas. First, strategic thinking in terms of implementing sustainable business approaches (e.g. Dubey and Gunasekaran, 2015) and the development of innovative business approaches and products (e.g. Maletic et al., 2014), combined with the flexibility to find new solutions (e.g. Simola, 2007). Second, the ability to identify future business opportunities (e.g. Osagie et al., 2014; Wesselink et al., 2015).

Consistent with the findings in Research area 1, 'Sustainability/Compliance' includes knowledge of sustainability policies and regulations (e.g. Osagie et al., 2014). In particular, Osagie et al. (2014) and Wesselink et al. (2015) emphasize the role of a sustainability/compliance competence centre to drive sustainability implementation by managing programs and by facilitating, motivating and coaching other departments. Also, the development and establishment of sustainability measures is seen as a key competence (e.g. Pullman and Collins, 2013).

'Commitment to change' in the sense of personal awareness and commitment towards sustainability as well as the willingness to bring assignments into action was also emphasized in this set of papers (e.g. Buller and McEvoy, 1999, Osagie et al., 2014, Wesselink et al., 2015).

Furthermore, 'Systems thinking competence' is defined as the ability to understand the impact of sustainability implementation on different systems and their interaction (e.g. Maletic et al., 2014, Osagie et al., 2014, Wesselink et al., 2015), combined with an understanding and anticipation of upcoming sustainability challenges (Fadeeva and Mochizuki, 2010, Maletic et al., 2014, Osagie et al., 2014).

'Communication skills' is comprised of interpersonal communication competences and the application of communication tools. The former includes networking, collaboration, and motivation of others (e.g. Osagie et al., 2014, Wesselink et al., 2015), as well as empathy and active listening (e.g. Simola, 2007). The application of communication tools and techniques to support clear and consistent organisational communication is, for example, outlined by Buller and McEvoy (1999), and Osagie et al. (2014), who identify facilitation as an asset for CSR managers.

Closely linked were statements regarding 'Cross-functional teamworking' and 'Stakeholder management (Communication)'. These encompass the competence to interact with multiple business units within the firm (e.g. Eltantawy et al., 2009; Maletic et al., 2014; Osagie et al., 2014; Wesselink et al., 2015) and, more broadly, the competence to deal with different stakeholders and sectors of society outside the firm (e.g. Simola, 2007; Mochizuki and Fadeeva, 2010; Osagie et al., 2014; Wesselink et al., 2015). Some authors refer explicitly to the competence to communicate with supply chain partners (e.g. Eltantawy et al., 2009; Craig and Allen, 2013; Pullman and Collins, 2013; Osagie et al., 2014), which refers to 'Supplier relationship management (Communication)'. 'Self-reflection' was highlighted in many papers as a crucial success factor for acting in a network with different stakeholders (Simola, 2007; Mochizuki and Fadeeva, 2010; Osagie et al., 2014).

'Communication skills', 'Cross-functional teamworking', 'Stakeholder management (Communication)', 'Supplier relationship management (Communication)' and 'Self-reflection' are predominantly tacit knowledge areas. Basic sustainability knowledge is more explicit in terms of the basic understanding of sustainability issues and products (e.g. Pullman and Collins, 2013; Dubey and Gunasekaran, 2015; Subramanian et al., 2015), including knowledge about sustainability initiatives and their impact within organisations (e.g. Eltantawy et al., 2009; Craig and Allen, 2013).

Combined results

In order to arrive at a more aggregated result of the overall list of competences the results were further consolidated, based on the competence typology according to Delamare-Le Deist and Winterton (2005), as outlined in section 2.2. The nodes that were coded during the evaluation of the papers were grouped into the four competence clusters 'cognitive', 'social', 'functional' and 'meta' competences. Table 4.5 shows the classification according to these competence areas.

Competence Domain	Allocated Nodes	Total # of codings (domain)
Cognition-oriented competences	• Ability to make decisions • Critical thinking • Resourcefulness (creative resource combinations) • Supplier relationship management (holistic view) • **Systems thinking competence**	81
Social-oriented competences	• **Communication skills** • **Cross-functional teamworking** • Organisationally and politically savvy (Interaction) • **Stakeholder Management (communication)*** • **Supplier relationship management (communication)**	99

Functional-oriented competences	• **Basic individual knowledge on PSM***
	• **Basic sustainability knowledge**
	• Data & Systems
	• HR Management & Training
	• Performance Management
	• Resourcefulness (Application of tools)
	• Stakeholder Management (Application of tools)
	• Source-to-contract
	  ○ **Demand Management – Category Strategy**
	  ○ Demand Management – Tender Analysis
	  ○ Implementation – Contract Management
	  ○ Implementation – Reporting & Measurement
	  ○ Negotiation
	• **Supplier Relationship Management (Application of tools)**
	• **Sustainability & Compliance**
		272

Meta-oriented competences	• **Commitment to change** • Organisationally and politically savvy (playful attitude) • **Self-reflection*** • Supplier Relationship Management (cooperative attitude)	77
*Legend: Bold = Most coded competences; * = Competences received the same number of codings*		

Table 4.5: SLR competence clusters

Nodes that reflected a common competence domain (i.e. the cognition-oriented, function-oriented, social-oriented, or meta-oriented domain) were selected and grouped by the author and discussed with her supervisors. During this process, it became evident that some nodes, such as SRM, had to be further divided into the different domains, e.g. 'SRM (holistic view)' in the cognition-oriented, 'SRM (communication)' in the social-oriented, 'SRM (application of tools)' in the functional-oriented, and 'SRM (cooperative attitude)' in the meta-oriented competence domains. After further discussion and alignment with other researchers, the resulting clustering was implemented for further analysis in NVivo.

The evaluation of the academic papers resulted in a clear prioritisation of competence areas and assigned nodes. Also, the evaluation provided a clear picture in terms of the PSM process steps that do not require specific sustainability competences. The researcher neither found evidence of sustainability competences related to the Purchase-to-Pay Process (Invoice & Payment, Order Confirmation & Claim Management, Ordering, Requisition & Approval), nor for Source-to-Contract Spend & Demand Analysis. Therefore, these nodes are not reflected in Table 4.5.

'Functional-oriented competences' were identified most frequently. This domain was clearly emphasized, compared to the other three competence domains. The analysis of academic papers from both research areas (see Figure 4.3) resulted in a high number of findings with regard to 'Demand management – Category strategy' and 'SRM (Application of tools)'. In the articles, the researcher also found frequent references to 'Sustainability/Compliance' (papers from both research areas) in terms of the sustainability management competences required for specialised competence centres within an organisation.

Regarding 'social-oriented competences', the academic papers in research areas one and two focused on 'Communication skills', 'Cross-functional teamworking', 'Stakeholder management (Communication)' and 'Supplier relationship management (Communication)'.

'Meta-oriented competences' were identified less frequently compared to the others. Academic papers in research area 2 (see Figure 4.3) revealed competences in the node 'Self-reflection'.

Only very few of the papers that resulted from the SLR covered SPSM training. Walker et al. (2009) designed, delivered and evaluated a virtual course for sustainable procurement in the public sector. Overall, their findings point toward a combination of online learning and interactive, face-to-face learning phases, including the work with practical examples, tailored to fit with the specific professional background of the training participants. Interestingly, the authors discuss how the training participants in their study emphasised the impact of organisational enablers and supporting factors for SPSM implementation, confirming the framework of Von Rosenstiel (2010) which was introduced in Figure 2.7. They also suggest to consider mindset and attitude when looking at how to educate SPSM, which refers to the competence 'commitment to change' in the meta-oriented

competence cluster. The work of Pullman and Collins (2013), dealing with the integration of sustainability into curricula for operations and supply chain management at business schools, includes sustainable purchasing as one topic amongst others. They suggest the work with case studies that for example increase the awareness of risk in the upstream supply chain, or foster the understanding of third-party certifications. Finally, although focusing on SSCM, Dubey and Gunasekaran (2015) elaborate on a framework for a professional training framework that should include hard and soft skills, combining theoretical inputs and case analysis. The findings of these papers were integrated in this research when developing the SPSM training module (section 4.3).

Summarising the main findings, the SLR resulted in a first overview of competences required for SPSM, although the number of 22 papers that matched with the search criteria was relatively low. In brief, all the identified competences relate to strategic PSM processes, none were identified in relation to transactional PSM process steps (purchase-to-pay in Figure 2.4). The SLR evaluated a range of competences in four domains (cognition-oriented, social-oriented, functional-oriented and meta-oriented competences). The analysis shows that functional-oriented competences are central, and academic papers also emphasized social-oriented competences. Moreover, the domain analysis suggested that sometimes one task, such as SRM, requires competences in all four domains. Therefore, the researcher decided to split these into sub-categories that reflect the competence clusters.

When considering the general goals of a SLR as described in section 3.4.3 in reference to Boer et al. (2014), the findings indicate the following. The practical importance of the issue, in this research SPSM competences, was confirmed, considering that 14 out of the 22 papers were empirical studies referring to issues that are related to practice. The list of competences clustered into four domains provides a valid overview on what is known to explain the phenomena of SPSM competences. Finally, the small number of papers could only provide an initial starting point when looking at SPSM competences and confirmed "[…] that what we presently know cannot explain the phenomena and hence we need new facts/theories" (Boer et al., 2014, p. 1245).

To ensure that no current publications were overseen in the approach, the author repeated the SLR with the same search terms in February 2019, including the same databases. She was looking for publications in the timeframe from January 2016 to December 2018. This search did not lead to any more recent studies of SPSM competences. Nevertheless, a few publications were identified that focus on the individual aspect of either SPSM or SSCM. Some studies rather look at the motivational aspect (e.g. Eriksson and Svensson, 2016; Eriksson and Svensson, 2018; Eikelboom et al., 2018; Putz et al., 2018), others focus on competences and knowledge for individual functional tasks and job roles (e.g. Huq et al., 2016; Steinfeld et al., 2017). Interestingly, the SLR on research in the field of ethical sourcing of Kim et al. (2018) led to four major clusters of the major research areas, and none of them includes the individual competence dimension or the identification of new competences.

The findings show that there is no comprehensive study yet on a SPSM competence model and SPSM training, with all of the papers focussing on dedicated aspects and areas as outlined above. Therefore, relying on Pratt (2008), the SLR resulted in a first set of competences, but also revealed gaps and therefore the necessity for further research: "Creating open theoretical frames involves both reviewing and critiquing the literature in such a way that the author(s) is (are) able to delineate the boundaries of what has been written, and at the same time, create a space representing where research has been largely silent" (Pratt, 2008, p. 498).

4.1.4 Limitations

It is acknowledged that the SLR was a one-time screening of a pre-defined sample set in a selected database. Having conducted the SLR in 2016, there might have been other papers published in the meantime covering the research question. The researcher did screen the field again in the first quarter of 2019, but nevertheless she might have missed some publications. Also, the cultural and academic disciplinary background of the researcher having an influence on the information selection approach cannot be completely ruled out. The restriction on articles written in English or German language and therefore the focus on authors as well as journals that publish in these languages certainly needs to be taken into consideration. Although a considerable effort was made to ensure that the review be all-inclusive, it is possible that some relevant research studies may have inadvertently been omitted. However, this review provides a preliminary overview of the SPSM competences provided in current literature published before the specific time frame when the review was conducted. Considering the research objective to determine individual sustainability competences for PSM professionals, this overview builds the foundation of a SPSM competence model that will be further developed.

4.2 Delphi Study

To evaluate and to add to the findings of the SLR, a Delphi study (e.g. Häder, 2002; Linstone and Turoff, 2011) with experts in the field of sustainability and PSM was conducted. The Delphi study was focused on gathering input to the rather new research area of SPSM competences, being purely qualitative in nature (see section 3.4.4, Delphi type 1, based on Häder, 2014). Interviews with Delphi experts were conducted by applying the critical incident technique (CIT) (Flanagan, 1954). The CIs reflected the most often mentioned competences in the SLR. The results of the Delphi study were evaluated using the same coding methodology as in the SLR, taking the node structure that resulted from the SLR as the ex-ante coding and extending it further with open coding. In a second Delphi round, the input from experts was gathered using a structured template. The following sections describe how the data was collected, evaluated, and give insights into the results and findings. Also, limitations of the approach are outlined.

4.2.1 Sample & data collection

The data collection approach in the course of the Delphi study was set up to include two Delphi rounds, conducted to gather input from a group of experts.

As described by Häder (2014), the selection of experts for a Delphi panel is much different than for instance the selection of participants for a survey. Experts for a Delphi study are selected intentionally, and they do not reflect a random sample of any given population. The selection of adequate experts is a prerequisite for a successful type 1 Delphi study (see above) with the aim to find answers to a complex and rather new research problem. Following Häder (2014, p. 106), the principle to select the experts for a qualitative Delphi study is that each expert represents one specific perspective towards the research topic, and the individual professional expertise impacts the outcome of the study. The quality and uniqueness of experts is therefore the most important factor for a qualitative study, not the quantity of participants. Obviously, this is at the same time a limitation of this approach, as the possibility of generalisation is limited. Nevertheless, coming back to the objective of the Delphi method in this research, knowledge generation within a circle of true experts to deal with a new and complex topic can still be achieved.

The sampling strategy of the expert panel was continuously discussed by the author and the supervisors involved in this study (Delbeqc et al., 1975; Okoli and Pawlowski, 2003). First, the researcher defined the relevant disciplines that experts should come from. The researchers agreed that practitioners from companies and from public institutions as well as experts from academia should be included in the panel. The aim was to cover the main areas where SPSM is applied, discussed or investigated. Second, selection criteria were defined for each discipline and for the experts to be nominated. Experts allocated in companies were supposed to work in a firm that publicly committed to SPSM and that proved evidence of efforts to implement SPSM. For example, the publication of sustainability goals for PSM, the publication of code of conducts, reporting on projects to foster sustainability in PSM were used as sources for evidence, together with publicly available feedback and recognition received from NGOs or other institutions on the company's SPSM activities. Also, the companies should belong to industries faced with a certain sustainability risk (e.g. chemicals, automotive). The experts should have subject knowledge in PSM and sustainability. Additionally, they were required to have at least two years of work experience in the field of PSM and sustainability and currently be involved in sustainable PSM activities. The study also intended to include procurement professionals from public institutions, as public procurement in some instances is on the forefront of SPSM, due to laws and regulations (e.g. see the modern slavery act in the UK). The selection criteria for the experts were the same as for the company representatives. For both groups, proof of expertise in PSM and sustainability was to be reflected by their role in the organisation. Public or private practitioners had to have a role related to sustainable purchasing, being e.g. the sustainability officer in purchasing. Finally, academics doing research or

education in the field of SPSM should be included in the study. They were expected to hold a chair either in sustainability management or purchasing management with a dedicated focus on sustainability and ethical issues. Additionally, they were required to have research and publications in the field of sustainability in PSM and related competences.

As the Delphi study applied in this research complemented the findings of the SLR, its conceptual design was closely connected to the outcome of the latter, but at the same time should allow to gain new findings for a SPSM competence model in an exploratory manner. Additionally, the researcher developed the competence model considering its relevance in the professional context. Therefore, it was intended to be applicable to the most relevant SPSM situations that purchasing professionals have to manage. The data collection approach for the Delphi method had to meet these requirements. Concurrently, the researcher looked for a possibility to discuss competences in a way that made it convenient and inspiring for the participants. For example, if simply being asked for a list of competences that they consider to be important for SPSM, the outcome would have probably been rather abstract, tedious and restricted.

The application of the CIT was considered to meet the aim and requirements mentioned above. It allowed the findings from the SLR to be adapted to the professional SPSM context. Moreover, the discussion of competences based on critical incidents was at the same time a structured but also explorative approach. Finally, the CIT provided the experts with the opportunity to speak about situations that they were familiar with, and thus invited them to elaborate how these situations were handled based on their professional experience. Thus, the guide for the interviews with experts in Delphi round 1 was developed using the CIT. The characteristic of the CIT and the approach how it was applied here is outlined in the next paragraph.

Grounded in organisational psychology, the CIT can be defined as a methodology to gather a set of descriptions of actions and behaviour that are critical for success in certain situations (Flanagan, 1954; Bartsch and Specht, 2009; Brannick et al., 2012). In a rather condensed definition, the essential character of CIT is to collect critical situations and ask subject matter experts to describe how these situations are mastered in a successful manner. Additionally, subjects are to describe what kind of actions and behaviour hinder a successful accomplishment. The CIs and the gathered descriptions are then analysed and combined into clusters and dimensions (Flanagan, 1954; Butterfield et al., 2005). A critical incident is defined being relevant for the successful achievement of a certain goal attained to an activity. Flanagan (1954) proposes the following description for a critical incident: “A definition which has been found useful is that an incident is critical if it makes a “significant” contribution, either positively or negatively, to the general aim of the activity. The definition of “significant” will depend on the nature of the activity” (Flanagan, 1954, p. 338). CIT as a methodology was first comprehensively outlined by Flanagan in his publication “The critical incident technique” (Flanagan, 1954). He describes the method as “[…] a set of procedures for collecting direct observations of human behaviour in such a way as to facilitate their potential usefulness in solving practical problems and developing broad psychological principles” (Flanagan, 1954, p. 327).

First CIT studies were conducted in the military context to select and classify aircrews for the US Army Air Forces in World War II. Since then, the CIT has been applied in various disciplines and for different purposes. Several studies refer to the CIT in the context of job analysis and competence descriptions (e.g. Graeme and Staines, 1994; Ley and Albert, 2003; Brannick et al., 2012). In this regard, the researcher believes that the CIT shows parallels to the Role Construct Repertory Grid approach, based on the personal construct theory developed by George A. Kelly (1955). Repertory Grids also work with the description of successful and unsuccessful behaviour of individuals, but in contrast to CI by comparing and contrasting different ways of behaviour. Besides the human resource related fields, other studies for instance applied the CIT to investigate customer experience (e.g. Oldenburger et al., 2008; Bitner et al., 2009), or investigated issues in the health sector (e.g. Kemppainen, 2000). In the PSM context, studies applied the CIT for example to evaluate the impact of outsourcing on PSM organisations (Mugurusi and Bals, 2017) or supply chain disruptions (Blackhurst et al., 2005). A notable number of studies apply the CIT in combination with other research methods, like surveys (e.g. Martin and Staines, 1994; Schuler, 2014), focus groups (e.g. Blackhurst et al., 2005), Grid (Graeme and Staines, 1994), case studies (Mugurusi and Bals, 2016) and Delphi (Williams and Webb, 1994).

Overall, the CIT is considered to be useful to contribute to rather new areas of interest in an exploratory manner (Flanagan, 1954; Butterfield et al., 2005; Schuler, 2014). In terms of its application, it is considered to be flexible and adaptable to various research strategies. Flanagan (1954) already states that "[…] it should be emphasized that the CIT does not consist of a single rigid set of rules governing such data collection. Rather it should be thought as a flexible set of principles which must be modified and adapted to meet the specific situations at hand." (Flanagan, 1954, p. 335). Nevertheless, five steps are proposed for a critical incident procedure (see Flanagan 1954, p. 335ff.), including the definition of the aim of the research, the planning and specification of the approach, data collection, data analysis and finally the reporting of the results (Flanagan, 1954, Bartsch and Specht, 2009). Table 4.6 provides an overview how the steps were adapted in this research.

Steps in a CI procedure (Flanagan, 1954)	*Application in this research*
1. Definition of the aim of the research - What is the research question? - Why is CI the appropriate methodology?	"What competences are needed to implement SPSM?" - Complement findings from literature in an exploratory manner - Contribute to a research topic that is rather new - Get detailed input for a SPSM competence model - Enable experts to discuss SPSM competences based on critical situations in their professional context
2. Planning and specification of the approach - How are CIs defined? - What is the sample?	- Pre-defined CIs that were derived from literature (see Table 4.7) - Each CI covered one of the 12 most prominent competence areas - Allowed additional CIs contributed by experts - Detailed description of each CI and adaptation to educational, private and public procurement context of the experts - Confirmed relevance of CIs by academic and professional peers - Pre-test session conducted - Selection of 16 participants (Table 4.8)
3. Data collection - Which format to use for gathering data?	- Interviews with experts conducted by Skype - Retrospective self-reporting - Documentation by the interviewer
4. Data analysis - How to code and classify the data?	- Coding of the described successful and unsuccessful actions and behaviour for each CI - Classification of the data into competence clusters (see step 4 of the Delphi study and section 4.2.2)
5. Reporting of the findings - How to evaluate and outline the results?	- see Delphi study round 2

Table 4.6: Application of the CI procedure (based on Flanagan; 1954; Bartsch and Specht, 2009)

This study modified the classical CI procedure regarding the definition of the CIs, in terms of the data collection and finally for data analysis.

First, the researcher decided to predefine the CIs that were used for the expert interviews, referring to Schuler (2014), who suggests that the dimensions of CIs might either be pre-defined or generated by statistical methods or by expert consensus (Schuler, 2014, p. 75). The CIs were supposed to be derived out of the findings of the SLR.

The second main difference compared to the procedure shown in the left hand column in Table 4.6 refers to the data collection. In their stock-taking paper, Butterfield et al. (2005) provide an overview of the evolution of the CIT over time, pointing out some of the major departures of the original application described by Flanagan (1954). One of the major departures, namely the way how to collect the data, is reflected also in this study. As described above, referring to Flanagan (1954), the original data collection was supposed to be done by the researcher observing human behaviour in the CIs. Over time, according to Butterfield et al. (2005), a considerable number of studies that applied the CIT gathered the data using retrospective self-reports, either by interviews conducted in person or by phone (Butterfield et al., 2005; Oldenburger et al., 2008). By conducting Skype interviews, using the pre-defined CIs, retrospective-self reporting seemed to be the most reasonable way to gather the data from the experts.

Finally, the first two adaptions of the CI method also impacted how the data analysis was done. Applying a structured and thorough data analysis and clustering process (see section 3.5), this research narrowly focused the analysis on the gathered statements regarding successful or unsuccessful behaviour in the CIs.

The data collection in the course of the Delphi study followed a structured approach, as described in Figure 4.6. Overall, six steps led to the results that are explained in section 4.2.2. Details on each step of the process will be given in the following section.

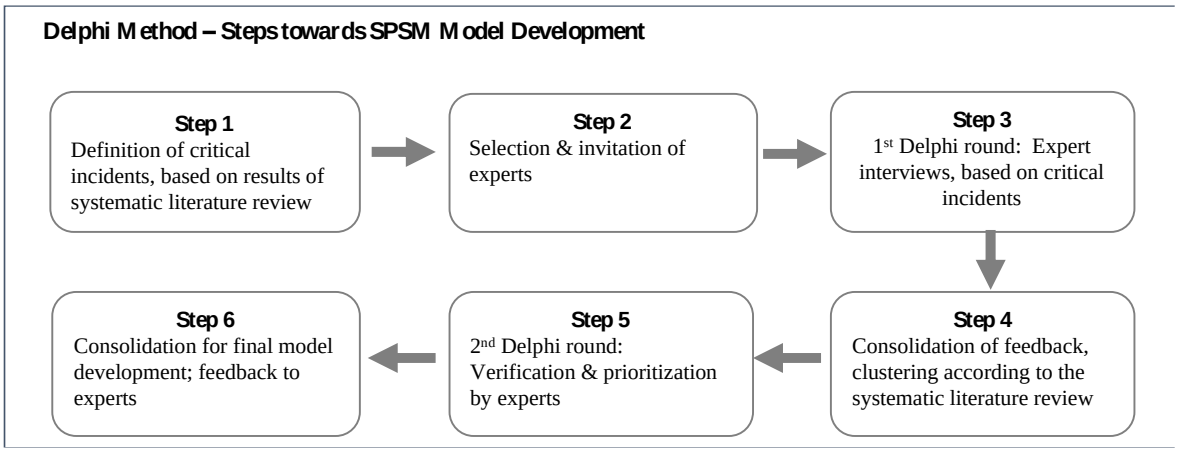


Figure 4.6: Steps of the Delphi study for SPSM model development

Delphi study – Step 1: Critical incidents

As outlined above, the interviews with Delphi experts were conducted based on CIs.

The CIs for the Delphi study in this research were derived from the most prominent competences and knowledge areas that were evaluated in the SLR (Figure 4.4). Being mentioned most often in literature indicated that these competences were critical in the SPSM context. Therefore, it was ensured that the situations covered incidents of high significance for SPSM, following the definition of a critical incident by Flanagan (1954), as outlined earlier in this section. The codings for each competence found in literature, documented in NVivo 11, delivered descriptions of actions and behaviour. Based on these descriptions, adequate critical situations were derived. 12 CIs were described, based on examples taken from academic papers, text books, business press and publicly available case studies. Table 4.7 shows the CIs, the sources and exemplary codings. The format how the CIs were applied in the interviews with the experts in the first Delphi round can be seen in the example provided in Appendix C. The benefit of pre-defining the CIs was manifold. It allowed to consistently inter-relate the first round of the Delphi study with the findings in SLR. At the same time, using the same CIs helped to standardise the expert interviews and allow to collect facts in a rather objective manner (see Flanagan, 1954). They provided a common ground that experts were easily able relate to when asked to describe successful or unsuccessful behaviour. Also, the interviewer was familiar with the situations due to her individual professional expertise, which enabled a profound communication with experts during the interviews, and contributed to the quality of the data analysis (see Flanagan, 1954). To avoid confirmation bias, experts were provided with the opportunity to additionally define their own CIs or to skip those incidents that they could not relate to.

#	Competence	Exemplary codings	Critical Incident	Source
1	*Supplier relationship management (Communication)*	"[...] having skills and opportunities for not only controlling activities, but also for building relations and dialogue with suppliers" (Börjeson et al., 2015, p. 135) "[...] collaborating and working jointly with suppliers [...] by supporting them to meet evolving social and environmental requirements" (Klassen, Vereecke, 2012, p. 112) "[...] the purchasing staff has the appropriate capabilities for evaluating and working with suppliers" (Eriksson, Svensson, 2015, p. 562)	An annual supplier audit was conducted to ensure compliance to sustainability requirements of the company. The auditors came back with the impression that there might be children working in some of the production lines. However, they were not sure, as the age of the workers was hard to estimate. When faced with the situation during the audit, the supplier was not able to proof that the age of the workers was in line with the requirements of the company. Following up the audit report, the category manager contacts the supplier to discuss the issue.	Johnsen, Howard and Miemczyk, 2014, p. 48-51.
2	*Systems thinking competence*	"[...] have an understanding of how purchasing can contribute to the firm's corporate objectives, including its environmental strategy" (Börjeson et al., 2015, p. 178) "[...] being able to understand how the sustainability initiatives might influence their organisation [...]" (Craig, Allen, 2013, p. 297) "[...] ability to switch between different mindsets, mirror the position of others, reflect on one's own stands and, ultimately, creatively design alternatives for the pressing complex problems" (Fadeeva, Mochizuki, 2010, p. 398)	Due to a significant decrease in sales, combined with quality issues resulting in negative consumer feedback, bad media reports and severe loss of the companies' credibility and image, the top management decided to implement sustainability as one key factor of a turnaround program. The top management issued a corporate commitment to reduce the environmental and social footprint and to support sustainable product development. The category manager within the purchasing department is invited to a meeting with representatives of corporate strategy, sales and marketing. It will be discussed how purchasing can contribute to the new sustainability strategy and commitment. Nevertheless, as the company is still in a difficult financial situation, the contribution of purchasing in terms of prices for products and raw material is expected.	Johnsen, Howard and Miemczyk, 2014, p. 86-89.

3	*Communication skills*	"CSR professionals must: be persuasive; network (locally ad globally); be able to identify a broad group of stakeholders; have good communication and networking skills; [….]" (Osagie et al., 2014, p. 241) "Interpersonal competence (8 labels): […] 2. Communicating […]" (Wesselink et al., 2015) "Those listening may be listening through the noise of their own culture, experiences, values and beliefs, and, therefore, unable to truly hear the message being sent by others. They may, therefore, need to learn more about the culture and language of others, in order to fully appreciate what is being conveyed" (Simola, 2007, p. 140)	In a regular Skype meeting with a supplier in a developing country that takes place on a quarterly base to discuss current topics in the business relationship, the buyer introduces the sustainability standards and expectations to the supplier representatives. As a first reaction, the business partners explain that their priority is to develop economically, and that the purchasing organisation should take into account this priority. They also explain that Western buying firms and suppliers in their country are in different development stages. Therefore, they express their concerns to be able to commit to the ambitious sustainability standards that the buyer presented.	Busse et al., 2016, p. 442-468
4	*Cross-functional teamworking*	"We will now address each of the main competences and resources appropriate for green supply […]. Liaison between purchasing and other functions: Green supply may be facilitated by cross-functional teamworking" (Bowen et al., 2014, p. 176) "SM executives must interface with many different functional areas in the firm, such as marketing and distribution management, to perform jobs such as handling packaging issues, new product design, materials management, and warehousing" (Eltantawy et al., p. 101) "[…] working with people with a different (disciplinary) background" (Wesselink et al., 2015, p. 503)	The company decided to exclude dangerous chemicals from its products by the year 2020. Therefore, sales, marketing and product development installed a project to discuss the impact of this decision on the product, e.g. its quality and functionality, to align this with customer requirements, and to develop a marketing strategy. In addition, driven by product development, the project members will decide on substitutes for the dangerous chemicals. The buyer who is responsible for the commodity of the dangerous chemicals is told about this project by a colleague from marketing during lunch. He/she thinks that it would make sense for purchasing to get involved.	Schneider and Wallenburg, 2012, p. 243-257

5	*Stakeholder management (Communication)*	"[...] improved collaboration with stakeholders to find common solutions to environmental problems" (Bowen et al., p. 178) "Moreover, rather than working with existing stakeholders in mitigation, including suppliers and customers, the capability for innovation, leading to development, is often based on working with *new stakeholders* or existing stakeholders in creatively different ways" (Klassen and Vereecke, 2012, p. 112) "Therefore, a key challenge of CS integration is to address the diverse needs of different stakeholders and interested parties […]" (Maletic et al., 2014, p. 186) "One would expect to find a competence like communicating with stakeholders outside the organization [….]" (Wesselink et al., 2015, p. 503).	A buyer for coffee visits one of the supplying coffee farms on a regularly base. He/ she is aware that the water from the coffee processing was going directly into the rivers. As the issue was not solved so far by communicating with the supplier, putting pressure on the coffee farms' management or developing corrective action plans, the purchasing management team and the corporate sustainability officer decide to cooperate with a non-governmental organization (NGO) to solve the issue. The next visit at the coffee farm is conducted by the buyer together with a representative from the NGO. In a meeting with the management of the coffee farm, the NGO representative explains how the environmental issue could be solved and which investments are required. The coffee farms' management directly refuses to cooperate. They refer to the cost pressure that they experience from their customers which would not allow any additional investments. Both parties expect a reaction from the buyer to solve the conflict.	Rahbek and Pedersen, 2015, p. 60-65

6	*Demand management – Category strategy*	"In the present case, knowledge thus refers to e.g. capacity to understand and interpret data and other information on substances, and what implications that might have for RSCM (responsible supply chain management)" (Börjeson et al., 2015, p. 131) "These buyers – referred to here as "transformers" – can reconfigure SM activities when confronted by disturbances of sufficient magnitude or duration rather than return to its original "shape". This buyer tends to be on a continuous quest, i.e. ongoing supply chain exploration for new competencies and better practices. Situational awareness and access to keystone vulnerabilities competencies aid transformers in searching, experimenting and acquiring new supply chain processes, resources and technologies" (Eltantawy, 2016, p. 129) "[…] sustainability exploration practices reflect process innovation (e.g., end-of-pipe technological solutions), product innovation (e.g., improvements or entirely new products or services) and sustainability-oriented learning (e.g., development of capabilities and competence for sustainability-related innovation)" (Maletic et al., 2014, p. 185)	The company committed not to use components that contain raw materials that are produced or mined by violating human rights or environmental standards. A new product will be developed, in line with this commitment. A certain component could me made of different materials. The buyer is asked to identify sustainable sourcing possibilities for the various material options. She/ he is new in this position and does not know about product specifications or regulations. The supply market is scarce, and product development intends to bring the new product to the market as soon as possible.	Hofmann et al., 2015, p. 115-141

7	*Supplier relationship management (Application of tools)*	"[…] ask suppliers for information […]" (Börjeson et al., 2015, p. 134) "Actions of this type are changes to the process of collecting environmental information of suppliers and assessing and ranking suppliers' environmental performance" (Bowen et al., 2001, p. 175) "Identifying which dimensions of risk are most relevant for operations continues to be an important challenge" (Klassen and Vereecke, 2012, p. 105) "[…] monitoring includes gathering and processing of supplier and customer information, setting of assessment criteria, and the evaluation of factors related to social issues for purchased goods" (Klassen and Vereecke, 2012, p. 105) "[…] managing the supply chain's reputation and mitigating the risks associated with it" (Lemke and Petersen, 2013, p. 419)	The company published a code of conduct for suppliers some time ago. Some suppliers proactively committed to support the code of conduct, others gave a vague commitment to comply with it, others did not react. One day, based on an issue at one of the suppliers, a non-governmental organisation (NGO) accuses the company that it does not take care of sustainability standards in its supply chain. The NGO and the public expect answers how the company will ensure adherence to its supplier code of conduct in the future. Therefore, the buyer being responsible for a specific commodity/ category needs to implement certain monitoring measures.	Zadek, 2004, p. 129
8	*Sustainability/ Compliance*	"[…] inviting procurers to take part in the development of procedures or policy documents." (Grandia et al., 2015, p. 255) "Implementation involves the development of the appropriate policy, establishing goals and metrics, identifying roles and responsibilities, acquiring the needed resources and starting the implementation programme" (Lemke and Petersen, 2013, p. 421) "[…] Understanding drivers, standards, and regulations […]" (Osagie et al., 2014, p. 237) "When faced with CSR challenges, a CSR professional must understand how the company should cope with the challenges and apply important industry regulations (e.g., collective industrial standards and integrity pacts), national and international regulations, political processes, and corporate governance (such as codes of conduct). Moreover, the CSR professional should be able to contribute to the development of these standards for example by participating in roundtable meetings" (Osagie et al., 2014, p. 241)	An important customer, a big multi-national corporation, requires all suppliers to adhere to its sustainability program and to make sure that sustainability standards are implemented through the entire supply network. As a prerequisite to participate in the next RFQ, the company needs to make a checkmark in a system that it has a code of conduct that was communicated to its own suppliers. So far, there is no code of conduct for suppliers. A purchasing professional gets the assignment to develop such a code of conduct	Johnsen et al., 2014, p. 158-160

9	*Basic individual knowledge on PSM*	"A certain minimum level of individual knowledge on both procurement and environmental issues is necessary […]" (Grandia, 2016, p. 185) "[…] Explore new ways for improving (new) processes […]" (Maletic et al., 2014, p. 188) "This, the CSR professional should be alert to trends in CSR and should be able to translate and realize these developments into business opportunities for the company. In order to do so, the CSR professional must have at least some business, organizational, and sector-specific knowledge, […]" (Osagie et al., 2014, p. 242).	The company committed to high-level sustainability goals, issued a code of conduct for suppliers and communicated it extensively. Some suppliers are reporting on their sustainability initiatives, including certain certificates and labels for their products. It is unclear and confusing how to evaluate all the data and information and how to integrate the information in purchasing decisions. Therefore, the sustainability manager within the purchasing organisation is asked to develop a concept how to integrate sustainability in PSM processes. For the management in the purchasing organisation it is out of question that the existing priorities and goals regarding cost, quality and delivery are not changed. Also, there is no resource to set up entirely new processes and tools.	The Case Centre, (http://www.thecasecentre.org), accessed on December 21st, 2017
10	*Basic sustainability knowledge*	"Managers indicated they were not well aware of the content of monitoring systems and reports of working conditions from contractors. Emphasizing what the worth of monitoring systems is, such as the values of human rights and/ or the importance of international labor law compliance, would enhance idealistic and/ or relativistic message effects" (Park, 2005, p. 94) "The supply chain managers must possess knowledge to appreciate environmental, social and economic dimensions" (Dubey and Gunasekaran, 2015, p. 90) "Thus, understanding ethical responsibility in the SM arena and its impact on SM performance is a key responsibility of supply managers" (Eltantawy and Giunipero, 2009, p. 100)	The purchasing professional plans to conduct a regular audit at a new supplier site to evaluate quality and delivery capabilities. For the first time, she/he is asked from the purchasing management to include ten pre-defined questions in the audit procedure that evaluate basic sustainability standards such as human rights, environmental policies and anti-bribery commitments.	Zadek, 2004, p. 129

11	*Commitment to change*	"Procurers will thus have to change their existing organizational routine for a new one, which makes sense to them and others" (Grandia, 2016, p. 184) "Thinking ethically involves the resource of ethical awareness. In the context of MNC, ethical awareness includes an understanding of the various ethical frameworks […], as well as sensitivity to the differences among ethical perspectives across cultures" (Buller and McEvoy, 1999, p. 330) "These change management-related and program management-related competencies include the ability to lead the transition toward CSR, to develop crucial alliances with important individuals both within and outside the company, and to deal with 'resistance to change' by inspiring and motivating others" (Osagie et al., 2014, p. 242)	After having attended a supplier visit in a developing country for the first time, a young buyer comes back with the feeling that the working conditions at the supplier site weren´t good. She/ he feels unsure what to do, being rather new in the company. Issues related to working conditions at suppliers were never discussed before with the purchasing management or colleagues. However, what the buyer saw at the supplier factory did not match with her/his personal ethical values. She/ he wants to raise the issue in the purchasing organization.	Rahbek and Pedersen, 2015, p. 60-65
12	*Self-reflection*	"Attitude impact extends beyond training as employees must ultimately critically evaluate their personal mindset on sustainability topics" (Swaim et al., 2016, p. 312) "[…] ability to switch between different mindsets, mirror the position of others, reflect on one's own stands and, ultimately, creatively design alternatives for the pressing complex problems" (Fadeeva and Mochizuki, 2010, p. 398) "That is, entering the underground required not only a suspension of the lens of your own world view, but also, an openness to hearing perspectives so different from your own that they might cause anxiety. It also requires openness to receiving feedback about our own past omissions or mistakes" (Simola, 2007, p. 139)	In a corporate stakeholder dialogue event, a buyer gets in conflict with a representative of a non-governmental organisation (NGO), specialised in ethical sourcing and human rights issues in a specific country. The NGO representative, a young, politically engaged woman, insults the buyer not to have monitored the supply chain in this country adequately, and instead to focus on cheap prices. The buyer has been working on a human rights assessment program for suppliers in this country for a few years already, gained some expertise in this area, and feels very offended that the NGO representative does not consider these efforts. Consumers and other stakeholders perceive the NGO as a very established institution with a high moral integrity and expertise in ethical sourcing. Therefore, the other participants of the stakeholder event blame the buyer to give wrong information to the public and therefore to act unethical.	Rahbek and Pedersen, 2015, p. 276

Table 4.7: CIs, sources and exemplary codings

Delphi study – Step 2: Selection and invitation of experts

Section 3.4.4 describes how the Delphi process was planned for this study, including the selection criteria for the experts that were supposed to contribute to the research.

The researcher populated the three disciplines private, public, and academia with potential candidates that fit with the selection criteria. It occurred either that a person was identified which led to a certain company, or that a certain company or public institution seemed to be interesting for the Delphi panel, and then an expert in this organisation was identified. The potential experts were contacted by email and asked for participation in the Delphi study. They were informed about the objectives of the study, their required involvement and asked to sign a consent form. An exemplary communication sheet is enclosed in Appendix D.

Finally, the selection process resulted in 16 experts that participated in two Delphi rounds. Some of them required a short phone call to discuss the research topic and the approach of the study before giving their approval to participate. Within a timeframe of six weeks, the final set of 16 experts was confirmed. Table 4.8 shows the expert demographics. In total, nine experts from private companies, four experts from academia, and three experts from public procurement participated in the Delphi study. For some institutions, two experts participated in the Delphi study, with one of them representing purchasing and the other more being in the sustainability area. Three interviews were conducted with two participants, thereof two with experts from private companies and one with experts from the public procurement area. Research does not clearly define the appropriate number of experts that should be involved in a Delphi study (e.g. Häder, 2014). Most references indicate that the size is highly dependent on the objective and type of Delphi study, but recommend rather smaller samples, resulting in a frequently mentioned number of 10-20 experts for a panel (e.g. Okoli and Pawlowski, 2004; Giunipero et al., 2012, Häder, 2014). Delphi studies with a purely qualitative character (see type 1 in Table 3.6) might even rely on a smaller number of experts (e.g. Hasse, 1999 worked with 6 experts). Therefore, the number of 16 experts in this Delphi seemed to be very appropriate.

Delphi Expert	Practitioner or Academic	Job title/Area of Focus	Sector	Job Experience	Educational background
Expert A	Practitioner	Senior manager, consultant sustainability & SCM	Consulting	10 years	Industrial engineering
Expert B	Practitioner	Procurement director	Chemicals	20 years	International Business Administration
Expert C	Practitioner	Sustainability expert, procurement manager	Public procurement	5 years	Environmental Management; Sustainability Development
Expert D	Practitioner	Supply chain manager	Public procurement	4 years	Geography
Expert E	Practitioner	Sustainability in supplier relations	Automotive	Not specified	Political sciences; Environmental politics and sustainability
Expert F	Practitioner	Procurement & supply chain manager	Public procurement	3 years	European studies, philosophy, languages, international Development
Expert G	Practitioner	Head of management systems and sustainability, procurement	Chemicals	7 years	Economics
Expert H	Practitioner	Group sustainability scouting and advocacy director	Interior & Design	Not specified	Not specified
Expert I	Practitioner	Purchasing advisor	Interieur & Design	5 years	Industrial engineering
Expert J	Practitioner	Head of sustainable development EMEA Region	Interieur & Design	6 years	Textile engineering
Expert K	Practitioner	Sustainability in purchasing	Automotive & consumer goods	>10	Not specified
Expert L	Practitioner	Sustainability in purchasing	Automotive & consumer goods	Not specified	Not specified
Expert M	Academic	Chair of corporate sustainable management	Higher Education	16 years	Economics
Expert N	Academic	Chair of operations & supply	Higher Education	10 years	Occupational psychology; Business
Expert O	Academic	Professor for SCM	Higher Education	30 years	Business; Supply chain management
Expert P	Academic	Chair of supply chain management	Higher Education	10 years	Not specified

Table 4.8: Demographics Delphi participants

For all the steps to follow in the research project, the researcher continuously shared findings and results of the study with the experts, asking for their feedback, in order to ensure the validity and transferability of the finding and as well to acknowledge their contribution accordingly.

Delphi study – Step 3: first Delphi round

The data collection on Delphi round 1 started with a pre-test to see whether the envisioned approach as described in section 3.4.4 and above was applicable. Expert K and expert L participated in the pre-test interview session. Both worked in the competence centre 'compliance/sustainability' (see process chart Figure 2.4) in the PSM organisation of a company in the automotive and consumer goods industry. Expert K was the head of the competence centre. They were selected to be the pre-test candidates, as they were very interested in the topic, mature and settled in the SPSM context and willing to spend extra time for feedbacks and testing. The researcher also worked with the head of the competence centre in other projects and could rely on an open and constructive feedback. After an initial informal contact by email, asking for their willingness to act as pre-test candidates, both experts were formally invited with the initial communication sheets (see Appendix D). Consequently, a face-to-face meeting with both of them at the same time was scheduled to do the pre-test session. A two hour timeframe was defined, which was supposed to be the timeframe for all the expert interviews to come. The interview took place in January 2018. The pre-test was conducted in German, the input to the CIs was documented in German during the conversation by the researcher, and translated after the meeting. The CIs were only provided to the participants during the meeting, they were not provided to them in advance. The documentation of the input to the CIs and the translation was sent to the two participants at the company after the meeting for their review.
Both pre-test candidates provided their feedback during the interview, and in a follow-up phone call after the meeting. It was documented in a pre-test protocol (see Appendix E), and the author discussed the findings with her supervisors. The main findings of the pre-test maybe summarised as follows. Overall, the researcher gained helpful ideas to enhance the procedure and communication with the other Delphi experts. In general, both experts that participated in the pre-test session were very interested in the approach, thought that the research makes a lot of sense and liked the CIs and the procedure in general. The methodology of using CIs did work out, as both experts were able to provide input as requested. Also, the two hours seemed to be a reasonable timeframe to discuss the CIs. Both experts agreed that the meeting should not exceed the two hours frame to ensure the motivation of the participants. They even suggested to reduce the number of CIs to not overwhelm the Delphi participants. Regarding the transcripts of their input, they had only minor corrections, e.g. in terms of specifying some of the answers (change "knows resources of the company" to "knows budget resources of the company") and in terms of additions ("Validates the hypothesis child labour" – add "or makes others to validate it"), or typos. Both interviewees also gave feedback to the

communication material (email and participant information sheet), like “Explain what a Delphi study means”, “Add fact that the study does not intend to make a company benchmark”, and “Explain the academic procedure in the context of ethical requirements, for example the consent form”. An important finding of the pre-test resulted out of the tendency of the pre-test candidates to explain corporate regulations and processes, and not their view on individual actions and behaviour. This sometimes resulted in statements like “The buyer needs to know our processes”, or “There is no choice for the buyer what to do, because our […] processes are very clear here”. Statements like this did not give any helpful input for the research question. The researcher became aware of the importance of continuously asking questions during the interview to guide the experts towards providing descriptions of successful and unsuccessful actions and behaviour on the individual level. Additionally, this revealed the initial misunderstanding that the Delphi study was considered by the two experts as being a benchmarking study. Therefore, the author became aware that it is very important for the communication with the other experts to emphasise that the intention of the study is not to compare company approaches, but to collect input from experts. For all the subsequent interviews, she included a respective remark in her introduction to the study. She explained to the participants that they are supposed to describe ideal behaviour of purchasing professionals in the critical situations, and not necessarily refer to what the company framework requires. She became aware that it is very important to emphasise that the participants of the study were selected based on their expertise, and that they are asked to give their input to the CIs based on their individual expertise instead of speaking for their company or organisation.

To summarise, the pre-test confirmed the approach for the first Delphi round and helped the researcher to further improve the communication and interaction with the other Delphi participants. By contrast to the feedback that was given in the pre-test, the researcher decided to keep the number of CIs, and rather accept that some might be quite similar, considering that the perception which one serves best to think of competences might be different for each Delphi participant.

After the pre-test was finalised and evaluated, interviews were conducted with all experts between mid of February until end of April, 2018. Each interview took two hours. All of the interviews were conducted as Skype meetings. The language of the interviews was adapted to the preference of the experts. Some of them preferred German, others English, to give their input to the CIs. The CIs and the written documentation of all the interviews in a Word-Document was done in English. The two supervisors were involved in case there was need to resolve translation questions, one of them an English native speaker. In those cases, there was a discussion among the researchers until everybody agreed the translation exactly captured the intended meaning.

All experts described successful and unsuccessful actions and behaviour for each of the twelve pre-defined CIs. To accustom the participants to the procedure and to give them the opportunity to practice the description of behaviour, a test critical incident was discussed in the beginning. The test

critical incident was not related to SPSM, but referred to a situation from daily professional context, being easily adaptable: *"A purchasing professional will move to another position and has to ensure a handover to her/his successor".* For the interviews, the 12 CIs were permuted to avoid bias, for example with one critical incident being always the first or the last, or the influence of CIs in a certain order.

To adapt the pre-defined CIs to the private, public or academic context, the wording was slightly changed. For example, for experts from public procurement, a wording like "company strategy" was changed into "governmental strategy". For experts from academia, the instruction for the CIs was slightly adapted, e.g. not mentioning "[…] your role in the organisation […]". All CIs can be found in Appendix Q.

All experts confirmed that the pre-defined 12 CIs described valid situations in the SPSM context. Depending on the individual professional background, in exceptional cases, some interviewees either adapted CIs or indicated that they are not able to give input to certain situations. This occurred in four of the 13 interviews. Two of the four cases were from the public procurement sector. The incidents that were related to raw material purchasing or auditing turned out not to be feasible for this professional context. Therefore, the CIs were either skipped or adapted. For example, one interviewee from public procurement adapted the critical incident "Implementation of monitoring tools" to the public procurement context. Instead of the given situation

> *"The company published a code of conduct for suppliers some time ago. Some suppliers proactively committed to support the code of conduct, others gave a vague commitment to comply with it, others did not react. One day, based on an issue at one of the suppliers, a non-governmental organisation (NGO) accuses the company that it does not take care of sustainability standards in its supply chain. The NGO and the public expect answers how the company will ensure adherence to its supplier code of conduct in the future. Therefore, the buyer being responsible for a specific commodity/category needs to implement certain monitoring measures",*

the critical incident was adapted as follows:

> *"The administration published a code of conduct for suppliers some time ago. Some suppliers proactively committed to support the code of conduct, others gave a vague commitment to comply with it, others did not react.*
>
> *One day, based on an issue at one of the suppliers, a non-governmental organisation (NGO) accuses the local government that it does not take care of sustainability standards in the public procurement area. The NGO and the public expect answers how the local government will ensure adherence to the supplier code of conduct in the future. Therefore, the purchasing professional being responsible for a specific commodity/category needs to implement certain monitoring measures."*

In the same manner, the situation called "ten new questions for an audit" was adapted by the interviewee to the public procurement context:

> *"The buyer plans to conduct a regular audit at a new supplier site to evaluate quality and delivery capabilities. For the first time, she/he is asked from the purchasing management to include ten pre-defined questions in the audit procedure that evaluate basic sustainability standards such as human rights, environmental policies and anti-bribery commitments."*

was changed to

> *"The purchasing professional plans to conduct a regular audit at a new supplier site to evaluate quality and delivery capabilities. For the first time, she/he is asked to include pre-defined questions around the UK Modern Slavery Act in the audit procedure that evaluate basic sustainability standards such as human rights, environmental policies and anti-bribery commitments."*

In addition to the public procurement sector, two CIs ("Suspected child labour at a supplier" and "ten questions for a new audit") did not work for the interviewee with a professional background in consulting, as the interviewee indicated not to have any expertise in the area of child labour and audits. Finally, with one interviewee from academia, two CIs were not discussed due to time restrictions.

All CIs resulted in a number of descriptions of successful or unsuccessful actions and behaviour of PSM professionals. Four experts each added one new CIs that they considered to be important:

> *<u>Experts C&D (common interview):</u> Human Resources Department at the institution is committed to living wages and requires procurement to communicate this as a regulation to all suppliers.*
>
> *<u>Expert F:</u> The government has produced a report which has recommended increased collaboration in public procurement and, to advance this agenda, it has established sectoral procurement consortiums. In addition, the government's model of procurement puts sustainability at its core and, in this regard, it has extended the scope of procurement legislation to cover lower value contracts. A procurement manager within an organisation is tasked with managing a collaborative tender process with the involvement of two other organisations in the same geographical area. One organisation in the tender process is financially well resourced and has a high commitment to sustainability in its procurement process, the second organisation has some financial pressure but remains keen to include sustainable elements within its tendering and the third organisation is extremely stretched financially and prioritises cost over sustainability. The procurement manager needs to find an approach to addressing sustainability within the process which will be accepted by all organisations.*

Expert E: A buyer receives an anonymous note that one of the company's suppliers is not paying minimum wage. When talking to the supplier about the accusation, the supplier feels very offended because there is a lot of price pressure. Also, the supplier has the suspicion that the note came from one of its competitors.
Expert B: Fit of individual values with company values – Where do you want to work as a purchasing professional?

The three additional incidents from experts C, D, F and E were discussed in the individual interviews with the experts, data for successful and unsuccessful behaviour was collected and the results were coded. Still, the newly created incidents were not integrated in the standard set of CIs for the other expert interviews due to their rather individual relevance for a specific situation. Additionally, the question that expert B additionally wanted to discuss, was considered to be of high importance for career planning in HE, but did not serve as a critical incident for SPSM. Therefore, it was not included in the final data set for coding.
The researcher documented the experts' input and provided it to them right after the meeting to allow for corrections or additions.

Delphi study – Step 4: Consolidation of feedback, coding and clustering

After the first Delphi round, the researcher coded the written documentations of the expert interviews and clustered them according to the four competence clusters. The transcripts of the interviews were the sources for coding. Figure 4.7 shows an example of such a transcript for one critical incident. The 13 interviews with 16 experts yielded to a total of 150 pages of transcribed text.

Critical incident "The stakeholder event"

In a corporate stakeholder dialogue event, a buyer gets in conflict with a representative of a non-governmental organisation (NGO), specialised in ethical sourcing and human rights issues in a specific country. The NGO representative, a young, politically engaged woman, insults the buyer not to have monitored the supply chain in this country adequately, and instead to focus on cheap prices. The buyer ha been working on a human rights assessment program for suppliers in this country for a few years already, gained some expertise in this area, and feels very offended that the NGO representative does not consider these efforts. Consumers and other stakeholders perceive the NGO as a very established institution with a high moral integrity and expertise in ethical sourcing. Therefore, the other participants of the stakeholder event blame the buyer to give wrong information to the public and therefore to act unethical.

a) Please characterise successful behaviour of the buyer to deal with this situation.

- Sits down with the representative of the NGO
- Convinces the NGO
- Explains very quietly the own work in progress on Human Rights Assessment program.
- Admits that she/ he forgot to involve the NGO
- Asks the NGO to give feedback on blind spots and necessary additional activities
- Asks the NGO if she/ he forgot to involve her
- Understands the expectations of the NGO
- Cooperates with the NGO
- Communicates the outcome of a cooperative approach with the NGO to the other stakeholders
- Takes the opportunity to learn
- Does not feel offended

b) In comparison to a successful behaviour, how would a buyer behave and act in an ineffective manner

- (N) Blames the NGO
- (N) Fights with the NGO
- (N) Draws a hard line "This is what I do, and I think this is sufficient"
- (N) Does not listen to the NGO
- (N)Puts her/ his head in the sand

Figure 4.7: Exemplary interview transcript Delphi round 1 for coding

The documented descriptions of actions and behaviour were uploaded to NVivo 11. For some situations, the interview participants found it easier to describe unsuccessful actions and behaviour. Therefore, the interviewer actively asked them to describe unsuccessful actions and behaviour, as it was intended by the CIT. The gathered statements helped to identify competences that were not mentioned in the "successful behaviour" context. For example, the negative behaviour "is not getting involved" resulted in the positive equivalent "becomes active to solve the issue", which contributed to the final description of the competence 'Persistence'.

Each statement regarding successful or unsuccessful actions and behaviour in the context of one of the 12 CIs was allocated to a competence. All interview transcriptions were coded similar to the coding of the 22 papers in the systematic literature review in NVivo 11. For initial coding of the interview transcripts, the nodes structure from the systematic literature review was used, comprising 29 nodes. The 29 competences are listed in the first column of Table 4.9. They were either pre-defined based on the PSM process (see Figure 2.4), or were created during coding of the academic papers. During the coding process of the Delphi data, the researcher referred to the definitions of the nodes that were already established in the systematic literature approach (see section 4.1.3). For

newly found competences, new node descriptions were defined and documented. The researcher discussed all new nodes with the two supervisors, to ensure reliability and transparency. Sometimes, the discussion also led to changes in the wording or the naming of the nodes, especially with one supervisor being a native English speaker. For example, the author first proposed a new node 'Thoughtfulness', which was then separated into 'Thoughtful towards others' and 'Conscientiousness'. Also, the proposed 'Steadfastness' resulted in 'Persistence' and 'Confidence'. Finally, the same coding methodology described in section 3.5 and the same structured coding approach (Mayring, 1993, Myers, 2013) as outlined in Figure 3.6 was applied.

To ensure reliability, the researcher coded the data based on a coding protocol that was also used for the evaluation of the academic literature. The coding protocol described each of the competence nodes, and included exemplary quotes. For example, the coding protocol for the competence 'Demand management – Category strategy' included 'identify new, potential suppliers for changing business needs'. Therefore, statements from the interviewees like "Searches the markets to find legitimate potential suppliers" were coded to this competence/node. When the researcher identified new competences/nodes in coding the expert interviews, the coding protocol (Appendix B) was adapted.

Delphi study – Step 5: Second Delphi round

In a fifth step, a second Delphi round was conducted with the same group of experts. The goal of the second round was to validate and prioritise the findings of the first Delphi round. Additionally, the experts were asked to indicate which moderating factors in the organisational context are the most important to ensure that purchasing professionals apply their knowledge for sustainable PSM.

It was decided not to use the CIs again, because the experts were meant to be given a new context. Otherwise, there would have been the risk that the CIs influenced the experts' feedback too strongly. Therefore, the researcher asked the experts to rank the competences in terms of their importance for training in HE and in the professional context. This approach was chosen for two reasons. First, the reference to curricula provided a context for the experts that made it more applicable to set priorities, rather than just rank competences generally. Second, the ranking for training curricula confirmed the design of the two action research modules in terms of the competences that were covered, and in terms of the selection of CIs for the training modules.

This Delphi round started with a comprehensive status update on the research project for all Delphi experts to award their contribution so far. They were informed about the preliminary results and the next steps. Together with the status update, they received a template in a written format that asked for their input. The experts were provided with a document showing all 41 competences gathered in the first Delphi round. The competences were split into those that directly refer to an element in the

PSM process (see Figure 2.4), and others with a broader scope. They were sorted into the four competences clusters based on Delamare-Le Deist and Winterton (2005), as specified in section 2.2. Each competence was described by exemplary actions and behaviours taken from the expert interviews. Within this structure, experts were asked to checkmark whether they think a specific competence should be part of a SPSM curriculum in HE as well as in the professional context or not. Figure 4.8 gives an example of the approach.

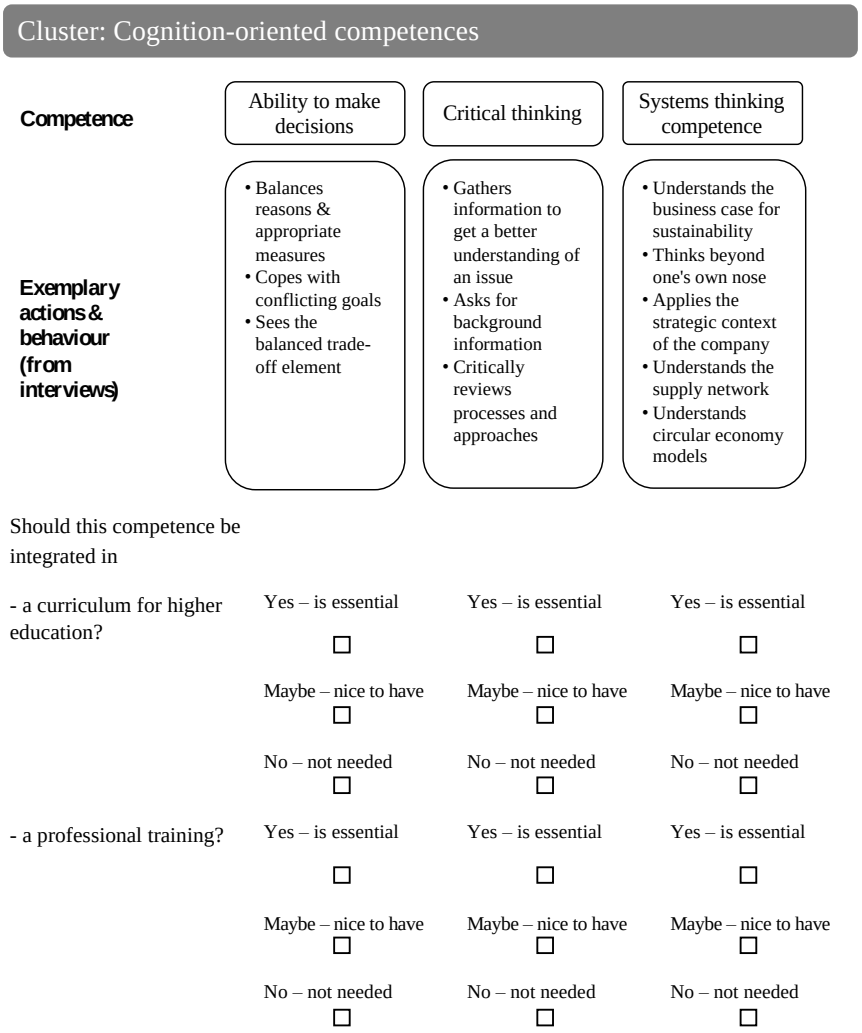
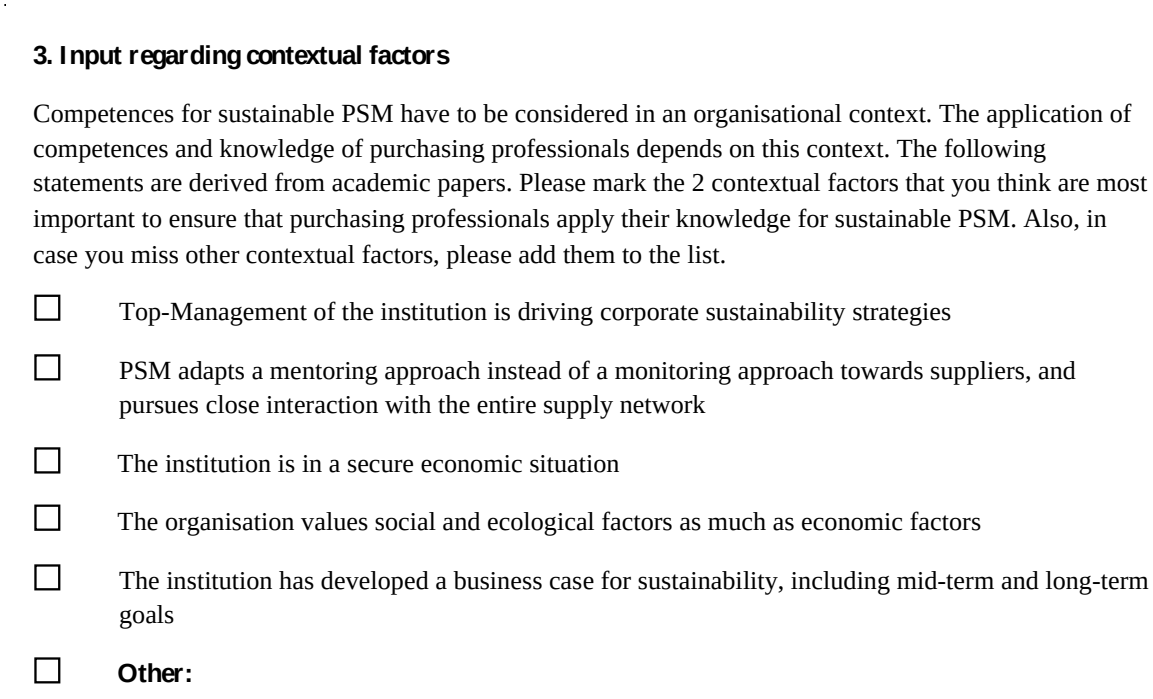


Figure 4.8: Template Delphi round 2 – Example

In addition to the checkmarks, experts were also provided with the opportunity to give any other input regarding the competences or anything else they wanted to mention in a comment field. This allowed to collect feedback on the process, to add any additional competences that might not have appeared in the first Delphi round, or to critically discuss the list of the 41 competences or their clustering in the four competence areas.

As mentioned, having a closer look at contextual factors was another goal of the second Delphi round. In reference to section 2.4 of this study, behaviour is influenced not only by individual factors, but equally by the organisational setting. Therefore, the researcher did not want to disregard this aspect in the Delphi study, even when the evaluation of SPSM competences and their description for the SPSM competence model were the main point of interest. Therefore, the experts were provided with a range of contextual factors discussed in academic literature (e.g. Walker et al., 2008; Porter and Kramer, 2011; Giunipero et al., 2012; Meqdadi et al., 2017; Goebel et al., 2018), and asked to name the two most important from their point of view (Figure 4.9). Additionally, they were offered to add others not included in the list.



3. Input regarding contextual factors

Competences for sustainable PSM have to be considered in an organisational context. The application of competences and knowledge of purchasing professionals depends on this context. The following statements are derived from academic papers. Please mark the 2 contextual factors that you think are most important to ensure that purchasing professionals apply their knowledge for sustainable PSM. Also, in case you miss other contextual factors, please add them to the list.

☐ Top-Management of the institution is driving corporate sustainability strategies

☐ PSM adapts a mentoring approach instead of a monitoring approach towards suppliers, and pursues close interaction with the entire supply network

☐ The institution is in a secure economic situation

☐ The organisation values social and ecological factors as much as economic factors

☐ The institution has developed a business case for sustainability, including mid-term and long-term goals

☐ **Other:**

Figure 4.9: Template Delphi round 2: Input regarding contextual factors

Before sending out the written template for Delphi round 2 (Appendix F), the researchers discussed with her supervisors whether it would be feasible to split the group of experts, assuming that one group might be more dedicated to give answers to a specific set of questions, for example experts from academia versus experts from companies. Thus, the analysis in the data set with NVivo 11 did not give any indication that expert groups did differ in terms of their mentioning of certain competences, therefore finally all experts were in one set for the second Delphi round.

All experts were provided with the template document by email in the beginning of May, 2108. They were offered to either answer the questions in another Skype call or provide their feedback in a written format by doing the checkmarks and adding written text into the open format questions. None of them asked for a Skype call, therefore feedback was received by end of May, 2018 in a written format.

In total, ten experts provided their feedback in Delphi round 2, whereof one only provided a general comment confirming the results of Delphi round 1 without filling in the template that was provided. Therefore, the results as outlined below refer to data gathered from nine experts, thereof four company representatives (experts B, E, G, J; see Table 4.8), three public procurement experts (experts C, D, F; see Table 4.8), and two experts from academia (experts M, N; see Table 4.8). This set of experts reflects a proportional spread over the three expert categories private, public and academia compared to the 16 experts from Delphi round 1, with experts coming from a variety of industries (chemicals, automotive, interior & design) as well as from the two different academic fields, namely one being the chair of corporate sustainable management and the other holding the chair of operations & supply (see Table 4.8 on case demographics).
In terms of the data analysis for the checkmarks, they were converted to an Excel sheet and added up (see section 3.5).

Delphi study – Step 6: Consolidation for final model development

The data gathered from the experts in the second Delphi round was evaluated as outlined in section 3.5. After the evaluation of the results of the second Delphi round, the author and her supervisors decided that saturation was done and that any further rounds will not lead to a further validation of the model. Literature on the Delphi methodology does not provide a standardised recommendation on the number of rounds that are required in a Delphi study. The common recommendation is to finalise the Delphi process when stability in the responses is attained and no further increase in knowledge creation is expected (e.g. Linstone and Turoff, 1975; Häder and Häder, 2000; Häder, 2014). With this study being a Delphi Type 1 (accumulation of ideas, see Table 3.6), the iteration of rounds was decided to be finalised when saturation in terms of knowledge gathering and confirmation of knowledge by the experts was achieved (e.g. Holsappel and Joshi, 2002).
To finalise the Delphi process, in September 2018, the researcher communicated the results of the Delphi study and its impact on the action research design to all Delphi experts (see Appendix H). The results of the Delphi study led to the design of the action research (see section 4.3.1) and contributed to the development of the SPSM competence model (see chapter 5).

4.2.2 Results

The contribution of the Delphi study was twofold. First, the results contributed to the development of the SPSM competence model. Second, the Delphi study set the ground for the action research. Overall, the Delphi study confirmed the findings in literature, delivered complementary competences and provided comprehensive input for competence descriptions. The detailed results will now be described.

Delphi round 1

Overall, the data analysis of the interviews in the first Delphi round resulted in a total of 41 competences that experts considered to be relevant to successfully manage the CIs. Table 4.9 provides a list of all competences gathered in Delphi round 1 compared to the SLR, sorted by competence clusters. According to the coding process as described in the previous section, these competences are based on the individual descriptions of the interviewees in terms of successful and unsuccessful behaviour in the CIs. The clustering to the four competence domains is based on the definition of Delamare-Le Deist and Winterton (2005), outlined in the conceptual background of this dissertation in section 2.2.

Competence Domain	**Step 1: Allocated competences coded from literature (29 competences, incl. sub-categories) Bold: Top 10**	**Step 2: Allocated competences coded from Delphi Study Round 1 (41 competences incl. sub-categories) Bold: Top 10**

Functional-oriented competences	• **Basic individual knowledge on PSM**
	• **Basic sustainability knowledge**
	• Data & Systems
	• HR Management & Training
	• Performance management
	• Resourcefulness (Application of tools)
	• Stakeholder management (Application of tools)
	• Source-to-contract
	  ○ **Demand management – Category strategy**
	  ○ Demand management – Tender analysis
	  ○ Implementation – Contract management
	  ○ Implementation – Reporting & Measurement
	• Negotiation
	• **SRM (Application of tools)**
	• **Sustainability/ Compliance**
		• Basic individual knowledge on PSM
		• **Basic sustainability knowledge**
		• Source-to-contract
		  ○ Demand management – Category strategy
		  ▪ Purchasing specifications (NEW)
		  ▪ Supply market research (NEW)
		  ▪ Strategic positioning (NEW)
		  ○ Demand management – Tender analysis
		  ○ Implementation – Contract management
		  ○ Implementation – Reporting & Measurement
		• Intercultural knowledge (NEW)
		• Knowledge on product development (NEW)
		• Resourcefulness (Application of tools)
		• Stakeholder management (Application of tools)
		• **SRM (Application of tools)**
		• Sustainability/ Compliance
		  ○ Development of tools (NEW)
		  ○ Participation in peer initiatives (NEW)
		• Systematic way of working (NEW)

Cognition-oriented competences	• Ability to make decisions • Critical thinking • Resourcefulness (Creative resource combination) • SRM (Holistic view) • **Systems thinking competence**	• Ability to make decisions • Conscientiousness (NEW) • Creativity (NEW) • **Critical thinking** • Resourcefulness (Creative resource combination) • SRM (Holistic view) • **Systems thinking competence**
Social-oriented competences	• **Communication skills** • **Cross-functional teamworking** • Organisationally and politically savvy (Interaction) • **Stakeholder management (Communication)*** • **SRM (Communication)**	• **Communication skills** • **Cross-functional teamworking** • Interpersonally savvy • Stakeholder management (Communication) • **SRM (Communication)** • **Thoughtfulness towards others (NEW)**
Meta-oriented competences	• **Commitment to change** • Organisationally and politically savvy (Playful attitude) • **Self-reflection*** • SRM (Cooperative attitude)	• **Commitment to change** • Confidence (NEW) • Curiosity (NEW) • Integrity (NEW) • Organisationally savvy • Persistence • Politically savvy • Self-awareness (NEW) • Self-reflection • **SRM (Cooperative attitude)**
*Legend: * = These competences received the same number of codings*		

Table 4.9: List of competences after coding in SLR and Delphi round 1 (new competences gathered in Delphi round 1 marked in blue, competences not coded in Delphi round 1 are marked in italics, the top competences in bold)

Compared to the findings of the systematic literature review, 16 new competences were found when analysing the input of the experts. Half of them, namely eight, were added to the functional-oriented competence cluster, and another five new competences enriched the meta-oriented competence cluster. Two new competences were found for the social-oriented competence cluster, and one for the cognition-oriented area. Seven of the most often coded competences in literature were confirmed in their importance also by the experts: 'Systems thinking competence', 'Communication skills', 'Cross-functional teamworking', 'Supplier relationship management (Communication)', 'Basic sustainability knowledge', 'Supplier relationship management (Application of tools)' and, finally, 'Commitment to change'. The coding of the transcripts also led to a further specification of some existing nodes from the literature review. Therefore, some of the existing nodes were split up into new sub-categories. 'Demand management – Category strategy' was divided into the new sub nodes 'Purchasing Specifications (NEW)'; 'Supply Market Research (NEW)' and 'Strategic Positioning (NEW)'. Also, 'Sustainability/Compliance' was separated into 'Development of tools (NEW)' and 'Participation in peer initiatives' (NEW) when coding of Delphi round 1. Finally, after having

analysed the codings for ‘Organisationally and politically savvy’, it turned out that the node included a social-oriented perspective in terms of ‘Interpersonally savvy’, as well as different notions regarding ‘Politically savvy’ and ‘Organisationally savvy’ in the meta-oriented competence cluster. Therefore, the node was split into the three separate competences. The set of 41 competences gathered in the expert interviews does not include ‘Data & Systems’, ‘HR Management & Training’, ‘Performance Management’ and ‘Negotiation’. These four nodes were not mentioned by the experts, and therefore did not receive any codings.

Turning towards a detailed analysis, the results presented in the second column in Table 4.9 show that the interviewees described competences in all four competence clusters. Also when looking at the ten main competences in terms of number of codings, they are spread over all four competence clusters, with a slight dominance of the cognition- oriented and social-oriented cluster. To provide evidence on the sources that led to the main competences and knowledge areas, the researcher evaluated in NVivo which of the CIs created the highest number of codings regarding the main competences listed in Table 4.9.

When looking at the main competences that reference to the PSM process, there is an unambiguous focus on SRM. No other process-related competence is within the top ten most often coded competences of Delphi round 1. It turned out already in the coding of the literature that SRM includes competences regarding all four clusters. Thus, SRM is the only process-related competence that is not only reflected in the functional-oriented cluster, but also in the other three. Therefore, the researcher created appropriate sub-categories. The experts in the Delphi study especially referred to three of them. Table 4.10 outlines how the sub-categories were defined, providing exemplary quotes from the Delphi experts.

	Description based on quotes from Delphi participants	***Competence cluster***
Supplier relationship management (Communication)	• Explains requirements and issues to the supplier • Shows the benefits of sustainability to the supplier • Convinces • Explains the business risk to the supplier	*Social-oriented*
Supplier relationship management (Application of tools)	• Applies a code of conduct and monitoring tools • Conducts a risk assessment • Draws consequences in case of non-compliance	*Functional-oriented*
Supplier relationship management (Cooperative attitude)	• Coaches the supplier in the implementation of sustainability standards • Shares experiences • Offers training to the supplier • Works together with the supplier	*Meta-oriented*

Table 4.10: Main aspects of SRM and quotes from Delphi participants

Two CIs stand out in terms of competences related to Supplier Relationship Management. The first, called "Suspected child labour at a supplier", was described as follows:

> "*An annual supplier audit was conducted to ensure compliance to sustainability requirements of the company. The auditors came back with the impression that there might be children working at some of the production lines. However, they were not sure, as the age of the workers was hard to estimate. When faced with the situation during the audit, the supplier was not able to proof that the age of the workers was in line with the requirements of the company. Following up the audit report, the buyer contacts the supplier to discuss the issue."*

The second, being titled "The supplier in a developing country", reads as

> *"In a regular Skype meeting to discuss current topics in the business relationship with a supplier in a developing country, the buyer introduces the sustainability standards and expectations to the supplier representatives. As a first reaction, the supplier representatives explain that their priority is to develop economically, and that the purchasing organization should take into account this priority. They also explain that Western buying firms and suppliers in their country are in different development stages. Therefore, they express their concerns to be able to commit to the ambitious sustainability standards that the buyer presented."*

Hence, considering the input gained for 'Supplier relationship management' in the Delphi round 1, PSM professionals are required to apply a broad set of competences to interact with the supply network in the context of sustainability. This seems to be especially important for job roles related to the competence centre supplier relationship management, referring to the PSM process in Figure 2.4. Delphi experts also mentioned competences that can be allocated to other steps of the PSM process, especially regarding the strategic purchasing activities. Interestingly, no competences were mentioned regarding the purchase-to-pay process. This indicates that SPSM hardly relates to the transactional purchasing tasks. Both findings, SRM being the most important process-related competence and the insignificance of the purchase-to-pay process for SPSM confirm the findings from academic literature, although papers did also focus on 'Sustainability/Compliance'.

In addition to nodes referring to the PSM process, there was a range of generic competences within the top ten that were gathered out of the interviews with the Delphi participants. Table 4.11 shows the main generic competences and their descriptions based on quotes.

	Description based on quotes from Delphi participants	*Competence cluster*
Systems thinking competence	• Understands the business case for sustainability • Thinks beyond one's own nose • Applies the strategic context of the company • Understands the supply network • Understands circular economy models	*Cognition-oriented*
Critical thinking	• Gathers information to get a better understanding of an issue • Asks for background information • Critically reviews processes and approaches	*Cognition-oriented*
Communication skills	• Presents & sells facts • Conducts an open conversation • Interacts with others • Adapts to a target group • Uses appropriate communication channels • Moderates	*Social-oriented*
Cross-functional teamworking	• Cooperates with others to find common solutions • Knows relevant internal departments to cooperate with	*Social-oriented*
Thoughtfulness towards others	• Shows understanding for the other position • Acts in a tactful manner • Is understanding • De-escalates • Is aware how to avoid conflicts	*Social-oriented*
Basic sustainability knowledge	• Knows sustainability strategies & procedures of the institution • Knows frame-works & law • Understands sustainability does not mean "doing good", but preventing risk and following a business case	*Functional-oriented*
Commitment to change	• Is passionate and beliefs in the benefit of sustainability • Does commit personally to the next steps • Takes on leadership to bring in new sustainability initiatives • Is willing to participate	*Meta-oriented*

Table 4.11: Main generic competences from Delphi round 1

For the main generic competences, a different set of CIs inspired the Delphi participants, named "The stakeholder event", "Purchasing is not involved", "Purchasing contribution to a new sustainability strategy", and "The supplier in a developing country".

"The stakeholder event" had the strongest impact on codings for 'Communication skills' and 'Critical thinking':

> *"In a corporate stakeholder dialogue event, a purchasing professional gets in conflict with a representative of a non-governmental organisation (NGO), specialised in ethical sourcing and human rights issues in a specific country. The NGO representative, a young, politically engaged woman, insults the purchasing professional not to have monitored the supply chain*

in this country adequately, and instead to focus on cheap prices. The purchasing professional has been working on a human rights assessment program for suppliers in this country for a few years already, gained some expertise in this area, and feels very offended that the NGO representative does not consider these efforts. Consumers and other stakeholders perceive the NGO as a very established institution with a high moral integrity and expertise in ethical sourcing. Therefore, the other participants of the stakeholder event blame the purchasing professional to give wrong information to the public and therefore to act unethical."

For 'Systems thinking competence' and for 'Basic sustainability knowledge', most input was given by the experts when discussing the incident about "Purchasing contribution to a new sustainability strategy":

"Due to a significant decrease in sales, combined with quality issues resulting in negative consumer feedback, bad media reports and severe loss of the companies' credibility, the top management decided to implement sustainability as one key factor of a turnaround program. The top management issued a corporate commitment to reduce the environmental and social footprint and to support sustainable product development. A buyer is invited to a meeting with representatives of corporate strategy, sales and marketing. It will be discussed how purchasing can contribute to the new sustainability strategy and commitment, taking into consideration the entire supplier network. Nevertheless, as the company is still in a difficult financial situation, the contribution of purchasing in terms of prices for products and raw material is expected."

The critical incident called "Purchasing is not involved" led to the description of 'Cross-functional teamworking' and 'Commitment to change':

"The company decided to exclude dangerous chemicals from its products by the year 2020. Therefore, sales, marketing and product development installed a project to discuss the impact of this decision on the product, e.g. its quality and functionality, to align this with customer requirements, and to develop a marketing strategy. In addition, driven by product development, the project members will decide on substitutes for the dangerous chemicals.

The buyer who is responsible for the commodity of the dangerous chemicals is told about this project by a colleague from marketing during lunch. He/she thinks that it would make sense for purchasing to get involved."

Finally, the incident described above called "The supplier in a developing country" not only contributed to 'Supplier Relationship Management', but also to 'Thoughtfulness towards others'.

To conclude, the main generic competences mentioned by the Delphi participants cover all competence clusters, with three of them being social-oriented, two on the cognition-oriented cluster and one in the functional- and the meta-oriented area respectively. In terms of their priorities, the Delphi experts support the findings from the systematic literature review, with regard to 'Systems thinking competence', 'Communication skills', 'Cross-functional teamworking', 'Basic

sustainability knowledge' and 'Commitment to change'. Also when considering the demographics of the participants, the results were quite similar, although some minor differences occurred. 'Category strategy' with all of its three sub-nodes was more often coded for practitioners in the public sector as well as for academics, compared to practitioners from the private sector. The public sector representatives also found 'Stakeholder management (Communication)' more important than the other two groups. Additionally, academics did not consider 'Basic sustainability knowledge' being as important as the other two expert groups did. Taking into consideration that these were the only considerable differences in the relatively small sample of experts, the researcher nevertheless did not want to stress these differences for the further interpretation of the results.

Summarizing the findings, the literature and preliminary findings of the first Delphi round are consistent in terms of priorities and confirm the relevance of the four competence clusters 'cognition-oriented', 'social-oriented', 'functional-oriented' and 'meta-oriented', as defined by Delmare- Le Deist and Winterton (2005). The Delphi experts complemented the SLR findings, as new competences were added to the set (e.g. 'Thoughtfulness towards others', 'integrity', 'creativity'), and comprehensive descriptions of the competences were gathered.

Delphi round 2

The second Delphi round was conducted with the aim to validate, complement and prioritise the results of Delphi round 1 and to get some insights into the contextual factors that the experts considered to be important for the application of SPSM competences.

The degree of agreement in the feedback was high. None of the experts, for example, added new competences, and the spread in the rating of the provided competences allowed to identify common priorities. Therefore, the return rate of nine answers was regarded as being sufficient to provide further input for the development of the SPSM competence model. A higher number of involved experts presumably would not have led to any additional perspectives.

Regarding the list of competences gathered in Delphi round 1, the expert feedback was collected based on a structured template with checkboxes. Delphi participants were asked to prioritise knowledge and competences for SPSM training in the HE as well as in the professional context (see 4.4). The right hand column in Table 4.12 shows the 24 competences that the experts which participated in Delphi round 2 defined as being 'essential' or 'nice to have' in total. Their prioritisation was based on the 41 competences gathered in Delphi round 1.

Competence Domain	Step 1: Allocated competences coded from literature (29 competences, incl. sub-categories) Bold: Top 10	Step 2: Allocated competences coded from Delphi study round 1 (41 competences incl. sub-categories) Bold: Top 10	Competences prioritised in Delphi study round 2 (24 competences incl. sub-categories)

Functional-oriented competences	• **Basic individual knowledge on PSM**
	• **Basic sustainability knowledge**
	• Data & Systems
	• HR Management & Training
	• Performance management
	• Resourcefulness (Application of tools)
	• Stakeholder management (Application of tools)
	• Source-to-contract
	  ○ **Demand management – Category strategy**
	  ○ Demand management – Tender analysis
	  ○ Implementation – Contract management
	  ○ Implementation – Reporting & Measurement
	• Negotiation
	• **SRM (Application of tools)**
	• **Sustainability/ Compliance**
		• Basic individual knowledge on PSM
		• **Basic sustainability knowledge**
		• Source-to-contract
		  ○ Demand management – Category strategy
		  ▪ Purchasing specifications (NEW)
		  ▪ Supply market research (NEW)
		  ▪ Strategic positioning (NEW)
		  ○ Demand management – Tender analysis
		  ○ Implementation – Contract management
		  ○ Implementation – Reporting & Measurement
		• Intercultural knowledge (NEW)
		• Knowledge on product development (NEW)
		• Resourcefulness (Application of tools)
		• Stakeholder management (Application of tools)
		• **SRM (Application of tools)**
		• Sustainability/ Compliance
		  ○ Development of tools (NEW)
		  ○ Participation in peer initiatives (NEW)
		• Systematic way of working (NEW)
			• Basic individual knowledge on PSM
			• Basic sustainability knowledge
			• Implementation – Contract management
			• Implementation – Reporting & Measurement
			• Knowledge on product development (NEW)
			• Resourcefulness (Application of tools)
			• Stakeholder management (Application of tools)
			• SRM (Application of tools)
			• Sustainability/ Compliance (Development of tools)

Cognition-oriented competences	• Ability to make decisions • Critical thinking • Resourcefulness (Creative resource combination) • SRM (Holistic view) • **Systems thinking competence**	• Ability to make decisions • Conscientiousness (NEW) • Creativity (NEW) • **Critical thinking** • Resourcefulness (Creative resource combination) • SRM (Holistic view) • **Systems thinking competence**	• Conscientiousness (NEW) • Resourcefulness (Creative resource combination) • SRM (Holistic view) • Systems thinking competence
Social-oriented competences	• **Communication skills** • **Cross-functional team working** • Organisationally and politically savvy (Interaction) • **Stakeholder management (Communication)*** • **SRM (Communication)**	• **Communication skills** • **Cross-functional team working** • Interpersonally savvy • Stakeholder management (Communication) • **SRM (Communication)** • **Thoughtfulness towards others (NEW)**	• Interpersonally savvy • Stakeholder management (Communication) • SRM (Communication) • Thoughtfulness towards others (NEW)
Meta-oriented competences	• **Commitment to change** • Organisationally and politically savvy (Playful attitude) • **Self-reflection*** • SRM (Cooperative attitude)	• **Commitment to change** • Confidence (NEW) • Curiosity (NEW) • Integrity (NEW) • Organisationally savvy • Persistence • Politically savvy • Self-awareness (NEW) • Self-reflection • **SRM (Cooperative attitude)**	• Confidence (NEW) • Curiosity (NEW) • Organisationally savvy • Persistence • Politically savvy • Self-awareness (NEW) • SRM (Cooperative attitude)
*Legend: * = These competences received the same number of codings*			

Table 4.12: List of competences after coding in SLR, Delphi round 1+Delphi round 2 (new competences gathered in Delphi round 1 marked in blue, competences not coded in Delphi round 1 are marked in italics, the top competences in bold)

In general, also in the second Delphi round the experts confirmed competences to be relevant for SPSM in all four competence clusters, with a slight dominance of the functional-oriented competence cluster in terms of the variety competences. This is in accordance with the results out of the SLR and Delphi round 1. A number of 24 competences was considered to be either essential or nice to have for the HE and the professional training context. Table 4.13 shows an overview of the competences that were considered either essential or nice to have for the two different educational contexts. Regarding the category 'not needed', 'Politically savvy' and 'Sustainability/Compliance (Participation in peer initiatives)' were the only mentioned competences in this category in the HE context. For professional training, none of the competences was rated in the 'not needed' category.

	Essential	Nice to have
Higher Education	• **Systems thinking competence** • **Basic sustainability knowledge** • Stakeholder Mgmt.(Communication) • Basic individual knowledge on PSM • Contract Mgmt.	• **Persistence** • Resourcefulness (Creative resource combination) • Conscientiousness • Thoughtfulness towards others • Confidence • Sustainability/ compliance (Development of tools)
Professional Training	• **Basic individual knowledge on PSM** • Stakeholder Mgmt. (Communication) • Systems thinking competence • Basic sustainability knowledge • Organisationally savvy • SRM (Application of tools) • SRM (Communication) • SRM (Cooperative attitude) • SRM (Holistic view) • Contract Mgmt. • Measurement/ Reporting	• **Politically savvy** • **Self-awareness** • **Curiosity** • Conscientiousness • Thoughtfulness towards others • Interpersonally savvy • Stakeholder Mgmt. - Application of tools • Knowledge on product development • Resourcefulness - Application of tools

Table 4.13: Delphi round 2 – Competences for Higher Education and professional training (competences most often mentioned by experts in bold; if more than one in bold, competences received an equal number of codings)

Looking at the competences being essential, the generic competences 'Systems thinking competences', 'Basic sustainability knowledge' and 'Basic individual knowledge' stand out being the ones most often mentioned. Even when emphasised with different priorities for HE and professional training, they were rated to be essential for both. The experts also considered 'Stakeholder management (Communication)' to be within the essential set of competences for both target groups, professionals and students. The generic competences are complemented by rather process-related ones. 'Supplier relationship management (SRM)' with all 4 sub-categories is the most prominent competence related to the PSM process (see Figure 2.4), being named as essential for the professional training context, complemented by 'Contract management' and 'Measurement/ Reporting'. Interestingly, 'Contract management' was also considered to be essential for training in the HE curriculum, whereas experts did not prioritise SRM here. To summarise, cognition-oriented, functional-oriented, and social-oriented domains are predominantly covered by the competences considered to be essential for either the HE or the professional SPSM curriculum. The only meta-oriented competences here are 'SRM (Cooperative attitude)' and 'Organisationally savvy' for professional training.

Interestingly, when looking at what the participants on the second Delphi round considered being nice to have for both educational areas, a range of meta-oriented competences appear. 'Persistence'

and ‘Confidence’ were mentioned for the HE curriculum, ‘Politically savvy’, ‘Self-awareness’ and ‘Curiosity’ for the professional training context. They were complemented by social-oriented items, like ‘Thoughtfulness towards others’ and ‘Interpersonally savvy’, by ‘Conscientiousness’ and ‘Resourcefulness (Creative Resource Combination)’ being cognition-oriented, and also by a few functional-oriented competences like ‘Sustainability/Compliance (Application of tools)’ (HE) and ‘Knowledge on product development’ (professional). There is a clear focus on generic competences that were considered to be nice to have for both academic and professional curricula. The only competence that is related to the PSM process (see Figure 2.4) is ‘Sustainability/Compliance (Application of tools)’. The comment from an expert from public procurement might give an indication why a range of predominantly meta-oriented competences was listed in the nice to have category, but nevertheless with the notion of being important:

> “*Several of these competencies seem to be areas that some people have an innate aptitude for, but which would be difficult to teach others. I've marked most of these as 'Maybe - nice to have' because, although they may be essential, I'm not sure if they could be integrated in to a curriculum for HE or a professional training in PSM. I've listed the competencies I would put in that category below: ‘Creativity’, ‘Conscientiousness’, ‘Interpersonally savvy’, ‘Thoughtfulness towards others’, ‘Self-reflection’, ‘Politically savvy’, ‘Self-awareness’, ‘Persistence’, ‘Integrity’, ‘Curiosity*’ ”

(expert public procurement, comment in Delphi round 2). It might be possible that other experts also restricted their choice of competences by the notion how difficult to teach these would be. This finding is mentioned below as a limiting factor of the prioritisation in the template provided for the second Delphi round.

Overall, there is a dedicated focus on functional and cognition-oriented competences when looking at the essential list in Table 4.13 for both curricula, with ‘Systems thinking competence’ being the most prominent generic item, and SRM and ‘Contract management’ the most prominent competences related to the PSM process. A range of meta-oriented competences were listed by the experts as being nice to have for both curricula. In the comment field, one expert requested to add “The need for a business case and give examples” (expert private sector) in a professional training curriculum. Table 4.11 outlines that this aspect is comprised in the description of ‘Systems thinking competence’.

In addition to the checkmarks in the template, some experts provided comments. The input provided in the comment fields was listed and considered for coding in NVivo. As it occurred that only a minor number of comments were delivered with none of them related to the competences in terms of adding, refining or changing them, no coding was done. Table 4.14 summarises comments and additions gathered.

Expert	Comment
Expert F	"*Several of these competencies seem to be areas that some people have an innate aptitude for, but which would be difficult to teach others. I've marked most of these as 'Maybe - nice to have' because, although they may be essential, I'm not sure if they could be integrated in to a curriculum for HE or a professional training in PSM. I've listed the competencies I would put in that category below:* *Creativity, Conscientiousness, Interpersonally savvy, Thoughtfulness towards others, Self-reflection, Politically savvy, Self-awareness, Persistence, Integrity, Curiosity*".
Expert B	"*In a professional training: Add The need for "The Business Case" and give examples; […] wants to supply enough coffee for future generations. Action: get rid of all intermediate companies, hire experts from Agricultural University to teach planters to improve quality and increase the coffee crop. Result: Prosperity for the coffee farmers, security of good quality coffee supply to meet future demand*".
Expert B	"*Please make a distinction between the Procurement Director and the "Purchasing persons". The procurement Director should have a different education level strategic thinking. In my view he/she should be member of the management team, Proof value and not try to, but Convinces the colleagues that Sustainability IS the future.* *For him/her systems knowledge and market information is a need that he will get organized by his procurement team.* *To me this questionnaire is a mix between the highest level Procurement Director/CPO and peoples reporting to him*".
Expert L	"*Overall, I think the structure that you apply for clustering the competences is very good. Although the difference between meta-oriented and social-oriented competences was not that clear to me. But I think as this is an established model, it is fine. Maybe just change the order when listing the clusters, going from hard competences to soft ones: cognition-oriented, functional-oriented, social-oriented and meta-oriented.* *Another small comment: Make sure that you explain the abbreviation ‚PSM‘*“ (translated from the author).

Table 4.14: Overview of comments provided by experts in Delphi round 2

To conclude, in reference to the findings in Delphi round 1 and of the systematic literature review, the second Delphi round did not lead to gather any new competences, but confirmed the competence list as well as the priorities of the preceding steps. Therefore, it fulfilled the goal to validate previous findings and helped to determine priorities for the final SPSM competence model.

In addition to the input to the gathered set of competences, the experts were also asked for a statement regarding contextual factors for SPSM. As outlined in Figure 4.9, the template listed five options, and participants were asked to mark the two that they considered to be the most important. There was the opportunity to add additional contextual factors not listed, but no participant made use of this opportunity. When looking at the prioritisation of the five pre-defined contextual factors, one striking aspect needs to be pointed out: None of the Delphi participants considered "*The institution is in a secure economic situation*" as being relevant for the application of SPSM competences. The other factors were ranked nearly equivalent, with five checkmarks for "*Top management of the institution is driving corporate sustainability strategies*" and "*PSM adapts a mentoring approach instead of a monitoring approach towards suppliers, and pursues close interaction with the entire supply network*", and four checkmarks each for "*The organisation values social and ecological factors as much as economic factors*" and "*The institution has developed a business case for sustainability, including mid-term and long-term goals*". These findings will discussed more in-depth in section 5.1.

4.2.3 Limitations

In general, this research tried to ensure the quality of the Delphi study by applying certain measures regarding its validity, reliability, objectivity and transferability as described in section 3.4.4. Nevertheless, there are a number of limitations that need to be outlined.

The Delphi method allowed the acquisition of knowledge from a number of different experts in a semi-structured setting with a focused communication about SPSM competences. The anonymous approach ensured that no group dynamics influence the knowledge generation process, the iterative two rounds allowed the experts to validate the findings and to comment and further develop their first input. Other methods like expert interviews or focus groups might have resulted in comparable results, but without providing the opportunity to gather information in an anonymous and iterative manner. Nevertheless, the Delphi study can only be considered as a first step into a more in-depth analysis of SPSM competences, as its findings are based on the restricted number of 16 experts.

For the first Delphi round, the methodological approach to conduct the interviews with experts based on pre-defined CIs that reflected the main findings on the systematic literature review, might have influenced the outcome. However, the findings indicate that the discussions of the CIs result in a broader range of competences beyond the ones that they were initially intended to cover. Additionally, they helped to gather more in-depth descriptions of the individual competences. Although it needs to be considered as a potential limitation that data was evaluated outside the

individual and organisational context of the experts. The researcher interpreted their input and drew conclusions that are based on her subjective knowledge and perception background. Therefore, following the CIT approach defined by Flanagan (1954), a more in-depth discussion of the general aim of SPSM as such, also considering the wider organisational context, would have provided additional insights. The researcher considers this as an opportunity for future research on SPSM competences, potentially by running case study research.

Also, some experts gave their input in German, and the documented text was translated from the researcher before coding. Certain aspects of meaning might have been lost by this procedure, although the translations were discussed with the individual Delphi experts and the two supervisors. In general, the cultural background of the author as well as the Delphi experts needs to be considered. The experts involved in this study were mainly based in Europe, with only one being from the United States. Involving participants from other cultures might have led to other descriptions of successful or unsuccessful behaviour.

Three limitations need to be mentioned for the approach in the second Delphi round, using a structured template to validate and prioritise competences. First, regarding the prioritisation by checkmarks for HE and professional training curricula, experts might have restricted their choice of competences by the notion of how difficult to teach these would be. Respective feedback was given by one participant and leads to the assumption that others acted accordingly. Second, the prioritisation exercise does not consider different job roles, which was also mentioned as a comment by an expert from the private area. And third, the discussion on contextual factors was limited by only selecting the two most important ones, and would certainly need more in-depth evaluation in future research.

Finally, the validity of the Delphi method itself as a research methodology might need further investigation in the area of cognition psychology (see Häder and Häder, 2000; Häder, 2014). Therefore, Häder and Häder (2000) conclude that "[…] when applying the Delphi method, the researcher must be aware that the opportunities and the limitations of this method are not investigated yet on a satisfactory level." (Häder and Häder, 2000, p. 27; translated from German by the author).

4.3 Action Research

To validate the SPSM model in practice and initiate a change towards SPSM, action research was applied. It was considered to be the appropriate methodology complementing the SLR and the Delphi study due to multiple reasons. First, as section 3.4.1 explains, action research fitted with the interpretivist paradigm, and it contributed to the aim to inductively gather facts around SPSM competences. Second, when looking at the underlaying definition for competence in this research, the action research part shed light on the inherent aspect of learning: "[competences are] a set of abilities, skills and other attributes and characteristics that enable a person to manage complex

situations effectively; this set can be developed through learning and experience" (Krumm et al., 2012, p. 3, translated by the author). Finally, the action research part reflects the personal commitments of the author (section 3.2.1). She follows the ontological and epistemological view of reality being a social and subjectivist construct, defining the role of the researcher to observe and interpret constructs by getting involved in the field. Furthermore, she is convicted that education contributes to sustainable development.

These three elements were the motivation to conduct training in academic and organisational settings. The learning goals for the training focused on the competences that were mentioned to be relevant in the Delphi study. Training participants discussed the CIs that were also applied in the Delphi study. The findings and the reflection of the action research led to a deeper understanding of how best to teach SPSM to generate impact on SPSM implementation at the individual level of purchasing professionals. In what follows, the sampling and data collection approach is shown, the process is reflected from the researcher's point of view and the results are discussed. Also, limitations of the applied approach are clearly outlined.

4.3.1 Sample & data collection

The author developed a SPSM training concept based on the findings in the earlier research steps, and aimed to test the training prototype in a rather design-based action research format. Thus, when considering the data collection and the sampling for the action research part in this study, the training design and the selection of training participants need to be described. In general, the training design was embedded in the setting of the multi-method approach. It incorporated the results of the SLR as well as the Delphi study. Because the latter already included HE and practice in private as well as public organisations, the sampling therefore intended to include stakeholders representing these perspectives, namely students as well as private and public procurement professionals. The format of several consecutive training sessions with the researcher being involved as the trainer allowed to gather data in an iterative manner, which contributed to the further development of the SPSM training format as well as the SPSM competence model. Sampling criteria for academia included that the students should be part of a business grade in economics, on a Bachelor and on a Master level. They should already have heard about PSM and SCM basics in one of their courses. Regarding the professional training, the author decided to include organisations with a clear motivation to enhance their sustainability performance in PSM, driven either by their products, stakeholders or regulation. The organisations should be willing and interested to participate, rather than doing it for sake of the researcher or her PhD supervisors. The target group for the training were purchasing professionals that have to deal with sustainability topics in their daily job, for instance buyers for certain commodities or categories, sustainability experts or supplier relationship managers.

Literature on training and curriculum development outlines the importance to ground the development of training or curricula on a thorough analysis of training gaps and needs and a

definition of training goals (Anderson et al., 2001; Howard and Warwick, 2013; Kauffeld, 2016). Therefore, it was decided to follow a systematic approach to link training requirements, goals, methods and training evaluation for the development of the SPSM training. The development of the training followed the process as suggested by Kauffeld (2016) which is shown in Figure 4.10. The process includes seven steps. First, training needs should be analysed. Kauffeld (2016) emphasises the importance of aligning the training development with the corporate strategy. Second, training goals should be defined, followed by the development of evaluation criteria and formats, as well as success factors that support the transferability of learnings. Then, suitable training methods need to be derived and applied in training sessions. Finally, the training evaluation should lead to refinements and adjustments in an iterative manner. The approach ensures an alignment of an organisation's strategy, training goals and professional contexts that impact transferability. It also includes the notion of continuous reflection and development of a training approach, supporting the idea of the action research cycle.

Figure 4.10 shows how the process steps were adapted in this research. The following paragraph describes the decisions that were taken for each step and the resulting SPSM training approach.

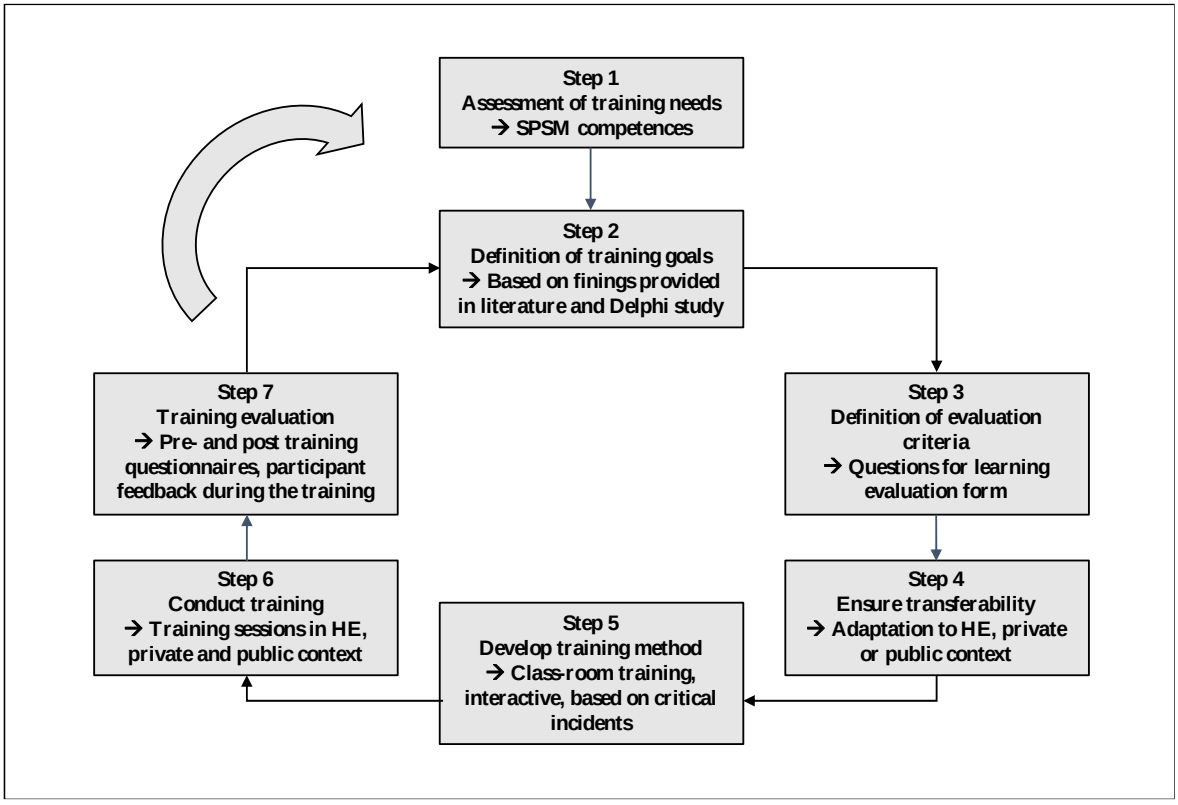


Figure 4.10: SPSM training development process (adapted from Kauffeld, S., 2016, p. 17)

At first, it needs to be emphasised at this point that Kauffeld (2016) embeds the training development process in an organisational setting. The training conducted in the action research phase of this study on SPSM competences, however, was not entirely connected to the strategy of the organisations

involved. This was due to the character of testing a prototype in a rather short timeframe, as part of an academic research project. Therefore, to be precise, step one of the process in Figure 4.10, the assessment of training needs, was not conducted in-depth with the individual organisations, but derived from the academic setting in the research. It was decided to derive the training needs, the goals and the evaluation criteria from the findings that were gathered in the SLR and in the Delphi study. Also the training method was supposed to be consistent with the other two research steps and should be closely connected to the outcome of the latter. Therefore, it was decided to apply the CIs in the training sessions.

Second, the definition of the training needs, the training goals and of the evaluation criteria, reflected in steps one, two and three of the process, was derived from the findings from the SLR and the Delphi study. As described earlier, according to the evaluation of the literature, 12 CIs were derived, based on the most often coded competences (see also section 4.2.1). The 12 CIs were discussed with experts in Delphi round 1. The expert interviews resulted in an extended list of competences (Table 4.9). The second Delphi round confirmed and reprioritised the list in terms of their importance for training in the HE or the professional context. As outlined in the detailed description of the results in section 4.2.2, some of the competences are generic in nature, others refer to the PSM process (Figure 2.4). To ensure that the SPSM training concept is closely connected to the core PSM objectives, the author decided that both, generic as well as process-related competences, should be reflected equally. Therefore, she selected the five most often mentioned competences in Delphi round 1 for each of those, instead of just taking the top 10 competences as indicated in Table 4.9. She also cross-checked and confirmed with the priorities that were evaluated in the second Delphi round. As the prioritisation of essential competences for training in the educational and the professional context did not vary, the same set was applicable for all the training that was conducted. Resulting competences that built the framework for the design of the SPSM training in both, the educational as well as the professional context, are listed in Table 4.15.

Generic competences	Competences related to the PSM process
Communication skills	Supplier relationship management (Application of tools)
Systems thinking competence	Stakeholder management (Communication)
Basic sustainability knowledge	SRM (Cooperative attitude)
Cross-functional teamworking	Demand management – Category strategy
Commitment to change	Sustainability/Compliance

Table 4.15: Competences covered in the SPSM training

Subsequently, learning goals were defined for each of the ten competences. The training goals allowed to measure learning effects. To describe the learning goals, the Bloom taxonomy was applied

(Bloom, 1956; Anderson et al., 2001). The expected learnings were allocated to domains one ‘knowledge’, two ‘comprehension’, and three ‘application’ of Bloom’s taxonomy. Table 4.16 lists the competences, the definition (see also chapter 5), the assigned learning goal as well as the relevant question to evaluate the competence. It has to be mentioned again that for the application of the SPSM training in a specific context outside the general scope of this study, the overall learning goals would need to be specified and adapted to a specific organisational setting and individual learning needs in more detail. Here, it was decided from the author that the overarching training goals are the following: Participants will be able to describe basic sustainability concepts and they will identify opportunities and risk for purchasing. Furthermore, participants will be able to apply concepts in critical situations and demonstrate successful actions and behaviour in these situations. Professionals will transfer the experience and the learnings from the training to daily practice and feel more comfortable when they are faced with similar situations in their daily job environment. Finally, participants will be aware of the required prerequisites on the organisational level to successfully implement sustainability competences. The evaluation of the latter two goals would have needed a long-term study with the participants in the professional context, and therefore could not be covered in-depth in this study. Nevertheless, the ongoing reflection and interaction during the training gave an indication how the learning content is related to the job reality of the participants.

Competence	Definition	Learning goal	Question learning evaluation form*
Communication skills	This competence includes the ability to articulate and present sustainability issues in a convincing manner by applying appropriate communication styles and channels depending on target groups and situations.	Participants are able to present SPSM issues in a way that convinces the audience.	If I would be an intern in the purchasing department of a company, I would be able to give a presentation to my colleagues and convince them how important it is to implement sustainable purchasing and supply management.[1] I would be able to give a presentation to my colleagues and convince them how important it is to implement sustainable purchasing and supply management.[2, 3]
Systems thinking competence	"Systems thinking is defined as a discipline for seeing wholes and a framework for seeing interrelationships rather than things, for seeing patterns of change rather than static snapshots" (Senge, 1990). In the SPSM context, it includes the recognition of interdependencies within a supply chain network and the consideration of the impact when implementing a SPSM strategy. Opposite: Having a small view of the world	Participants explain the business case for SPSM, including the benefit of SPSM for the company, suppliers and customers.	Imagine you work as a consultant for sustainable purchasing and supply management (SPSM). Are you able to explain the benefits of SPSM for the company to a customer?[1] Imagine you would need to discuss with the management why sustainable purchasing and supply management efforts pay off for the company. Are you able to explain the business case for sustainability in purchasing?[2, 3]
Basic sustainability knowledge	Basic sustainability knowledge includes a general sustainability subject matter expertise as well as knowledge about laws, regulations and frameworks as well as specific rules and procedures within an organisation.	Participants know basic sustainability concepts like the triple bottom line approach, as well as some international frameworks and standards.	I know sustainability theories, international frameworks and standards.[1, 2, 3]

Cross-functional teamworking	Cross-functional teamworking competence encompasses interpersonal and self-management knowledge, skills and abilities (Stevens, Campion, 1994). In the SPSM context, it implies the knowledge about relevant stakeholders and partners, the skills to work in multi-disciplinary teams and the ability to build relationships and liaisons with other functions within the organization.	Participants are able to cooperate with representatives from other functions than procurement to find common solutions	You work as an intern in the purchasing department of a company, and you are supposed to attend a meeting with colleagues from marketing and from product development. Do you think you can compare their priorities and goals to those from purchasing?[1] You are supposed to attend a meeting together with colleagues from marketing and from product development. a) Do you know their priorities and goals regarding sustainability compared to those from purchasing? b) Do you think it would be easy for you to cooperate in the meeting to find common solutions?[2] You are supposed to attend a meeting together with colleagues from strategy, student recruitment and marketing. [same questions a) and b) as above][3]
Commitment to change	Commitment to change in the SPSM context is expressed by individual motivation and actions to implement sustainability in PSM and to be open and willing to change routines to enable the implementation.	Participants are motivated and interested after the training to get involved in SPSM topics in the future	Please rate this statement: "When I buy new clothes, I prefer brands that are known for their adherence to environmental and social standards. I would even send an email to the company to ask for their sustainability standards."[1, 2, 3]

Supplier relationship management (Application of tools)	Supplier relationship management (Application of tools) is the competence to be aware of a range of tools to be applied in the SPSM context. In includes the ability to choose the best tools and make use of them in a specific situation.	Participants know how to conduct a risk analysis and they know tools how to measure environmental and social performance in the supply network	Imagine again that you work as an intern in a company. A colleague asks if you know how to conduct a risk assessment for sustainability in the supply chain. Would you know how to do that?[1] A colleague asks if you know how to conduct a risk assessment for sustainability in the supply chain. Would you know how to do that?[2, 3]
Supplier relationship management (Communication)	Communication competence in the context of Supplier relationship management includes the ability to articulate, explain and promote sustainability issues by applying appropriate communication styles towards suppliers.	Participants are able to explain the benefits of sustainability to suppliers	Again, you are an intern in a company. You visit a supplier, together with an experienced buyer of the company. The buyer has to leave the meeting for a few minutes to take an important phone call. In the meantime, the supplier representatives ask you to explain, why sustainable purchasing and supply management is important for them as a supplier. Would you be able to find arguments?[1] You are conducting a regular meeting with a supplier. The supplier representatives ask you to explain why sustainable purchasing and supply management is important for them as a supplier. Would you be able to find arguments?[2, 3]
Supplier relationship management (Cooperative attitude)	Supplier relationship management (Cooperative attitude) is the ability and motivation to work together with the supplier in a supportive manner to reach SPSM goals, including the understanding of the benefit of supplier cooperation.	Participants understand cooperative elements of a buyer-supplier relationship that enhance sustainability performance, such as training, coaching and sharing of information	In the same situation as in question 2.7., the supplier representatives ask you whether you understand what it means to cooperate to implement sustainability. Would you be able to name some cooperative measures?[1] In the same situation as in question 2.7., the supplier representatives indicate that they need some support to implement sustainability. Would you be able to name some cooperative measures that you can offer?[2, 3]

Demand management – Category strategy	"Category management is the process of developing insights into stakeholder requirements, comparing these to external industry intelligence, supply base capabilities and operational risks, and developing a strategy to align internal requirements with external supply market conditions" (Monczka et al., 2016, p. 47). For SPSM, it includes the competence to gather and understand purchase needs specifications in terms of their sustainability impact, to search the supply market for sustainable products or solutions, and to derive a strategic approach how to include sustainability in the processes of category management.	Participants understand how the specifications of a product impact the supply market research and supplier selection	Please rate this statement: "I can analyse how a technical specification of a product, that improves the environmental and/or social footprint, impacts the supply market research".[1, 2, 3]
Sustainability/ compliance	The competence required in a centre of excellence for sustainability/ compliance is to develop a SPSM strategy and to derive concepts and measures for its implementation internally in the organisation as well as with various external stakeholders.	Participants have basic knowledge about industry initiatives and why companies get engaged in these	Please rate this statement: "I know joint sustainability initiatives in some industries and I understand why companies get involved in those".[1, 2, 3]
Legend: * = see Appendix, rating was required on a 5-point scale; [1] = Questionnaire applied in Higher education; [2] = Questionnaire applied for professionals; [3] = Questionnaire applied for the public procurement context			

Table 4.16: Overview learning goal by competence, coverage in evaluation form action research

For steps four and five in the training development process (Figure 4.10), the author developed an approach to ensure that the training goals and needs are reflected in the training design, and to allow transferability to the research context consistent to the preceding steps. After having decided on the ten competences that were to be covered in the SPSM training (Table 4.15), the author evaluated in NVivo in which CIs these competences were mentioned most often. The evaluation resulted in four CIs that were selected for the training: "Purchasing contribution to a new sustainability strategy", "The supplier in a developing country", "Purchasing is not involved", and "The stakeholder event" (see Appendix Q). Selecting those four CIs was supposed to be the most integrated and promising approach in terms of the learning outcome. The four CIs build the nucleus for the training design, with the aim to provide a playing field that refers to the professional reality of SPSM, but that at the same time allows adaptations and interpretations during the training sessions. To foster the involvement of training participants and the individual adaptation to the setting at the same time, an open, interactive class-room approach was chosen. A half-day training schedule was developed with four main agenda topics: First, an introduction into the training goals, the approach and the dissertation project, second an input on 'Basic sustainability knowledge', third a group work to find solutions for the Cis, and finally a common discussion and evaluation. The first part, an introduction into the training goals and the research project, was supposed to help the participants to get involved in the process. They should be made aware that their input before, during and after the training was appreciated to further develop and adapt the training on SPSM competences. Next, the input on 'Basic sustainability knowledge' was expected to contribute to the learning goal that was defined for this competence as well as for 'Sustainability/ compliance': 'Participants know basic sustainability concepts like the triple bottom line approach, as well as some international frameworks and standards', and 'Participants have basic knowledge about industry initiatives and why companies get engaged in these'. A presentation was chosen to be the appropriate methodology. The role of the researcher in the first two parts of the training was being the instructor, expert and presenter. The third and fourth part of the agenda framework, the group work and discussion of the CIs, was considered to be the core of the training, as it covered the remaining competences and learning goals (Table 4.16). The four CIs (see Appendix Q) were transformed into case descriptions (Appendix O). For the cases "Supplier in a developing country" and "The stakeholder event", two different descriptions were prepared. One case covered the buyer perspective, the other case the supplier or NGO point of view. The interactive group work allowed the participants to learn by proposing appropriate behaviour and actions, to rely on their experience, and to gather feedback from others. The concluding discussion with the entire training group was supposed to gather the learnings and findings, as well as feedback in terms of the evolving approach of the action research. For the latter two agenda topics, the researcher again was in the role of giving instructions for the group work, of helping to form the groups and explain the method. In addition, she moderated the findings and discussion.

Referring to step six in the training development process (Figure 4.10), training was conducted in the academic, the public and private professional context. Covering the three areas, the sampling was congruent with the sampling approach of the Delphi study. The intended target group for the academic sector were students in business degrees, on either Bachelor or Master level. For the professional context, the sampling was set up to include purchasing professionals that have to deal with sustainability topics in their daily job, for instance being in the role of sustainability experts, supplier relationship managers or buyers for certain commodities. A number of 15-20 participants was recommended.

Finally, reflected in step seven in Figure 4.10, the evaluation of the training was planned. Being one of the core components of action research as outlined above, the dialogue with the training participants during the event and the steady adaptation of the approach to the situation was foreseen. Additionally, to measure the learning outcome according to the ten competences, evaluation questionnaires were developed. Table 4.16 shows the questions that were related to the learning goals and competences. To have a basis for comparison, a pre-training questionnaire intended to evaluate the current state of knowledge of the participants. After the training, the same questionnaire was supposed to indicate learning effects. Also, the post-training questionnaire asked the participants to give feedback on the training itself (Appendices I-N). The questions relating to the ten competences were the same for all questionnaires, slightly adapted in the wording for students or professionals in the private and public sector. The post-training questionnaire for the professional context additionally included a block of questions with a few of them focusing on the trainer as well as on the impact of the training for the daily work. It was not considered to be applicable in the academic context, as students did not have a choice in terms of the trainer, and also no working background to relate to. Nevertheless, they had the opportunity to provide any feedback in the last question: “Do you have any other comment that you would like to share?”.
In a circular understanding, learnings from previous training were planned to be transferred to the following training sessions, for example from the pilot training in HE to other HE training, or from the training in the private setting to the one that took place in the public setting at a later stage. Therefore, the questionnaires should be evaluated right after a training took place.

To describe and evaluate the application of action research, the author refers to the statement of Coghlan and Brannick (2010), who define that “[…] a good action research project contains three main elements: a good story, rigorous reflection on that story, and an extrapolation of usable knowledge or theory from the reflection on the story” (Coghlan and Brannick, 2010, p. 15). They outline that the first element, the good story, needs to be reported in a neutral manner and should be based on observable behaviour. Also, the description of what happened should not interfere with any

interpretations of the researcher. Therefore, it is now described how the SPSM training was conducted in the different settings. As outlined earlier, the sample and data collection will be described based on the steps of the action research circle (Figure 3.5), focusing on planning, and taking action. The evaluation step is covered in the results section.

The first SPSM training took part in the academic context. Because the author was working as a lecturer for operations and supply chain management at a university for applied sciences in Germany, the academic setting was easiest for her to assess. Supported by one of her PhD supervisors, who was the responsible professor for the subject, she was able to integrate the SPSM training in her lectures, which fit with the syllabus of the course already. Therefore, shortly after having finalised the second Delphi round, the author conducted training with students. Overall, three training sessions were undertaken, involving Bachelor and Master students. Table 4.17 shows the demographics of the three training sessions.

Date	**# of participants**	**Duration**	**Language**	**Participant demographics**
30.05.2018	10	1 h 45 min	English	Students Bachelor program Business Studies, 3rd semester, full-time, Mainz University of Applied Sciences
30.05.2018	25	3h 15 min	German	Students Bachelor program Business Studies, 3rd semester, full-time, Mainz University of Applied Sciences
02.06.2018	25	6h	German	Students Master program Business Studies, first semester, part-time, Mainz University of Applied Sciences

Table 4.17: SPSM training in academia – Demographics

The planning phase for the sessions included the decision for the sample and the communication to the students before the SPSM training took place. All three training sessions were undertaken within the framework of regular courses that students attended on a weekly base. The courses were selected, because they all covered supply chain management issues, therefore the SPSM training topic contributed to the syllabus and learning aims. Additionally, the number of around 15-20 participants fit with the planning for the SPSM training. Also, one course was completely conducted in English, which allowed the training session to be run completely in English, as it was drafted. In terms of the communication to the participants and their active involvement, the SPSM training session was announced in all three classes a week beforehand by the author and one of her PhD supervisors, being the professor of the courses. The students were informed on the aim of the SPSM training and that is was part of a PhD research project (Appendix I). Also, they were informed that their participation was voluntary.

Turning to the taking action phase of the action research circle, it will now be described how the training was conducted. Two pilot training sessions took part the same day, on May 30st, 2018. The author conducted the training, and her supervisor participated in the training sessions, taking notes and gathering input on issues and needs for adaptations in the training approach.

The first training was performed with ten Bachelor students in their third semester, participants of a lecture on operations, production and supply management, held in English. As they had to discuss some issues regarding their exam preparation first, the timeframe for the SPSM training was adapted and only took one hour and 45 minutes. The agenda of the training session is described in Table 4.18 below. Even with a shorter timeframe than foreseen, the author and her PhD supervisor thought that a test of the concept would contribute to the pilot experience, and probably provide first insights regarding the feasibility of the approach. As shown in the agenda (Table 4.18), the SPSM training session started after a break, with an introduction into the training, including the preparation of the case study group work. The researcher presented the introductory slides. At an earlier date, basics on sustainability were presented to the class. Therefore, and also for time reasons, there was no separate presentation of basics on sustainability in this training, but only a short wrap-up of what the students heard earlier. Consequently, the students were provided with the participant information sheet and consent form, then they filled in the pre-training questionnaire.

#	Time	Topic
1	11:45 – 13:00	Exam preparation
		13:00 – 13:15 Break
2	13:15 – 13:30	Introduction & Preparation of case study group work - Wrap-up from last sustainability input - Goal of the session
3	13:30 – 13:40	Fill-in questionnaire
4	13:40 – 14:10	Group Work on 2 critical incidents
5	14:10 – 14:30	Group: Incident No.2 - Group presentation (10 min.) - Discussion & best practice (10 min.)
6	14:30 – 14:50	Group: Incident No. 4 - Group presentation 1 (10 min.) - Discussion & best practice (10 min.)
7	14:50 – 15:00	- Questionnaire

Table 4.18: Agenda training 1 for Bachelor students on May 30st, 2018

As the group turned out to be smaller than expected, the researcher decided to work only with two groups, discussing the CIs number two "Purchasing contribution to a new sustainability strategy" and number four "Purchasing is not involved" (see Table 4.7). After she explained to the groups how

to work with the situations, the groups discussed the incidents and prepared a presentation, based on the following leading questions. First, ‘Your goals for the meeting with the other departments: What do you want to achieve?’, second ‘Your strategy to achieve these goals: What are your main arguments to achieve your goals?’, third ‘How can you build a good relationship to the other colleagues?’, and fourth ‘Which additional data and information do you need to get prepared?’. In case the groups needed assistance in terms of understanding the case situation or the questions, the author supported them on demand. For example, one group asked whether it is relevant where the case company Smith & Sons is located. After having prepared their team presentations, each group presented the results to the other group, findings were discussed together and best practice solutions were derived. The author facilitated the discussion and contributed to the best practice part by referring to her experience in practice. For example, she explained that cross-functional working in organisations is sometimes cumbersome due to organisational politics, and that the purchasing function is still not regarded to be of strategic importance in some organisations. Shortly before finalising the session, the participants provided their feedback using the post-training questionnaires. Due to time restrictions, there was no dedicated feedback round in the training itself. Overall, the planned timing was met during the training and no deviations were made.

Right after the first training session on May 30st, 2018, the next one started with a group of 25 students (see Table 4.17). Being in a Bachelor’s programme, also in the third semester, the students attended a regular lecture on operations, production and supply management. This time, the session was run in German, while using the material, like the agenda, questionnaires and case descriptions, in English. The timeframe was three hours and 15 minutes, following the usual timetable for this lecture in general (see Table 4.19). Still being in the pre-test mode, the author conducted the training, and one of the PhD supervisors attended the training, taking notes.

#	Time	Topic
1	15:15 – 15:30	Introduction: - Goal of the session - Wrap-up from last sustainability input on April 25th
2	15:30 – 15:45	Preparation of case study group work - Leading questions - Input on how to prepare for communication or negotiation situations in a systematic way
3	15:45 – 16:15	Group Work on 4 critical incidents
4	16:15 – 16:40	Group 1: Incident No.2 - Group presentation (10 min.) - Discussion & best practice (10 min.)
		16:40 – 16:55 Break
	16:55 – 17:25	Groups 2.1 & 2.2: Incident No. 3 - Group presentations (2 x 10 min.) - Discussion & best practice (10 min.)
	17:25 – 17:45	Group 3: Incident No. 4 - Group presentation (10 min.) - Discussion & best practice (10 min.)
	17:45 – 18:15	Group 4.1 & 4.2: Incident No. 12 - Group presentation (2x 10 min.) - Discussion & best practice (10 min.)
5	18:15 – 18:30	Wrap-up; Students to fill in feedback questionnaires

Table 4.19: Agenda training 2 for Bachelor students on May 30st, 2018

The agenda for the training followed the same structure as for the one before. The training started with an introduction given by the researcher. As the students already attended a session on sustainability basics at an earlier date, a short wrap-up was provided, but no detailed input. In the end of the introductive part, students received the participant information and also filled in the pre-training questionnaire. This time, timing and group size allowed to work with all four CIs, with split groups for the incidents "The supplier in a developing country" and "The stakeholder event", covering the supplier or respectively the NGO view. Just as in the previous training, after the researcher explained the procedure, students discussed and prepared their input, and then provided their presentations to the group. Again, the researcher supported them in case of questions. The group that worked on the incident "The stakeholder dialogue" needed, for example, the explanation that they worked as a buyer for the company. The results were discussed and best practice was derived. The researcher was the moderator, but also switched to the role of being an expert when best practice was discussed. Finally, students filled in the post-training questionnaire. Also, in the end of the training, some students provided their feedback spontaneously, indicating that they liked to work

with the cases, and that they also liked the split into the two groups for two incidents, covering opposed point of views. They also said that they would have liked to take this a bit further and for example do role plays.

Right after the two pilot training sessions that were conducted at that day, the author and the PhD supervisor who attended both of the training sessions reflected and documented the experiences and the lessons learned. Table 4.20 summarises the feedback that was incorporated for the design for the upcoming training.

Before the group work	- Explain that everybody works for the same company (despite the supplier and NGO)
	- Indicate that the goal is to cope with the situation that is described in the case, for example the meeting that will happen
	- Make sure that the groups send their presentations to the training before they present it to the class
Training documents	- For the "Stakeholder Event", adapt the text of the case to clearly indicate that the role is being a buyer working for Smith & Sons. This was not entirely clear to the group. - Specify the country where Smith & Sons is located
After the groups read the case study	- Go to each group and let them paraphrase what they understood; add and correct if necessary
Before the results are presented to the class	- Trainer to wrap-up each critical incident, so that the others have a clear understanding of the situation
Proposal	- Try to identify which competences are covered in the individual presentations and discussion and cross-check with SPSM competence list

Table 4.20: Documentation of findings from pilot training

The third academic training took part on June 2nd, 2018. This time, the pilot mode was finalised, and the findings from the first two sessions were already incorporated (Table 4.20). Therefore, according to the notion of iterative knowledge creation based on the input of stakeholders, in this case the training participants, and based on how the researcher experienced her role, changes were implemented. For instance, training material was adapted, and the trainer, when being in the role of the instructor, was more attentive to verify if the cases were understood by the groups. The PhD supervisor did not attend this training. The session was part of a Supply Chain Management course for 25 Master students in their first semester (Table 4.17). As they were part-time students, the course was organised in longer blocks, covering a whole Saturday. The day was held in German, but as in the preceding training, the entire training material was used in English.

#	Time	Topic
1	08:15 – 09:45	- Basics on PSM in the Supply Chain context - Sustainability: Definitions, Basics, Conceptual frameworks - Sustainability in PSM: Challenges, Standards, Tools
2	10:00 – 11:30	Sustainability in PSM: Challenges, Standards, Tools Implementation in the corporate context → Teamwork
		Lunch
		SPSM Training Module – Critical incidents in PSM
3	12:00 – 12:15	Introduction: - Goal of the session Preparation of case study group work - Leading questions
4	12:15 – 13:00	Group Work on 4 critical incidents
5	13:00 – 15:00	Group presentations & discussion
6	15:00 – 15:15	Wrap-up; Students to fill in feedback questionnaires

Table 4.21: Agenda Training 3 for Master students on June 2, 2018

The agenda therefore differed from the two previous SPSM training sessions, driven by the timeframe for the class (Table 4.21). In the morning, a dedicated input first on basics about PSM, and second about sustainability was given, including some group work on sustainability concepts and their implementation in companies. The researcher had the role of being the expert and presenter. She defined the learning goals for the morning session as follows: gathering of knowledge about basic PSM responsibilities and processes, understanding of the main challenges regarding SPSM, and the ability to discuss major SPSM tools. The group learned about the role of PSM in a supply chain context, about the main PSM processes and current challenges for PSM. Then the author provided them with a presentation of basic information on sustainability, including the definition, the historic development and basic concepts, such as the triple-bottom-line approach (Elkington, 1998). Additionally, the presentation showed the meaning of sustainability for PSM, the challenges, main goals and measures for SPSM. The following group work further elaborated on these topics, therefore, one group for instance, gathered information about the United Nations Global Compact, or another group investigated what Apple does to ensure sustainability in its supply chain. After lunch, the SPSM training session based on CIs took place. As in the second training, the timeframe was three hours 15 minutes. Also, the structure of the afternoon was exactly the same as in the second training session. All CIs were prepared, discussed and led to the definition of best practice behaviour. For this part of the training day, the researcher was more in the role of giving instructions of the

group work and facilitating the discussion. At the end of the training day, the students filled in the feedback questionnaire (Appendix L). Also, some students provided their feedback in the discussion already. The results of all the training sessions are described further below.

After having conducted the training with HE students, which led to the first iterative changes of the approach as described above, the author planned to further apply the SPSM training in an organisational setting with purchasing professionals. The planning phase turned out to be much longer than the one for the training in the academic context and took from June to mid of November 2018. The author looked for a company that was motivated to do the training, based on a clear need and commitment to improve sustainability issues in PSM. In the acquisition phase, she informed her company network on the possibility to run a SPSM training and did attend practitioner conferences. At one of the conferences in June 2018, she met representatives from an automotive company. The company was implementing a new eMobility strategy with new products coming up in future. They especially considered two moderating factors of this new strategy to be relevant for their purchasing department. First, new products in the eMobility sector required the purchase of certain raw materials or products with a high sustainability risk. Second, the image being on the forefront of eMobility included a much more explicit scope on sustainability, asking purchasing to contribute. Therefore, they were interested in the SPSM training concept. The representatives acted as gatekeepers to the PSM organisation of the company. After two meetings with two responsible sustainability managers in the PSM organisation in September and October 2018, they decided to participate and to run the training in their purchasing organisation. The author had to sign a non-disclosure agreement.
The communication to the participants was coordinated by one of the sustainability managers at the company, together with the author. The sustainability manager decided whom to invite for the training, based on the recommendation to focus on purchasing professionals that are faced with sustainability issues in their daily job. An invitation was sent to 16 designated participants, describing the goal of the training and indicating that the participation was on a voluntary base. The participant information and consent form was attached to the invitation. To include other stakeholders in the company, the sustainability manager also informed the HR department. Additionally, the responsible person at the HR department involved the workers' council representatives, as they were required to be informed about training activities. The involvement of the workers' council was at rather short notice. Thus, two days before the training was supposed to take place, the workers council intervened and asked for major changes to the pre- and post-training questionnaires. The author planned to use the same questionnaires to measure the learning effects and evaluate the training that were used in the academic context. Resulting in minor changes, the questionnaires were adapted to the professional context, e.g. not use the term 'intern', but 'buyer' instead. Also, in terms of a continuous improvement, some minor issues were corrected, like not asking two questions in one (e.g. question 2.4 in pre-training questionnaire, see Appendices J, K). Although, as of the workers' council, the

questionnaires had to be adapted. First, it was required to translate them into German. Second, the workers' council insisted to take out questions three, four and five in the post-training questionnaire that were supposed to gather feedback regarding the training methodology and concept (Appendix M). It was not clear neither to the researcher nor to the sustainability manager in the PSM department why those questions had to be taken out of the questionnaire. As a consequence, this information was collected in the format of a discussion and open feedback round at the end of training, and the researcher documented the input from the participants. Finally, the workers' council requested the training to meet strict confidentiality requirements. Therefore, it was required to hand out both questionnaires to the participants in the beginning of the training. Each pair of questionnaires was marked with a number to allow a comparison without any personal data from the participants. All participants filled in the questionnaires before and respectively right after the training.

After planning and preparation, the action phase started and the training session took part on November 29th, 2018, at the company facility. The author was in the role of being the PhD researcher and trainer. Eight participants joined the training, thereof seven purchasing professionals from various areas and the sustainability manager who organised the training. Table 4.22 shows the working experience, the role and the involvement in sustainability issues so far of the participants. A few participants already met before, others did not know each other. The training was conducted in German, but all training materials like presentations and CIs were used in English.

Participant #	Working experience	Role	Sustainability 'experience'
1	< 3 years (6 months in current position)	Sustainability Manager	Dedicated job role
2	3-10 years	Buyer (e.g. tires)	Involvement in a sustainability project together with a supplier
3	3-10 years	Buyer (e.g. electric parts)	Had to deal with supplier sustainability audits
4	3-10 years	Buyer (e.g. Exterior)	Was involved with health & safety issues at a supplier side
5	3-10 years	Buyer (e.g. Batteries)	Had to deal with conflict minerals/ critical raw material
6	3-10 years	Buyer (various commodities)	No experience with sustainability so far
7	< 3 years (3 months)	Buyer (Interior)	Had to deal with sustainability frameworks and regulations in a former job in public procurement
8	3-10 years	Buyer (Coatings)	Was involved in a strategy sustainability project in the company

Table 4.22: Participant demographics SPSM training automotive company

Following the agenda as outlined in Table 4.23, the meeting started with a welcome and introduction of the sustainability manager of the company. Then, the author took over and presented the goals of the training. She asked the participants to introduce themselves, leading to the input for Table 4.22. It turned out that only one participant was not involved in any sustainability issues before.

As the next point of the agenda, the author provided an overview on her dissertation project, including the research questions, the research approach and the findings so far. There was no agenda topic that covered the presentation of 'Basic sustainability knowledge'. The topic was not covered because the sustainability manager mentioned that all the participants already had 'Basic sustainability knowledge', and that more time should be dedicated to the work with the CIs instead. Therefore, after the presentation of the dissertation project, the author explained the procedure of the group work, outlining the CIs. As the training group consisted of eight persons, the author and the sustainability manager of the company together had decided right before the training to discuss only three CIs. The sustainability manager voted to not include "The stakeholder event", as this situation was not considered to be related to the job situation of the majority of the participants, being buyers on the operative level. Also, due to the small number of participants, the situation "The supplier in a developing country" (see Table 4.7) was not split into the two groups taking over either the supplier or the buyer point of view. In general, the CIs were the same as for the training in the educational context: 'What do you want to achieve?', 'What are your main arguments to achieve your goals?', and 'Which additional data and information do you need to get prepared?'. Only one question was taken out: 'How can you build a good relationship to your colleagues/the supplier?'. This question had a benefit for students who are not familiar with the situation in a company and therefore explicitly had to be directed to discuss this, but the researcher considered it not to be appropriate for purchasing professionals.

Time	Topic	Training Method
08:30 – 08:45	1. Welcome - Short introduction by the sustainability manager - Goals of the training - Agenda - Participant introduction	
08:45 – 09:15	2. Sustainability competences for Purchasing& Supply Chain Management: Introduction of the research project	Presentation
09:15 – 09:30	3. Preparation of case study group work: - Cases & Leading questions - Formation of groups	Presentation
09:30 – 10:15	4. Group Work on 3 critical incidents	Group work
10:15 – 10:30	*Coffee break*	
10:30 – 11:00	5. Group 1: Incident "Supplier in a developing country" - Group presentation, discussion & best practice	Group presentations & discussion
11:00 – 11:30	6. Group 2: Incident "Purchasing contribution to a new sustainability strategy" - Group presentation, discussion & best practice	Group presentations & discussion
11:30 – 12:00	7. Group 3: Incident "Purchasing is not involved" - Group presentation, discussion & best practice	Group presentations & discussion
12:00 – 12:30	8. Discussion of common finings; Documentation of take-aways for participants	Discussion
12:30 – 13:00	9. Participant feedback to the training	

Table 4.23: Agenda training for purchasing professionals private sector, November 29th, 2018

The participants worked and discussed in groups, and documented the results of the discussion and the answers to the leading questions using pin-boards. Then, each group presented the results. Other participants contributed with additional topics or ideas. Here, the author moderated the discussion and listened to the findings. In the end of the discussion, she provided an input of supplementary findings coming from the literature and Delphi interviews. The participants asked her to do so, indicating that they were interested in what she found out in her PhD research so far. All the inputs were used to cover the best practice aspect.

At the end of the training session, the participants filled out the post-training questionnaire. Additionally, as some questions regarding the training had to be taken out of the questionnaire as described above, the author collected feedback from the participants in a conversational mode and documented it on a pin-board. She asked the questions regarding the training methodology and concept that had to be taken out of the questionnaire due to the veto of the workers' council. Finally, after the training, all documented findings and results were photographed and provided to the participants with the training documentation. The training documentation was sent to all participants

three days after the training. It contained the agenda, the critical incident descriptions, the results of the documentations on the pin-boards as well as the main findings and feedback gathered in the discussion at the end of the training. The documentation was distributed by the coordinating person at the company. In terms of the main learnings in this action research circle, the researcher planned to include a section on 'Basic sustainability knowledge' in her next training, as well as to consider how to promote 'Commitment to change' (see also below and section 4.3.2).

The Delphi study of this research included experts from academia as well as from private and public procurement organisations. To reflect this setting also in the action research approach, a training session with public procurement professionals complemented the training with students and buyers from an automotive company that were described above. In the course of the Delphi study, the author got in contact with a procurement organisation in the educational sector in the UK. The organisation is a procurement centre of expertise for universities and colleges. A supply chain manager from the organisation participated as an expert in the Delphi study, and acted as a gatekeeper to introduce the training in her organisation. Therefore, in the beginning of the planning phase, she scheduled a Skype call in early November 2018, together with the CEO and the head of development and sustainability of the organisation to evaluate whether the training approach is of interest for them. In the Skype call, the author first introduced the PhD project, the training concept and the experience gathered in the academic context at that time. In the following conversation, it turned out that the organisation was keen on finding new ideas for sustainability training to support the purchasing professionals. The main two drivers for this were the increasing amount of policies and legislation in the context of sustainability in the public sector, and the strategic goal to be a leader in sustainable procurement in the sector. The CEO and the head of sustainability reported that the organisation already conducted sustainability training for purchasing professionals, but that they were looking for a more interactive training approach. Therefore, they found that the SPSM training approach developed in this PhD project matched with their need. The author offered to provide an overview of the goals and the methods of the training, including a proposed agenda. It was also said that the CIs would need to be adopted to the public procurement context. The CEO and the head of sustainability and development agreed to take a final decision whether to run a pilot training as soon as the author provided the overview of the goals, an agenda proposal and the CIs. Thus, the author developed a respective document, providing the requested information. Based on this input, another Skype call with the gatekeeper and the head of sustainability and development took place two weeks later. It was then decided that the pilot training will finally take place with a group of purchasing professionals at the organisation. The head of sustainability confirmed funding for the travel expenses of the author. She also decided whom to invite and coordinated the communication to the participants. The target group was the same as the one in the private context, being purchasing professionals that have to handle sustainability issues in their daily job. The head of sustainability sent out the invitation to 16 purchasing professionals, describing the goal and the format of the training. The participant

information sheet and consent form was provided with the invitation. In addition, she sent out the pre-training questionnaire already with the invitation and asked the participants to bring it with them to the training. This was not intended by the author, but was decided by the organisation. The questionnaires were the same that were already applied in the academic and private procurement context, although they were slightly adapted to the public procurement context. For example, the situation in question 2.4 read 'You are supposed to attend a meeting together with colleagues from representatives of strategy, student recruitment and marketing', instead of 'You are supposed to attend a meeting together with colleagues from marketing and from product development'. Also, the counterpart at the organisation found that it would be better to add the meaning of the rating to each question. Therefore, the meaning of the extremes of the scale was added in brackets: "A (strongly disagree) – B – C – D – E (strongly agree)" (Appendices K, N). Finally, being the last step of the planning phase, the supply chain manager of the organisation and the author worked on the adaptation of the CIs to the public procurement context (see also section 4.2.1).

The action phase took part on February 26th, 2019. The researcher conducted the training at the organisation's facility. 14 purchasing professionals participated in the training, thereof one sustainability manager and the supply chain manager that acted as a gatekeeper in the planning phase. Table 4.24 shows the demographics of the participants. They all knew each other from other training or their daily jobs.

Participant #	Working experience	Role	Sustainability experience
1	3-4 years	Head of IT procurement	Circular economy, challenges in IT category
2	10 years	Sustainability Manager	Dedicated job role
3	10 years	Construction and facility procurement manager	Sustainability challenges in these categories
4	1 year	IT procurement manager	Implement sust. frameworks in institutions
5	6 years	Responsibility Manager	Provide support in sustainability matters to procurement managers
6	9 years	Head of , shared service, procurement; procurement manager laboratories & research	Carbon Heat mapping, implement standards for the research category
7	7 years	Head of contracting	Implement sustainability frameworks in contracts
8	3	Supply Cain Manager	Sustainable procurement leaders group
9	2,5 years	Supply Chain Manager (IT & Construction/ facility)	sustainability leadership group
10	1 years	Buyer	Tries to implement in her role
11	2,5	Supply Chain manager	Sustainability leadership group
12	11,5 years	Professional services HR	Consider sustainability when engaging audits
13	5 years	Collaborative procurement team (IT, hardware)	Embed sustainability in frameworks
14	3,5 years	Procurement manager	Involved in responsible supply chain projects

Table 4.24: Participant demographics SPSM training public procurement context

Following the action research cycle, the researcher built the training on the experience gathered already in the academic and the private procurement context. As further described in section 4.3.2, the evaluation of the questionnaires in the preceding training did not document any learning effects regarding the competences 'Commitment to change' in the sense of a general motivation for sustainability. Instead, participants in the private procurement training stated that input from top management regarding the drivers and the importance of the topic was missing, which was found to be one of the reasons for a lack in 'Commitment to change'. Therefore, for this training session, the researcher managed to convince the organisation to bring their CEO to the training. As shown in the agenda in Table 4.25, he was present for a 15 minute timeslot, indicating how important and necessary the sustainability topic is for the organisation, and why he found it important to run this training. Another finding from previous training was the importance of 'Basic sustainability knowledge'. Particularly in the training in the automotive company, it became evident that the buyers

did not have a full understanding on what sustainability really means, and sometimes were not even aware of the company's own activities and standards in sustainability, which hindered the successful solution of the CIs. Consequently, for the training session in the public procurement organisation, the author added basics on sustainability to the training agenda, including definitions, concepts and the most important information that participants need to know in the public procurement context.

Time	**Topic**	**Training Method**
10:00 – 10:15	1. Welcome, Introduction - Goal and agenda of the training session - Participants to fill in pre-training evaluation questionnaire	
10:15 – 10:30	2. CEO input: - Why is sustainability important for APUC and public procurement?	Speech/ Presentation
10:30 – 11:15	3. Basic sustainability knowledge: - Definitions & Concepts - The public procurement context - Individual competences and organisational enabling - Overview information about the research project on sustainability competences in purchasing & supply management	Presentation
11:15 – 11:30	*Coffee break*	
11:30 – 12:15	4. Critical incidents Preparation of case study group work: - Cases & Leading questions Group Work on critical incidents	Group work
12:15 – 12:45	*Lunch break*	
12:45– 14:45	5. Group presentations and common discussion Cases 1 and 4, including a group covering the supplier/ NGO view Cases 2 and 3, purchasing professional view only	Group presentations & discussion
14:45 – 15:00	6. Wrap-up Participants to fill in post- training evaluation questionnaire	Discussion

Table 4.25: Agenda training purchasing professionals public procurement, February 26th, 2019

Overall, the training started at 10:00 and ended at 15:00 in the afternoon, with two breaks of 45 minutes in total. Thus, the overall training time was the same as for the training at the automotive company. As already indicated above, first the CEO provided a welcome and a short speech on the importance of sustainability and the reason for having decided to participate in the pilot training. As the head of sustainability and development, who was supposed to do the welcome note, had to call in sick at that day, the first two agenda points were combined and both presented by the CEO. He took about 20 minutes altogether, welcoming the participants and the author, explaining how the

contact to the author was established and why the training takes part. After the introduction of the CEO, the participants filled out the pre-training questionnaire. As it was provided to them with the invitation, a few of them did bring it already. Also, the consent form was collected from each participant. The following agenda point was dedicated to 'Basic sustainability knowledge'. After a short introduction of her individual CV and motivation, the author provided a presentation, including definitions of sustainability, the triple bottom line approach, basic international frameworks and standards and specifics regarding the public procurement context. As this took 15 minutes longer than expected, she skipped the presentation of details on the research methodology and approach of her PhD study. Also, the participants indicated that they were more interested to start with the group work. Then, after the coffee break, the work with the CIs started. The researcher gave instructions and helped forming the groups. Having a group of 14 participants, all four CIs were considered, including the split into the buyer and the supplier view for critical incident number 1 "The supplier in a developing country", as well as for number 12 "The stakeholder event" the buyer and NGO view. The latter were covered by groups of two purchasing professionals each, the other CIs were discussed in groups of three participants. The participants worked in groups in two meeting rooms. Especially the groups working on the same CIs were split in different rooms to make sure they prepared the case separately in their individual role. The leading questions were the same as for the training in the private context: 'What do you want to achieve?', 'What are your main arguments to achieve your goals?' and 'Which additional data and information do you need to get prepared?'. The groups worked for 45 minutes on the CIs and documented their answers to the leading questions taking notes individually, as no pin boards were available. Then, after a working lunch, each group presented the results. As they did this verbally, the author documented the main findings and statements of each group on a flip chart (see exemplary documentation in Figure 4.11).

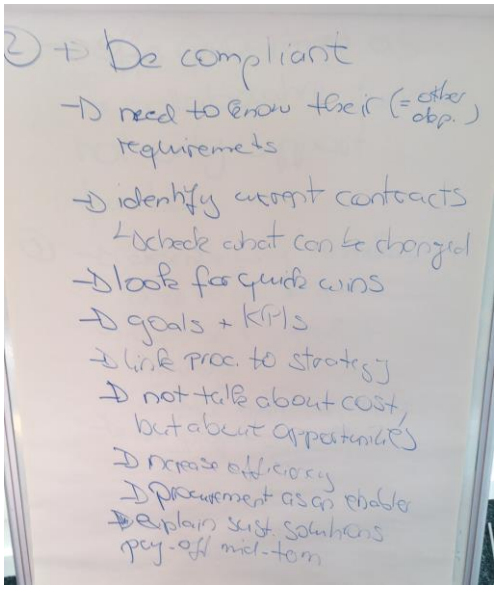


Figure 4.11: Exemplary documentation of discussion in class

As in the other training, other participants contributed with additional topics or ideas, and finally the author provided an input of supplementary findings coming from the literature and Delphi interviews. When discussing the critical incident "Purchasing contribution to a new sustainability strategy", a vivid discussion started on the impact of procurement on the strategy of an organisation in general, and the role and image of procurement as such. The participants considered how current developments like digitisation might impact procurement, and discussed whether the area becomes obsolete or even more important in future. For example, some participants said that procurement might have a future role as a moderator in an organisation. It was discussed whether sustainability competences feed into a role like this. Then some of the procurement professionals said that very often, also for sustainability issues, they get involved on short notice, being asked to provide rather last minute decisions. Overall, the discussion of the CIs lasted until 14:30, and therefore to 15 minutes less than expected. At the end of the training session, the author asked for feedback regarding the training method and the applicability of the CIs. Finally, the participants filled in the post-training questionnaire (Appendix N).

4.3.2 Reflective discussion of the results

When again referring to Coghlan and Brannick (2010) and their statement that "[…] a good action research project contains three main elements: a good story, rigorous reflection on that story, and an extrapolation of usable knowledge or theory from the reflection on the story" (Coghlan and Brannick, 2010, p. 15), the following section will cover the latter two elements. It reflects on the experiences and learnings, and extrapolates not theory, but usable knowledge for the SPSM competence issue. Furthermore, following Friedman et al. (2018), who describe how best to write about action research projects, the author reflects her own experiences and learning, as well as the voices from the stakeholders of the SPSM training sessions, namely the training participants. Therefore, this section is structured accordingly. First, the researcher evaluates how the action research contributed to her intention to foster SPSM competences. Second, the feedback that she gathered from the participants is described, differentiating between the results found in the training with Bachelor students, Master students, and those of the training conducted with purchasing professionals in a private and public procurement environment. The section concludes with a summary of the findings and their impact for this research. The limitations of the action research approach are described in section 4.3.3. Nevertheless, the author believes that it is important to point out already at this stage that the most important findings and the benefit of the five SPSM training sessions are discussed and presented at an aggregated rather than an individual level, showing the main directions. The training contributes to the discussions and thoughts about the character of sustainability competences as such, taking into consideration the role of PSM in an organisational context. Also, the SPSM training proposes interactive training methods and at the same time revealed the need for further investigation on how to educate and train sustainability in PSM. The evaluation of the questionnaires and the field notes

provide indications as to whether the training resulted in learning effects regarding SPSM competences. Future research might focus on a more comprehensive evaluation, based on a quantitative empirical study, or an in-depth action research project within one organisation. Overall, it needs to be considered that the action research and the application of the questionnaires in this context still follow the research philosophy and approach outlined in chapter 3.

The researcher's voice

The results of the action research depend on the assumptions and motives of the researcher (e.g. Easterby-Smith et al., 2008), as she was actively involved in the observation. She was part of every training session, being in the role of the researcher, the trainer, the moderator, and the expert. Therefore, it makes sense to start with an analysis of her own experience in the process before looking at the results from the viewpoint of the participants of the training sessions.

The assumptions and motives are based on the personal values and beliefs of the researcher (section 3.2.1). The motivation for this thesis is grounded in her conviction that sustainability should be integrated in the daily business of purchasing professionals, because only then can true sustainability be achieved. She considers education as being decisive to enable purchasing professionals to act in a sustainable manner. Positioning herself as being a researcher following the interpretivist paradigm, based on a subjectivist, constructionist view (section 3.2.2), she believes that knowledge creation in an educational setting requires to integrate the perspective of those that are supposed to learn. Only then, in an iterative process of providing input and discussing it with stakeholders, knowledge can evolve. Therefore, for the action research part, she decided to get actively involved in each training session to further evolve her research on SPSM competences.

When looking at her voice after having conducted the action research part, the researcher found that the decision to conduct five SPSM training sessions contributed well to her expectation that the knowledge of how to conduct SPSM training would evolve over time, based on the feedback and learning gained in every single training session. The importance of certain topics, for example 'Basic sustainability knowledge', became evident, which led to an adaptation of the agenda for the following training sessions. After having included the topic in the agenda, the next round of knowledge creation resulted in a clearer picture of what training participants considered to be 'Basic sustainability knowledge'. Due to the number of training sessions with a broad group of stakeholders in the HE and professional context, the researcher also understood much better the differences in terms of understanding as well as training needs. A one-time training with only one group of stakeholders would not have led to this finding.

In terms of the involvement of the stakeholders' perspective, the researcher experienced the CIs to be very useful to initiate group discussions. The CIs were accepted and understood by all training participants. They led to in-depth discussion about how to successfully manage day-to-day

sustainability issues. The different participant groups, especially the professionals, used the CIs to refer to their own specific situations. The input that was gathered in their discussions helped the training group and the researcher to derive learning and knowledge, as well as a more general understanding of the situation. Therefore, the intended inductive approach was confirmed in the course of the training. Nevertheless, as the participants adapted the CIs to their own needs, the researcher became aware that learning of SPSM competences should focus even more on individual professional backgrounds and issues. Pre-defined incidents did work well to initiate discussions, but especially for training in the professional context it might be useful to let the participants create their own situations.

In terms of her own role in the research process, according to the constructivist viewpoint, the researcher got involved in the training by taking over various roles. As a researcher, she observed the event and how her planned approach worked out in the real-world. During the training, she was the responsible instructor, leading through the course of the event. She facilitated discussions, summarised statements and documented findings. Finally, for instance when presenting facts for 'Basic sustainability knowledge', she was in the role of being the subject expert. Covering all these roles in the condensed format of a half-day training event was perceived to be exciting, useful and challenging at the same time. Exciting, because the researcher was part of bringing her research into real-life, giving her the opportunity to further improve the understanding of SPSM competences. She also found it useful to be for example in the role of the moderator and the expert. Her subject expertise in SPSM motivated the participants to contribute to the discussion and to get engaged, because they wanted to learn from her experience, too. Nevertheless, the researcher found it also challenging and demanding to combine the roles. For instance being the observer who is undertaking research for academic purposes and contributing expert knowledge in a setting that she was very familiar with, due to her own professional experience, required the ability to continuously monitor herself in terms of not getting too engaged in the practitioner role herself.

The voices of the stakeholders as presented in the following sections certainly were influenced by the involvement of the researcher. Participants were biased because they wanted to support her research, or they were influenced by her experience and expert knowledge, which has to be taken into consideration when looking at the input of all the training participants. Two data sources provided the input. The first data source were the questionnaires filled-in by the participants before and after the training. The questionnaires measured the learning effects regarding the ten competences that were reflected in the training concept. Table 4.16 shows how each question aims to measure one of the ten competences. Second, feedback data was gathered during the training sessions and documented in the researcher's field notes. The data provides insights into how the training format as such was perceived.

The voice of student participants

The feedback gathered in the three training sessions with students is provided separately for Bachelor students and for Master students. The two courses for Bachelor students were run in a pre-test setting on the same day, and both did not include an introduction of 'Basic sustainability knowledge'. The class for the Master students took place at a later stage, and learnings from the previous sessions were incorporated in the training design. For example, a session on sustainability basics was included. Also, as described in section 4.3.1, the SPSM training module was part of a whole training day. Therefore, considering these differences, the author decided to evaluate the feedback of those two groups separately.

Overall, 29 post-training questionnaires were filled out in both classes with Bachelor students, compared to 35 pre-training questionnaires that were provided. This was due to some students having left the class earlier, or for other reasons. One student even provided her questionnaire a day after the training by leaving it in the author's mailbox at the institution. When comparing the answers to the questions related to specific competences before and after the training by running a paired sample t-test, the results as presented in Table 4.26 show significant improvement in scores in all competences except for 'Commitment to change' and 'Sustainability/compliance'.

Although the data collected was from relatively small samples and was on a Likert-type scale, the use of the paired sample t-test is justifiable on the grounds of its established robustness for use in these situations (Norman, 2010; de Winter & Dodou, 2012).

		Mean	Std. Deviation	Sig. (2-tailed)
Pair 1	Communication (Pre-training) - Communication (Post-training)	-1.10345	.93903	.000
Pair 2	Systems Thinking (Pre-training) - Systems Thinking (Post-training)	-1.06897	.96106	.000
Pair 3	Basic Knowledge (Pre-training) - Basic Knowledge (Post-training)	-.41379	1.05279	.043
Pair 4	Cross-functional Teamworking 1 (Pre-training) - Cross-functional Teamworking 1 (Post-training)	-1.00000	1.16496	.000
Pair 5	Commitment to Change 1 (Pre-training) - Commitment to Change 1 (Post-training)	-.06897	1.03272	.722
Pair 6	SRM Application of Tools (Pre-training) - SRM Application of Tools (Post-training)	-.96552	.98135	.000
Pair 7	SRM Communication (Pre-training) - SRM Communication (Post-training)	-1.00000	1.00000	.000
Pair 8	SRM Cooperative Attitude (Pre-training) - SRM Cooperative Attitude (Post-training)	-.89655	1.11307	.000
Pair 9	Demand Management (Pre-training) - Demand Management (Post-training)	-.44828	1.08845	.035
Pair 10	Sustainability/Compliance 1 (Pre-training) – Sustainability/Compliance 1 (Post-training)	-.34483	1.00980	.077

Table 4.26: Paired sample t-test results for training with Bachelor students (competences where the data shows no improvement highlighted in yellow)

The statistical results indicate that the Bachelor students overall, for example, increased their understanding of how to explain the importance of a sustainability issue either internally or towards a supplier, which is reflected in the questions covering the competences "Communication skills" and "SRM communication" (Table 4.16). Also, the training led to a better rating of their own knowledge in terms of 'Supplier relationship management (Application of tools)', at least regarding the application of a sustainability risk assessment. On the other hand, the results indicate that the training made no difference when looking at 'Sustainability/compliance' and 'Commitment to change'. 'Sustainability/compliance' was measured by the following question: "Please rate this statement: I know joint sustainability initiatives in some industries and I understand why companies get involved in those". As outlined above, the two SPSM training sessions for Bachelor students did not include an agenda topic on sustainability basics. Only nine of the 29 students indicated in question one of the pre-training questionnaire that they already had attended a sustainability training before. Therefore, they probably never heard of joint sustainability initiatives before, and the topic was also not covered in the SPSM training. Thus, the reason for the statistical results are quite evident here. SPSM training that included a basic session on sustainability information like industry initiatives and their relevance, for instance the training with the Master students, led to a statistical significance (see table Table 4.27). Turning to 'Commitment to change', the data showed no significant improvement for all training that was conducted with students and with professionals (see Table 4.28). This result may be interpreted in two different ways. First, 'Commitment to change', that was assigned to the cluster of meta-oriented SPSM competences, is probably the competence that relates most to personal attitudes and values when looking at the SPSM competences overall. A half-day training session may not be sufficient to change an attitude. Moreover, a class-room teaching event might not be the appropriate training method at all for 'Commitment to change'. Second, taking into consideration the rather behavioural character of the competence, the author found it difficult to find an adequate question to measure 'Commitment to change'. The chosen "Please rate this statement: When I buy new clothes, I prefer brands that are known for their adherence to environmental and social standards. I would even send an email to the company to ask for their sustainability standards" might not have been the most suitable one. Section 5.2 discusses in more details how the meta-oriented competence domain as such in this research reflects the intersection between competences and attitudes, and what this means for the application of the SPSM competence model.

The feedback that was provided in questions two, three and four of the questionnaire, asking about what the participants liked most and weather they have suggestions for enhancing the learning experience, supported for example the need for more basic sustainability information. One student from the first training class wrote "Get some more information about the topic before that could maybe help to solve the case", or others in the same class said "It was too short, I'd like to learn more

about sustainability", or "Talk more about the certifications that could be interesting for the scenario".

The students appreciated the interactive character of the SPSM training. A student who participated in the second training class highlighted "The group exercise and the discussion of different ideas and concepts of the participants". Also, participants liked the real-life character related to the critical incidents from practice. For example, a student who participated in the first training class said "I liked that we got the opportunity to solve a problem in purchasing that often occurs in real life", or another from the same class "I liked working in a group and think like being in a real company". Figure 4.12 shows an exemplary slide of one of the presentations that students provided, indicating that they tried to act as being in a real situation.

Figure 4.12: Exemplary slide presented by the students

Some of the participants also found it very good that they were able to practice their presentation skills. "We had to work on the topics on our own; it was a good presentation exercise", said for instance one participant of class 1.

The training class with Master students resulted in 20 pre-training questionnaires and 15 post-training questionnaires. As in the other training, some students left earlier and therefore did not fill out a post-training questionnaire. Overall, the results of the paired sample t-test show statistical significance (Table 4.27). In contrast to the participants in the two classes for Bachelor students, the Master students documented a learning in 'Sustainability/compliance'. In terms of 'Sustainability/ compliance', a respective session in sustainability basics was part of the training, as outlined above. Therefore, the perceived learning might result from this input that was not given in the Bachelor classes. Master students interestingly also documented a slight increase in the competence 'Commitment to change'.

When looking at the students' comments in questions two, three and four, some participants said that the work on the CIs and their discussion in the class could have been more in-depth and detailed. One participant for example wrote "Take more time and play the situations in class", or another said

"Real negotiation in class would be nice". One participant found the training class too long, referencing to the entire training day. Overall, the participants liked the case-based examples and the interactive character of the session, like the Bachelor students did.

		Mean	Std. Deviation	Sig. (2-tailed)
Pair 1	Communication (Pre-training) - Communication (Post-training)	-1.40000	.82808	.000
Pair 2	Systems Thinking (Pre-training) - Systems Thinking (Post-training)	-1.93333	.79881	.000
Pair 3	Basic Knowledge (Pre-training) - Basic Knowledge (Post-training)	-1.73333	.70373	.000
Pair 4	Cross-functional Teamworking 1 (Pre-training) - Cross-functional Teamworking 1 (Post-training)	-.93333	.79881	.000
Pair 5	Commitment to Change 1 (Pre-training) - Commitment to Change 1 (Post-training)	-.86667	1.12546	.010
Pair 6	SRM Application of Tools (Pre-training) - SRM Application of Tools (Post-training)	-1.66667	1.29099	.000
Pair 7	SRM Communication (Pre-training) - SRM Communication (Post-training)	-1.26667	1.03280	.000
Pair 8	SRM Cooperative Attitude (Pre-training) - SRM Cooperative Attitude (Post-training)	-1.60000	.91026	.000
Pair 9	Demand Management (Pre-training) - Demand Management (Post-training)	-1.33333	.89974	.000
Pair 10	Sustainability/Compliance 1 (Pre-training) – Sustainability/Compliance 1 (Post-training)	-1.13333	.83381	.000

Table 4.27: Paired sample t-test results for training with Master students (competences where the data shows no improvement highlighted in yellow)

The voice of purchasing professionals

Turning towards the two training sessions that were conducted with purchasing professionals, the consolidated statistical results are presented in Table 4.28, Table 4.29 and Table 4.30.

The paired sample t-test evaluation was based on the questionnaires gathered in the two training sessions with professionals from one private and one public organisation. Before discussing the consolidated results, some specifics in each of the two training sessions need to be outlined. At the automotive company, the entire group of eight participants filled-in the pre-and post-training questionnaires. As outlined in section 4.3.1, the questionnaires had to be adapted to get the approval from the company's workers council. They were translated to German, and all the questions that asked for feedback regarding the training itself had to be taken out. Due to these adaptations, the question regarding 'Commitment to change' was split in two sub-questions in the German version, instead of one question in the English version: "Please rate this statement: When I buy new clothes, I prefer brands that are known for their adherence to environmental and social standards. I would even send an email to the company to ask for their sustainability standards." The wording stayed exactly the same also in German, and the results showed no significant change in the responses however the questions were presented. Therefore, Table 4.29 and Table 4.30 provide the results separately for the two training groups. The agenda and the timing for the training at the automotive company was outlined in section 4.3. As described, based on the decision of the sustainability manager, no input on 'Basic sustainability knowledge' was included. In the pre-training questionnaires, three out of eight participants indicated that they already participated in other sustainability training.

The learning from the other training was incorporated in the training design for the event in the public procurement sector, following the idea of the iterative and circular nature of the action research circle. For instance, a dedicated topic on the agenda covered sustainability basics in terms of definitions and standards. Also, to foster the commitment of participants, a welcome and introduction of the CEO was organised, giving him the opportunity to promote the relevance of sustainability for the company and for procurement in the sector. The 14 participants filled out the pre- and post-training questionnaires. They provided additional feedback in the open questions comment fields, and also in a feedback round at the end of the training.

		Mean	Std. Deviation	Sig. (2-tailed)
Pair 1	Communication (Pre-training) - Communication (Post-training)	-.63636	.84771	.002
Pair 2	Systems Thinking (Pre-training) - Systems Thinking (Post-training)	-.31818	.94548	.129
Pair 3	Basic Knowledge (Pre-training) - Basic Knowledge (Post-training)	-.40909	.73414	.016
Pair 4	Cross-functional Teamworking 1 (Pre-training) - Cross-functional Teamworking 1 (Post-training)	-.54545	.80043	.004
Pair 5	Cross-functional Teamworking 2 (Pre-training) - Cross-functional Teamworking 2 (Post-training)	-.54545	.73855	.002
Pair 6	Commitment to Change 1 (Pre-training) - Commitment to Change 1 (Post-training)	-.22727	.61193	.096
Pair 7	Commitment to Change 2 (Pre-training) - Commitment to Change 2 (Post-training)	-.09091	.86790	.628
Pair 8	SRM Application of Tools (Pre-training) - SRM Application of Tools (Post-training)	-.45455	.67098	.005
Pair 9	SRM Communication (Pre-training) - SRM Communication (Post-training)	-.59091	.79637	.002
Pair 10	SRM Cooperative Attitude (Pre-training) - SRM Cooperative Attitude (Post-training)	-.81818	.95799	.001
Pair 11	Demand Management (Pre-training) - Demand Management (Post-training)	-.40909	1.36832	.175

Table 4.28: Paired sample t-test results for training with professionals; public+private (competences where the data shows no improvement highlighted in yellow)

		Mean	Std. Deviation	
Pair 1	Sustainability/Compliance 1 (Pre-training) – Sustainability/ Compliance 1 (Post-training)	-.37500	1.40789	.476
Pair 2	Sustainability/Compliance 2 (Pre-training) – Sustainability/ Compliance 2 (Post-training)	-.37500	.51755	.080

Table 4.29: Paired sample t-test results for training with professionals; private–Sustainability/ Compliance (competences where the data shows no improvement highlighted in yellow)

		Mean	Std. Deviation	
Pair 1	Sustainability/Compliance (Pre-training) – Sustainability/ Compliance (Post-training)	-.07692	.49355	.584

Table 4.30: Paired sample t-test results for training with professionals; public–Sustainability/ Compliance (competences where the data shows no improvement highlighted in yellow)

The paired sample t-test shows statistically significant results for competences related to cooperation and communication at the interface to suppliers (e.g. 'SRM (Application of tools)' and 'SRM (Cooperative attitude)'), and also regarding the collaboration with other functions in the organisation (e.g. 'Cross-functional teamworking'), as well as general communication skills. In contrary the statistics reveal rather less learnings in terms of 'Systems thinking', 'Commitment to change', 'Demand management – Category strategy' and 'Basic sustainability knowledge'. For the latter, there was a slight difference when looking at the questionnaires of the two training groups separately. The participants in the public sector did document a higher increase in 'Basic sustainability knowledge'. This might indicate that the input on sustainability basics that was added to the agenda, based on the experiences from the other training, came to fruition in the training with the public procurement group. Nevertheless, another rather functional competence, namely 'Sustainability/ compliance' did not show significant increase in knowledge also for the public procurement professionals. The related question, asking for knowledge about industry initiatives and their benefit, probably did cover a rather too specific aspect, which was not relevant to the public procurement sector. For 'Systems thinking', when looking at the individual questionnaires, participants from both groups did document only a very minor increase in learnings. Their feedback was based on the following question that measured this competence: "Imagine you would need to discuss with the management why sustainable purchasing and supply management efforts pay off for the company. Are you able to explain the business case for sustainability in purchasing?". This finding appears to be relevant for future professional training. It might be important to emphasise this aspect, and to think of how the CIs could be used to foster participants to think about a business case and to find arguments. Role plays or group discussions may be the best teaching methods. Interestingly, the results for both student groups showed improvements in 'Systems thinking competence'. Therefore, the results seem to suggest that the approach was appropriate for the level in HE, but needs to be further adapted for professional training. Finally, the data evaluation did not show significant changes in terms of 'Commitment to change' also for purchasing professionals. As mentioned above, the two reasons for this may be the setting of the training being too short to gather learning effects in a rather attitude-related competence, as well as the difficulty in measuring 'Commitment to change'. Interestingly, also the input from the CEO at the beginning of the training course in the public sector did not lead to an increase in 'Commitment to change'. In terms of learning within the action research circle, the author included the CEO input, considering that it may help to promote 'Commitment to change'. At least in the specific situation of the training here, the measure did not help. However, the speech from the CEO was rather short and not very specific. For future training, it should be considered to prepare managerial input thoroughly and allow a longer timeframe than 15 minutes.

When looking at the comments from public procurement professionals that were provided in the open questions comment fields, participants said that they liked most working with the CIs and the discussion with their colleagues. Participant P2 for example stated "I liked the interactive approach. The opportunity to work on case studies and listen to the views of other procurement specialists", or participant P10 liked the "Sharing knowledge/best practice with colleagues in other business areas". Also, the inclusion of different points of views in two CIs was appreciated by the purchasing professionals. Participant P6 said that he liked "The case studies. Mine was very similar to what I do on a daily basis, but the case studies of the other teams made me think about the reverse side (supplier side) of my daily job. I found this very useful", or participant P13 wrote "Good interactive session – looking at the same issue from multiple angels". One participant (P14) pointed out that the training was different compared to others: "[I liked most the] Participative nature from research angle, which is different from previous sustainability training". On the other hand, the purchasing professionals who participated in the training found that the CIs could have been more dilemma-like, and especially they missed a closer relation to their working background and the procurement processes they use in their daily work: "A companion course could be run, one for each of our major spend categories to advise procurement colleagues of areas suitable for consideration" (P10), or "Another exercise perhaps, looking at identifying issues relating to ICT, providing background to main exercise" (P13), as well as "The training could cover exact examples, one for a service, good and (unclear to read for the author), and identify the sustainability issues relating to them. For example: furniture, window cleaning and a building project" (P6). This was comparable to what the purchasing professionals from the automotive training stated.

Also, some participants proposed to integrate more background information in the training. Participant 9, for example, stated "More discussion around different forms of sustainability, i.e. social/economic/environment. It is a bit generic currently. More detail could help. More discussion about how procurement professionals can embed sustainability in the procurement process, i.e. specification, contract management". The following statements go into the same direction: "More information on learning outcomes/competencies, their definition and how they interlink" (P11), "Stronger definitions for the various elements of sustainability" (P12).

Only two participants shared other comments, one being happy with the training day "No, I really enjoyed today. Thank you!" (P6), and another wondering about her role and sustainability implementation: "In general, my experience working in a small college, it is me that tries to embed sustainability into procurement exercises and not the end users like the IT department" (P8).

The table in question three provided the following results, consolidated in Table 4.31.

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
3.1 The objectives of the training were clearly defined.	2	9	3		
3.2 Participation and interaction were encouraged.	10	4			
3.3 The topics covered were relevant to me.	5	8	1		
3.4 The content was organised and easy to follow.	7	6	1		
3.5 This training experience will be useful in my work.	2	9	3		
3.6 The trainer was knowledgeable about the training topics.	10	4			
3.7 The trainer was well prepared.	10	4			
3.8 The training objectives were met.	4	7	3		
3.9 The time allowed for the training was sufficient.	6	8			

Table 4.31: Consolidated feedback question 3, post-training questionnaire, training public

Overall, the participants rated the training positively, especially the experience with the trainer as well as the participative character of the course. The latter fits with the comments provided above. In terms of the relevance of the training for the own work and the training objectives, the ratings go in line with the comments that were provide in the other questions. Participants missed the dedicated reference to their individual job environment.

The statements and feedback that was provided in the questionnaire includes what was also discussed at the end of the training in a short wrap-up session. It became evident that the closer relation to the daily work of purchasing professionals in the public sector would add a significant benefit to the training. In terms of ideas for future training, one participant contributed the idea to train quick steps in sustainability implementation, as she described that very often purchasing is asked to integrate sustainability aspects in a project or tender on short notice, without having very much time to start a process or implementation from scratch. Another idea was a format to discuss impact and benefits of procurement to foster sustainability in more detail and on the job level, including the environmental and social implications and benefits of a specific decision and discuss this in groups. Finally, participants thought that a future training could focus on a real-life case study, e.g. a tender process and discuss close to the real time example how and when in the process sustainability topics can be considered. Finally, the group agreed that sustainability needs to be embedded in organisational structures, and that it needs to be considered as a long-term topic for future procurement.

As indicated, at the training in the automotive company, no feedback was gathered by questionnaires in terms of what the participants especially liked, or where they would see room for improvement.

As described above, this was due to the intervention of the workers' council. Therefore, the feedback was gathered in a discussion at the end of the training, and the author took field notes to document what the participants contributed. The notes were shared with the participant group after the training, together with the entire documentation.

Participants found the CIs realistic, nevertheless they said that some more information could have been provided. For example, the critical incident "The supplier in a developing country" should include the information whether the supplier in Vietnam is a strategic supplier or not. Also, with being more detailed, the CIs should even be more critical or difficult to solve, said the participants. They proposed to design the CIs in a dilemma-like manner. The critical incident "Purchasing is not involved", for instance, should include that nobody informs purchasing at all, not even a colleague during lunch. In general, participants were missing input on sustainability basics, like the definition of sustainability and an overview of the aspects that fall under the definition. Some of the participants indicated that they thought only of one aspect, for example health and safety or environmental sustainability, and did only realise in the course of the training that the scope obviously is much broader. They were also missing input on the company's sustainability standards and activities. One group had the idea to make a new critical incident "Development of a code of conduct", based on an input on sustainability. Others said that a training and incidents for a specific issue or commodity like conflict minerals would help those that are involved. The group that discussed the critical incident "Purchasing contribution to a new sustainability strategy" came up with a circle, showing why PSM contribution has a benefit (see Figure 4.13). They missed a more in-depth discussion on this framework with the whole group.

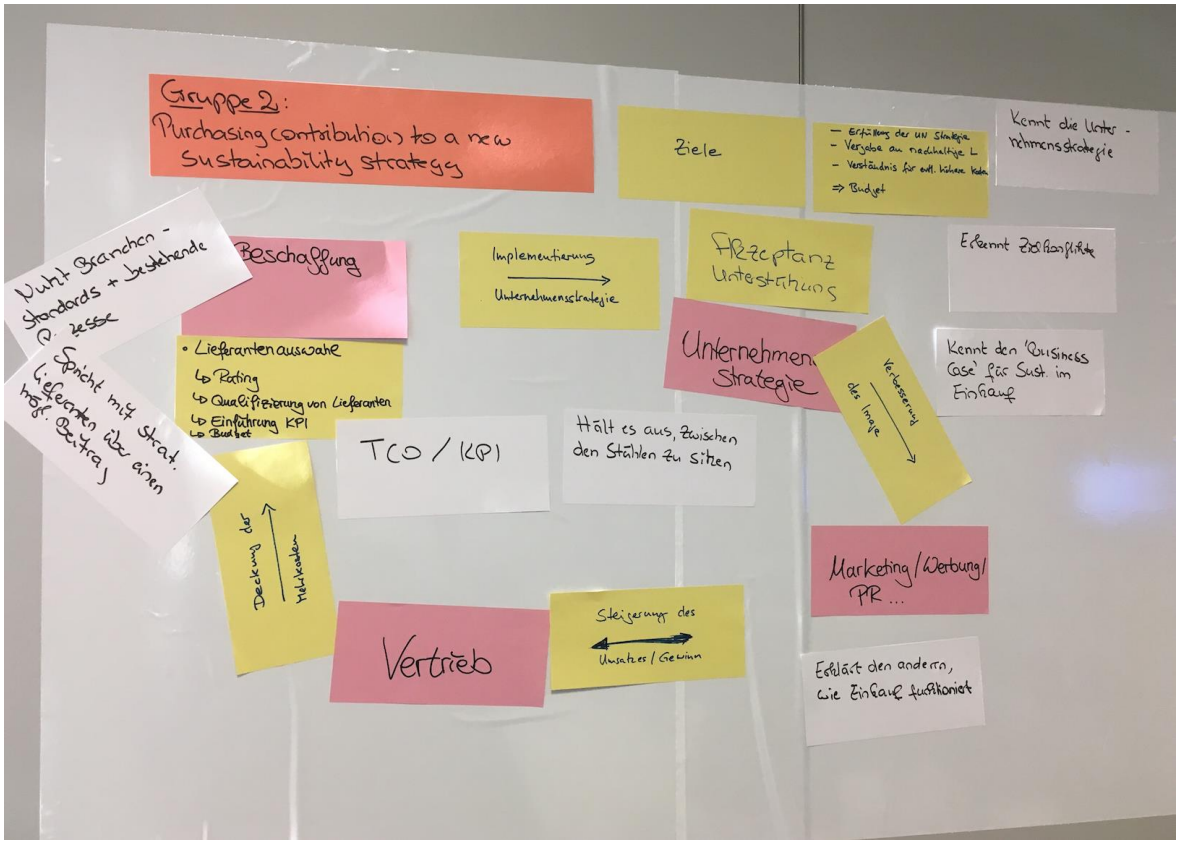


Figure 4.13: Exemplary result of group work, automotive training, conducted Nov. 29, 2018

Summary of learnings

In summary, aiming for "[….] extrapolation of usable knowledge or theory from reflection of the story" (Coghlan and Brannick, 2010, p. 15), the main findings were the following.

All participants, being students or purchasing professionals, said that the CIs were a valid base for the interactive discussion in class. Some purchasing professionals stated that the CIs that were discussed in the training reflected situations that they know from their daily practice. Therefore, the application of the CIs in the five training sessions confirmed the approach in this research in the sense of having covered the main competences in the coding of the literature and the Delphi expert interviews, mirrored with the feedback in the second Delphi round. The ideas how to solve the critical situations were conform to what was found in literature and in the Delphi study. All participants, especially the purchasing professionals, confirmed that the CIs covered relevant areas in SPSM.

Also, when looking at the feedback from participants documented in the questionnaires, the paired sample t-test shows a significant difference for the vast majority of variables after the training. Especially social-oriented competences like communication or SRM (Communication) were mentioned by all participants, as well as functional-oriented competences. For the latter, SRM (Application of tools) was mentioned most often. When looking at the individual questionnaires, purchasing professionals from the public sector additionally documented an increase in 'Basic

sustainability knowledge' compared to the participants from the automotive company. This may have resulted from the agenda topic on basic sustainability information that was included only in the training for the public sector, and not for the private company. Therefore, for future training, it is recommended to add a session on basics in sustainability, including definitions, general standards and industry-driven activities as well as company specific regulations and standards before working with the CIs. Especially in the training at the automotive company, it became evident that the buyers did not have a full understanding on what sustainability really means, and sometimes were not even aware of the company's own activities and standards in sustainability. This was a big learning effect for the group. Looking at 'Systems thinking competence', Master students documented learnings, whereas the data provided from professionals did not lead to a significant change here. This finding indicates that the training was more feasible to foster 'System thinking competence' in the HE context, and needs adaptations for the professional target group. More dedicated role-plays or discussions, being more focused on the management context and the business case for sustainability might help to initiate learnings in 'Systems thinking competence' also on the professional level. Being the most evident item with rather no relevant improvements after the training for all groups, 'Commitment to change' needs to be evaluated in a more in-depth manner in future research and in future SPSM training. Chapter 6 discusses the implications, and proposes future research directions. Finally, from a methodological point of view, the circular approach of the action research as it was applied in this research approach led to useful findings and improvements of the training module, like for example the importance of the tone from the top to include the organisational level, and the requirement of a standard agenda topic on sustainability basics.

4.3.3 Limitations

Although the findings of the action research part of this study were valuable for the transformation of the SPSM competence model in a training module, it is important to bear in mind some limitations. Looking at the rather small numbers of participants in the training, especially in the professional context, the results must be interpreted with caution. A follow-up study with a larger data set for empirical testing is therefore recommended. Apparently, for follow-up studies, questionnaires may be reworked, and the measurements for competences like 'Commitment to change' might to be adapted. The questions applied in this research were meant to be closely linked to the competences they were supposed to measure (Table 4.16), nevertheless the learnings that were gathered should be incorporated in future research. This includes rather evident issues like not asking two questions in one.

The restrictions in the usage of the questionnaires in the automotive company led to certain limitations in terms of the richness of the data. Feedback regarding the training session as such was not given anonymously, but only in person at the end of the training. There is a potential of bias in terms of the participants being rather polite towards the researcher, willing to support her research.

Also, language issues need to be taken into consideration, as the training was conducted in German and in English, with the researcher being a German native speaker, and the participants being either German or British. Misinterpretations and translation issues might have occurred. Also, if the training had been conducted with participants from other cultures, feedback on the training method and probably also learnings might have been different.

Finally, the format of a compressed action research was applied in this study, which did not allow to investigate any mid- or long-term impact on individual competence of the action research. Also, the restricted insights in the two professional organisations that were involved due to the merely one-time contact at the day of the training event did not allow any in-depth case analysis. It was not possible to gather a deeper view on organisational impacts and enablers (see 2.4) that might have influenced how the training was perceived. Therefore, it might be interesting for future research to apply a more in-depth action research approach in a more iterative manner over a longer period of time to measure individual learnings and organisational learnings at the same time.

5 Towards a SPSM Competence Model for purchasing professionals

This chapter consolidates the findings from research and practice and presents the derived SPSM competence model.

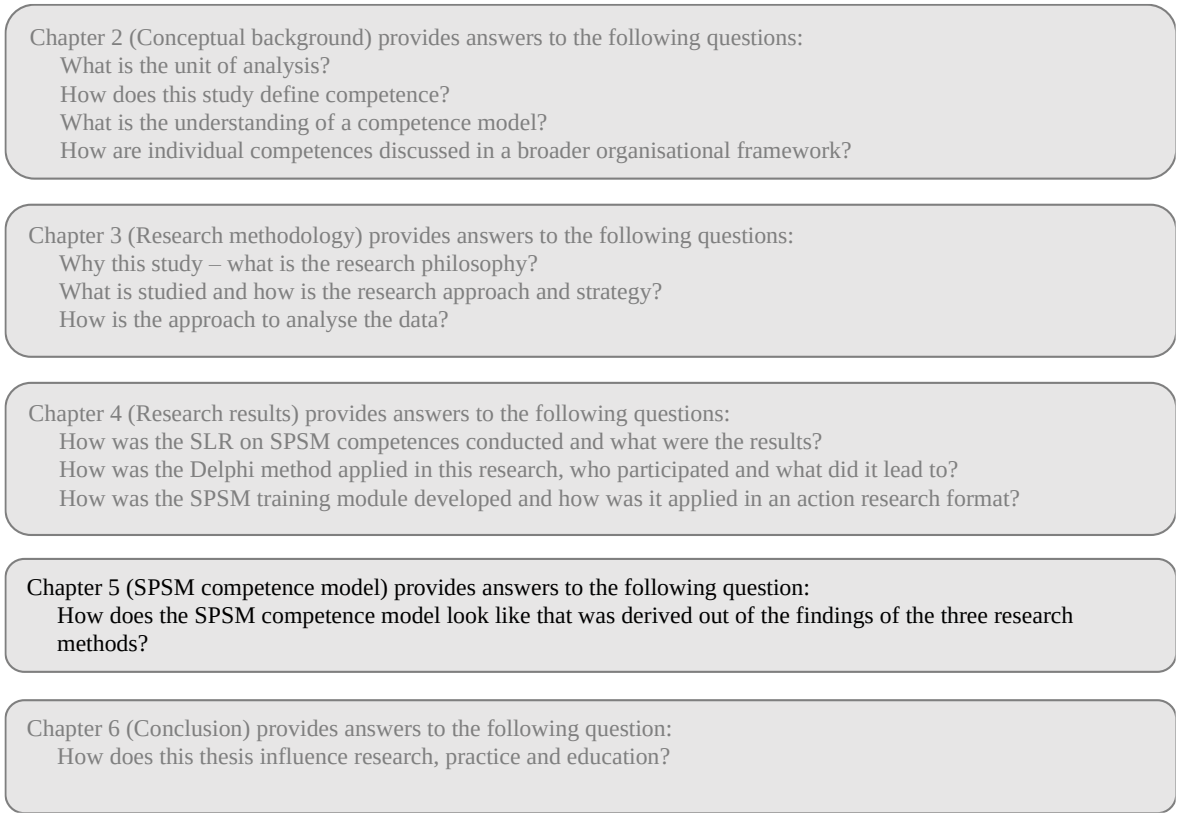


Figure 5.1: Contribution of chapter 5 in reference to the structure of the thesis

5.1 Combined results from research and practice

The development of a SPSM competence model for purchasing professionals was based on a multi-method approach (see chapter 3). First, current knowledge was evaluated by conducting a systematic literature review. Papers were coded, using a pre-defined node structure, according to PSM process steps (Figure 2.4). The node structure was complement with new nodes during coding. The coding of the relevant literature resulted in a first list of SPSM competences (Figure 4.4), clustered according to Delamare-Le Deist and Winterton's (2005) competence typology (Table 2.1). The results of the SLR were the basis for selecting CIs. Following the research-based approach to develop a competence model (see section 2.3), the CIs were applied for interviews with experts in the first round of a Delphi study. The coding of the interview data complemented existing nodes, but also led to new ones. Additionally, during the process, some nodes were renamed or new sub-categories were built. This was driven by the richness of the data that was gathered. The data led to more precise and

profound descriptions for each node or namely competence, and in turn therefore required adaptions in terms of the denomination or the grouping of codes to nodes. Table 4.9 shows the list of competences after coding the interviews with the Delphi experts. Figure 5.2 gives an example how the data was summarised, structured and assigned to one of the four competence clusters. In reference to Gioia et al. (2013), coded parts of the text are considered to be first order concepts, leading to nodes in the sense of second order themes. Finally, these were aggregated to dimensions, in this case the four competences clusters, defined by Delamare-Le Deist and Winterton (2005).

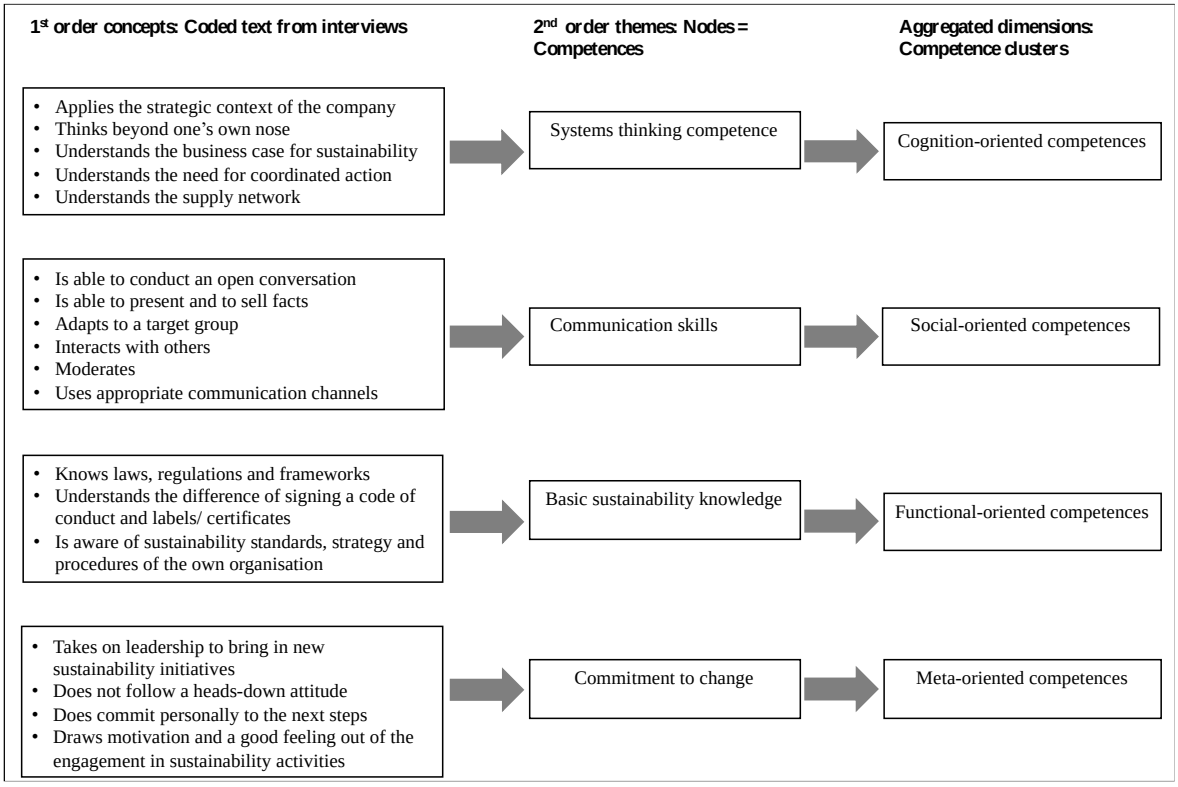


Figure 5.2: Exemplary description of data aggregation (based on Gioia et al., 2013, p. 21)

The second Delphi round validated the findings, and the experts prioritised competences towards their relevance for training in the educational or the professional context (Table 4.12). Finally, a set of 26 competences was developed, being a blueprint for a SPSM competence model that can be adapted for individual organisational and educational contexts (Figure 5.4). Table 4.12 shows the steps in gathering the competences throughout the research process. In what follows, the main changes in terms of the competence set for each of the steps according to Table 4.12 are described, and the consolidated results are provided. The selection of the final set of 26 SPSM competences will then be discussed.

In the first step, when coding the papers that resulted out of the SLR, 14 pre-defined nodes did get codings. These pre-defined nodes reflected elements of a PSM process (Figure 2.4), namely in the source-to-contract area and for centres of competence. It turned out during coding that 'Supplier relationship management' covers a very broad range of associated competences. Therefore, the node

was split into four new nodes, covering the different aspects of communication, application of tools, a holistic view, and a cooperative attitude. All four of them belong to a different competence cluster in the final model. In addition, the coding of the literature led to 15 new nodes. Overall, a list of 29 competences resulted from the SLR, reflected in the first column of Table 4.12. The second step, the evaluation and systematic coding of the transcribed interviews with Delphi experts, resulted in an additional 16 nodes, and confirmed 25 of the nodes that were in the pre-defined set of the SLR. As outlined above, the rich set of data led to the re-sorting of nodes. 'Organisationally and politically savvy' was split into 'Interpersonally savvy', 'Organisationally savvy' and 'Politically savvy', all of them covering different aspects. The latter two belong to the meta-oriented competence cluster, whereas 'Interpersonally savvy' was considered to be a social-oriented competence. 'Demand management – Category strategy' was structured into the three sub-nodes 'Purchasing specifications', 'Supply market research', and 'Strategic positioning'. The new sub-nodes reflected the codings of the expert interviews and helped to better describe the competence 'Demand management – Category strategy'. Nevertheless, the three elements confirmed the allocation in the functional-oriented competence cluster. The sub-nodes were not further prioritised, and therefore were all included in the final competence set. Finally, in the second step of the model development, 'Thoughtfulness' was divided into 'Thoughtful towards others' and 'Conscientiousness'. It turned out that Delphi experts described different actions for the two compared to the findings in literature, therefore the two new nodes made sense to the author. 'Thoughtfulness towards others' is part of the social-oriented competences, 'Conscientiousness' is rather cognition-oriented. Similarly, the new nodes 'Persistence' and 'Confidence' resulted out of the former 'Steadfastness'. As described in section 3.4.2, all decisions regarding the labelling and grouping of competences were discussed with the two supervisors of the dissertation, with one being a native English speaker. 41 competences built the set after coding the interviews with the Delphi experts. The 41 competences are listed in column two of Table 4.12. All of those were discussed and prioritised in the second Delphi round. The experts prioritised 24 competences when being asked which ones they consider to be relevant in a training context. Also, they did not mention additional competences that they were missing in the list gathered in the first Delphi round. The priorities that they assigned to both the educational and the professional training context did overlap. Therefore, it was decided to create one common list for both the educational and the professional context. The third column in Table 4.12 shows 24 competences that resulted out of the second Delphi round. As is discussed in the conclusions chapter, a broader empirical validation of the model might result in a differentiation between the educational and the professional training context.

At this point, it is useful to look at the commonalities and differences in the results that were achieved in the individual steps of the process. Overall, regarding the four competence clusters as of Delamare-Le Deist and Winterton (2005), the SLR as well as both rounds in the Delphi study led to competences that populated each cluster. At the same time, the researcher did not code any

competence that did not fit to one of the four clusters. Therefore, the clustering model seemed to be the appropriate framework for the SPSM competence model. The data evaluation of the SLR and the two Delphi rounds led to a clear prioritisation of the functional-oriented domain. The highest number of competences was allocated in this area. The high priority of functional-oriented competences might be influenced by two factors. First, the pre-defined nodes regarding the PSM process (Figure 2.4) pre-populated the functional area. Second, authors of academic papers as well as experts might have found it easier to describe functional or technical competences than others. Nevertheless, the consolidated results provide a clear indication that a range of functional-oriented competences form the basis for a SPSM competence model, because they were considered to be relevant from literature and from experts. When thinking about appropriate learning methods, this kind of competences might be trained by established learning methods like presentations, readings and application in practice.

Interestingly, the meta-oriented domain was much more emphasised by the Delphi experts compared to what was found in literature. They contributed five new meta-oriented competences in the first Delphi round, and provided additional input to the existing ones. Also in the second Delphi round, meta-oriented competences were prioritised the second most often, following the functional-oriented domain. This indicates that in a forward-looking manner, a SPSM competence model should include a range of meta-oriented competences. Experts delivered a broad range of descriptions of actions that help solving critical sustainability situations and are grounded in the meta-oriented cluster. Therefore, these competences seem to have a reasonable influence on the successful implementation of SPSM. SPSM training concepts will have to deliver appropriate training methods (see section 6.3). The codings for the other two competence domains did not vary to a high degree, nevertheless contributed new competences and rich descriptions of successful behaviour also in those areas.

When now looking at which competences directly refer to an element of the PSM process, there was a clear priority in literature as well as from the Delphi experts on the strategic part of the PSM process and on centres of competence (Figure 2.4). Neither the SLR nor the two rounds of the Delphi study depicted competences related to the transactional part of the PSM process. Due to this finding, the application of the SPSM competence model in organisations can be adapted to specific job roles or job profiles in the strategic area, or for centres of competence. Overall, ‘Supplier relationship management’ was emphasised in all steps of the process. With its four characteristics ‘Application of tools’, ‘Holistic view’, ‘Communication’ and ‘Cooperative approach’, ‘Supplier relationship management’ belongs to all of four different competence domains. All other process-related SPSM competences are positioned in the functional area. For instance, ‘Sustainability/compliance’ with its two sub-nodes was another prominent competence related to the centre of competence part of the PSM process. In terms of the strategic source-to-contract process elements, ‘Demand management – Category strategy’ stood out in the entire evaluation process. These results may be interpreted to indicate that some process steps are more relevant in terms SPSM than others. As already mentioned

above, this might impact the application of the SPSM competence model for specific job roles in organisations. Additionally, the findings strongly support the inclusion of 'Supplier relationship management' in SPSM training, considering the four competence domains that probably require different training methods. Also, PSM education should focus on the strategic elements of the PSM process. As is discussed in chapter 6, this might go in line with the future positioning of PSM as a function in organisations. Overall, the majority of the listed competences were not related to a specific step in the PSM process, although they presumably support the successful fulfilment of certain process steps. 'Systems thinking competence', 'Communication skills', 'Cross-functional teamworking', 'Basic sustainability knowledge', and 'Commitment to change' were the most relevant according to literature and to Delphi experts. Delphi experts also found 'Critical thinking' to be very important, whereas literature pointed on 'Self-reflection'. Especially the ones that were clustered in the cognition-oriented, in the social-oriented, and in the meta-oriented area, which was valid for the majority of those competences listed here, require adequate attention when implementing the SPSM competence model.

To summarise, the evaluation of the literature resulted in a set of competences that was generally confirmed by Delphi experts. Even when considering the bias that the CIs were derived from the SLR findings, the experts were provided with the opportunity to add own additional situations and actions in the interviews and in the second Delphi round. They were also free to reject given CIs when they felt they were not appropriate for their individual context. Therefore, the researcher interpreted the results as described, namely that the literature provided a solid set of competences that was further elaborated and complemented in the Delphi study. Therefore, the combination of the research methodologies provided a profound basis for the development of the final SPSM competence model. The following section describes the decision path that led to the SPSM competence model.

Based on the lists of competences that were gathered in the process as just described, the author developed the final set of SPSM competences. Figure 5.3 shows the leading parameters to transform the data delivered in Table 4.12 into the final set of 26 SPSM competences (Figure 5.4).

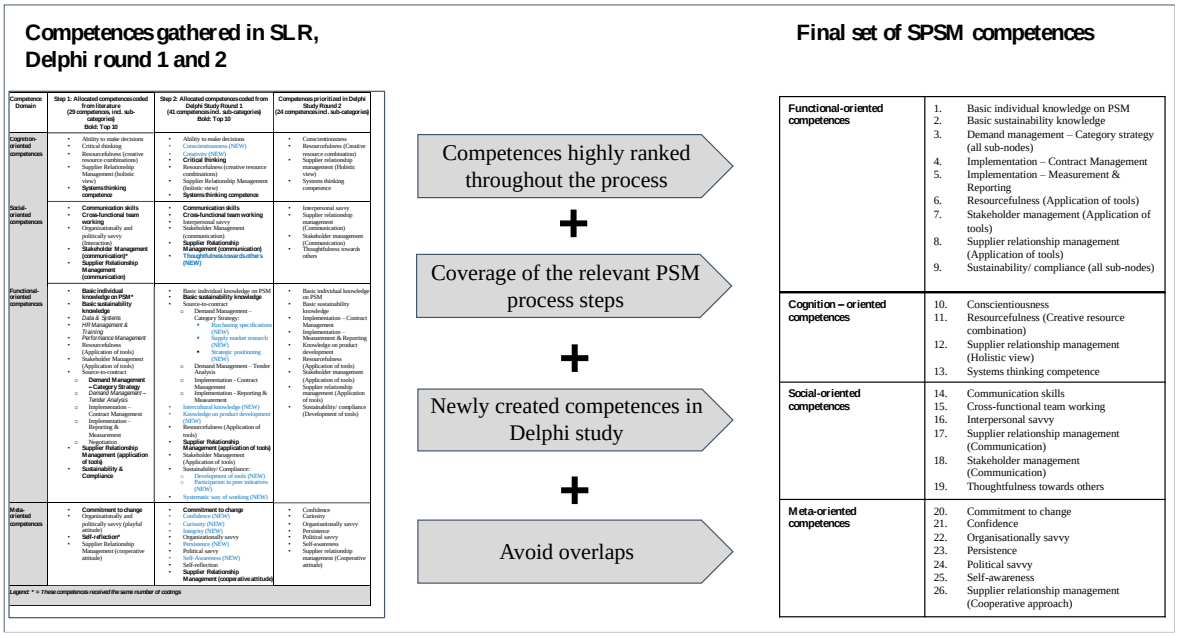


Figure 5.3: Developing the final set of SPSM competences (referring to Table 4.12 on the left, and Figure 5.4 on the right)

As indicated in Figure 5.3, four parameters led to the decision for the final SPSM competence set. First, the set was supposed to include competences that were highly ranked throughout the entire research process. Second, complementing the first selection criteria, the final list should reflect competences that were related to PSM process steps. Third, the newly created competences gathered in the Delphi study should be reflected in the final set. Finally, to make the final set as meaningful as possible, overlaps were avoided. In what follows, details for the four steps are provided.

In the first step, the entire list of 24 competences prioritised in Delphi round 2 was taken for the final set, with two exceptions being made. First, the codings for 'Curiosity', for example "Is eager to learn" or "Is open towards challenges", led to the decision to merge 'Curiosity' with 'Commitment to change'. Second, 'Knowledge on product development' was assigned to 'Demand management – Category strategy'. This was decided because the gathered descriptions of behaviour provided evidence of these two competences being closely connected. For example, for 'Demand management – Category strategy' it was coded "[…] talks to the product development department to understand what materials are not allowed", and very similar for 'Knowledge on product development': "Understands the interconnection of product development, raw materials and risk". Then, priority competences from the SLR and the first Delphi round were added to the list, covering 'Demand management – Category strategy' with all sub-nodes, 'Sustainability/compliance' with all sub-nodes, 'Cross-functional teamworking', 'Communication skills' and 'Commitment to change'. Two competences that were part of the top 12 or top 10 in the SLR and in Delphi round 1 were not taken for the final list, namely 'Self-reflection' and 'Critical thinking'. For 'Self-reflection' it turned out that the node 'Self-awareness' which was newly created based on the Delphi expert input, covered in a more comprehensive manner a comparable range of behaviour. For instance, "Is aware and

conscious when she/he cannot answer some of the questions" was coded for 'Self-reflection', whereas "Is aware of own sphere of influence, competences and role" in a later stage led to 'Self-awareness'. Therefore, to avoid redundancies, the author decided to include the newer 'Self-awareness' in the final list. Having two rather related nodes in the competence lists simply reflects the dynamic over the entire process where the more and more data was gathered and re-ordering and continuous development took place. Similarly, 'Critical thinking' was not taken over to the final SPSM competence set. Although it was within the top 10 competences in the first Delphi round, experts did not prioritise 'Critical thinking' in the second round. Again, when looking at the codings, it turned out that other competences include what was coded earlier in the 'Critical thinking' node. For example, "Is able to keep to the topic; shows endurance in asking questions" was at a later stage in the process more appropriately covered in the node 'Persistence'. Finally, the author checked whether competences that were newly created based on the expert interviews are represented in the final SPSM competence set. For four of them she decided not to include them: 'Creativity', 'Systematic way of working', 'Intercultural knowledge' and 'Integrity'. For 'Creativity' and 'Systematic way of working', the coded data did not support the creation of a rich SPSM competence. The latter is covered in a more specific manner to SPSM in the nodes 'Resourcefulness (Creative resource combination)', 'Resourcefulness (Application of tools)' and 'Conscientiousness'. For 'Creativity', the node included only eight codings, which were rather general, as for example "Is creative to find new solutions". With 'Integrity', the author decided that 'Self-awareness' and 'Confidence' cover related items in a more applicable manner. For example, "Acts in a reliable way" or "Indicates that this does not meet her/his personal values" fit to the latter two. The aspect of values apparently needs to be considered when talking about SPSM. As outlined in section 2.4, individual motivations and values impact SPSM behaviour. Nevertheless, looking at the focus of this research, 'Integrity' here was finally not considered to be a competence in the true sense of the competence definition that was chosen for this study (see section 2.2). The decision to leave out 'Intercultural knowledge' is arguably to be discussed. In the process of this research, the codings for 'Intercultural knowledge' were redundant to 'Communication skills', 'Implementation-Contract management' and 'Supplier relationship management (Communication)'. Nevertheless, considering global supply networks, intercultural competence is apparently relevant. A further development of the SPSM competence set might evaluate whether the intercultural aspect should rather be an integral part of other competences, as it was decided at this stage, or if a separate competence category is needed.

To summarise, the process to develop the final set of SPSM competences intended to ensure that both, the backward view as represented by academic literature, as well as the current view of the Delphi experts, were reflected in the final SPSM competence list. The 26 SPSM competences provide the answer to the leading research question for this research: "Which individual competences of PSM professionals are required to implement SPSM?". As the pure list of SPSM competences as such

nevertheless does provide rather familiar denominations of competences, the following section will elaborate in detail the meaning and the SPSM specifics for each competence.

5.2 Competence and knowledge areas

As outlined in the previous section, the research process led to a final set of 26 SPSM competences for purchasing professionals. The set includes the competences that were highly ranked in literature and in the two Delphi rounds (Figure 5.3). The development process of the model followed the recommended approach for competence model development, design and description (e.g. Spencer and Spencer, 1993; Dalton, 1997; Campion et al., 2011; Krumm et al., 2012) as described in section 2.3. The competences resulted out of the discussion of 12 CIs, and they cover the relevant parts of the PSM process. Each competence was given a name and was assigned to a competence cluster. The competences were sorted to one of the four clusters based on the cluster definitions as shown in Figure 2.5. Figure 5.4 lists the competence names by competence clusters. Also, a definition was developed for each competence. Descriptions of successful behaviour for each competence, taken from either the literature or the Delphi interviews, complemented the definition. They were tested in terms of their relevance and robustness in five training sessions in the action research part of this dissertation. Considering that most of the competences that are listed in the final set are rather general in terms of their denomination, the definition and in particular the behavioural descriptions are the core of the SPSM competence model.

Definitions and descriptions, together with the critical incident situations, allow to position a competence in the SPSM context, and to derive for example job descriptions or learning goals for SPSM training and education. It was decided not to specify any scales or levels of competence maturity, because the SPSM competence model was supposed to provide a rather generic framework that allows and requires adaptation to a specific organisational context. Companies need to tailor the SPSM competence model for example to strategic goals, to company culture, job roles and HR processes (Mansfield, 1996; Campion et al., 2011; Krumm et al., 2012; Spencer and Spencer, 2012). In the HE context, educational institutions probably want to adapt and further elaborate the model to learning objectives and taxonomies in their study programmes, their degrees and their curricula (Bloom, 1956; Kallioinen, 2010; Anderson et al., 2014).

In what follows, each competence is described according to the structure as outlined above, sorted by the four competence clusters functional-oriented, cognition-oriented, social-oriented, meta-oriented competences (Delamare-Le Deist and Winterton, 2005). The author explains why the competences were sorted to a specific cluster. Additionally, interrelations of competences and references to the PSM process (Figure 2.4) are discussed. These interrelations may be considered

when developing job profiles, which is discussed in the managerial implication section. At the end of this chapter, the clustering of the SPSM competences is compared with the work of Osagie et al. (2014) to further validate the approach and to discuss at the same time the limitations of the clustering and clear-cut definitions of competences. Osagie et al. (2014) identified eight individual CSR competences and applied the same framework from Delamare-Le Deist and Winterton (2005) for their clustering.

The following competence descriptions are positioned in the conceptual framework (section 2.2) of this study, therefore the underlying competence definition is quoted again at this point: A competence is "a set of abilities, skills and other attributes and characteristics that enable a person to manage complex situations effectively; this set can be developed through learning and experience" (Krumm et al., 2012, p. 3, translated by the author).

Functional-oriented competences	1. Basic individual knowledge on PSM 2. Basic sustainability knowledge 3. Demand management – Category strategy (all sub-nodes) 3.1 Purchasing specifications 3.2 Supply market research 3.3 Strategic positioning 4. Implementation – Contract Management 5. Implementation – Measurement & Reporting 6. Resourcefulness (Application of tools) 7. Stakeholder management (Application of tools) 8. Supplier relationship management (Application of tools) 9. Sustainability/ compliance (all sub-nodes) 9.1 Development of tools 9.2 Participation in peer initiatives
Cognition-oriented competences	10. Conscientiousness 11. Resourcefulness (Creative resource combination) 12. Supplier relationship management (Holistic view) 13. Systems thinking competence
Social-oriented competences	14. Communication skills 15. Cross-functional team working 16. Interpersonal savvy 17. Supplier relationship management (Communication) 18. Stakeholder management (Communication) 19. Thoughtfulness towards others
Meta-oriented competences	20. Commitment to change 21. Confidence 22. Organisationally savvy 23. Persistence 24. Political savvy 25. Self-awareness 26. Supplier relationship management (Cooperative approach)

Figure 5.4: Final set of 26 SPSM competences

5.2.1 Functional-oriented SPSM competences

The functional-oriented competence cluster as it was defined in this research (Figure 2.5) includes SPSM competences in a rather technical sense, directly related to an occupational context. Overall,

the functional-oriented competence cluster is the one that includes the highest number of SPSM competences.

All competences that describe specific elements of the PSM process were added to this cluster, as they refer to PSM activities that need to be performed in an operational sense. ‘Demand management – Category strategy’, including the sub-nodes ‘Purchasing specifications’, ‘Supply market research’ and ‘Strategic positioning’, ‘Implementation – Contract management’ and ‘Implementation – Measurement & Reporting’ refer to the source-to-contract part of the PSM process in Figure 2.4. ‘Supplier relationship management (Application of tools)’ and ‘Sustainability/ compliance’ with its sub-nodes ‘Development of tools’ and ‘Participation in peer initiatives’ belong to the level of competence centres. Supplier relationship management is the only process-driven competence that is also included in the other competence clusters, depending on a focus on tool application, communication, holistic view or cooperative approach.

Other competences in the functional-oriented group are such as ‘Basic individual knowledge on PSM’ and ‘Basic sustainability knowledge’. Both include the term ‘knowledge’, in the sense of “information that a person has in specific content areas” (Spencer and Spencer, 1993, p. 10; see also section 2.2). Therefore, the author sorted them to the functional cluster, considering its technical and operational character. Finally, two other SPSM competences were added to this cluster, because they describe competences regarding the application of operational tools: ‘Resourcefulness (Application of tools)’ and ‘Stakeholder management (Application of tools)’. Table 5.1 shows the competences associated to the cluster, their definitions and observable behaviour.

Functional-oriented SPSM competences		
Competence name	**Definition**	**Observable behaviour (based on CIs)**
Basic individual knowledge on PSM	Basic individual knowledge on PSM is the understanding of the role of the function, and the ability to contribute to this role in terms of "[…] the management of external sources – goods, services, capabilities, and knowledge – that are necessary for running, maintaining and managing the primary and secondary support processes of a firm at the most favourable conditions" (van Weele, 2010, p. 8).	• Is familiar with the purchasing strategy • Knows the company processes • Looks at process descriptions • Looks at the materials database • Knows the performance of the supply base (economically, ecologically, social) • Analyses the dependency of this supplier • Conducts market analyses • Investigates on potential suppliers • Explains the sourcing situation (cost, sourcing capacity) to colleagues • Knows and understands price developments • Explains how prices could be kept (e.g. through bundling) • Does a classic Pareto analysis

Basic sustainability knowledge	Basic sustainability knowledge includes a general sustainability subject matter expertise as well as knowledge about laws, regulations and frameworks and specific rules and procedures within an organisation.	• Knows generic trends in sustainability • Knows a range of sustainability solutions related to products or processes • Knows legislation • Knows the mission and the sustainability strategy of the own company • Knows the established compliance processes in the company • Knows the thresholds of the organisation • Understands what non-compliance to environmental standards mean to the supplier, the own company and the other companies in the industry in terms of risk • Is able to ask for specifics e.g. about environmental or social aspects within her/his commodity/ category • Knows about other organisations which provide useful sustainability information • Knows and understands eco-balances

Implementation – Contract management	Contract management in the SPSM context requires the competence to incorporate the various dimensions of sustainability requirements into contracts with suppliers (Johnsen et al., 2014), and taking into consideration the requirements of the relevant legal system that a contract is based on, as well as the impact on PSM processes.	• Is aware of legal implications if a sustainability dimension is integrated in contracts • Understands how to include human rights and environmental standards in contracts • Breaks down general guidance into specific requirements that can be integrated in certain process steps (e.g. contracts) • Understands what is in the contract • Does not impose the laws and standards of the own country to the suppliers' countries
Implementation – Measurement & Reporting	Measurement & Reporting in the SPSM context requires the competence to monitor, document and report suppliers' sustainability performance based on KPIs.	• Proposes how to integrate sustainability in the supplier evaluation process • Develops ideas how adherence to a code of conduct can be monitored with the existing supplier management processes and tools • Discusses and derives targets for procurement • Develops a standard reporting template and integrates supplier data to get an overview how every supplier complies with the code of conduct • Works to get approval for changing the KPIs and performance metrics • Keeps a file with complete information which suppliers signed the code of conduct, and copies of them • Sets up regular meetings with a supplier to monitor measures

Demand management – Category strategy • Purchasing specifications • Supply market research • Strategic positioning	"Category management is the process of developing insights into stakeholder requirements, comparing these to external industry intelligence, supply base capabilities and operational risks, and developing a strategy to align internal requirements with external supply market conditions" (Monczka et al., 2016, p. 47). For SPSM, it includes the competence to gather and understand purchase needs specifications in terms of their sustainability impact, to search the supply market for sustainable products or solutions, and to derive a strategic approach how to include sustainability in the processes of category management.	• Tries to get informed by talking to the product development department to understand what materials are not allowed • Looks out for substitutes and discusses with subject matter experts • Explores other more sustainable sources • Has insights in the market of commodities (e.g. raw materials) • Reflects if a certain component fits to the strategic long-term purchasing and product portfolio from a sustainability point of view • Explains how the company can benefit from suppliers in terms of its sustainability strategy • Explains the consequences of changes for the sourcing of any kind of material • Takes a look at the goals of the company and thinks of how purchasing could contribute (e.g. reduce the carbon footprint by working together with suppliers on this issue)
Resourcefulness (Applications of tools)	Resourcefulness in the sense of tool application is the competence to apply existing SPSM standards and tools provided by external parties, either based on own knowledge or by using external know-how and resources.	• Conducts online research and gets a right set of standard documents that can be applied • Looks at code of conducts of peer companies • Looks at industry standards • Applies industry standards • Buys external know-how if required • Consults with specialists including external organisations and NGOs

Stakeholder management (Application of tools)	Stakeholder management can be defined as "Assessing the interests and impact on influencing parties on purchasing decision-making outcomes" (van Weele, 2018, p. 34), here applied to the SPSM context. It includes being able to identify stakeholders and to assess their interests, and to implement a range of different working models, adapted to specific stakeholder groups*. ** Excluding suppliers, as this is covered in Supplier relationship management (Application of tools) in this model*	• Looks out for stakeholders in this procedure like the marketing department in the own company, government, other customers • Tries to assess and determine what are the goals and plans of the stakeholders • Develops a cooperation and integration strategy with the NGO • Involves a third party perspective (e.g. NGO) • Works together with all parties involved • Offers different approaches to the stakeholders to achieve the goals

Supplier relationship management (Application of tools)	Supplier relationship management (Application of tools) is the competence to be aware of a range of tools to be applied in the SPSM context. In includes the ability to choose the best tools and make use of them in a specific situation.	• Looks at the existing supply base and ranks suppliers on a sustainability scale • Looks at potential environmental and social risks of potential suppliers • Thinks of how to monitor (e.g. by auditing with internal or external auditors) • Evaluates suppliers based on a code of conduct • Asks suppliers for what the company wants in terms of data and information • Meets with the supply base to go through the code of conduct and the measures that have been taken • Asks for certificates and data from suppliers • Asks for policy on ethical buying and selling • Asks for proof and examples (e.g. personnel records) • Conducts pre-qualification training for suppliers • Applies a self-assessment questionnaire • Develops an action plan with the supplier to implement the guidelines • Applies audits on a case-by-case decision • Prepares for how to ask questions during the audit • Has an escalation process in place • Announces purchase stops

Sustainability/ compliance • Development of tools • Participation in peer initiatives	The competence required in a centre of excellence for sustainability/compliance is to develop a SPSM strategy and to derive concepts and measures for its implementation internally in the organisation as well as with various external stakeholders.	• Defines for the organisation "What is sustainability for us?" • Formulates minimum standards as a first step in case there is nothing yet, and then starts with monitoring measures and other activities • Links the approach to industry initiatives • Participates in industry initiatives or initiates participation of the own company • Develops a code of conduct • Considers regulations in the context of a code of conduct • Sets up rules/a zero-tolerance definition under which certain suppliers should not be nominated/be given business • Establishes a process how to react if a supplier does not sign the code of conduct • Evaluates appropriate ways for direct monitoring • Develops a questionnaire for suppliers

Table 5.1: Functional-oriented SPSM competences

The competences that do not reflect a step in the PSM process (Figure 2.4) are nevertheless closely connected to the latter. 'Basic individual knowledge on PSM', 'Basic sustainability knowledge', and 'Resourcefulness (Application of tools)' can be considered as fundamental competences that are not related to specific elements of the PSM process, but are required for all process steps and roles in SPSM. Therefore, especially when looking at the descriptions of behaviour for 'Basic individual knowledge on PSM', interrelations can be seen to 'Category strategy – Demand management', to 'Implementation – Contract management', and to 'Implementation – Measurement & Reporting'. Another rather generic competence is 'Stakeholder management (Application of tools)'. As it excludes suppliers from the stakeholder understanding, which are covered in the competence 'Supplier relationship management (Application of tools)', it is suggested to be an underlaying competence for 'Sustainability/compliance', assuming that dealing with all kinds of stakeholders outside the supplier relationship is probably part of the job role in a competence rather than of an operative job role in the source-to-contract process.

5.2.2 Cognition-oriented SPSM competences

Following the structure provided in the work of Delamare-Le Deist and Winterton (2005) and its application in this research, the cognition-oriented SPSM competences are types of conceptual competences in an occupational context. In line with the definition in Figure 2.5, the cognition-oriented SPSM competences encompass generic knowledge and understanding related to a conceptual and a systematic way of thinking. Table 5.2 lists the four SPSM cognition-oriented competences that were identified, their definitions and examples of observable behaviour. As outlined already when the functional competences were described, supplier relationship management is the only competence that is represented in each of the four competence clusters. Also, no other competence that is reflecting a PSM process step was grouped into a cluster besides the functional one. In the cognition-oriented area, 'Supplier relationship management (Holistic view)' reflects the cognitive and intellectual competence to understand the broader context of SRM, compared to the functional character of SRM that covers the operational ability to apply tools. Therefore, the author found this competence to fit with the cluster definition for the cognition-oriented area. 'Supplier relationship management (Holistic view)' includes for instance the understanding of a supplier's motivation, and the ability to find solutions that benefit both sides in a buyer-supplier relationship. 'Systems thinking competence' is closely connected to this aspect of supplier relationship management, but with a broader view on the supply chain network. Literature and Delphi expert interviews mentioned 'Systems thinking competence' as one of the most important SPSM competences. It includes the understanding of interdependencies within members in a supply network and the recognition of the impact of SPSM measures in terms of risk and opportunities. New approaches like circular economy concepts foster and require 'Systems thinking competence' for

SPSM, for instance to understand process requirements as well as financial impacts on the involved parties. As mentioned in a number of the interviews with Delphi experts, purchasing professionals who are competent in 'Systems thinking' can describe a business case for sustainability, considering the view of different stakeholders. Based on these examples and descriptions which include a conceptual and an occupational aspect, 'Systems thinking competence' was assigned to the cognition-oriented domain.

'Conscientiousness' is the third competence in the domain here. It was defined as the ability to thoroughly analyse SPSM issues combined with a manner of carefully approaching solutions and taking issues and situations seriously. The allocation of 'Conscientiousness' in the cognition-oriented cluster is arguably not clear at first sight when thinking about what it means to carefully deal with a situation or to take an issue seriously. It might also fit to the social- or meta-oriented competence cluster. But the descriptions of observable behaviour clearly led to the decision to allocate 'Conscientiousness' in the cognition-oriented cluster. They all include a notion of thinking something through before acting in an occupational context, of the ability to gather an understanding, and to thoroughly investigate on SPSM issues in a conceptual and systematic way. In this regard, 'Conscientiousness' may also be a supporting competence for 'Systems thinking competence', and also for 'Supplier relationship management (Holistic view)'. Finally, compared to the latter two competences, 'Resourcefulness (Creative resource combination)' is a cognitive competence on a more operative occupational level. As it can be seen in the descriptions for this competence in Table 5.2, the core characteristic can be summarised as being efficient and effective when dealing with SPSM issues in the occupational context. Compared to 'Resourcefulness (Application of tools)' within the functional-oriented competence cluster, the specification here is concerned with conceptual methods and a systematic way of working. Considering that SPSM is a task that purchasing professionals need to cope with in addition to their daily job (Goebel et al., 2017; Fayezi et al., 2018), 'Resourcefulness (Creative resource combination)' might be a competence that contributes to successfully implement SPSM in all steps of the PSM process and the job roles that are involved.

When considering the relationship of 'Systems thinking competence' and 'Conscientiousness' to the PSM process, both of them may be underlaying competences that are required to perform SPSM in all source-to-contract process steps as well as in the centres of competence.

Cognition-oriented SPSM competences		
Competence name	**Definition**	**Observable behaviour (based on CIs)**
Conscientiousness	Conscientiousness is defined as the ability to systematically gather facts before taking a decision, to understand details and a broader context of a sustainability issue at the same time. This analytic ability is combined with a manner of carefully approaching solutions and taking issues and situations seriously. *Opposite: Jumping into conclusions and looking out for fast solutions*	• Is very careful with jumping into conclusions • Investigates thoroughly on the topic • Tries to get to the bottom of the issue • Sorts out the situation/clarifies the issue • Balances possible directions/solutions • Takes her/his time to avoid mistakes • Analyses the situation • Follows up carefully • Takes care of follow-up activities personally and does not delegate them • Goes to the supply market only when specifications and regulation requirements are clear • Proceeds step by step • Makes an effort to follow the audit report properly

Resourcefulness (Creative resource combination)	Resourcefulness in the meaning of creative resource combination is the competence to systematically implement SPSM aspects efficiently and effectively in a given environment, taking into consideration financial or other resource restrictions. It includes the ability to develop concepts and to find solutions based on existing procedures and processes for SPSM, as well as the capability to evaluate and combine different resources in favour of SPSM goals.	• Focuses on priorities to start with • Makes a proposal how sustainability could be integrated in existing processes • Defines a threshold for process integration • Uses solutions that are already there that suit the need of the company • Understands that it is not necessary to re-invent the wheel but that it is about to build on what is already there • Uses an existing risk management system if it is good • Makes suggestions to improve the overall efficiency of sustainable procurement • Suggests solutions: Are there alternatives that cost less? Can the own company and the supplier invest together? Are there subsidiaries from government? • Checks if a common initiative with other customers could be initiated • Cooperates with other customers of the supplier to benefit from the common purchasing power • Thinks collaboratively to simplify processes

Supplier relationship management (Holistic view)	The competence to adapt a holistic view in supplier relationship management is the ability to understand motivators and restrictions for suppliers when implementing SPSM actors, the ability to systematically analyse the business environment of suppliers, and the ability to develop solutions that meet different needs and requirements and promote SPSM at the same time.	• Takes the supplier's point of view into consideration (win-win perspective) • Understands risk • Develops a plan and a timeline for sustainability that allows the supplier to develop economically at the same time • Explains short-, mid- and long-term benefits (total value) • Finds solutions how the supplier can save money • Understands that helping suppliers to develop creates a long-term input and benefit • Understands how the supplier could fulfil the requirements within the agreed prices/ the existing financial framework of the business relationship • Is open to accept the code of conduct of a supplier if it is a good one

Systems thinking competence	"Systems thinking is a framework for seeing wholes and a framework for seeing interrelationships rather than things, for seeing patterns of change rather than static snapshots" (Senge, 1990, p. 68). In the SPSM context, it includes the recognition of interdependencies within a supply chain network and the consideration of the impact when implementing a SPSM strategy. *Opposite: Having a small view of the world*	• Develops the business case for sustainability • Understands circular economy models • Is open to balance different requirements in the situation • Gets the big picture and realises the different needs and issues of the stakeholders • Links corporate goals to PSM actions that support these goals • Explains the contribution of PSM to a companies' sustainability strategy • Contributes the PSM perspective to a complex interdisciplinary decision process • Sees the connection between risk management and sustainability • Understands how bad working conditions impact product quality • Explains what non-compliance to environmental standards mean to the supplier, the own company and the other companies in the industry in terms of risk

Table 5.2: Cognition-oriented SPSM competences

5.2.3 Social-oriented competences

Moving now from the occupational dimension to competences that are more related to personal effectiveness on an operational level (see Table 2.1), six competences in the social-oriented domain are described. Social-oriented competences enable the interaction with others to cope with sustainability issues, including the willingness and ability to experience and shape relationships to foster SPSM. First of all, a set of competences in this cluster covers the area of communication. Referring to the basic communication model of Shannon and Weaver (1949), the competences specify the communication process between sender and receiver in terms of SPSM requirements, including factors like communication channels and dealing with 'noise' in the interaction between sender and receiver, as is was called in the Shannon and Weaver (1949) model.

Being the competence with the broadest scope on communication is 'Communication skills', including the ability to articulate and present sustainability issues in a convincing manner by applying appropriate communication styles and channels depending on target groups and situations. In terms of the main factors in the Shannon and Weaver model (1949), behavioural descriptions include the ability to explain SPSM issues to others (sender), to apply appropriate communication tools for different target groups (channel) and the ability to listen to other SPSM actors (receiver). Moreover, 'Communication skills' include dealing with conflicting positions (noise) for example by negotiating and de-escalating in interaction with others.

As the SLR and the Delphi study resulted in a range of different behavioural descriptions around communication competence, it was decided for the SPSM competence model not to subsume the descriptions to one general communication competence like 'Communication skills', but to add other more specific categories. Therefore, SRM is also included here. Whereas the functional aspect of SRM covers the application of SPSM tools, and the cognitive type is around the understanding and awareness of the supplier point of view, 'Supplier relationship management (Communication)' is the personal competence to interact with suppliers in such a way to achieve SPSM goals. 'Stakeholder management (Communication)' is comparable in its character, but addresses other stakeholders than suppliers, whereas 'Cross-functional teamworking' encompasses the interaction with the internal interfaces within an organisation to foster SPSM.

Besides the competences that deal with communication in the PSM context, two others were allocated in the social-oriented cluster: 'Thoughtfulness towards others' and 'Interpersonally savvy'. Being probably rather less explicit as the other competences in the cluster, both of them might be seen as enablers for interaction in the field of SPSM. 'Thoughtfulness towards others' includes a certain attitude when dealing with others, contributing for instance to a more cooperative, de-escalating communication style. To a certain degree, there is a close connection to 'Conscientiousness' in the cognition-oriented area, but 'Thoughtfulness towards others' stands by itself with aiming towards the interaction with others. Therefore, it was listed as a separate competence within the social cluster. Finally, including 'Interpersonally savvy' in the social-

oriented competence set ensured that the importance of being able to relate to others personally and sometimes in an informal manner was sufficiently represented in the SPSM competence model. When discussing the impact of the social-oriented competences on the PSM process steps, it is apparent that there are various interfaces. For example, ‘Cross-functional teamworking’ might be especially important for ‘Demand management – Category strategy’ when looking at the definition of this process step, which includes for example “Support internal customers in purchasing specifications; functional and technical” or “Build a category team with different non-purchasing functions” (see Appendix B). ‘Stakeholder management (Communication)’ is probably an asset for ‘Sustainability/compliance’ competence centre. For both of those, different job descriptions are probably applicable.

Social-oriented SPSM competences		
Competence name	**Definition**	**Observable behaviour (based on CIs)**
Communication skills	This competence includes the ability to articulate and present sustainability issues in a convincing manner by applying appropriate communication styles and channels depending on target groups and situations.	• Raises her/his voice and the issue • Prepares well for convincing others • Makes others understand what the issue is • Articulates concerns • Explains the own approach in an open and transparent manner • Presents the own achievements and expertise according to the target group • Presents PSM as a thoughtful partner • Tries to find a common understanding • Listens to concerns • Looks for consensus • Shows an open attitude for the conversation • De-escalates in the meeting • Reacts and behaves facts-based • Negotiates • Knows requirements for intercultural communication • Uses the communication department to leverage the issue

Cross-functional teamworking	Cross-functional teamworking competence encompasses interpersonal and self-management knowledge, skills and abilities (Stevens and Campion, 1994). In the SPSM context, it implies the knowledge about relevant stakeholders and partners, the skills to work in multi-disciplinary teams and the ability to establish relationships and liaisons with other functions within the organization.	• Knows relevant internal departments to cooperate with • Asks internal experts • Keeps in close contact with others internally to make sure to be aligned • Explains the sourcing situation (cost, sourcing capacity) to colleagues • Establishes and uses a network internally and externally • Cooperates with others to find common solutions • Involves R&D in the supplier selection process • Includes expertise from other areas • Convinces other departments that purchasing needs to be involved • Is very clear towards product development and sustainability department what she/he can stand for • Checks with legal and HR • Cooperates with sustainability officer

Interpersonally savvy	Interpersonally savvy can be defined as "having a range of interpersonal skills and approaches and knowing when to use what with whom. The outcome is ease of transaction where you get what you need without damaging other parties unnecessarily and leave them wanting to work with you again" (Lombardo, Eichinger, 2006, p. 265). For SPSM, this includes the ability to connect with others to discuss sustainability issues, to find peers that help promoting the topic and to adapt to different stakeholder representatives inside and outside the own organisation.	• Is smart and knows where and how to get information • Builds strategic alliances • Shows a sense for the reaction of the supplier in terms of how to interpret the supplier's reaction • Anticipates how the different parties will behave and act • Makes use of informal contacts with colleagues or the sustainability department to discuss the issue • Asks experienced buyers if the own observations are conform with the company policy • Goes through the right chain of demand: Speak to direct manager first • Looks out for communication channels to the management to discuss non-compliance • Speaks to the right contacts

Stakeholder management (Communication)	Stakeholder management can be defined as "Assessing the interests and impact on influencing parties on purchasing decision-making outcomes" (van Weele, 2018, p. 34). The competence to communicate with stakeholders includes the ability to articulate, explain and promote SPSM issues by applying appropriate communication styles towards different stakeholder groups*. ** Excluding suppliers, as this is covered in Supplier relationship management (Communication) in this model, and excluding internal stakeholders, covered in 'Cross-functional teamworking'*	• Realises the gap between internal and external perception • Refers to the concerns of stakeholders, e.g. NGOs • Implements a pro-active communication strategy to avoid risk • Sells the own activities to stakeholders, e.g. NGOs • Explains the approach of PSM to internal stakeholders with the goal to find the best solution possible • Explains to the NGO (if involved) the dependencies of the company on this supplier • Connects with stakeholders and checks their expectation • Asks NGOs very precisely about what exactly is the problem • Spends time to listen to the relevant stakeholders • Understands the internal problems and is able to translate those to the external party • Accepts feedback from stakeholders • Takes stakeholders, e.g. NGO representatives, seriously • Shows vulnerability and shows the challenges in a transparent manner • Discusses with stakeholders and finds out their knowledge on sustainability in their area • Tries to get across to the stakeholders what the actual facts are • Does not talk too much in a vague manner • Is discreet towards the external environment

Supplier relationship management (Communication)	Communication competence in the context of supplier relationship management includes the ability to articulate, explain and promote sustainability issues by applying appropriate communication styles towards suppliers.	• Explains to the supplier why the monitoring tools are implemented • Is able to communicate the reasons for company decisions to suppliers • Explains the process to the supplier before its implementation • Talks to suppliers and explains that their contribution is needed and will probably result in a growing business also for them • Communicates the consequences of non-compliance • Explains the business risk for the supplier • Explains clearly that in order to maintain the business relationship the supplier needs to work on implementing the sustainability standards • Knows the cultural background of the country where a supplier is located • Convinces suppliers based on facts • Dares to speak up to the supplier • Listens to the supplier • Asks questions to the supplier

Thoughtfulness towards others	Thoughtfulness towards others in the SPSM context is about applying a certain attitude of respect when discussing the implementation of sustainability requirements with others, mainly suppliers in this context. *Opposite: Being forceful, aggressive, emotional*	• Shows understanding for the other position • Asks the supplier what would allow the supplier more to comply with the standards • Acts in a tactful manner • Is open to balance different requirements in the situation • De-escalates in the meeting • Keeps calm • Acts carefully • Is aware how to avoid conflicts • Follows up carefully

Table 5.3: Social-oriented SPSM competences

5.2.4 Meta-oriented SPSM competences

Based on the typology as shown in Table 2.1, meta-oriented competences complement the cognitive-oriented cluster on the personal level. Following Delamare-Le Deist and Winterton (2005), meta-oriented competences facilitate the acquisition and application of the other substantive competences, and are therefore rather different to the other three competence clusters. Especially when applied in the SPSM context, meta-oriented competences are sometimes positioned at the intersection between attitude and competence. The SPSM competence model includes a list of seven competences that were sorted to the meta-oriented area (Table 5.4). The twofold character of competences in this field of being a competence and/or an attitude is in particular relevant for 'Commitment to change'.

'Commitment to change' is defined in this research as the individual motivation to implement sustainability in PSM, and to be open and willing to change routines. When looking at the descriptions for successful behaviour, they include facets of passion, willingness and personal interest to get engaged in sustainability-related issues and to contribute to successful SPSM. Literature and Delphi experts gave 'Commitment to change' a top priority Therefore it was decided to include this aspect in the SPSM competence model as a meta-oriented competence, being aware of the difficulty to clearly differentiate between attitudes and competences (see section 2.2). 'Confidence' is nearly similar in terms of its positioning between attitude and competence, and it includes the understanding what needs to be done, and at the same time the courage to do what needs to be done. There is a significance relation to 'Persistence', emphasising the competence and the attitude to follow-up closely and not let go when dealing with SPSM. Both 'Confidence' and 'Persistence' are enablers for the acquisition of other SPSM competences and were therefore assigned to the meta-oriented cluster. 'Organisationally savvy' and 'Politically savvy' are types of wisdom or intelligence, adding to the 'Interpersonally savvy' competence in the social-oriented field. Contrary to the communicative stance of the latter, these two encompass the understanding of organisational mechanisms ('Organisationally savvy'), and the usage of a repertoire of politics in an organisation ('Politically savvy'). Without doubt, the three competences are closely related. Literature and Delphi experts emphasised all of them, pointing out that they become especially relevant when the organisational enabling for SPSM is not very mature (see also 2.4). Finally, 'Self-awareness' was added to the meta-oriented cluster, being at a certain level the match to 'Conscientiousness' in the cognitive area, focussing on the intrapersonal aspect.

When discussing the impact of meta-oriented competences on the PSM process steps, the author found it evident that all of them foster SPSM in any of the PSM process steps and functions and job roles that are implied. Considering the importance of the supplier network for successful SPSM, as already mentioned in the introduction of this dissertation, 'Supplier relationship management (Cooperative attitude)' was added as a separate category also in this competence cluster. It was decided to add the attitudinal character of this competence even in the nomination, because the

competence is focused on the motivation and understanding of SRM and is clearly a facilitator for the other three forms of SRM that are reflected in the SPSM competence model.

Meta-oriented SPSM competences		
Competence name	**Definition**	**Observable behaviour (based on CIs)**
Commitment to change	Commitment to change in the SPSM context is expressed by individual motivation and actions to implement sustainability in PSM, and to be open and willing to change routines to enable the implementation.	• Is passionate and beliefs in the benefit of sustainability • Acts her-/himself • Takes it serious if a supplier does not sign the code of conduct • Draws motivation and a good feeling out of the engagement in sustainability activities • Goes the extra mile to come to a good result • Is willing to participate • Deals with new tasks in a motivating manner • Gets educated, e.g. asks to be trained in sustainability topics • Takes on leadership to bring in new sustainability initiatives • Comes up with ideas to solve the issue • Gives the topic a high priority • Does not follow a “heads down” attitude • Is eager to learn • Is open towards challenges

Confidence	Confidence in the SPSM context includes a clear understanding of what needs to be done and not being afraid to push for the desired result.	• Does not make the sustainability standards of the company negotiable • Explains to the supplier that as long there is any doubt, she/ he will start to look for an alternative supplier • Bears ambiguity • Does not get scared • Has the guts to ask questions and react • Dares to speak up to the supplier • Stands up for her/his professional role/ interests • Is able to say "This is not my responsibility"
Organisationally savvy	Organisationally savvy can be defined as the ability to understand organisational mechanics and to make use of this understanding to actively promote and implement SPSM.	• Understands that SPSM implementation needs to be started at the right level within the company, and not at the individual level of a buyer • Identifies roles and definitions in the company before doing the next step • Knows where to get information • Looks for support in the management • Knows how hierarchy ticks • Tries to create a more interesting role for PSM • Makes sure that procurement is involved in strategy processes in the institution • Identifies key people leading the project • Takes a role as a gatekeeper • Gives the assignment back if nobody is willing to cooperate

Persistence	Persistence in the SPSM context means to continuously stick to an issue and don´t let it go without finding a solution, even when the situation in the supply network or within the own organisation is complex and the commitment of the involved stakeholders is low.	• Puts pressure on the topic • Does not accept not to be involved • Keeps on asking • Digs deeper and deeper • Tries to get involved, even if other functions do not understand the need to involve purchasing • Follows-up closely to the situation
Politically savvy	Politically savvy can be defined as the ability to smoothly work with different stakeholders in complex political situations to achieve business objectives.	• Actively uses the repertoire of company politics • Tackles the task politically • Does networking between decision makers (CEO – PSM-divisions) • Acts diplomatically • Balances interests • Is smart and “street-wise” to find practical applications • Is aware of the delicacy of some situations in the SPSM context • Is aware that with sustainability one very often gets into a whole range of different problems • Is able to deal with resistance • Is looking for back-up to secure her-/himself

Self-awareness	Self-awareness can be defined as the intrapersonal intelligence to know and handle one's own emotions, needs, values and capabilities.	• Is aware of own values • Knows her/his individual threshold in coping with an unclear situation and knows how long she/he can stand this situation • Is aware of own sphere of influence, competences and role • Explains the own role: How can I help to achieve the goals and what are my limitations? • Is aware of the impact of her/his own behaviour • Is able to say "This is not my responsibility" • Trusts and follows up on the own feeling that something was not right • Has a gut feeling and a conscience for working conditions • Is aware how to avoid conflicts • Follows up carefully

Supplier relationship management (Cooperative approach)	Supplier relationship management (Cooperative approach) is the ability and motivation to work together with the supplier in a supportive manner to reach SPSM goals, including the understanding of the benefit of supplier cooperation.	• Evaluates what to do together with the supply base to contribute to the corporate goals • Develops the benefit together with the supplier • Develops a roadmap with the supplier • Coaches the supplier in the implementation of sustainability standards • Gives expertise to suppliers • Understands that there has to be something that is given to the suppliers for their sustainability engagement – e.g. higher volumes • Identifies together with the supplier how to solve the situation • Learns from suppliers • Brings the supplier in contact with other experts • Shares experiences with the supplier • Expresses understanding for the situation of the supplier • Helps to develop the supplier to a good stage in the expected requirements • Helps the supplier to understand the issue

Table 5.4: Meta-oriented SPSM competences

5.2.5 Discussion of the clustering in the SPSM competence model

It was mentioned already in sections 2.3 and 4.1 that the research of Osagie et al. (2014) impacted this dissertation because the authors also worked on the development of a competence model in the sustainability context, and because they used the clustering framework of Delamare-Le Deist and Winterton (2005). Therefore, the author considered it worthwhile to compare her own clustering of SPSM competences with the approach of Osagie et al. (2014), aiming to validate and position her own work. Table Table 5.5 summarises the clustering of competences based on Osagie et al. (2014).

Functional-Oriented Competence Domain	• CSR Management Competences; incl.
	  o CSR Leadership Competences
	  o Identifying and Realizing CSR-Related Business Opportunities
	  o Managing CSR Implementation

Cognitive-Oriented Competence Domain	• Foresight Thinking: Anticipating Future Developments Regarding CSR-Related Challenges • Systems Thinking: Understanding the Interdependency Between Systems and Subsystems that are Relevant to CSR Practice • Instrumental Understanding: Understanding CSR-Relevant Standards and Regulations
Social-Oriented Competence Domain	• Interpersonal Competencies: Realizing CSR-Supportive Interpersonal Processes in CSR Implementation

Meta-Oriented Competence Domain	• Personal Attributes and Attitudes: Employing CSR-Supportive Personal Characteristics and Attitudes
	• Personal Value-driven competences
	  o Ethical Normative Competences
	  o Balancing Personal Ethical Values and Business Objectives
	  o Realizing Self-regulated CSR-Related Behaviour and Active Involvement
	• Reflection Competence: Reflecting on Personal CSR Views and Experiences

Table 5.5: Classification of competences for CSR managers (based on Osagie et al.; 2014, p. 244-247)

Interestingly, the clustering in Table 5.5 shows a high degree of communality with the clustering of the SPSM competence model, especially in the meta-oriented and the social-oriented cluster. Osagie et al. (2014) also provide a list of competences at the intersection of competence and attitudes in the meta-oriented domain, and they focus on interpersonal processes in the social-oriented domain, too. As the authors developed a competence model for CSR managers, they emphasise leadership competences in the functional cluster. Interestingly, they grouped the 'instrumental understanding of CSR-relevant standards and regulations' into the cognitive area. Looking at the SPSM model above, a comparable SPSM competence like 'Basic sustainability knowledge' is found in the functional area, and not in the cognitive cluster. Other than that, 'Systems thinking competence' was considered to be a cognitive competence by both, Osagie et al. (2014) and the author.

It needs to be taken into account that the comparison here was done on a rather general level. Detailed insights into the competence definitions and the approach can be found in the paper of Osagie et al. (2014). Nevertheless, the comparison shows that the clusters from Delamare-Le Deist and Winterton (2005) obviously provide a clear framework to group competences in a model that allows to differentiate types of competences. Additionally, when looking at the decisions taken in this thesis where to group which competence in the SPSM competence model, they were at least supported to a certain degree by the research of Osagie et al. (2014). When looking at the differences, and when comparing the naming of competences, it becomes at the same time quite evident that the description and the grouping of competences at a certain point depends on nuances and certainly includes areas of interferences. For the implementation of a competence model in research, practice, and education it may be already helpful to have a clustering as such, and the nuances of uncertainty may be less relevant compared to the benefit of having a competence framework. The next chapter further elaborates on the implications of the SPSM competence model on research, practice and education.

6 Conclusion

The aim of this research endeavour was to shed light on the role, the responsibility, and on the impact of purchasing professionals on SPSM. It looked for answers to the central research question "Which individual competences of purchasing professionals are required to implement SPSM?". A SPSM competence model was developed, together with a SPSM training module. Both were intended to bring SPSM into action in the daily work of purchasing professionals. They should also provide direction how SPSM can be trained in an either HE or professional context.
This chapter discusses the findings with regard to their impact on research, practice, and education, and outlines opportunities for future research in the field.

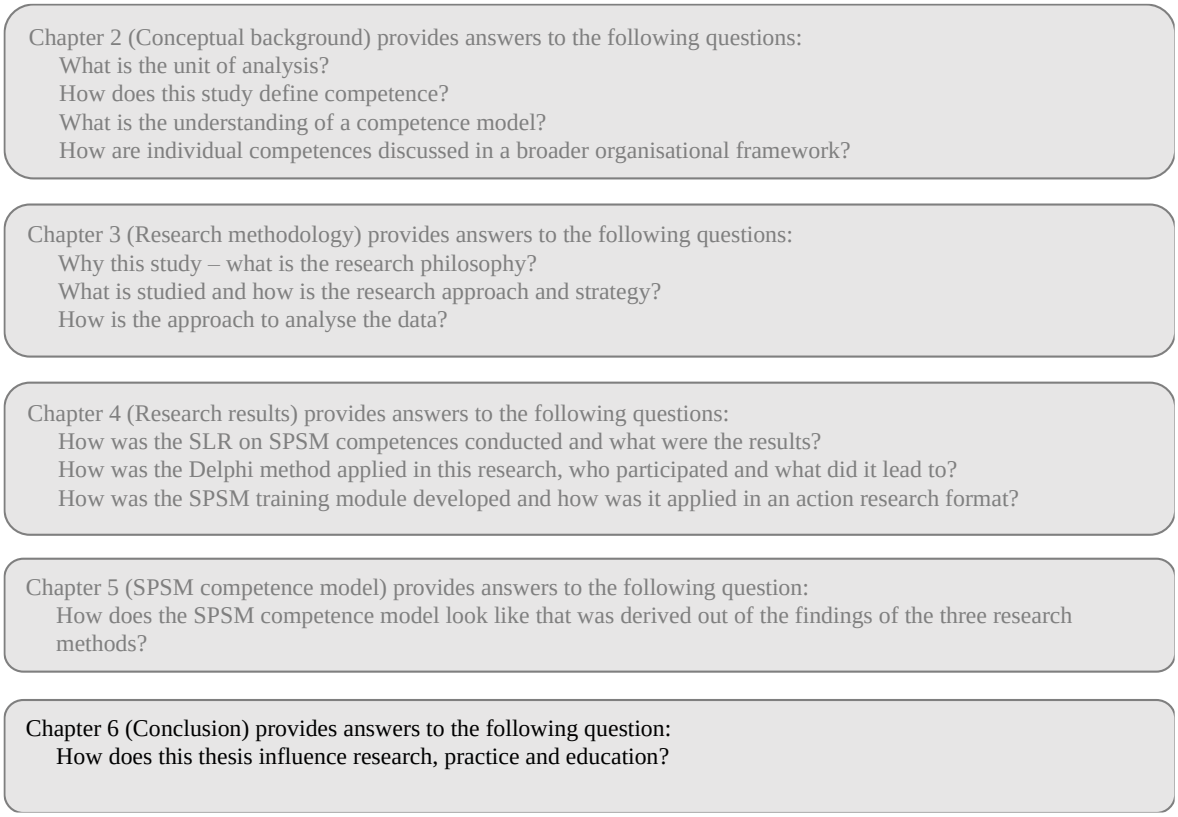


Figure 6.1: Contribution of chapter 6 in reference to the structure of the thesis

6.1 Research Implications

The systematisation of SPSM competences in a competence model, its positioning in a broader framework on organisational behaviour, and the verification and application of the model by conducting training sessions using CIs impacts the academic field in different regards.

6.1.1 New insights for research on PSM competences – Closing the sustainability gap

Being one of the first studies on the nature of SPSM competences for purchasing professionals, this thesis contributes to a field that previous research has paid little attention to. The SLR conducted in this study led to the small number of 11 papers that covered the search terms 'competences/knowledge', 'sustainability' and 'PSM' (section 4.1; R1 in Figure 4.3), with none of these focussing on a broad picture of SPSM competences, including social and environmental sustainability. On the other hand, as described in section 1.2, there is a well-established field of research on PSM and SCM competences. Therefore, this work contributes to narrow the gap in research on SPSM competences by providing the competence model and its 26 clearly defined SPSM competences (chapter 5). Publications and conference papers enrich the academic discourse in the field (Schulze and Bals, 2016; Schulze and Bals, 2017a; Schulze and Bals, 2017b; Schulze and Bals, 2018; Schulze and Bals, 2019; Schulze et al., 2019). The findings add the sustainability perspective to the existing research on PSM and SCM competences. The SPSM competences complement general competence frameworks for professionals in PSM, and also in SCM. The clustering in the four dimensions as of Delamare-Le Deist and Winterton (2005) might inspire research in the field to adapt the same approach. The four dimensions for SPSM competences might be transferred to a general PSM competence model. Besides a mere adding of SPSM competences to existing framework proposals, the nature of the SPSM competences that resulted out of this study may drive a discussion in the academic field as to how SPSM competences are related to a future competence profile for PSM professionals in general. The core of the SPSM competence model are the definitions for each SPSM competence and the descriptions of observable behaviour. They resulted from the analysis of academic literature in the SLR and the evaluation of the Delphi interviews. Although, even when considering definitions and examples of behaviour, most of the competences might be also adapted to a broader, rather general context. Therefore, a purchasing professional who holds SPSM competences is probably at the same time well prepared for other tasks. This finding certainly contributes to research on current and future competence requirements in PSM, for example adding to the findings of the European research project PERFECT (Technische Universität Dortmund, 2019). The project PERFECT evaluated current and future competence requirements for purchasing professionals and derived a curriculum for HE institutions in Europe. When looking at curriculum development in this area, and research on learning methods to foster PSM competences, the finding that SPSM competences are allocated to four different competence clusters which apparently require different learning methods, motivates future inquiry in this area.

6.1.2 Fostering the academic discourse on integrative SPSM concepts

For research on SPSM in particular, the analysis of the relevance of competences with regard to purchasing process stages (Figure 2.4) offers a conceptual basis for bringing sustainability into

overall PSM models, instead of simply positioning sustainability as an ‘add-on’ activity, which risks the potential of sustainability development becoming marginalised. This follows the suggested perspective of Johnsen et al. (2014), integrating sustainability into all PSM processes. The perspective is supported by the work of Aguinis and Glavas (2013), who distinguish on a general organisational level between embedded and peripheral CSR. Embedded CSR reflects the integration in a firm‘s strategy and its core processes. Going in the same direction, in the paper “Why research in sustainable supply chain management should have no future”, Pagell and Shevchenko (2014) discuss the importance of integrating SSCM in SCM research and practice as an inherent and not as a separate topic. Only then do the authors see opportunities to “move the field from studying how to manage unsustainable supply chains in a more sustainable manner, to managing truly sustainable supply chains” (Pagell and Shevchenko, 2014, p. 45). The concept of an ecologically dominant logic that is outlined by Montabon et al. (2016) points in the same direction. The authors plead for a new concept where ecological interests supersede social interests and economic interests. The concept is positioned in contrast to the well-established TBL approach (Elkington, 1998) that considers the three areas of interests with equal importance, or the approach of creating shared value, defined by Porter and Kramer (2011), also focusing on a beneficial balance of the three interests. Montabon et al. (2016) ground their newly developed logic in the need to prevent ecosystems to ensure welfare of current and future generations. They recognise, that “To build a new way of thinking, we must consider culture, logic and cognition” (Montabon et al., 2016, p. 4), differentiating culture and logic occurring on the institutional or organisational level from cognition, driven either by the supply chain, the institutional or the individual level. To the latter, the conceptual framework from organisational psychology which includes individual and organisational moderating factors on behaviour contributes to the fundamental discussion on the moderating factors and prerequisites for ‘truly sustainable supply chains’. As further discussed in section 6.4 when looking at future research directions, the model can contribute to a structured discussion about the pre-requisites to implement an ecologically dominant logic on the institutional and the individual level. The work on SPSM competences suggests a basic competence set that sheds light on the individual level. It is furthermore suggested to apply the framework when looking at drivers for SPSM implementation in a firm. Figure 2.10 depicts the three elements of the framework besides individual skills as moderating factors. A combined view of individual and organizational levels helps to bridge findings on both levels, taking into account that both are vital to achieve SPSM implementation in practice via sustainable individual behaviour and favourable organisational conditions. The application of such models from other disciplines like organisational or social psychology and human resources also contributes to an interdisciplinary debate in the future research on SPSM.

6.1.3 Gaining insights into the nature and impact of sustainability training

The action research part of this study provides a format for training, and therefore learning action research. Looking at the few findings on academic papers dealing with sustainability training and education that resulted out of the SLR (section 4.1.3), this thesis contributes to a rather less prominent research area also in this regard. The conceptual framework and the focus on individual competences complements the studies for instance from Sarkis et al. (2010) and Wolf (2013), who discuss the influence of employee competences acquired in training on sustainability performance of a firm.

Moreover, this research provides a structured approach for embedding learning and training in a broader context. The process for SPSM training development (Figure 4.10) is grounded in an analysis of training needs and overall training goals. Considering the discourse about integrative SPSM concepts and the role of organisational as well as individual determinants for change in behaviour, the systematic approach might inspire other research on PSM education on how to align concepts with competences, learning goals and evaluation criteria (Table 4.16).

Having defined the set of 26 SPSM competences provides research in the field of sustainability education with valuable input. For instance, other research areas like marketing or business innovation can now verify, based on this list, whether the competences are also applicable in another context.

The finding that SPSM competences can be grouped into the four competence clusters of functional-oriented, cognition-oriented, social-oriented, and meta-oriented competences indicates that for each cluster, adequate learning methods need to be developed. Research in the field of learning psychology or education might map current learning theories with each of the four clusters.

Applying the CIs in the action research part introduces a format for aligning stakeholder experiences, here the training participants, with learning goals. The reflective discussion of the results of the action research showed that the CIs were very well perceived by the participants, and they led to learning in the area of functional-oriented, cognition-oriented, and social-oriented competences. This result might add to future research on the integration of CIs into sustainability education.

Finally, especially when looking at meta-oriented competences in the SPSM competence model, and the academic discussion on new sustainability paradigms, the study revealed the close interrelation between competences and individual traits, motives and values. A broader theoretical discourse on how to change motives and values might be initiated.

6.1.4 Enriching the spectrum of PSM research strategies

Finally, the research philosophy and approach of this work might inspire future research and contributes to a broader variety of the applied methods in the field of PSM research. The interpretivist paradigm with a subjectivist view led to a selection of research methods and data collection formats being in contrast with a rather positivist approach. Most significantly, the action research reflects the

notion of the researcher being involved in what is being observed, looking to gather data in an iterative manner, including the voice of stakeholders. PSM research might be inspired by this approach, in terms of its research design and the way the results are reported. The combination of a SLR, a purely qualitative Delphi study, and action research is rather seldom used, according to the findings in the SLR, and according to the feedback that was gathered when presenting the research at conferences. Also, other researchers found the application of the CI technique interesting. CIs might be a useful approach for research in the field of PSM competences in general.

Moreover, the author intended to add at least a humble piece of robust and relevant research in the PSM discipline, as it was requested by Van Weele and Van Raaij (2014) in their article "The future of purchasing and supply management research: About relevance and rigour". The qualitative and inductive research approach led to findings that allowed the researcher to answer the research questions and contribute to the identified research gap. The quality assurance approach of this research combines traditional measures with those for qualitative research only, aiming to measure quality in accordance to the research philosophy and the research strategy (section 3.4.2). The approach as well as the reporting format (Table 3.4, Table 3.5, Table 3.7, Table 3.8) might inspire other qualitative research projects.

To summarise the implications on research, this study shed light on a rather new research field and therefore set the ground for various options for future research, which are discussed below in section 6.4. It complements the academic discourse on PSM and on SCM competences by adding the SPSM competence set. Moreover, it inspires PSM research to look beyond its own discipline and integrate findings from organisational psychology or other areas when discussing future SPSM development.

6.2 Managerial implications

From a managerial perspective, this work contributes to the pertinent question of how PSM can foster sustainability throughout supply chains in practice. The role of PSM in organisations and its potential impact on sustainability performance of a firm was explained in the introduction in chapter 1.

6.2.1 SPSM competence model as a blueprint for company specific implementation

The SPSM competence model draws the attention to the human assets of PSM organisations. Being a generic competence model, it provides the basis for implementation in a specific firm (e.g. Spencer and Spencer, 1993; Mansfield, 1996; Campion et al., 2011; Krumm et al., 2012). Organisations may take the model as a blueprint for the development of their specific SPSM competence model. They should position it in the strategic context, align it with strategic and operational goals, and finally allocate it in a set of HR processes and tools. Then, the SPSM competence model serves to develop job descriptions, job roles and assessment methods (Campion et al., 2011; Krumm et al., 2012). The

set of competences supports organisations in selecting the right personnel, and in developing professional training and development plans, leading to an optimal job fit and therefore improved performance (Caldwell and O'Reilly, 1990).

When thinking of the different steps of a PSM process, organisations may consider which SPSM competences are relevant for each phase in the process (Figure 2.4). Resulting from the coding of literature and expert interviews in the present research, some process elements require more SPSM competence than others. For instance, 'Category strategy', 'Supplier relationship management' and 'Sustainability/compliance' were identified as being relevant for SPSM. These results probably lead to the description of three main roles that are the most relevant for SPSM. First, a strategic sourcing professional, doing the category strategy. Second, a supplier manager, being responsible for the implementation and monitoring of SPSM performance criteria and supplier development. Third, a role that might be located in a centre of competence or the staff department (Schulze et al., 2019) dealing with 'Sustainability/compliance' in terms of setting SPSM standards, supporting operative functions in their implementation and dealing with stakeholder relationships. Depending on the size and overall organisation of a firm, these roles might be separated or simply reflect different aspects of certain PSM positions.

6.2.2 Innovative SPSM training approach

The SPSM training module which was developed and applied in the action research part impacts the current state of SPSM training approaches in organisations. It provides an example of how to derive training content from a competence model in a systematic way, and it introduces a rather interactive, case-based training methodology through the work with CIs. Based on the researcher's own professional experience, companies still conduct SPSM training driven by compliance regulations or requirements for sustainability reporting rather than driven by actual issues that need to be solved by purchasing professionals. This often results in standardised web-based training modules that induce a click-through mentality to provide sufficient documentation. Looking at the feedback that was gathered in the two professional training sessions here, the work with cases that reflect real-world situations and help purchasing professionals in their daily work was considered to be a useful approach.

As it is further elaborated in the section that discusses the educational implications (section 6.3), the challenges for training lay in the different nature of SPSM competences, which is reflected in their allocation to one of the four competence clusters. Functional-oriented competences and some of the social-oriented competences are apparently easier to cover in a training session than for example the cognition-oriented 'Systems thinking competence'. Especially competences in the meta-oriented cluster might need other or additional methods of socialisation, especially when being at the interface between competence and attitude, as was discussed above for 'Commitment to change'.

6.2.3 Interplay of organisational and individual factors

The framework of factors influencing behaviour (Figure 2.7) that was applied in this research points organisations towards establishing a realistic and honest view of their individual positioning in this context. This is suggested before setting up a competence model and derive roles, personnel development and training initiatives. Figure 2.10 depicts this aspect by including respective moderating factors in a SPSM competence model framework. Organisations need to invest in both the individual level, i.e. select the right employees and train them, as well as the organisational level. The latter is essential, as it requires 'situational enabling' and 'empowerment & obligation' to have SPSM competences contributing to a firm's sustainability performance. Put differently, even the best individual SPSM competences will hardly come to fruition if there is no organisational frame in which to apply them. For example, a web-based training to ensure compliance with basic sustainability requirements might be appropriate and sufficient when the organisational positioning does not empower any further SPSM objectives. The recruitment of SPSM talents in this case might lead to a demotivated and frustrated workforce. By contrast, if the organisational frame is in place but individual SPSM competences or motivation is lacking, the impact is also likely to be less than optimal.

Moreover, referring to the results of Osagie et al. (2014) and transferring them to the SPSM context, different stages of sustainability maturity may require a different set of competences. For example, competences to raise awareness and position SPSM on the agenda might be more important in less mature organisations, whereas dedicated expertise in the application of SPSM measures and tools becomes more relevant when maturity in terms of organisational empowerment enabling is more advanced. It might even be worth investigating whether certain values, mechanisms and structures within an organisation enable or hinder SPSM competence implementation. This aspect may help organisations to understand that SPSM implementation sometimes requires support by change management measures and instruments.

6.2.4 A future-oriented PSM competence profile

Finally, as already outlined when discussing the research implications, the results of this research showed that SPSM competences have a general character and therefore can be also relevant for a range of other PSM issues and topics. This might improve the recognition of SPSM in purchasing organisations, because it stands for what PSM as a functional area can contribute in future. The SPSM competence model covers what professionals generally need to know to cover a modern role of PSM. SPSM training therefore pays off in a wider regard, as participants learn not only about SPSM, but also about other future challenges. Talents that are selected based on a SPSM competence model are probably the modern purchasing professionals. When looking at the views of CPOs of a number of companies that were gathered in a case study during the PERFECT project (Bals et al., 2017), the

scale of the future of the PSM function was widespread. Some practitioners predicted the possibility of PSM not existing at all as a separate function while others thought that PSM would have a key role in the overall organisation, coping with future challenges. For the latter alternative, people with SPSM competences might be an asset for a PSM function.

In summary, the managerial implications of this dissertation are threefold. On an operational level, the SPSM competence model and the training module are blueprints for individual adaptation in a firm, resulting in HR measures and training concepts. On a cultural level, this research points practitioners towards the recognition of all moderating factors on behaviour and possibly stimulates reflection about the firm's sustainability maturity as such. Finally, on a strategic level, the finding that SPSM competences might be useful to cope with a broader range of challenges can help to define the requirements as to how to position the PSM function as a strategic asset in an organisation.

6.3 Educational implications

The results of this research have several implications for education in the field of sustainability and SPSM specifically. Overall, the findings and the SPSM competence model might initiate a debate around how SPSM teaching is delivered, as was also outlined when discussing the implications on research. In terms of what should be learned, the list of SPSM competences (Figure 5.4) is a source for developing curricula and training modules. The SPSM training module gives answers to the sub-research question "How can SPSM competences be trained?". Additionally, the findings when evaluating the training in the action research part lead to indications of how to measure outcomes of SPSM training (see Table 4.16).

The following summarised findings may support the prioritisation or selection of SPSM competences for educational purposes, and therefore the design of SPSM education measures. In general, it turned out in the action research that an introduction into the basics of sustainability is an important foundation for SPSM training in both the HE environment and in the professional context. Still, the results underline the necessity to think beyond function-oriented competences to include cognition-oriented, social-oriented and meta-oriented competences. Taking into consideration the different nature of the competences in these four clusters, suitable educational methods need to be considered, leading to the question of 'How to train SPSM'. First, it will now be discussed how this impacts SPSM education in HE, followed by the implications for training in the professional context.

6.3.1 SPSM education in HE

When again referring to the findings of organisational psychology that show the impact of individual competences on behaviour in organisations, HE institutions should be aware of the importance to equip future talents with the right set of competences, also for SPSM. The SPSM competence model helps HE institutions to focus on a defined set of competences. By classifying the competence in the four competence clusters, it becomes evident that different teaching methods are required for the four competence clusters. For example it is suggested to apply interactive or, perhaps, simulation-based methods to foster for example social-oriented or cognition-oriented competences. Functional-oriented competences can be learned in a more traditional classroom setting or maybe even by using online platforms or Massive Open Online Courses. Additionally, mentoring and internships could be a valuable method to foster meta-oriented competences, referring to the aspect of socialisation (Nonaka and Takeuchi, 1995).

The SPSM competence list and the systematic clustering of the competence areas does also provide HE institutions with a blueprint that can be aligned with other qualification frameworks that require transparency in terms of which competence areas are covered in HE curricula. For instance on an international level, the AACSB standard for international business education requires HE institutions to document in a transparent manner how they contribute to the themes engagement, innovation, and impact (AACSB, 2019). A clear cut model that allows the alignment of competences, competence clusters, and learning methods facilitates efforts to meet the standard. Equally, compliance with national qualification frameworks, like the UK Quality Code for Higher Education, might be supported by the systematic competence model.

As it was already described above when discussing the research impact of this work, a more integrative perspective of sustainability can be considered to be the future direction for companies. Therefore, HE institutions are required to follow this approach, in order to reflect the current academic discourse, and to prepare future talent accordingly. Following the stages of evolution in management education regarding CSR as defined by Visser (2016), business schools should avoid treating sustainability topics either as part of legal frameworks and requirements or as optional ethics modules. Instead, CSR – or here SPSM – should be a compulsory module integrated into all management subjects. The usage of the CIs transferred into cases can be considered a first step in this direction. They include the PSM perspective, but equally consider other areas like marketing, product development or public relations. Depending on the timeframe available for a SPSM module, the CIs might be even further elaborated and complemented. They can also be used to initiate role plays, allowing students to take different perspectives and experience them in a realistic situation. For instance, the CIs “The supplier in a developing country” and “The stakeholder event” both provide the basis for a role-play situation. Furthermore, new CIs can be developed together with students, bringing theoretical learnings into real business situations. Finally, the awareness of organisational and individual components of behaviour (Figure 2.7) and the framework of change

(Figure 2.10) might be a very useful input for making students aware of strategic interdependencies and challenges on a strategic level. Both figures and the underlaying message are probably worthwhile integrating in any business course that discusses change and the implementation of new strategies and approaches.

6.3.2 Professional SPSM education

Turning towards professional training in companies, as outlined when discussing the managerial impact of this research, organisations should be aware of the impact of individual knowledge of PSM on overall sustainability behaviour. Moreover, the discussion on the impact of the organisational level on sustainability performance of a company is necessary to signal to participants that their individual impact requires a certain organisational setting (Figure 2.7, Figure 2.10). Therefore, based on the experience in the action research part of this research, it is suggested to proactively put this aspect on the training agenda and maybe even discuss in groups. However, it depends on how open the organisation is to do this, by coming back to what was already said in section 6.2. Depending on the goals and the sustainability maturity of the organisation, for example whether it follows a more embedded sustainability approach or whether sustainability is a rather peripheral activity (Aguinis and Glavas, 2013), it may consider integrating SPSM competences in the overall learning goals of PSM qualifications. The findings here suggest to especially focus on SRM in all four dimensions, complemented by functional-oriented competences such as 'Basic sustainability knowledge' and 'Demand management – Category strategy', as well as 'Systems thinking competence' (cognition-oriented). Given the importance of suppliers engaging with and adopting sustainability initiatives from customer companies, purchasing professionals also need to develop competences to enhance interaction with suppliers, especially 'Communication skills', as well as a general understanding of challenges and interdependencies in the supply network. In reference to the finding that SPSM seems to be important for certain roles with regard to the PSM process, for instance strategic sourcing professional, supplier manager, sustainability/compliance expert in a competence centre, tailored training programmes for such functions are recommended. In terms of the training methods, the findings of this research showed that the reference to the job reality of the participants is an important success factor for the anticipation of training and learning achievements. Even with this study using pre-defined critical situations, the participants were already very positive towards the approach. When applying the same approach for an individual company, it might be worthwhile to work with situations provided by the participants themselves. Also, depending on the situations, a much more in-depth work on some items might be included in training, for example the development of a sustainability audit. This would facilitate integrating SPSM training into project-based learning.

As mentioned in section 6.2, the four competence clusters, similarly to how they impact HE programmes, indicate that a range of training methods should be applied. The CIs provide a framework for learning in terms of cognition-oriented, social-oriented and meta-oriented

competences, functional-oriented competences might be best to be acquired in classroom training or web-based training modules. Also, mentoring programmes might add to the range of tools to support SPSM competence development.

To conclude, this dissertation offers a set of thoroughly described SPSM competences to HE environments and professional training contexts, together with a training module based on an interactive, case-based method, applying the CIs. It suggests prioritisations and ways to implement SPSM in existing programmes.

6.4 Future research directions

The implications of this work as described above lead to a range of future research opportunities on SPSM competences. From a research perspective, it is first suggested to further explore theoretical frameworks that the research on SPSM competences can be embedded in. Second, more empirical studies applying different research strategies would be useful to validate and further develop the SPSM competence model. In a broader view, third, considerably more work would be useful to understand the organisational as well as the individual drivers for successful SPSM implementation in supply chains, and how the relationship of these drivers impacts SPSM performance and finally the success of a firm. The framework for change that was presented in Figure 2.9 might be used as a conceptual point of reference. Considering the academic discourse on integrative SPSM concepts, it might also need to be further evaluated which SPSM competences would support a more integrative approach. Fourth, when looking at the role of PSM as a bridge between internal and external stakeholders (Figure 2.3), another pertinent area for more research is the supply chain and how SPSM competences might differ for actors in the network. Also, fifth, additional research is required to assess teaching methods for SPSM education, looking at the challenges in the HE field and the professional environment. Finally, being the sixth suggestion, it would be useful to fully understand how the SPSM competence model contributes to findings with regard to general PSM competences, especially looking at future challenges in the field.

In what follows, the six areas of identified future research directions are described in more detail.

6.4.1 Theoretical frameworks for further application in the SPSM competences context

First, as outlined above, more work can be done to embed the research on SPSM competences in a theoretical framework. Referring to Van Weele and Van Raaij (2014), to improve the relevance of PSM research as such, research should refer to relevant management theories. Looking at the SPSM competences context, one potential candidate might be the knowledge-based view (KBV) of a firm (Grant, 1996; Nickerson and Zenger, 2004). The KBV is derived from the resource-based view (RBV) of the firm, which posits that a firm's competitive advantage is derived from the existence

and management of tangible and intangible resources. The RBV sees firms as collections or bundles of resources (Penrose, 1959) and seeks to understand how the effective and efficient use of these internal resources can increase competitive advantage, if they are sufficiently valuable, rare, imperfectly imitable, and non-substitutable (Barney, 1991; Hitt et al., 2013). The RBV has been extended by the NRBV (natural resource-based view; Hart, 1995; Hart and Dowell, 2011) and SRBV (social resource-based view; Tate and Bals, 2018). An increasingly important intangible resource is knowledge (Grant, 1996). Another potential theoretical framework might be provided by the resource orchestration theory (ROT, e.g. Hitt et al., 2011; Sirmon et al., 2011). ROT focuses on effective management of resources in a firm to create value. Employee competences can be considered to be one of these resources. In this context, the role of organisational strategies and structures and how PSM is embedded in an organisation might be interesting perspectives (Aguinis and Glavas, 2013; Miandar, Johnsen and Caniato, 2019).

6.4.2 Research strategies to validate and complement the findings

Second, as it was indicated when considering the limitations of the applied methods (see sections 4.1.4, 4.2.3 and 4.3.3), the findings of this research need further evaluation and empirical validation. This could be done by either other qualitative research strategies, for example by conducting an extended Delphi study including more experts, or running case studies or action research projects in organisations. Case studies or action research might focus on gathering more critical situations from practitioners that lead to observable behaviour, or they might analyse the implementation of a SPSM competence model in an organisation. Following the social-constructivist approach (e.g. Easterby-Smith et al., 2008), an even more in-depth involvement of the researcher in the data collection process, for example by observations in the field, is suggested. Further studies could also look at other sources to gather SPSM competences like job advertisements for PSM professionals. Another interesting approach here could be the integration of a stakeholder point of view, asking suppliers or NGOs what they consider to be relevant SPSM competences. Especially in the HE context, the involvement of the future SPSM talents might lead to new findings and perspectives – asking them what they would be interested in learning about SPSM. This might also result in a differentiation between the educational and the professional training context.

Additionally, quantitative methods, for example a survey to ask purchasing professionals to confirm or prioritise the gathered set of SPSM competences, could help to verify the SPSM competence model that resulted from this research.

6.4.3 The interplay of factors influencing organisational behaviour

The third area that offers a broad range of future research opportunities refers to the conceptual background of this study. The applied framework from organisational psychology (section 2.4)

distinguishes between organisational and individual level influences on SPSM behaviour (Figure 2.7). This thesis focused on one of these influences, namely on individual abilities and skills, using the nomination of the framework. Different aspects, with regard to the underlying model of this research as shown in Figure 2.10, need further exploration. For example, the moderating factors on the organisational level were only a minor part covered in the second Delphi round of this research. More detailed analysis is required to fully understand how such moderating factors influence SPSM competences. It might also be worthwhile looking at it the other way round, investigating the impact of individual competences on organisational norms, cultures and processes. The results of this research showed that the distinction between the two individual level influences of the framework described in Figure 2.7 is not clear cut. Individual competences and individual motives, values and attitudes interrelate. In the SPSM competence model, they are reflected in the meta-oriented competence cluster (Figure 2.5). The individual motivational and value-based differences of PSM professionals might initiate fruitful research that also includes further academic disciplines like marketing and its research on consumer behaviour, or applied philosophy looking at values and business ethics. For instance, findings from consumer buying behaviour research on decision making to buy sustainable products might provide valuable insights, being an inspiration for the PSM context (e.g. Valsesia et al., 2015; Di Donato and Jakubiak, 2016). With regard to how the different organisational and individual variables influence SPSM behaviour, the findings of Wolf (2013) and Sarkis et al. (2010) that indicate a positive relation between employee qualification and sustainability implementation of a firm can be further assessed, now focussing on the 26 SPSM competences that are delivered in this research.

Finally, the conceptual framework that distinguishes the organisational and individual levels of behaviour should be discussed when looking at the attempt of integrative SPSM concepts (Aguinis and Glavas, 2013; Johnsen et al., 2014; Pagell and Shevchenko, 2014; Montabon et al., 2016). In terms of SPSM competences, it needs to be evaluated if the SPSM competence set that was developed in this research would be useful for an integrative SPSM model. For instance, with regard to the ecologically dominant logic (Montabon et al., 2016), it might be useful to find out if other competences are needed to be able to behave successfully following this logic, or if the SPSM competence set would be sufficient. A future research project might duplicate the Delphi study approach, but including experts from organisations that follow an integrative sustainability approach, or even the ecologically dominant logic.

6.4.4 The upstream supply chain perspective

Fourth, a greater focus on a broader upstream supply chain perspective could lead to interesting findings. This research focusses on the upstream supply network, as defined in section 2.1. A PSM function is considered to be the bridge between internal and external stakeholders (Figure 2.3). The SPSM competence model describes a set of competences that are required for purchasing

professionals in a PSM function within an organisation. It would be useful to understand if the SPSM competence model is applicable for all such actors in an upstream supply chain. A horizontal perspective would look at SPSM competences and how they might differ between industries or cultures. Depending on industry-specific products, markets or customer expectations, the SPSM competence model might need to be adapted. Also, cultural differences need to be analysed in more detail. The description of successful or unsuccessful behaviour in the CIs that were applied in the Delphi study and in the action research might be different depending on the cultural background of Delphi experts or training participants. As this research very much focused on the European context, the Delphi study and the action research, both using the CIs, might be applied to a different cultural setting. A new set of CIs that can be applied in a specific cultural setting might be an interesting result. In terms of a horizontal perspective, there might also be different competence requirements for tier 1 actors compared to those in the middle or further up in the supply chain, in terms of the complexity of interfaces that need to be managed.

In addition to its tier in the supply chain, the size of the companies involved in a supply chain might influence the required set of SPSM competences. Additional work would be necessary to investigate competence requirements for small and medium enterprises (SME) which are necessary to implement sustainability strategies in their specific setting. They might have, for example, a rather restricted amount of resources to implement SPSM, compared to bigger, multinational firms. Here, as for instance suggested by Darcy et al. (2013), more research applying a social-constructivist view might be useful, looking at the development of organisational sustainability in the SME context.

Apart from evaluating whether the SPSM competence model is applicable in different contexts for organisations with different characteristics, future research might shed light on how to foster the SPSM competences in the entire upstream supply chain. The impact of supplier training, communication activities or supplier development measures should be assessed.

6.4.5 Curricula and learning methods for SPSM

Fifth, further work on innovative teaching and learning methods for SPSM competences in all four competence clusters is suggested, taking into consideration commonalities but also differences between the HE environment and the professional training context. The viewpoint here might be even need to be enlarged when looking at sustainability performance of an entire supply chain, as indicated above, including training for suppliers.

It was already discussed in the educational implications of this work that the four competence clusters probably require different training methods. More insights are needed on how to foster competences in the meta-oriented area, and in terms of enabling PSM professionals to cope with the role of being the interface in a complex supply chain or rather a supply network (Figure 2.3).

Apart from looking at the different competence clusters, training for students and for purchasing professionals or other actors in a supply chain might require different approaches. The application of

the CIs was considered to be a useful approach in this study by both students and professionals. Nevertheless, a more in-depth analysis of the appropriate educational methods to apply them would be necessary.

In reference to the framework of competences developed by Campion et al. (2011), presented in Figure 2.8, a more systematic approach to embed the SPSM competence model in organisational competence foundations and HE curricula is needed. In terms of the professional context, the linkage of SPSM competences to strategic goals needs to be undertaken in an individual firm environment. For HE, the development of a SPSM curriculum would be a fruitful area for future work. This could be aligned with other educational initiatives either in the PSM field (e.g. PERFECT, Technische Universität Dortmund, 2019) or the sustainability area, like the Principles for Responsible Management Education (PRME). PRME was set out to support the SDGs through responsible management education. One of its six principles, principle three, is about the creation of "[…| educational frameworks, materials, processes and environments that enable effective learning experiences for responsible leadership" (PRME, 2019). The findings of this research might contribute to the implementation of this principle.

6.4.6 The future profile of a purchasing professional

Finally, being the sixth suggestion for future studies, it should be assessed how the SPSM competence model contributes to the development of a basic set of competences required by PSM professionals. It was already described in section 6.2 that the gathered SPSM competences have a rather general character and can therefore also be relevant to successfully cope with other PSM requirements. In terms of future competence requirements for purchasing professionals, Bals et al. (2019) just recently complemented the taxonomy of Tassabehji and Moorehouse (2008). Based on interviews with practitioners, the authors confirm the skill set that was developed by Tassabehji and Moorhouse (2008), but identify an additional 17 skills that are required in future, with sustainability being one of these. As suggested by Bals et al. (2019), future research should be undertaken to validate the findings based on a broader database. The SPSM competence model might then be included in the development of a general PSM competence model for the future.

For both SPSM and other PSM competences, research might consider a vertical perspective in terms of different job roles, or in higher education with regard to different programme levels. Also, other business models like social businesses or businesses that follow a circular economy approach might be a source of future SPSM as well as PSM competences.

6.5 Final remarks

With these ideas on how the findings of the thesis can impact research, practice and education, the author hopes to contribute to the academic and practical discussion in the field. Considering the significant impact of SPSM on sustainability goals of companies as well as of society as such (section 1.1), this rather new focus on the SPSM competence context might support efforts of all actors involved. Overall, the SPSM competence framework is a first step towards recognising the impact of individual competences on organisational behaviour towards a successful implementation of SPSM. As outlined in Figure 2.10, this implies both, the positive effect that individual competences can have on SPSM implementation, but also the constraints in terms of their dependence on other individual and organisational factors. Therefore, from a broader strategic point of view, the conceptual positioning of this work in a framework for change (Figure 2.9) can be adapted to a specific organisational context. The holistic understanding of interrelations and dependencies can lead to a more structured approach for SPSM implementation, and might help actors to focus on the given scope of action.

The SPSM competence model and the training module also provide guidance from an educational viewpoint. The finding that SPSM competences are very much connected to future challenges that purchasing professionals need to cope with might help to position SPSM education in a more prominent position in management, PSM and SCM curricula at HE institutions, and support a more elaborated SPSM training approach in organisations.

Overall, the rather new research area of SPSM competences provides various options for future research, for instance in terms of theoretical, methodological and interdisciplinary aspects. Together, this will further foster SPSM and therefore sustainable management in supply chains.

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APPENDICES

Appendix A: SLR: Overview of papers

Papers for research area 1

Article no.	Authors	Year	Title	Journal	Scope (social/ environmental/ethics public/ private	Empirical/ conceptual
1	Börjeson et al.	2015	Knowledge challenges for responsible supply chain management of chemicals in textiles - As experienced by procuring organizations	Journal of Cleaner Production	Environmental Private, public	Empirical
2	Bowen et al.	2001	The role of supply management capabilities in green supply	Production and Operations Management	Environmental Private	Empirical
3	Eltantawy	2016	The role of supply management resilience in attaining ambidexterity: a dynamic capabilities approach	Journal of Business and Industrial Marketing	Social, environmental Private	Conceptual
4	Eriksson and Svensson	2015	Elements affecting social responsibility	Supply Chain Management	Social Private	Conceptual
5	Grandia	2016	Finding the missing link: Examining the mediating role of sustainable public procurement behaviour	Journal of Cleaner Production	Environmental Public	Empirical
6	Grandia et al.	2015	It is not easy being green: increasing sustainable public procurement behaviour	Innovation: The European Journal of Social Sciences	Environmental Public	Empirical
7	Klassen and Vereecke	2012	Social issues in supply chains: Capabilities link responsibility, risk (opportunity), and performance	International Journal of Production Economics	Social Private	Empirical

8	Lemke and Petersen	2013	Teaching reputational risk management in the supply chain	Supply Chain Management	Social, environmental Private	Empirical
9	Park	2005	The Role of Idealism and relativism as dispositional characteristics in the socially responsible decision-making process	Journal of Business Ethics	Social Private	Empirical
10	Swaim et al.	2016	Motivational influences on supply manager environmental sustainability behavior	Supply Chain Management: An International Journal	Environmental Private	Empirical
11	Walker et al.	2009	Greening Operations Management	Journal of Management	Social, environmental public	Empirical

Papers for research area 2

Article no.	Authors	Year	Title	Journal	Scope (social/ environmental/ public/ private	Empirical/ conceptual
1	Buller and McEvoy	1999	Creating and sustaining ethical capability in the multi-national corporation	Journal of World Business	Ethics Private	Conceptual
2	Craig and Allen	2013	Sustainability information sources: employee knowledge, perceptions, and learning	Journal of Communication Management	Social, environmental Private	Empirical
3	Dubey and Gunasekaran	2015	Shortage of sustainable supply chain talent: an industrial training framework	Industrial and Commercial Training	Social, environmental Private	Conceptual
4	Eltantawy et al.	2009	Supply management ethical responsibility: reputation and performance impacts	Supply Chain Management: An International Journal	Ethics Private	Empirical
5	Maletic et al.	2014	Sustainability exploration and sustainability exploitation: From a literature review towards a	Journal of Cleaner Production	Social, environmental Private	Conceptual

6	Mochizuki and Fadeeva	2010	International Journal of Sustainability in Higher Education Article information	International Journal of Sustainability in Higher Education	Social, environmental Private, public	Conceptual
7	Osagie et al.	2014	Individual Competencies for Corporate Social Responsibility: A Literature and Practice Perspective	Journal of Business Ethics	Social, environmental Private	Empirical
8	Pullmann and Collins	2013	Reshaping the Operations and Supply Chain Management Core Class Curriculum to.	Operations Management Education Review	Social, environmental Private, public	Conceptual
9	Simola	2007	The pragmatics of care in sustainable global enterprise	Journal of Business Ethics	Social, environmental Private	Conceptual
10	Subramanian et al.	2015	Green competence framework: evidence from China	The International Journal of Human Resource Management	Environmental Private	Empirical
11	Wesselink et al.	2014	Individual competencies for managers engaged in corporate sustainable	Journal of Cleaner Production	Social, environmental Private	Empirical

Appendix B: Coding protocol (Excerpt)

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Sustainability competences – Coding protocol: Systematic literature review & Delphi (Excerpt from working document that was used and evolved over time)

1. Coding Scheme

For the systematic literature review, two ways of establishing a coding scheme were tested:

Test 1: Pre-defined nodes according to Osagie et al. (2014) – the nodes did not fit with the idea to evaluate PSM competences → will not be implemented
Test 2: Pre-defined nodes according to the purchasing process steps (see figure 1) + addition of new nodes during coding. → worked out the best and was decided to be the way forward

Articles for testing:
Bowen, F.E., Cousins, P.D., Lamming, R.C., Faruk, A.C., 2001. The role of supply management capabilities in green supply. Production and Operations Management 10 (2), 174-189.
Grandia, J., 2016. Finding the missing link: Examining the mediating role of sustainable public procurement behavior. Journal of Cleaner Production 124 183-190.

2. Comments on test coding of academic papers (Example from coder 2):

- For Bowen et al 2001: Not coded in Table 1 "Develop co-operative relationships with suppliers", because positioned as "benefit"
- Misbeliefs/problematic attitudes on environmental PSM coded under "sustainability/compliance", interpreting this as a lack of knowledge
Comment coder 1: attitude could also be an own node potentially, though
- Table 2 not coded, because "just" attitudes; *Comment coder 1: agree, but some of the descriptions in the text referring to table 2 nevertheless indicate required competences: "recognize the potential for green supply & cost benefit" coded in "Sustainability/Compliance" and "Category strategy"/ "…might help them manage risk" coded in "category strategy" and "SRM"*
- Always coded joined initiatives with suppliers (for specific targets such as reducing waste etc.) under SRM, so rather as part of "supplier management"
- "Collecting environmental information on suppliers" coded in "SRM" and "Data & Systems", not in category strategy; *Comment coder 1: Code in category strategy when part of supplier selection, otherwise in SRM; data &Systems if explicitly mentioned*
- Coded "strategic competence" in "systems thinking" and "category strategy"
- Coded "Understand CSR drivers, regulations, standards" in "sustainability/ compliance", "SRM", "Category strategy", "tender analysis"; *Comment coder 1: we need to discuss our approach with the node "sustainability/compliance"* – Coder 2: I coded a lot into this node; *coder 1: yes, reduce; "sustainability/ compliance" only coded in light of "competence centre"*
- Coded "Deal with resistence to change" to "commitment to change" plus "persistence"
- Other personal characteristics not coded (Osagie et al., p. 243)

3. Nodes definitions (examples as they evolved over time)

a) Definition of nodes according to process steps (based on Monczka et al. (2016) =S1, van Weele, A.J. (2014) =S2, Johnsen et al. (2014) =S3 (only source-to-contract and centres of competence listed here, as there were no codings for purchase-to-pay)	
Source-to-contract	
• Spend & Demand Analysis	Collect historical data by commodity, relative to the demand from the lines of business, unit-level detailed and aggregated by commodity (S1, p.46) Provide common understanding of historical spend relative to demand from each end user within an organization (S1, p.46) Collect accurate information through defined and automated procure-to-pay systems (S1, p.46)
• Demand Mgmt.: Category Strategy	Support internal customers in purchasing specifications; functional and technical (S2, p.30 & p.32) Get involved in new product development projects to suggest technical solutions and suppliers 8S2, p.30) Built a category team with different non-purchasing functions (S1, p.46) Evaluate stakeholder requirements and compare these to external industry intelligence, supply base capabilities and operational risk (S1, p.47) Drive decision making in a stakeholder network (S2, p.31) Problem-solving in a stakeholder network (s2, p.31) Challenge product and service specifications to save cost (S1, p.47) Develop a strategy to align internal requirements with external supply market conditions (S1, p.47) Optimize sourcing strategies based on estimated buying projection (S1, p.46) Develop business plan (S1, p.47) Set policies, procedures and measurements to control expenditures of a unit of category of spend (S1, p.46) Develop a risk mitigation plan (S1, p.47) Supply Market Research (S2, p. 33) Identify new, potential suppliers for changing business needs (S2, p. 30) Ensure appropriate levels of capacity in the supply base (S1, p.47) Establish a fixed set of standards to focus on a preferred supply base regarding risk and compliance (S1, p.47) Conduct a supplier visit or audit (S2, p. 35) Specify purchase order: Quality, logistics, maintenance, legal and environmental requirements, target budget (S2, p. 33) Prepare request for quotation (S2, p. 34)
• Demand Mgmt.: Tender Analysis	Analyse bids received (S2, p. 34) Select suppliers for negotiation (S1, p.47, S2, p.33ff)

Appendix C: Exemplary critical incident (format used in interviews with Delphi experts)

Critical incident "Purchasing is not involved"
The company decided to exclude dangerous chemicals from its products by the year 2020. Therefore, sales, marketing and product development started a project to discuss the impact of this decision on the product, e.g. its quality and functionality, to align this with customer requirements, and to develop a marketing strategy. In addition, driven by product development, the project members will decide on substitutes for the dangerous chemicals. The buyer who is responsible for the commodity/ category of the dangerous chemicals is told about this project by a colleague from marketing during lunch. She/he thinks that it would make sense for purchasing to get involved.
a) Please characterise successful behaviour of the buyer to deal with this situation. …… …… …… …… …… …… …… …… b) In comparison to a successful behaviour, how would a buyer behave and act in an ineffective manner? …… …… …… …… …… …… …… ……

Appendix D: Information sheet for Delphi experts & consent form (Example)

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Participant Information Sheet: Knowledge for sustainable purchasing and supply management – Invitation to participate as a subject expert in a doctoral study (School of business ethics applications number: SchulzeBUSETH1705)

Mainz, 26.01.2018

Dear Madam or Sir,

You are being invited to take part in a research study. Before you decide whether to take part, it is important for you to understand why the research is being done and what it will involve. Please take time to read the following information carefully.

Ensuring sustainability in global value chains: Current and future individual competences

Implementing sustainability into global value chains remains a challenge for companies. Purchasing and Supply Management (PSM) is one of the functions with most interaction towards the upstream supply chain network of the firm, thus influencing a substantial part of how its value creation is delivered. While previous research has shed light on key elements such as stakeholder management on an organizational level, the individual level competences required to perform such tasks are much less understood.

Therefore, I work on a study being part of my doctorate to determine specific competences and knowledge for purchasing professionals required to implement sustainability. The goal is to develop a Sustainable Purchasing and Supply Management competence model. The model will enable higher education institutions to integrate sustainability into purchasing and supply management curricula. Hence, students will be adequately prepared for their professional career in this area. It also aims to support companies and organisations to develop a competence profile and training for sustainable purchasing and supply management.

Delphi Method

In the first step, the competence model was built out of findings in current research literature. In a second step, it should be verified and elaborated by expert knowledge from academia and practice by applying the Delphi method. A selected group of experts will be asked to give input based on CIs, the feedback will be consolidated and provided to the group for further discussion in a second round. Finally, a competence model will be developed and validated in an academic as well as in a professional setting.

The research questions for the Delphi study are the following:

1. Which Purchasing & Supply Management (PSM) knowledge and competences are required for sustainable purchasing?
2. How can such knowledge and competences be structured into a Sustainable Purchasing and Supply Management (SPSM) competence model to enhance professional practice?

You were selected as a potential participant of the Delphi study because of your expertise regarding sustainability in PSM. In total, 10 - 12 experts will participate in the Delphi study, from companies as well as from academia.

If you agree to participate, I will provide you with critical sustainability purchasing situations, and I will ask you to describe ideal actions and behaviour of purchasing professionals that help to solve

these situations successfully. We will go through the questions together by phone or in a face-to-face meeting. I am interested in your input based on your individual expertise. It is not the intention of this study to investigate on your companies' sustainability regulations or performance. Your input will be documented in a written format. The actions and behaviour that you and the other experts describe are the basis for me to derive knowledge and competences for the SPSM competence model. After I consolidated the feedback from all experts, I will provide the anonymised result to you in a second Delphi round. You will then be asked to complement or comment the findings in case you have any additions. This will be done either in a short phone call or by email, and your feedback again will be documented in a written format.
To award your effort, you will get access to the results of the study, which is the competence model with the feedback of all Delphi participants. I will also keep you informed about the next steps in creating a training module and its validation.
The Delphi study will run until April 24th, 2018, which means your input would be required within this timeframe. The estimated effort for you would be 2 hours in the first Delphi round, and another 30 minutes in the second Delphi round.

Conditions for participation
I would be very happy to gain your input for the study. If you do decide to take part as an expert in the Delphi study, I kindly ask you to sign the consent form that you can find on page 4 of this information and send it back to me before the first Delphi round. After you decide to take part you are still free to withdraw at any time and without giving a reason, just by sending me a respective email information.
All the information collected about you and other participants will be kept strictly confidential. All data will be stored electronically on a password-protected computer, accessed only by the researcher or the supervisors of the PhD project.
The data will be kept until 2 years after completion of the doctorate, then the data will be destroyed. Your privacy will be ensured by anonymizing all your feedback in the final competence model. No individual person or organisation will be named in any publications or reports derived from this research. The results will be used for my dissertation. Please contact me if you wish to obtain a copy when the research is published.
I conduct the research as a student of London Southbank University and Mainz University of Applied Sciences, School of Business. Both institutions approved this research. For any questions, please contact me or my supervisors:
Heike Schulze, heike.schulze@hs-mainz.de
Professor Dr. Lydia Bals, lydia.bals@hs-mainz.de
Professor Dr. Jon Warwick, warwick@lsbu.ac.uk
If you have concerns about the way in which the study has been conducted, please contact the Chair of the School of Business Ethics Panel or the Chair of the University Ethics Panel, Professor Shushma Patel: shushma@lsbu.ac.uk.
Thank you very much for taking the time to read this information.
Mainz, 23.01.2018

Heike Schulze
Mainz University of Applied Sciences - School of Business
Lucy-Hillebrand-Str.2
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Phone: +49 (0)6131 628-3429
Email: heike.schulze@hs-mainz.de

Research Project Consent Form

Full title of Project: Ensuring sustainability in global value chains: Current and future buyer competences
Ethics approval registration Number: SchulzeBUSETH1705
Name: Heike Schulze
Researcher Position: Doctoral student
Contact details of Researcher: Heike.schulze@hs-mainz.de

Taking part (please tick the box that applies)	Yes	No
I confirm that I have read and understood the information sheet/project brief and/or the student has explained the above study. I have had the opportunity to ask questions.	☐	☐
I understand that my participation is voluntary and that I am free to withdraw at any time, without providing a reason.	☐	☐
I agree to take part in the above study.	☐	☐
Use of my information (please tick the box that applies)	**Yes**	**No**
I understand my personal details and the details of my company such as phone number and address will not be revealed to people outside the project.	☐	☐
I understand that my data/words may be quoted anonymised in publications, reports, posters, web pages, and other research outputs.	☐	☐
I would like my real name to be used in the above.	☐	☐
I agree for the data I provide to be stored (after it has been anonymised) in a specialist data centre and I understand it may be used for future research.	☐	☐

_____

Name of Participant **Date** **Signature**

_____

Name of Researcher **Date** **Signature**

Appendix E: Delphi pre-test protocol (Excerpt)

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Introduction:

- Make it very clear that the input is required based on the individual expertise – not based on the company processes or regulations.
- Therefore, the intention of the study is not to compare or benchmark company approaches, but to collect input from experts! They are supposed to give feedback to the CIs based on their individual experience and knowledge. They should describe the ideal behaviour of individuals in purchasing – not necessarily based on what the company framework requires.
- Explain how "Purchasing and Supply Management (PSM)" is defined – show the process overview and make sure, that all participants have the same understanding.
- Based on the process overview, clarify a common understanding of the roles, referring to the individual background of the Delphi participant.
- Prepare one slide wrapping up the 5 most important topics (e.g. describe behaviour, not knowledge; based on individual expertise – not company standards; …)
- In general, introduction page that explains the procedure is good

CIs:

- Reduce the number of CIs to 6 -8
- Some critical incident dilemmas are similar, therefore reduce the number and focus on different critical incident situations/ dilemmas

→ decision of the researcher: Keep the number of CIs, change the order for each interview, accept that some might be quite similar, but the perception which one serves best to think of competences might be different for each Delphi participant

- When introducing each critical incident, explain the situation referring to the context of the Delphi expert; not only reading the incident description
- Maybe add a question after each incident; e.g. How should the buyer behave?"

General:

- Clearly define the question: Is it focused on behaviour or knowledge; what is knowledge? Knowledge is the pre-requisite for behaviour
- Maybe add additional critical incident: How to deal personally with different ethical standards and definition of standards? E.g. in comparison to competitors, compared to associations, etc.? Is the own definition "good" enough? What can the individual rely on?
- For the further analysis of the PhD, discuss the drivers for behaviour – e.g. leadership, organisational culture; is sustainability a competence issue or a cultural/ leadership issue? How would a CEO/ leadership team act successfully in critical incident situations?

Other findings:

- The methodology of asking for unsuccessful behaviour turned out to be useful to find competences that were not mentioned in the "successful behaviour" context. Example: "Ignores the fact" → positive equivalent would be "becomes active to solve the issue"

Appendix F: Delphi round 2 – Results & template provided to Delphi experts

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Buyer knowledge for sustainable purchasing and supply management – Delphi study round 2: Verification of competences and their allocation in the PSM process

Overview Results of Delphi study round 1

- 16 experts from companies, public institutions and academia were interviewed and gave their input based on 12 CIs. Each interview took 2 hours.
- The collected descriptions on successful and not successful action and behaviour were coded to 27 competence nodes. The 5 most often coded competences:
    - "Communication skills"
    - "Systems thinking competence"
    - "Basic sustainability knowledge"
    - "Cross-functional teamworking"
    - "Commitment to change"
- Additionally, 14 competence areas were identified that directly refer to activities in the procure-to-pay process (see page 14). The 5 most often coded competences:
    - "Supplier relationship management (Application of tools)"
    - "Supplier relationship management (Communication)"
    - "Supplier relationship management (Cooperative attitude)"
    - "Demand management – Category strategy"
    - Competence centre "Sustainability/ compliance"

  All the process steps regarding purchase-to-pay did not get any codings at all.

Goals for Delphi study round 2

1. Verification of competences, prioritisation and complementation (pages 4-13)
2. Verification of top competences in the context of a PSM process (pages 13 -18)
3. Input regarding contextual factors (page 19)

On pages 4 - 18, your input is required in terms of ticking the boxes below every competence. This is how it looks like – just click on one of the boxes then to give your feedback:

Should this competence be integrated in			
- a curriculum for higher education?	Yes – is essential ☒ Maybe – nice to have ☐ No – not needed ☐	Yes – is essential ☐ Maybe – nice to have ☐ No – not needed ☒	Yes – is essential ☐ Maybe – nice to have ☒ No – not needed ☐
- a professional training in PSM?	Yes – is essential ☐ Maybe – nice to have ☒ No – not needed ☐	Yes – is essential ☒ Maybe – nice to have ☐ No – not needed ☐	Yes – is essential ☐ Maybe – nice to have ☐ No – not needed ☒

Competence Clusters

The competences that were collected in the interviews are allocated to 4 competence clusters:

The competence cluster definitions are based on: *Delamare-Le Deist, F. D., & Winterton, J. (2005). What is competence?, Human resource development international, 8(1), 27-46.*

1. Verification of competences

Cluster: Cognition-oriented competences

Competence	Ability to make decisions	Critical thinking	Systems thinking competence
Exemplary actions & behaviour (from interviews)	• Balances reasons & appropriate measures • Copes with conflicting goals • Sees the balanced trade-off element	• Gathers information to get a better understanding of an issue • Asks for background information • Critically reviews processes and approaches	• Understands the business case for sustainability • Thinks beyond one's own nose • Applies the strategic context of the company • Understands the supply network • Understands circular economy models
Should this competence be integrated in			
- a curriculum for higher education?	Yes – is essential ☐ Maybe – nice to have ☐ No – not needed ☐	Yes – is essential ☐ Maybe – nice to have ☐ No – not needed ☐	Yes – is essential ☐ Maybe – nice to have ☐ No – not needed ☐
- a professional training in PSM?	Yes – is essential ☐ Maybe – nice to have ☐ No – not needed ☐	Yes – is essential ☐ Maybe – nice to have ☐ No – not needed ☐	Yes – is essential ☐ Maybe – nice to have ☐ No – not needed ☐

Cluster: Cognition-oriented competences

Competence	Creativity	Resourcefulness (creative resource combinations)	Conscientiousness
Exemplary actions & behaviour (from interviews)	• Is creative and innovative when looking at approaches, instead of looking only at the most obvious solutions • Looks out for other ways of leveraging the impact	• Uses tools and systems that are already available to increase efficiency when implementing sustainability requirements in PSM • Looks out for funding or cost sharing opportunities	• Tries to find out as much as possible • Takes time to avoid mistakes • Investigates thoroughly on the topic • Is very careful with jumping to conclusions
Should this competence be integrated in			
- a curriculum for higher education?	Yes – is essential ☐ Maybe – nice to have ☐ No – not needed ☐	Yes – is essential ☐ Maybe – nice to have ☐ No – not needed ☐	Yes – is essential ☐ Maybe – nice to have ☐ No – not needed ☐
- a professional training in PSM?	Yes – is essential ☐ Maybe – nice to have ☐ No – not needed ☐	Yes – is essential ☐ Maybe – nice to have ☐ No – not needed ☐	Yes – is essential ☐ Maybe – nice to have ☐ No – not needed ☐

Cluster: Social-oriented competences

Competence	Communication skills	Cross-functional teamworking	Stakeholder Management - communication
Exemplary actions & behaviour (from interviews)	• Presents & sells facts • Conducts an open conversation • Interacts with others • Adapts to a target group • Uses appropriate communication channels • Moderates	• Cooperates with others to find common solutions • Knows relevant internal departments to cooperate with	• Listens • Understands stakeholder expectations • Communicates with stakeholders in a cooperative manner • Respects the communication procedures in the organisation
Should this competence be integrated in			
- a curriculum for higher education?	Yes – is essential ☐ Maybe – nice to have ☐ No – not needed ☐	Yes – is essential ☐ Maybe – nice to have ☐ No – not needed ☐	Yes – is essential ☐ Maybe – nice to have ☐ No – not needed ☐
- a professional training in PSM?	Yes – is essential ☐ Maybe – nice to have ☐ No – not needed ☐	Yes – is essential ☐ Maybe – nice to have ☐ No – not needed ☐	Yes – is essential ☐ Maybe – nice to have ☐ No – not needed ☐

Cluster: Social-oriented competences

Competence	Interpersonal savvy	Thoughtfulness towards others
Exemplary actions & behaviour (from interviews)	• Uses formal and informal communication channels to get information • Interacts with internal and external stakeholders to get support in the interest of the own goals	• Shows understanding for the other position • Acts in a tactful manner • Is understanding • De-escalates • Is aware how to avoid conflicts

Should this competence be integrated in

- a curriculum for higher education?	Yes – is essential ☐ Maybe – nice to have ☐ No – not needed ☐	Yes – is essential ☐ Maybe – nice to have ☐ No – not needed ☐
- a professional training in PSM?	Yes – is essential ☐ Maybe – nice to have ☐ No – not needed ☐	Yes – is essential ☐ Maybe – nice to have ☐ No – not needed ☐

Cluster: Functional-oriented competences

Competence	Basic individual knowledge on PSM	Intercultural knowledge	Stakeholder Mgmt. -Application of tools
Exemplary actions & behaviour (from interviews)	• Knowledge on the supply base and market • Knowledge on PSM strategy & processes • Knowledge on price calculations	• Is aware of the cultural background and differences • Is aware of country specific legislation • Takes local conditions seriously	• Involves a third party perspective (e.g. NGO) • Develops an action plan how to start the dialogue with the NGO to solve the issues • Looks out for stakeholders in this procedure

Should this competence be integrated in			
- a curriculum for higher education?	Yes – is essential ☐ Maybe – nice to have ☐ No – not needed ☐	Yes – is essential ☐ Maybe – nice to have ☐ No – not needed ☐	Yes – is essential ☐ Maybe – nice to have ☐ No – not needed ☐
- a professional training in PSM?	Yes – is essential ☐ Maybe – nice to have ☐ No – not needed ☐	Yes – is essential ☐ Maybe – nice to have ☐ No – not needed ☐	Yes – is essential ☐ Maybe – nice to have ☐ No – not needed ☐

Cluster: Functional-oriented competences

Competence	Systematic way of working	Knowledge on product development
Exemplary actions & behaviour (from interviews)	• Proceeds step-by-step • Analyses what is useful and relevant • Keeps records • Makes a plan • Gets prepared before attending meetings	• Has a broad knowledge on product development • Understands the interconnection of product development, raw materials and risk

Should this competence be integrated in

- a curriculum for higher education?	Yes – is essential ☐ Maybe – nice to have ☐ No – not needed ☐	Yes – is essential ☐ Maybe – nice to have ☐ No – not needed ☐
- a professional training in PSM?	Yes – is essential ☐ Maybe – nice to have ☐ No – not needed ☐	Yes – is essential ☐ Maybe – nice to have ☐ No – not needed ☐

Cluster: Functional-oriented competences

Competence	Basic sustainability knowledge	Resourcefulness + Application of tools
Exemplary actions & behaviour (from interviews)	• Knows sustainability strategies & procedures of the institution • Knows frameworks & law • Understands sustainability does not mean "doing good", but preventing risk and following a business case	• Participates in industry initiatives or initiates participation of the own company • Uses existing tools • Buys external know-how if required

Should this competence be integrated in

- a curriculum for higher education?	Yes – is essential ☐ Maybe – nice to have ☐ No – not needed ☐	Yes – is essential ☐ Maybe – nice to have ☐ No – not needed ☐
- a professional training in PSM?	Yes – is essential ☐ Maybe – nice to have ☐ No – not needed ☐	Yes – is essential ☐ Maybe – nice to have ☐ No – not needed ☐

Cluster: Meta-oriented competences

Competence	Commitment to change	Self-Reflection	Organizational savvy
Exemplary actions & behaviour (from interviews)	• Is passionate and believes in the benefits of sustainability • Does commit personally to the next steps • Takes on leadership to bring in new sustainability initiatives • Is willing to participate	• Knows and admits own knowledge and also gaps • Is able to raise a flag • Asks for help • Acknowledges that more can be done	• Understands the impact of the company strategy & actively deals with this subject • Knows how to get this started within the organisation • Identifies key people leading the project

Should this competence be integrated in			
- a curriculum for higher education?	Yes – is essential ☐ Maybe – nice to have ☐ No – not needed ☐	Yes – is essential ☐ Maybe – nice to have ☐ No – not needed ☐	Yes – is essential ☐ Maybe – nice to have ☐ No – not needed ☐
- a professional training in PSM?	Yes – is essential ☐ Maybe – nice to have ☐ No – not needed ☐	Yes – is essential ☐ Maybe – nice to have ☐ No – not needed ☐	Yes – is essential ☐ Maybe – nice to have ☐ No – not needed ☐

Cluster: Meta-oriented competences

Competence	Political savvy	Self-Awareness	Confidence
Exemplary actions & behaviour (from interviews)	• Uses/"plays" the internal hierarchy • Acts diplomatically • Actively uses the repertoire of company politics • Has a good understanding of actions and the reactions they provoke	• Is aware of own values • Follows her/his gut feeling • Is aware of own sphere of influence, competences and role • Knows her/his own threshold	• Knows what needs to be done and is not afraid to push for desired results • Stands up for her/his professional role/interests • Makes it clear that the issue needs to be solved

Should this competence be integrated in

- a curriculum for higher education?	Yes – is essential ☐ Maybe – nice to have ☐ No – not needed ☐	Yes – is essential ☐ Maybe – nice to have ☐ No – not needed ☐	Yes – is essential ☐ Maybe – nice to have ☐ No – not needed ☐
- a professional training in PSM?	Yes – is essential ☐ Maybe – nice to have ☐ No – not needed ☐	Yes – is essential ☐ Maybe – nice to have ☐ No – not needed ☐	Yes – is essential ☐ Maybe – nice to have ☐ No – not needed ☐

Cluster: Meta-oriented competences

Competence	Persistence	Integrity	Curiosity
Exemplary actions & behaviour (from interviews)	• Drops the question again and again • Digs deeper and deeper • Tries to get involved, even if the project does not understand the need to involve PSM • Stays the course and implements the process	• Follows the established grievance process in the company • Acts in a reliable way • Acts with dignity and decorum • Is open, transparent an honest	• Is eager to learn • Is open towards challenges

Should this competence be integrated in			
- a curriculum for higher education?	Yes – is essential ☐ Maybe – nice to have ☐ No – not needed ☐	Yes – is essential ☐ Maybe – nice to have ☐ No – not needed ☐	Yes – is essential ☐ Maybe – nice to have ☐ No – not needed ☐
- a professional training in PSM?	Yes – is essential ☐ Maybe – nice to have ☐ No – not needed ☐	Yes – is essential ☐ Maybe – nice to have ☐ No – not needed ☐	Yes – is essential ☐ Maybe – nice to have ☐ No – not needed ☐

Additional comments, e.g. did you miss something or do you want to add something?

(Please write in the grey box)

2. Verification of top competences in the context of a PSM process

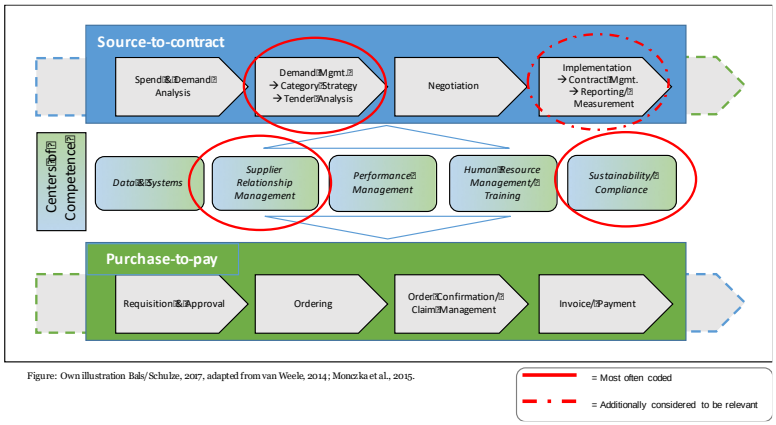


Figure: Own illustration Bals/Schulze, 2017, adapted from van Weele, 2014; Monczka et al., 2015.

2.1 Demand Management – Category strategy

Cluster: Functional-oriented competences

Competence	Supply Market Research	Purchasing specifications	Strategic positioning
Exemplary actions & behaviour (from interviews)	• Searches the market to find legitimate potential suppliers • Uses existing databases and published information to gather additional information and knowledge	• Tries to get informed by talking to the product development department to understand what materials are not allowed • Asks for product specifications from product development	• Convinces others that purchasing expertise can help to identify risks at an early stage of the project • Evaluates how the corporate goals impact the supply base
Should this competence be integrated in			
- a curriculum for higher education?	Yes – is essential ☐ Maybe – nice to have ☐ No – not needed ☐	Yes – is essential ☐ Maybe – nice to have ☐ No – not needed ☐	Yes – is essential ☐ Maybe – nice to have ☐ No – not needed ☐
- a professional training in PSM?	Yes – is essential ☐ Maybe – nice to have ☐ No – not needed ☐	Yes – is essential ☐ Maybe – nice to have ☐ No – not needed ☐	Yes – is essential ☐ Maybe – nice to have ☐ No – not needed ☐

2.2 Supplier Relationship Management (SRM)

Cluster: Functional-oriented competences

Competence	SRM Application of tools	SRM Communication
Exemplary actions & behaviour (from interviews)	• Applies a code of conduct and monitoring tools • Conducts a risk assessment • Draws consequences in case of non-compliance	• Explains requirements and issues to the supplier • Shows the benefits of sustainability to the supplier • Convinces • Explains the business risk to the supplier

Should this competence be integrated in		
- a curriculum for higher education?	Yes – is essential ☐ Maybe – nice to have ☐ No – not needed ☐	Yes – is essential ☐ Maybe – nice to have ☐ No – not needed ☐
- a professional training in PSM?	Yes – is essential ☐ Maybe – nice to have ☐ No – not needed ☐	Yes – is essential ☐ Maybe – nice to have ☐ No – not needed ☐

2.2 Supplier Relationship Management (SRM) - continued

Cluster: Functional-oriented competences

Competence	SRM Cooperative Attitude	SRM Holistic view
Exemplary actions & behaviour (from interviews)	• Coaches the supplier in the implementation of sustainability standards • Shares experiences • Offers trainings to the supplier • Works together with the supplier	• Explains short-, mid- and long-term benefits (total value) • Finds opportu-nities to generate additional cash flow for the suppliers to be able to invest for environmental measures

Should this competence be integrated in		
- a curriculum for higher education?	Yes – is essential ☐ Maybe – nice to have ☐ No – not needed ☐	Yes – is essential ☐ Maybe – nice to have ☐ No – not needed ☐
- a professional training in PSM?	Yes – is essential ☐ Maybe – nice to have ☐ No – not needed ☐	Yes – is essential ☐ Maybe – nice to have ☐ No – not needed ☐

2.3 Centre of competence: Sustainability/ Compliance

Cluster: Functional-oriented competences

Competence	Development of tools	Participation in peer initiatives
Exemplary actions & behaviour (from interviews)	• Makes a proposal to integrate sustainability in existing processes • Develops a questionnaire for suppliers • Evaluates how to monitor the suppliers • Develops a code of conduct	• Represents company in industry initiatives or initiates participation • Does projects together with customers and suppliers • Initiates joined reaction of customers

Should this competence be integrated in		
- a curriculum for higher education?	Yes – is essential ☐ Maybe – nice to have ☐ No – not needed ☐	Yes – is essential ☐ Maybe – nice to have ☐ No – not needed ☐
- a professional training in PSM?	Yes – is essential ☐ Maybe – nice to have ☐ No – not needed ☐	Yes – is essential ☐ Maybe – nice to have ☐ No – not needed ☐

2.4 Implementation – Contract Management & Reporting/ Measurement

Cluster: Functional-oriented competences

Competence	Contract Management	Reporting/ Measurement
Exemplary actions & behaviour (from interviews)	• Understands how to include human rights and environmental standards in contracts • Is aware of legal implications if sustainability aspects are integrated in contracts	• Discusses and derive targets for procurement • Works to get approval for changing KPIs and perfor-mance metrics • Tries to make improvements with positive impact on the traditional KPIs

Should this competence be integrated in		
- a curriculum for higher education?	Yes – is essential ☐ Maybe – nice to have ☐ No – not needed ☐	Yes – is essential ☐ Maybe – nice to have ☐ No – not needed ☐
- a professional training in PSM?	Yes – is essential ☐ Maybe – nice to have ☐ No – not needed ☐	Yes – is essential ☐ Maybe – nice to have ☐ No – not needed ☐

Additional comments, e.g. did you miss something or do you want to add something?
(Please write in the grey box)

3. Input regarding contextual factors

Competences for sustainable PSM have to be considered in an organisational context. The application of competences and knowledge of purchasing professionals depends on this context. The following statements are derived from academic papers. Please mark the 2 contextual factors that you think are most important to ensure that purchasing professionals apply their knowledge for sustainable PSM. Also, in case you miss other contextual factors, please add them to the list.

☐ Top-Management of the institution is driving corporate sustainability strategies

☐ PSM adapts a mentoring approach instead of a monitoring approach towards suppliers, and pursues close interaction with the entire supply network

☐ The institution is in a secure economic situation

☐ The organisation values social and ecological factors as much as economic factors

☐ The institution has developed a business case for sustainability, including mid-term and long-term goals

☐ **Other:**

Appendix G: Evaluation Delphi round 2

Delphi Round 2 - Results: # of checkmarks competences																				
	Green and yellow competences	*Ability to make decisions*	*Critical Thinking*	*Systems Thinking Competence*	*Creativity*	*Resourcefulness (Creative resource combination)*	*Conscientiousness [1]*	*Communication Skills*	*Cross-functional teamworking*	*Stakeholder Mgmt. - Communication*	*Interpersonal Savvy*	*Thoughtfulness towards others*	*Basic individual knowledge on PSM*	*Intercultural Knowledge*	*Stakeholder Mgmt. - Application of tools*	*Systematic way of working*	*Knowledge on product development*	*Basic Sustainability knowledge*	*Resourcefulness - Application of tools*	*Commitment to change**
Curriculum Higher Education																				
- essential	**- Systems thinking competence** **- Basic sustainability knowledge** - Stakeholder Mgmt. (Communication) - Basic individual knowledge on PSM - Contract Mgmt.	4	5	8	6	3	2	5	4	7	3	3	7	4	3	4	3	8	3	5
- Nice to have	**- Persistence** - Resourcefulness (Creative resource combination) - Conscientiousness - Thoughtfulness towards others - Confidence - Sustainability/ Compliance (Development of tools)	5	4	1	3	6	6	4	5	2	5	6	2	5	5	5	5	1	4	3
- not needed	**- Political savvy** - Sustainability/ Compliance (Participation in peer initiatives)	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	1	0	1	0
Professional Training																				
- essential	**- Basic individual knowledge on PSM** - Stakeholder Mgmt. (Communication) - Systems thinking competence - Basic sustainability knowledge - Organisational savvy - SRM (Application of tools) - SRM (Communication) - SRM (Cooperative attitude) SRM (Holistic view) - Contract Mgmt.	7	6	8	7	7	2	7	6	8	4	4	9	7	4	5	4	8	4	4
- Nice to have	**- Political savvy** **- Self-awareness** **- Curiosity** - Conscientiousness - Thoughtfulness towards others - Interpersonal savvy - Stakeholder Mgmt. - Application of tools - Knowledge on product development	2	3	1	2	1	5	2	2	1	5	5	0	2	5	4	5	1	5	4
- not needed	n/a	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0

Legend:
* = one expert did not rank this competence
[1] = one expert did not rank either higher education or professional training
Green = highest no. of checkmarks
Yellow = 2nd highest no. of checkmarks

Delphi Round 2 - Results: # of checkmarks competences																				
	Green and yellow competences	*Self-Reflection**	*Organisational savvy**	*Political savvy*	*Self-awareness*	*Confidence*	*Persistence*	*Integrity*	*Curiosity*	*Category Strategy - Supply market research*	*Category Strategy - Purchasing specifications*	*Category Strategy - Strategic positioning*[1]	*SRM - Application of tools*	*SRM - Communication*[1]	*SRM - Cooperative attitude*	*SRM - Holisic view*	*Sustainability/ compliance - Development of tools*	*Sustainability/ Compliance - Participation in peer initiatives*	*Contract Mgmt.*	*Reporting/ Measurement*
Curriculum Higher Education																				
- essential	**- Systems thinking competence** **- Basic sustainability knowledge** - Stakeholder Mgmt. (Communication) - Basic individual knowledge on PSM - Contract Mgmt.	5	6	1	3	3	1	3	5	6	6	4	5	5	4	6	3	2	7	3
- Nice to have	**- Persistence** - Resourcefulness (Creative resource combination) - Conscientiousness - Thoughtfulness towards others - Confidence - Sustainability/ Compliance (Development of tools)	3	2	5	5	6	8	5	4	3	3	4	4	4	5	3	6	5	1	5
- not needed	**- Political savvy** - Sustainability/ Compliance (Participation in peer initiatives)	0	0	3	1	0	0	1	0	0	0	0	0	0	0	0	0	2	0	0
Professional Training																				
- essential	**- Basic individual knowledge on PSM** - Stakeholder Mgmt. (Communication) - Systems thinking competence - Basic sustainability knowledge - Organisational savvy - SRM (Application of tools) - SRM (Communication) - SRM (Cooperative attitude) SRM (Holistic view) - Contract Mgmt.	4	8	3	3	7	5	6	3	7	7	7	8	8	8	8	7	4	8	8
- Nice to have	**- Political savvy** **- Self-awareness** **- Curiosity** - Conscientiousness - Thoughtfulness towards others - Interpersonal savvy - Stakeholder Mgmt. - Application of tools - Knowledge on product development	4	0	6	6	2	3	2	6	2	2	2	1	0	1	1	2	5	1	1
- not needed	n/a	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0
	Legend: * = one expert did not rank this competence [1] = one expert did not rank either higher education or professional training Green = highest no. of checkmarks Yellow = 2nd highest no. of checkmarks																			

Appendix H: Communication of final results to Delphi experts (Presentation)

Content

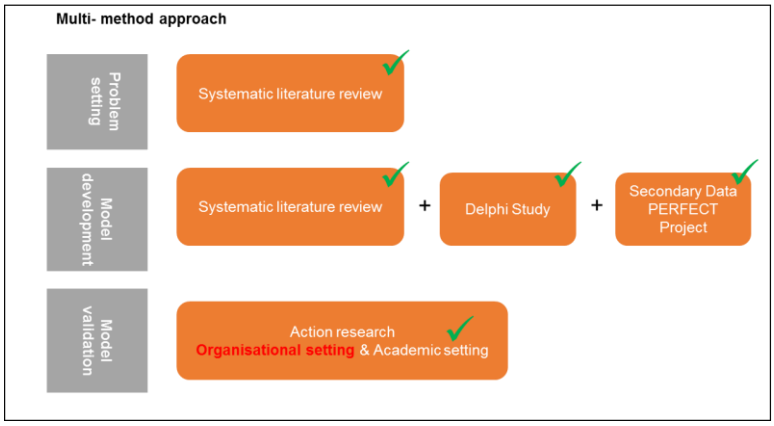
1. Wrap-up research questions and approach
2. Development of SPSM competence model - Results
3. SPSM Training – Approach & Results
4. Next steps

Please be aware that this presentation is meant to be a consolidated management summary to inform all Delphi experts on the current state of the research. Detailed empirical data and background information is available upon request.

1. Wrap-up: Research questions

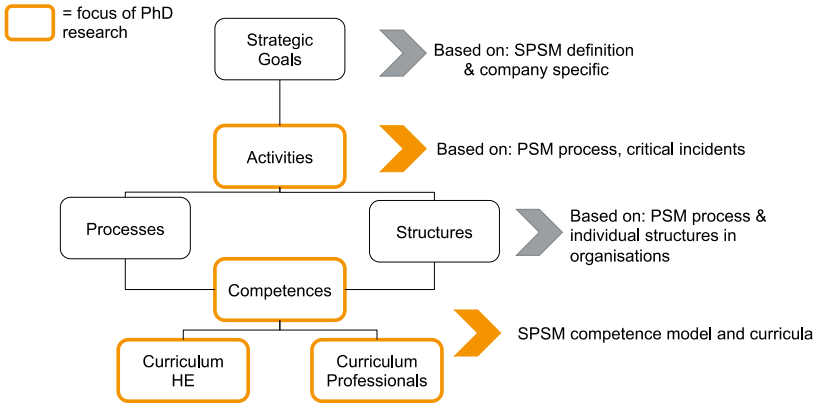
1. RQ1: Which knowledge and competences are required for sustainable purchasing & supply management (SPSM)?
2. RQ2: How can such knowledge and competences be structured into a (SPSM) competence model to enhance professional practice?
3. RQ3: How can the SPSM competence model be used to raise sustainability in companies, differentiating between professional training and academic education?

1. Wrap-up: Research approach



1. Wrap-up: Research approach

Model of SPSM integration and focus of this research



2. Development of competence model

Approach to gather final set of competences

Step 1: Systematic literature review
→ Preliminary list of competences grouped into 4 competence clusters

Step 2: Develop critical incidents
→ 12 critical incidents based on top competences gathered in the systematic literature review

Step 3: Delphi round 1 (based on critical incidents)
→ Updated list of competences within each of the 4 competence clusters, gathered

Step 4: Delphi round 2
→ Prioritised list of competences for academic and professional curricula

Step 5: Consolidation for SPSM competence model
→ Based on top competences Delphi round 2 + competences most often coded in literature and Delphi round 1

2. Development of competence model

Final list of 26 competences for SPSM

Functional-oriented competences	1. Basic individual knowledge on PSM 2. Basic sustainability knowledge 3. Implementation – Contract Management 4. Implementation – Measurement & Reporting 5. Knowledge on product development 6. Resourcefulness (Application of tools) 7. Stakeholder management (Application of tools) 8. Supplier relationship management (Application of tools) 9. Sustainability/ compliance (Development of tools)
Cognition – oriented competences	10. Conscientiousness 11. Resourcefulness (Creative resource combination) 12. Supplier relationship management (Holistic view) 13. Systems thinking competence
Social-oriented competences	14. Communication skills 15. Cross-functional team working 16. Interpersonal savvy 17. Supplier relationship management (Communication) 18. Stakeholder management (Communication) 19. Thoughtfulness towards others
Meta-oriented competences	20. Commitment to change 21. Confidence 22. Organisationally savvy 23. Persistence 24. Political savvy 25. Self-awareness 26. Supplier relationship management (Cooperative approach)

2. Development of competence model

Competence description, based on Delphi study, available for all 26 competences (Example: Systems thinking competence)

Cognition-oriented competences

Competence name:

Systems thinking competence

Competence definition:

"Systems thinking is defined as a discipline for seeing wholes and a framework for seeing interrelationships rather than things, for seeing patterns of change rather than static snapshots" (Senge, 1990). In the SPSM context, it includes the recognition of interdependencies within a supply chain network and the consideration of the impact when implementing a SPSM strategy.
Opposite: Having a small view of the world

Behaviour:

- Develops the business case for sustainability
- Understands circular economy models
- Is open to balance different requirements in the situation
- Gets the big picture and realises the different needs and issues of the stakeholders
- Links corporate goals to PSM actions that support these goals
- Explains the contribution of PSM to a companies' sustainability strategy
- Contributes the PSM perspective to a complex interdisciplinary decision process
- Sees the connection between risk management and sustainability
- Understands how bad working conditions impact product quality
- Explains what non-compliance to environmental standards mean to the supplier, the own company and the other companies in the industry in terms of risk

2. Development of competence model

Results Delphi rounds 1 & 2 (consolidated overview)

- Results Delphi round 1:
  - 5 most often coded: Communication skills, Systems thinking competence, Basic sustainability knowledge, Cross-functional teamworking, Commitment to change
  - 5 most often coded PSM process steps: Supplier relationship management: Application of tools, Communication, Cooperative attitude; Demand Management – Category Strategy, Sustainability/ Compliance
- Results Delphi round 2 – most often coded:
  - Higher Education:

    Essential: Systems thinking competence, Basic sustainability knowledge;

    Nice to have: Persistence
  - Professional training:

    Essential: Systems thinking competence

    Nice to have: Political savvy, Self awareness, Curiosity

3. Trainings in the academic context

Action research – SPSM trainings

- Focused on the 10 most often coded competences and the critical incidents that cover these competences:
  - Competences: Communication skills, Systems thinking competence, Basic sustainability knowledge, Cross-functional teamworking, Commitment to change, Supplier relationship management - Application of tools, - Communication, - Cooperative attitude, Demand management – category strategy, Sustainability/ compliance
  - Critical incidents: "Purchasing contribution to a new sustainability strategy"; "The supplier in a developing country"; "Purchasing is not involved"; "The stakeholder event"
  - Leading questions:
    1. What is best practice in dealing with such a situation (e.g. what to do with whom and how)?
    2. Why is it important to solve the situations? What is the benefit for the company, the customers, employees, suppliers, …?
    3. What are the negative effects when situations like this are not solved successfully?

3. Trainings in the academic context

Action research – SPSM trainings

- Feedback from students (consolidated overview); gathered by questionnaires filled-in before and after the training session:
  - Competences that students individually perceived they have increased their knowledge on (top 3): Supplier Relationship Management – Application of tools; Systems thinking competence, Communication skills
  - Competences that students individually perceived they have not increased their knowledge on (top 3): Commitment to change, Sustainability/ Compliance, Demand management – category strategy
  - In general, students liked the interactive approach and the critical incidents, being taken out of real business practice
  - They considered to have more time for the training, for example to conduct role plays and discuss the situations more in depth
  - A session on basic sustainability knowledge was recommended before working on the critical incidents

4. Next steps

- Investigate the relevance of the core SPSM competences for certain PSM process steps → e.g. impact on job profiles, job roles, training plans
- Adapt the training approach for the professional context and conduct pilot training session in a company *(still looking for a company that is interested to conduct the training!)*
- Investigate on moderating factors for SPSM → evaluate feedback given in Delphi round 2

Appendix I: Action research, pre-training questionnaire for students

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Participant Information Sheet: Buyer knowledge for sustainable supply chain management – Invitation to participate in Action research (University/Students) (School of business ethics applications number: SchulzeBUSETH1705)

Mainz, 30.05.2018

Dear student,
You are being invited to take part in a research study. In cooperation with professor Lydia Bals from your institution, I kindly invite you to participate in a training on "Sustainable purchasing & supply management". You will learn about social and environmental aspects when managing global supply chains.
I would like to ask you a few questions before and after the training. I will ask questions about your knowledge concerning sustainable supply chain management before and after the training to measure the learning outcome. In addition, after the training, I would like to get your feedback on the training methodology and design. Before you decide to take part, it is important for you to understand why the research is being done and what it will involve. Please take time to read the following information carefully.

Ensuring sustainability in global value chains: Current and future buyer competences

Implementing sustainability into global value chains remains a challenge for companies. Purchasing and Supply Management (PSM) is one of the functions with most interaction towards the upstream supply chain network of the firm, thus influencing a substantial part of how its value creation is delivered. While previous research has shed light on key elements such as stakeholder management on an organizational level, the individual level competences required to perform such tasks are much less understood.
Therefore, I work on a study being part of my doctorate to determine buyer specific competences and knowledge required to implement sustainability. The goal is to develop a Sustainable Purchasing and Supply Management competence model for buyers. The model will enable higher education institutions to integrate sustainability into purchasing and supply management curricula. Hence, students will be adequately prepared for their professional career in this area. It also aims to support companies and organisations to develop a buyer competence profile for sustainable purchasing and supply management.

Action research

In a first step, the competence model was built out of findings in current research literature. In a second step, it was verified and elaborated by expert knowledge from academia and practice. Finally, the competence model was developed and now needs to be validated in an academic as well as in a professional setting.

Conditions for participation

I would be very happy to gain your input for the study. If you do decide to take part in the Action research study, I kindly ask you to sign the consent form that you can find attached to this information and give it back to me together with the questionnaire. If you decide to take part you are still free to withdraw at any time and without giving a reason, just by

sending me a respective email information. It is important to state that students' decisions to take part in this study or to withdraw will have no impact on their marks, assessment or future studies.
All the information collected about you and other participants will be kept strictly confidential. All data will be stored electronically on a password-protected computer, accessed only by the researcher or the supervisors
The data will be kept until 2 years after completion of doctorate, then the data will be destroyed. Your privacy will be ensured by anonymizing all your feedback in the final competence model. No individual person or organisation will be named in any publications or reports derived from this research. The results will be used for my dissertation. Please contact me if you wish to obtain a copy of the published research.
I conduct the research as a student of London Southbank University and the University of Applied Sciences in Mainz, School of Business. Both institutions approved this research.
For any questions, please contact me or my supervisors:
Heike Schulze, heike.schulze@hs-mainz.de
Professor Dr. Lydia Bals, Lydia.bals@hs-mainz.de
Professor Dr. Jon Warwick, warwick@lsbu.ac.uk
If you have concerns about the way in which the study has been conducted, please contact the Chair of the School of Business Ethics Panel or the Chair of the University Ethics Panel, Professor Shushma Patel: shushma@lsbu.ac.uk .
Thank you very much for taking the time to read this information.
Mainz, 23.05.2018

Heike Schulze
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D- 55128 Mainz
Phone: +49 (0)6131 628-3429
Email: heike.schulze@hs-mainz.de

Survey before the training on competences for sustainable purchasing and supply management (SPSM)

The questions below are designed to identify your current knowledge on sustainable purchasing and supply management. Your responses will have no impact on your grade in this course or in other courses. Your name is required to identify your responses in a pre-training and a post-training questionnaire.

Question 1:
Did you attend a lecture or a training on sustainability before?

Yes: No:

If yes: What was the title of the training and what were the main topics discussed in the training? (please name no more than 3)

Question 2:
Please rate the degree of your knowledge as of today, before the training, by bubbling the response according to the following 5-point scale.

A = Strongly disagree
B = Disagree
C = Neutral
D = Agree
E = Strongly agree

2.1
If I would be an intern in the purchasing department a company, I would be able to give a presentation to my colleagues and convince them how important it is to implement sustainable purchasing and supply management.

A B C D E

2.2
Imagine you work as a consultant for sustainable purchasing and supply management (SPSM). Are you able to explain the benefits of SPSM for the company to a customer?

A B C D E

2.3
I know sustainability theories, international frameworks and standards.

A B C D E

2.4
You work as an intern in the purchasing department of a company, and you are supposed to attend a meeting with colleagues from marketing and from product development. Do you think you can compare their priorities and goals to those from purchasing?

A B C D E

2.5
Please rate this statement: “When I buy new clothes, I prefer brands that are known for their adherence to environmental and social standards. I would even send an email to the company to ask for their sustainability standards.”

A B C D E

2.6
Imagine again that you work as an intern in a company. A colleague asks if you know how to conduct a risk assessment for sustainability in the supply chain. Would you know how to do that?

A B C D E

2.7
Again, you are an intern in a company. You visit a supplier, together with an experienced buyer of the company. The buyer has to leave the meeting for a few minutes to take an important phone call.

In the meantime, the supplier representatives ask you to explain, why sustainable purchasing and supply management is important for them as a supplier. Would you be able to find arguments?

A B C D E

2.8

In the same situation as in question 2.7., the supplier representatives ask you whether you understand what it means to cooperate to implement sustainability. Would you be able to name some cooperative measures?

A B C D E

2.9

Please rate this statement: “I can analyse how a technical specification of a product, that improves the environmental and/or social footprint, impacts the supply market research”.

A B C D E

2.10

Please rate this statement: “I know joint sustainability initiatives in some industries and I understand why companies get involved in those”.

A B C D E

Question 3:

Using the choices provided below, indicate the item that best describes you

3.1

Please select the years for how long you have been studying Business Administration:

< 1 year
1-2 years
> 2 years

3.2

Please select:

I am in a bachelor program I am in a master program

3.3

Please select your work experience

None
< 1 year
1-2 years
> 2 years

Thank you very much!

Research Project Consent Form

Full title of Project: Ensuring sustainability in global value chains: Current and future buyer competences
Ethics approval registration Number: SchulzeBUSETH1705
Name: Heike Schulze
Researcher Position: Doctoral student
Contact details of Researcher: Heike.schulze@hs-mainz.de

Taking part (please tick the box that applies)	Yes	No
I confirm that I have read and understood the information sheet/project brief and/or the student has explained the above study. I have had the opportunity to ask questions.	☐	☐
I understand that my participation is voluntary and that I am free to withdraw at any time, without providing a reason.	☐	☐
I agree to take part in the above study.	☐	☐
Use of my information (please tick the box that applies)	**Yes**	**No**
I understand my personal details and the details of my company such as phone number and address will not be revealed to people outside the project.	☐	☐
I understand that my data/words may be quoted anonymised in publications, reports, posters, web pages, and other research outputs.	☐	☐
I would like my real name to be used in the above.	☐	☐
I agree for the data I provide to be stored (after it has been anonymised) in a specialist data centre and I understand it may be used for future research.	☐	☐

_____

Name of Participant **Date** **Signature**

_____

Name of Researcher **Date** **Signature**

****

Appendix J: Action research, pre-training questionnaire automotive company

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Fragebogen vor dem Vortrag "Nachhaltigkeitskompetenzen im Einkauf"

Mit den unten stehenden Fragen soll Ihr Wissen über Nachhaltigkeit im Einkauf vor dem heutigen Vortrag für Forschungszwecke erfasst werden.
Fragebogenidentifikationsnummer.: *z.B. Teilnehmer 1 (anonymisiert)*

Frage 1:
Haben Sie in der Vergangenheit bereits einen anderen Vortrag zum Thema Nachhaltigkeit gehört?
Ja: Nein:

Wenn ja: Was war der Titel des Vortrages und welches waren die hauptsächlichen Inhalte? (Bitte nennen Sie höchstens 3 Stichpunkte zum Inhalt)

Fragenblock 2:
Bitte geben Sie für die nächsten Fragen Ihren momentanen Wissensstand an, indem Sie entsprechend der folgenden Skala bewerten:

A = Nein, auf keinen Fall
B = Eher nicht
C = Neutral
D = Ich denke schon
E = Ja, auf jeden Fall

2.1
Ich könnte einen Vortrag zum Thema Nachhaltigkeit im Einkauf vor meinem Kollegenkreis halten und damit überzeugen, wie wichtig die Umsetzung von Nachhaltigkeit im Einkauf ist.
A B C D E

2.2
In einer Diskussion mit Führungskräften könnte ich sofort gute Argumente einbringen, warum sich die Umsetzung von Nachhaltigkeit im Einkauf für das Unternehmen auszahlt.
A B C D E

2.3
Ich kenne Theorieansätze sowie internationale Rahmenvereinbarungen und Standards im Themenfeld Nachhaltigkeit.
A B C D E

2.4
Sie planen die Teilnahme an einem Meeting mit Kollegen aus den Bereichen Marketing und Produktentwicklung.
a) Ich kenne die Nachhaltigkeitsziele der Kollegen aus den anderen Bereichen im Vergleich zu den Nachhaltigkeitszielen im Einkauf.

A B C D E

b) Es würde mir leicht fallen, im Meeting mit den Kollegen gemeinsame Lösungsansätze zu entwickeln.

A B C D E

2.5
Bitte bewerten Sie diese Statements:
a) "Beim Kauf neuer Kleidungsstücke bevorzuge ich Unternehmen/Marken, die bekannt dafür sind, dass sie Umwelt- und Sozialstandards einhalten."

A B C D E

b) "Wenn ich mir nicht sicher wäre, ob ein Unternehmen/ eine Marke Nachhaltigkeitsstandards einhält, würde ich eine eMail dorthin schicken und nachfragen".

A B C D E

2.6
Ich weiß, wie man eine Analyse zu Nachhaltigkeitsrisiken in der Lieferkette durchführt.

A B C D E

2.7
Es findet eine Besprechung mit einem Lieferanten statt. Wenn der Lieferant mich in der Besprechung fragt, warum die Umsetzung von Nachhaltigkeitsthemen für ihn als Geschäftspartner wichtig und von Vorteil ist, kann ich sofort Argumente aufzählen.

A B C D E

2.8
Wenn der Lieferant in der Besprechung signalisiert, dass er bei der Umsetzung von Nachhaltigkeitsthemen Unterstützung benötigt, kann ich direkt einige Maßnahmen nennen, mit denen ich bzw. mein Unternehmen ihn unterstützen können.

A B C D E

2.9
Ein bestehendes Produkt wird technisch so verändert, dass die negativen Auswirkungen auf Umwelt- und/ oder Gesellschaft reduziert oder eliminiert werden. Bitte bewerten Sie diese Aussage: "Ich kann bewerten, was diese technische Veränderung für die Beschaffungsmarktforschung bedeutet."

A B C D E

2.10
Bitte bewerten Sie diese Aussagen:
a) "Ich kenne industrieweite Initiativen zum Thema Nachhaltigkeit"

A B C D E

b) Ich verstehen, warum Unternehmen sich in diesen industrieweiten Initiativen engagieren."

A B C D E

Fragenblock 3:

Bitte markieren Sie in den folgenden Fragen die für Sie passenden Antworten.

3.1

Wie lange arbeiten Sie schon im Bereich Einkauf?

weniger als 3 Jahre
3- 10 Jahre
mehr als 10 Jahre

3.2

Was ist Ihre Aufgabe:

Ich bin Einkäuferin/ Einkäufer
Ich habe eine andere Rolle im Einkauf (z.B. Einkaufsstrategie, Nachhaltigkeitsexpertin/ -experte, Compliance,…):
Bitte beschreiben Sie Ihre Rolle: ……...

Vielen Dank!

Appendix K: Action research, pre-training questionnaire public procurement

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Survey before the training on competences for sustainable purchasing and supply management (SPSM)

The questions below are designed to identify your current knowledge on sustainable purchasing and supply management.
Questionnaire identification no.:

Question 1:
Did you attend a lecture or a training on sustainability before?
Yes: No:

If yes: What was the title of the training and what were the main topics discussed in the training? (please name no more than 3)

Question 2:
For the following questions, please rate the degree of your knowledge as of today, before the training, by bubbling the response according to the following 5-point scale.

A = Strongly disagree
B = Disagree
C = Neutral
D = Agree
E = Strongly agree

2.1
I would be able to give a presentation to my colleagues and convince them how important it is to implement sustainable purchasing and supply management.
A *(strongly disagree)* B C D E *(strongly agree)*

2.2
Imagine you would need to discuss with the management why sustainable purchasing and supply management efforts pay off for the company. Are you able to explain the business case for sustainability in purchasing?
A *(strongly disagree)* B C D E *(strongly agree)*

2.3
I know sustainability theories, international frameworks and standards.
A *(strongly disagree)* B C D E *(strongly agree)*

2.4
You are supposed to attend a meeting together with colleagues from representatives of strategy, student recruitment and marketing.
a) Do you know their priorities and goals regarding sustainability compared to those from purchasing?
A *(strongly disagree)* B C D E *(strongly agree)*

b) Do you think it would be easy for you to cooperate in the meeting to find common solutions?

A *(strongly disagree)* B C D E *(strongly agree)*

2.5

Please rate this statements:

a) "When I buy new clothes, I prefer brands that are known for their adherence to environmental and social standards".

A *(strongly disagree)* B C D E *(strongly agree)*

b) "I would even send an email to the company to ask for their sustainability standards."

A *(strongly disagree)* B C D E *(strongly agree)*

2.6

A colleague asks if you know how to conduct a risk assessment for sustainability in the supply chain. Would you know how to do that?

A *(strongly disagree)* B C D E *(strongly agree)*

2.7

You are conducting a regular meeting with a supplier. The supplier representatives ask you to explain why sustainable purchasing and supply management is important for them as a supplier. Would you be able to find arguments?

A *(strongly disagree)* B C D E *(strongly agree)*

2.8

In the same situation as in question 2.7., the supplier representatives indicate that they need some support to implement sustainability. Would you be able to name some cooperative measures that you can offer?

A *(strongly disagree)* B C D E *(strongly agree)*

2.9

Please rate this statement: "I can analyse how a technical specification of a product, that improves the environmental and/or social footprint, impacts the supply market research".

A *(strongly disagree)* B C D E *(strongly agree)*

2.10

Please rate this statement: "I know joint sustainability initiatives in some industries and I understand why companies get involved in those".

A *(strongly disagree)* B C D E *(strongly agree)*

Question 3:

Using the choices provided below, please indicate the item that best describes you

3.1

Please indicate for how long you have been working in purchasing:

< 3 years

3- 10 years

> 10 years

3.2

Please select:

I am a buyer

I have another role in purchasing (for example purchasing strategy, sustainability, compliance)

My role:……...

Thank you very much!

Appendix L: Action research, post-training questionnaire for students

****

Survey <u>after</u> the training on competences for sustainable purchasing and supply management (SPSM)

The questions below are designed to identify your knowledge on sustainable purchasing and supply management after you attended the SPSM training. Your responses will have no impact on your grade in this course or in other courses. Your name is required to identify your responses in the pre-training and a post-training questionnaire.

<u>Question 1:</u>
Please rate the degree of your knowledge as of today, after the training, by bubbling the response according to the following 5-point scale.

A = Strongly disagree
B = Disagree
C = Neutral
D = Agree
E = Strongly agree

<u>1.1</u>
If I would be an intern in the purchasing department a company, I would be able to give a presentation to my colleagues and convince them how important it is to implement sustainable purchasing and supply management.

A B C D E

<u>1.2</u>
Imagine you work as a consultant for sustainable purchasing and supply management (SPSM). Are you able to explain the benefits of SPSM for the company to a customer?

A B C D E

<u>1.3</u>
I know sustainability theories, international frameworks and standards.

A B C D E

<u>1.4</u>
You work as an intern in the purchasing department of a company, and you are supposed to attend a meeting with colleagues from marketing and from product development. Do you think you can compare their priorities and goals from purchasing?

A B C D E

<u>1.5</u>
Please rate this statement: “When I buy new clothes, I prefer brands that are known for their adherence to environmental and social standards. I would even send an email to the company to ask for their sustainability standards.”

A B C D E

<u>1.6</u>
Imagine again that you work as an intern in a company. A colleague asks if you know how to conduct a risk assessment for sustainability in the supply chain. Would you know how to do that?

A B C D E

1.7
Again, you are an intern in a company. You visit a supplier, together with an experienced buyer of the company. The buyer has to leave the meeting for a few minutes to take an important phone call. In the meantime, the supplier representatives ask you to explain, why sustainable purchasing and supply management is important for them as a supplier. Would you be able to find arguments?

A B C D E

1.8
In the same situation as in question 2.7., the supplier representatives ask you whether you understand what it means to cooperate to implement sustainability. Would you be able to name some cooperative measures?

A B C D E

1.9
Please rate this statement: "I can analyse how a technical specification of a product, that improves the environmental and/or social footprint, impacts the supply market research".

A B C D E

1.10
Please rate this statement: "I know joint sustainability initiatives in some industries and I understand why companies get involved in those".

A B C D E

Question 2:
What did you like most about this training session?

Question 3:
What suggestions do you have for enhancing the learning experience in this course?

Question 4:
Do you have any other comment that you would like to share?

Thank you very much!

Appendix M: Action research, post-training questionnaire automotive company

****

Fragebogen nach dem Vortrag "Nachhaltigkeitskompetenzen im Einkauf"

Fragebogenidentifikationsnummer.: *z.B. Teilnehmer 1 (anonymisiert)*

Fragenblock 1:
Bitte geben Sie für die nächsten Fragen Ihren momentanen Wissensstand an, indem Sie entsprechend der folgenden Skala bewerten:

A = Nein, auf keinen Fall
B = Eher nicht
C = Neutral
D = Ich denke schon
E = Ja, auf jeden Fall

1.1
Ich könnte einen Vortrag zum Thema Nachhaltigkeit im Einkauf vor meinem Kollegenkreis halten und damit überzeugen, wie wichtig die Umsetzung von Nachhaltigkeit im Einkauf ist.

A B C D E

1.2
In einer Diskussion mit Führungskräften könnte ich sofort gute Argumente einbringen, warum sich die Umsetzung von Nachhaltigkeit im Einkauf für das Unternehmen auszahlt.

A B C D

1.3
Ich kenne Theorieansätze sowie internationale Rahmenvereinbarungen und Standards im Themenfeld Nachhaltigkeit.

A B C D E

1.4
Sie planen die Teilnahme an einem Meeting mit Kollegen aus den Bereichen Marketing und Produktentwicklung.
a) Ich kenne die Nachhaltigkeitsziele der Kollegen aus den anderen Bereichen im Vergleich zu den Nachhaltigkeitszielen im Einkauf.

A B C D E

b) Es würde mir leicht fallen, im Meeting mit den Kollegen gemeinsame Lösungsansätze zu entwickeln.

A B C D E

1.5
Bitte bewerten Sie diese Statements:
a) “Beim Kauf neuer Kleidungsstücke bevorzuge ich Unternehmen/Marken, die bekannt dafür sind, dass sie Umwelt- und Sozialstandards einhalten.“

A B C D E

b) “Wenn ich mir nicht sicher wäre, ob ein Unternehmen/ eine Marke Nachhaltigkeitsstandards einhält, würde ich eine eMail dorthin schicken und nachfragen“.

A B C D E

1.6
Ich weiß, wie man eine Analyse zu Nachhaltigkeitsrisiken in der Lieferkette durchführt.

A B C D E

1.7
Es findet eine Besprechung mit einem Lieferanten statt. Wenn der Lieferant mich in der Besprechung fragt, warum die Umsetzung von Nachhaltigkeitsthemen für ihn als Geschäftspartner wichtig und von Vorteil ist, kann ich sofort Argumente aufzählen.

A B C D E

1.8
Wenn der Lieferant in der Besprechung signalisiert, dass er bei der Umsetzung von Nachhaltigkeitsthemen Unterstützung benötigt, kann ich direkt einige Maßnahmen nennen, mit denen ich bzw. mein Unternehmen ihn unterstützen können.

A B C D E

1.9
Ein bestehendes Produkt wird technisch so verändert, dass die negativen Auswirkungen auf Umwelt- und/ oder Gesellschaft reduziert oder eliminiert werden. Bitte bewerten Sie diese Aussage: “Ich kann bewerten, was diese technische Veränderung für die Beschaffungsmarktforschung bedeutet.“

A B C D E

1.10
Bitte bewerten Sie diese Aussagen:
a) “Ich kenne industrieweite Initiativen zum Thema Nachhaltigkeit”

A B C D E

b) Ich verstehen, warum Unternehmen sich in diesen industrieweiten Initiativen engagieren.”

A B C D E

Vielen Dank!

Appendix N: Action research, post-training questionnaire public procurement

****

Survey after the training on competences for sustainable purchasing and supply management (SPSM)

The questions below are designed to identify your knowledge on sustainable purchasing and supply management after you attended the training.

Questionnaire identification no.:

Question 1:

For the following questions, please rate the degree of your knowledge as of today, before the training, by bubbling the response according to the following 5-point scale.

A = Strongly disagree
B = Disagree
C = Neutral
D = Agree
E = Strongly agree

1.1

I would be able to give a presentation to my colleagues and convince them how important it is to implement sustainable purchasing and supply management.

A *(strongly disagree)* B C D E *(strongly agree)*

1.2

Imagine you would need to discuss with the management why sustainable purchasing and supply management efforts pay off for the company. Are you able to explain the business case for sustainability in purchasing?

A *(strongly disagree)* B C D E *(strongly agree)*

1.3

I know sustainability theories, international frameworks and standards.

A *(strongly disagree)* B C D E *(strongly agree)*

1.4

You are supposed to attend a meeting together with colleagues from representatives of strategy, student recruitment and marketing.

a) Do you know their priorities and goals regarding sustainability compared to those from purchasing?

A *(strongly disagree)* B C D E *(strongly agree)*

b) Do you think it would be easy for you to cooperate in the meeting to find common solutions?

A *(strongly disagree)* B C D E *(strongly agree)*

1.5
Please rate this statements:
a) “When I buy new clothes, I prefer brands that are known for their adherence to environmental and social standards”.

A *(strongly disagree)* B C D E *(strongly agree)*

b) “I would even send an email to the company to ask for their sustainability standards.”

A *(strongly disagree)* B C D E *(strongly agree)*

1.6
A colleague asks if you know how to conduct a risk assessment for sustainability in the supply chain. Would you know how to do that?

A *(strongly disagree)* B C D E *(strongly agree)*

1.7
You are conducting a regular meeting with a supplier. The supplier representatives ask you to explain why sustainable purchasing and supply management is important for them as a supplier. Would you be able to find arguments?

A *(strongly disagree)* B C D E *(strongly agree)*

1.8
In the same situation as in question 2.7., the supplier representatives indicate that they need some support to implement sustainability. Would you be able to name some cooperative measures that you can offer?

A *(strongly disagree)* B C D E *(strongly agree)*

1.9
Please rate this statement: “I can analyse how a technical specification of a product, that improves the environmental and/or social footprint, impacts the supply market research”.

A *(strongly disagree)* B C D E *(strongly agree)*

1.10
Please rate this statement: “I know joint sustainability initiatives in some industries and I understand why companies get involved in those”.

A *(strongly disagree)* B C D E *(strongly agree)*

Question 2:
What did you like most about this training session?

Question 3:

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
3.1 The objectives of the training were clearly defined.					
3.2 Participation and interaction were encouraged.					
3.3 The topics covered were relevant to me.					
3.4 The content was organised and easy to follow.					
3.5 This training experience will be useful in my work.					
3.6 The trainer was knowledgeable about the training topics.					
3.7 The trainer was well prepared.					
3.8 The training objectives were met.					
3.9 The time allowed for the training was sufficient.					

Question 4:
What suggestions do you have for enhancing the learning experience in this course?

Question 5:
Do you have any other comment that you would like to share?

Thank you very much!

Appendix O: Action research, application of CIs in the training (Example)

****

Instruction Group No. 2.1 - Case & situation for buyer:

"The supplier in a developing country"

The company Smith & Sons is a mid-size family-owned business in the cosmetics sector. Grandfather Smith started the business in 1929, producing soap. Since then, the company broadened the product range and today it offers a skin care program called "Happy Day", including shower gel, shampoo and body lotion. The company has always been run by a family member. When grandfather Smith was 75, his son, Albert Smith took over. Now Albert, being 75, handed over to his only child, daughter Sarah. Sarah has always been very engaged in charity projects and initiatives to protect the environment.

Today, the company is in a difficult situation. It has to cope with a significant decrease in sales, combined with quality issues resulting in negative consumer feedback, bad media reports and severe loss of the companies' credibility as one of the oldest brands in the cosmetics sector. Sarah decided to implement sustainability as one key factor of a turnaround program. Together with her top management, she communicated a new sustainability strategy to improve the environmental and social footprint and to support sustainable product development.

As a contribution to the new sustainability strategy, purchasing developed sustainability standards and expectations for suppliers. Every single supplier is supposed to sign the standards and implement them.

You are working as a young buyer in the purchasing department of Smith & Sons. Two weeks ago, you had a regular Skype meeting to discuss current topics in the business relationship with a supplier in Vietnam. You introduced the sustainability standards and expectations to the supplier representatives. You asked them to send you a signed copy. As a first reaction, the supplier representatives explained that their priority is to develop economically, and that you should take into account this priority. They also explained that Western buying firms and suppliers in their country are in different development stages. Therefore, they expressed their concerns to be able to commit to the ambitious sustainability standards that you presented. Now you scheduled another meeting with the supplier, because you cannot accept that they do not agree with the sustainability standards.

You know that it won't be an easy meeting, and therefore you get prepared thoroughly (short presentation, 3-5 slides)

1. Your goals for the meeting with the supplier: What do you want to achieve?
2. Your strategy to achieve these goals: What are your main arguments to achieve your goals?
3. How can you build a good relationship to the supplier?
4. Which additional data and information do you need to get prepared?

Appendix P: Action research, exemplary excerpt Excel data sheet

	A	B	C	D	E	F	G	H
1	**Participant**	**Group**	Question 1 (pre) 1 = yes 2 = no	Pre-Training Communication Skills Question 2.1	Post - Training Communication Skills Question 1.1	Pre-Training Systems Thinking Question 2.2	Post - Training Systems Thinking Question 1.2	Pre-Training Basic Sust. Knowled Question 2.3
2	**P1**	MLP_EN	2	3	5	4	4	1
3	**P2**	MLP_EN	1	4	5	3	5	2
4	**P3**	MLP_EN	1	3	5	3	4	4
5	**P4**	MLP_EN	1	1	4	2	4	1
6	**P5**	MLP_EN	2	1	2	1	3	1
7	**P6**	MLP_EN	2	4	4	4	4	3
8	**P7**	MLP_EN	2	2	4	2	4	3
9	**P8**	MLP_EN	2	4	4	4	4	3
10	**P9**	MLP_EN	1	4	5	2	5	3
11	**P10**	MLP_EN	1	4	5	4	4	4
12	**P11**	MLP_DE	1	3	5	3	5	2
13	**P12**	MLP_DE	1	2	4	4	4	4
14	**P13**	MLP_DE	2	2	4	3	4	2
15	**P14**	MLP_DE	2	4	4	2	4	2
16	**P15**	MLP_DE	1	3	4	4	4	4
17	**P16**	MLP_DE	2	2	4	4	4	4
18	**P17**	MLP_DE	2	2	4	2	3	2
19	**P18**	MLP_DE	2	2	2	3	4	2
20	**P19**	MLP_DE	1	2	4	2	3	3
21	**P20**	MLP_DE	2	2	3	2	3	3
22	**P21**	MLP_DE	2	3	3	3	4	2
23	**P22**	MLP_DE	2	2	3	2	3	2
24	**P23**	MLP_DE	2	5	4	5	4	3
25	**P24**	MLP_DE	2	4	4	2	3	2
26	**P25**	MLP_DE	2	2	4	2	4	2
27	**P26**	MLP_DE	2	2	3	1	4	1
28	**P27**	MLP_DE	2	3		2		3
29	**P28**	MLP_DE	2	2	3	3	4	2
30	**P29**	MLP_DE	2	2		3		2
31	**P30**	MLP_DE	2	2		3		2
32	**P31**	MLP_DE	2	2	3	2	3	1
33	**P32**	MLP_DE	2	3		3		1
34	**P33**	MLP_DE	2	2		2		3
35	**P34**	MLP_DE	2	3		5		2
36	**P35**	MLP_DE	2	4	4	3	4	2
37	**P36**	SCM_DE	2	2	4	1	4	2
38	**P37**	SCM_DE	2	1		2		1
39	**P38**	SCM_DE	2	2	4	2	5	1
40	**P39**	SCM_DE	2	2		3		2
41	**P40**	SCM_DE	2	3		4		2
42	**P41**	SCM_DE	2	2	4	1	4	2

Appendix Q: Complete list of critical incidents

"Suspected child labour at a supplier"

An annual supplier audit was conducted to ensure compliance to sustainability requirements of the company. The auditors came back with the impression that there might be children working at some of the production lines. However, they were not sure, as the age of the workers was hard to estimate. When faced with the situation during the audit, the supplier was not able to proof that the age of the workers was in line with the requirements of the company. Following up the audit report, the buyer contacts the supplier to discuss the issue.

"Purchasing contribution to a new sustainability strategy"

Due to a significant decrease in sales, combined with quality issues resulting in negative consumer feedback, bad media reports and severe loss of the companies' credibility, the top management decided to implement sustainability as one key factor of a turnaround program. The top management issued a corporate commitment to reduce the environmental and social footprint and to support sustainable product development.
A buyer is invited to a meeting with representatives of corporate strategy, sales and marketing. It will be discussed how purchasing can contribute to the new sustainability strategy and commitment, taking into consideration the entire supplier network. Nevertheless, as the company is still in a difficult financial situation, the contribution of purchasing in terms of prices for products and raw material is expected.

"The supplier in a developing country"

In a regular Skype meeting to discuss current topics in the business relationship with a supplier in a developing country, the buyer introduces the sustainability standards and expectations to the supplier representatives. As a first reaction, the supplier representatives explain that their priority is to develop economically, and that the purchasing organization should take into account this priority. They also explain that Western buying firms and suppliers in their country are in different development stages. Therefore, they express their concerns to be able to commit to the ambitious sustainability standards that the buyer presented.

"Purchasing is not involved"

The company decided to exclude dangerous chemicals from its products by the year 2020. Therefore, sales, marketing and product development started a project to discuss the impact of this decision on the product, e.g. its quality and functionality, to align this with customer requirements, and to develop a marketing strategy. In addition, driven by product development, the project members will decide on substitutes for the dangerous chemicals.
The buyer who is responsible for the commodity/ category of the dangerous chemicals is told about this project by a colleague from marketing during lunch. She/he thinks that it would make sense for purchasing to get involved.

"Environmental issues at a coffee farm"

A buyer for coffee visits one of the supplying coffee farms on a regularly base. She/ he is aware that the water from the coffee processing was going directly into the rivers. As the issue was not solved so far by communicating with the supplier, putting pressure on the coffee farms' management or developing corrective action plans, the purchasing management team and the corporate sustainability officer decide to cooperate with a non-governmental organization (NGO) to solve the issue. The next visit at the coffee farm is conducted by the buyer together with a representative from the NGO. In a meeting with the management of the coffee farm, the NGO representative explains how the environmental issue could be solved and which investments are required. The coffee farms' management directly refuses to cooperate. They refer to the cost pressure that they experience from their customers, which would not allow any additional investments. Both parties expect a reaction from the buyer to solve the conflict.

“Sustainable sourcing for new materials”

The company committed not to use components that contain raw materials that are produced or mined by violating human rights or environmental standards. A new product will be developed, in line with this commitment. A certain component could me made of different materials. The buyer is asked to identify sustainable sourcing possibilities for the various material options. She/ he is new in this position and does not know about product specifications or regulations. The supply market is scarce, and product development intends to bring the new product to the market as soon as possible.

“Implementation of monitoring tools”

The company published a code of conduct for suppliers some time ago. Some suppliers proactively committed to support the code of conduct, others gave a vague commitment to comply with it, others did not react.

One day, based on an issue at one of the suppliers, a non-governmental organisation (NGO) accuses the company that it does not take care of sustainability standards in its supply chain. The NGO and the public expect answers how the company will ensure adherence to its supplier code of conduct in the future. Therefore, the buyer being responsible for a specific commodity/ category needs to implement certain monitoring measures.

“Development of a supplier code of conduct”

An important customer, a big multi-national corporation, requires all suppliers to adhere to its sustainability program and to make sure that sustainability standards are implemented through the entire supply network. As a prerequisite to participate in the next RFQ, the company needs to make a checkmark in a system and state that it has a code of conduct that was communicated to its own suppliers. So far, there is no code of conduct for suppliers. A buyer gets the assignment to develop such a code of conduct.

“Sustainability and purchasing processes”

The company committed to high-level sustainability goals, issued a code of conduct for suppliers and communicated it extensively. Some suppliers are reporting on their sustainability initiatives, including certain certificates and labels for their products. It is unclear and confusing how to evaluate all the data and information and how to integrate the information in purchasing decisions. Therefore, the sustainability manager within the purchasing organisation is asked to develop a concept how to integrate sustainability in PSM processes. For the management in the purchasing organisation it is out of question that the existing priorities and goals regarding cost, quality and delivery are not changed. Also, there is no resource to set up entirely new processes and tools.

“10 new questions for an audit”

The buyer plans to conduct a regular audit at a new supplier site to evaluate quality and delivery capabilities. For the first time, she/he is asked from the purchasing management to include 10 pre-defined questions in the audit procedure that evaluate basic sustainability standards such as human rights, environmental policies and anti-bribery commitments.

“The young, committed purchasing professional”

After having attended a supplier visit in a developing country for the first time, a young buyer comes back with the feeling that the working conditions at the supplier site weren´t good. She/ he feels unsure what to do, being rather new in the company. Issues related to working conditions at suppliers were never discussed before with the purchasing management or colleagues. However, what the buyer saw at the supplier factory did not match with her/his personal ethical values. She/ he wants to raise the issue in the purchasing organisation.

“The stakeholder event”

In a corporate stakeholder dialogue event, a buyer gets in conflict with a representative of a non-governmental organisation (NGO), specialised in ethical sourcing and human rights issues in a specific country. The NGO representative, a young, politically engaged woman, insults the buyer not to have monitored the supply chain in this country adequately, and instead to focus on cheap prices. The buyer has been working on a human rights assessment program for suppliers in this country for a few years already, gained some expertise in this area, and feels very offended that the NGO representative does not consider these efforts. Consumers and other stakeholders perceive the NGO as a very established institution with a high moral integrity and expertise in ethical sourcing. Therefore, the other participants of the stakeholder event blame the buyer to give wrong information to the public and therefore to act unethical.