The PERFECT Consortium

Project PERFECT Intellectual Output 1 White Paper

Exploring the Purchasing and Supply Management Skills Concept

July 2016

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Content

Glossary and Key Definitions

AL – Activity Leader

EC – European Commission

Undergraduate (UG) degree - a bachelor's degree (B.Sc., B.A., etc), a degree requiring about three or four years of university-level full-time study beyond secondary/high school

Higher Education (HE) – in the context of this white paper HE is used to denote education at universities or similar educational establishments, especially to degree level

Intellectual Output (IO) – the six main parts/work packages/activities of the overall PERFECT Project resulting in defined outputs depending on the nature of the IO

IPSERA – International Purchasing & Supply Education & Research Association

PERFECT – Purchasing Education and Research for European Competence Transfer, name of the project

PSM – Purchasing and Supply Management, which comprises the management of external inputs – materials, services, capabilities and knowledge – that are required for building, running and maintaining the focal firm's processes, while simultaneously managing the external and internal stakeholder network with an extended upstream supply network understanding.

SME – small and medium-sized enterprise

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1. Executive Summary

- More than half of the total turnover of a modern industrial firm in Europe is directly transferred to suppliers in order for them to satisfy the requirements of their own customers. Moreover, the bulk of supplies is no longer just of a domestic origin, but of a European and international nature. The Purchasing and Supply management (PSM) function of a firm manages these suppliers, but with this high reliance on international suppliers and increasing levels of complexity, firms are struggling to find effective and efficient ways to cope with the demands, thus highlighting the need for employees possessing the necessary skills and competences in this field.

- Although buying organisations are increasingly dependent on their international suppliers, many of them lack the capabilities to deal with these situations. A basic root cause of this struggle is a lack of access to personnel with knowledge and PSM skills.

- Despite this importance, unlike other disciplines such as marketing or finance, PSM does not have any standardized PSM higher education curriculum. This issue is seen at national, European and regional/international (e.g. North America) levels. This makes it necessary for companies to hire university graduates with other specializations and often spend years bringing them up to a skill level that graduates in other disciplines already possess, therefore spending considerable funds on additional training activities.

- Changing this situation offers a significant opportunity to the European Union: If a standardized PSM curriculum in higher education would be implemented, the currently unused human potential could be made available to European companies and student mobility in international programs could be increased significantly.

- Project PERFECT (Purchasing Education and Research for European Competence Transfer) has been set up and funded by the European Union to become the first worldwide region to establish an empirically validated pan-European PSM higher education curriculum. The project is embedded into the ERASMUS+ 2015 KA2 program (Cooperation for Innovation and the Exchange of Good Practices Strategic Partnerships for Higher Education) with the project number 2015-1-DE01-KA203-002174.

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- In order to achieve these aims, a consortium has been formed, which brings together leading universities from across European, project management competence and practical exposure (e.g. associations and by industry partner workshops) with a very strong background and international network in PSM.

- The project aims to establish an international studying program at universities for higher education in PSM. This will be implemented by the participating universities, but simultaneously it would be disseminated through the relevant associations and thereby available to any higher education institution in Europe.

- This paper deals with the first Intellectual Output (IO1) of project PERFECT, which aims to explore the PSM skills concept by developing three outputs, which are: (1) the development of a PSM Competency Model using the KODE®X analysis tool, (2) a PSM Maturity Based Skills Model and (3) a gap analysis of these skills against the current PSM pan-European Higher Education landscape.

- A number of different analyses of PSM skills exist in both the academic and practitioner literature, so the aim of IO1 is to draw these together and analyse them in a novel way to provide a set of key findings that will be of use to a wide audience of interested parties and also to provide a platform for the later IOs of the project. This input data is taken from a wide variety of sources and is also supported by a series of workshops undertaken at the Educator's Conference at IPSERA 2016. Therefore, the report is focused on linking this input data to a series of outputs which have found the following:

    - Using a competency based model of analysis (KODE®X competence modulation), a series of idealised personality archetypes have been developed and a strong, persuasive and communicative professional with common sense and that has foremost common and specific knowledge, which is the archetype "A multi-disciplinary professional with knowledge of the profession and the market" derived from literature, represents the ideal person for PSM-related jobs [as shown in Chapter 8].

    - The inputs have been used to cluster the PSM skills identified into a PSM Maturity Model (Schiele, 2007) to provide interested parties with a view of what skills relate to

a specific stage of development level a purchasing organisation has reached [as shown in Chapter 10].

- An analysis of the PSM Education landscape shows that it is characterised as being constituted by mainly: Short courses, Professional courses (post-graduation, for individuals already working in the PSM field), Postgraduate courses and a greater focus on Supply Chain Management (SCM) courses [as shown in Chapter 12].

- An initial gap analysis between the PSM Maturity Skills model and a selection of courses from the Education landscape to establish whether gaps existed between the skills required and the current provision of education [as shown in Chapter 12].

2. Introduction to Project PERFECT

The PSM function in any organisation is a key contributor to firm performance (Drake 2012)[1], as more than half of the total turnover of a modern industrial firm in Europe is directly transferred to suppliers. Moreover, the bulk of supplies is now no longer of domestic origin, but of a European and international nature. As this network economy with a low depth of production and high reliance on international suppliers is a recent phenomenon that has emerged in the last two decades, firms are still struggling to find effective and efficient ways to cope with these circumstances. This highlights the need and request for employees possessing the necessary skills and competences in this field.

Although buying organisations are increasingly dependent on their international suppliers, many of them lack the capabilities to deal with these situations. A basic root cause of this struggle is a lack of access to personnel with knowledge and PSM skills. Despite this importance, unlike other disciplines such as marketing or finance, PSM does not have any standardized PSM higher education curriculum, yet. This issue is seen at national, European and regional/international (e.g. North America) levels. This makes it necessary for companies to hire university graduates with other specializations and often spend years bringing them up to a skill level that graduates in other disciplines already possess.

For students, a significant challenge lies in finding appropriate university courses and matching them to their course portfolio during international exchanges. For the higher education institutions involved, the varying course contents and depth in exchange programs hinder a stringent teaching of basic modules first, and then building on them further for PSM. To change this offers a significant opportunity to the European Union: If a standardized PSM curriculum in higher education would be implemented, the currently unused human potential could be made available to European companies and student mobility in international programs could be increased significantly.

The novelty of this project therefore lies in being the first region worldwide to have a clear PSM higher education curriculum. The question addressed by this project is how such a competence building program, i.e. a pan-European purchasing and supply management curriculum, could be structured. To seize this opportunity, the overall objective of project PERFECT (Purchasing Education and Research for European Competence Transfer) is: To develop an empirically validated European curriculum for

[1] Drake, M. 2012. Global Supply Chain Management. 1st ed. New York: Business Expert Press. In: Essex, A., Subramanian, N. & Gunasekaran, A., 2015. The relationship between supply chain manager capabilities and performance: empirical evidence. Production Planning & Control, 7287(February), pp.1-14

PSM education. The aim is to establish an international studying program at universities for higher education in PSM. This would be implemented by the participating universities, but simultaneously it would be disseminated through the relevant associations and thereby available to any higher education institution in Europe.

The PERFECT project includes the following milestones:

- The project starts with an in-depth **theoretical analysis** of PSM reviewing different sources, such as
    - Academic & practitioner literature dealing with PSM skills
    - European PSM Educational landscape
    - PSM Job adverts
    - Studies on trends and future requirements for PSM
- After the theoretical analysis and having the conceptual skill model as a basis the project will conduct **Case Study interviews** with industry PSM best practice to identify required skills and competences to cope with current requirements and future trends.
- The insights gained will be validated and developed further by a **survey** with European firms in order to identify those skills and competencies distinguishing successful companies and effective and efficient PSM, these link to performance outcomes and future requirements. Moreover, this provides a comprehensive and systematic analysis of skills and competences needed to be covered in the curriculum.
- Based on this first ever comprehensive competence assessment project, PERFECT is going to design a pan-European **PSM curriculum**. Furthermore, in order to promote fast and broad dissemination, PERFECT is going to develop a **self-assessment tool** for PSM skill evaluation and prepare an Introductory **Massive Online Open Course (MOOC)** for basic PSM skills, which can be used by students and organisations to gauge the levels of the PSM skills.

In order to achieve the objectives and milestones, a consortium has been formed, which brings together leading universities, European project management competence and practical exposure (e.g. associations and by industry partner workshops) with a very strong background and international network in PSM. The pan-European approach perfectly facilitates that students in future will be enabled to pursue their curricula Europe-wide, giving them the early international exposure ideal for later careers in the PSM field.

The development of a pan-European curriculum for PSM education that is based on a combination of identified best practices and industry requirements will ensure that individual students are provided with the necessary knowledge and learning to join a purchasing department of any size of organisation, and ready to engage in different aspects of PSM. It provides opportunities for students to gain experience in other European countries through student exchange programs and also through more informal discussions and activities which will help them to further develop their professional skills as well as their personalities. For the participating academic organisations, this provides an opportunity to strengthen their pan-European ties and ensure that their PSM curricula reflect the requirements of an increasingly pan-European industry. Pan-European organisations often adopt collaborative buying activities and an understanding of the European dimension of these activities will ensure that their staff is prepared. Small and medium-sized enterprises (SMEs), which may not have a pan-European presence, but will nonetheless buy from suppliers in many different countries and will therefore also benefit from this knowledge. Companies in general benefit from employees that are prepared to cope with current and future requirements of PSM. Additional target groups include PSM related associations. Reaching them is facilitated by the participants' memberships in various relevant associations such as IPSERA (International Purchasing and Supply Education and Research Association) and IFPSM (International Federation of Purchasing and Supply Management).

The goal of project management in PERFECT is to organise the work in an efficient, flexible and economic way and to monitor project results that are reached according to the work plan. This will be reached by means of an appropriate project management structure with properly assigned responsibilities and decision-making bodies, carefully selected project activities leaders with all necessary competences, as well as effective and efficient communication. The management approach avoids superfluous complexity and leads to efficient procedures to support the success of the project. PERFECT is managed by TU Dortmund University. Both leadership components—scientific and administrative—are closely related and the people involved constitute de facto one coordination and management team. The scientific management is done by the coordinator as the project leader and by the project activity leaders for each respective project activity. In each project activity scientific management is included. The project organisation has been developed based on the sample experience of the management, resulting from the coordination of EU projects since the Fifth Framework Program. It is designed for a stringent project management and decision making and for efficient exchange of knowledge.

The work is divided into six scientific project activities and additional project activity for the management of the consortium, communication and dissemination and exploitation of results.

Each of the six main activities (A1-A6) leads to a set of intellectual outputs (IOs) as follows:

A0	**Project management, coordination and promotion**
A1	**Development of Purchasing & Supply Management (PSM) Skills Concept**
IO 1	**PMS Skills Concept**
A2	**Development of Benchmarking Cases (Case Study Interviews)**
IO 2	**Best Practice Benchmark**
A3	**Pan-European Survey PSM Skills**
IO 3	**PSM Skills and Training Survey Results**
A4	**Development of PSM Curriculum for higher education**
IO 4	**Designed PSM Curriculum for higher education**
A5	**Development of PSM competence assessment tool**
IO 5	**PSM Skill ladder**
A6	**Development of Introductory Massive Open Online Course on PSM**
IO 6	**Massive Open Online Course on PSM**

Table 1: Overview PERFECT Activities and Intellectual Outputs

The evaluation and exploitation of project results is considered a crucial issue. Therefore, an Advisory Board (AB) has been created to ensure that an independent body can accompany the project and support its dissemination. It includes experts in the fields of PSM education and practice, whose task is to advise and guide PERFECT on promising directions and the long-term vision of the project, based on both their knowledge of the current state and global trends in their fields and also their practical experience. The AB will also comment on the implementation of the projects activities regarding the research, mobility, networking of researchers, dissemination of information, and exploitation of results.

3. Intellectual Output 1: PSM Skills Concept

1. Aims

In order to meet the overall aims of the PERFECT Project, it is firstly necessary to explore the PSM skill concept through a review of how different sources have considered what skills are required by modern PSM practitioners as they face the challenges associated with their workplace and that of the future. The outputs from this work feed into later IOs of the project.

2. Research Questions

To support the exploratory over-arching aim, a number of research questions were developed as follows:

1. What are the skills (both PSM specific and more general) that have been identified in the PSM academic literature as being necessary for modern PSM practitioners?
2. Through a review of current publically available practitioner competency models and a set of representative PSM job adverts, what PSM specific and general skills does the PSM practitioner environment see as necessary?
3. Identify what future skills the PSM practitioners sees as being required for dealing with future challenges?
4. What courses are currently being offered in the Higher Education landscape, what skills does PSM higher level education currently teach and is there a gap between this and what is needed by modern PSM practitioners?

3. Structure of the White Paper

Prior to the more focused analysis of PSM skills areas, an understanding of skills concepts in a more general sense and the importance of these for organisations was developed and is provided in Chapter 4. In order to deal with the research questions and to provide some order to a complex discussion, the project team have used an interrelated inputs-outputs model, which uses different sets of input data to produce 3 key outputs and the paper is structured to deal with each of these in turn. The inputs are as follows:

INPUTS:

NUMBER	INPUT NAME	DESCRIPTION	WHITE PAPER CHAPTER
1	PSM Skills from the academic literature	A systematic review of PSM related academic literature to identify what skills are needed for PSM professionals in their workplace	5
2	PSM Skills from job advertisements	A review of a selected number of PSM job adverts that identify certain skills that are needed for applicants to the job role, job adverts in Austria and in the Netherlands taken into account	6
3	Practitioner models of PSM skills	Using defined search terms, a list of publically available practitioner (i.e. from organisations) skills models was generated from a range of countries and also organisation type (e.g. public, private sector etc.)	7
4	PSM Future Requirements	Using defined search terms, articles and studies in German and English were scanned for trends and competences required for future purchasers	9
5	PSM Education Landscape	Using defined search terms, a list of PSM related courses and their content (e.g. module titles) was identified	11

Table 2: IO1 inputs

OUTPUTS:

NUMBER	OUTPUT NAME	DESCRIPTION	WHITE PAPER CHAPTER
1	PSM Competency model	Classification of PSM skills using the KODE®X Competence Model and Development of PSM archetypes and analysis of their importance	8
2	PSM Skills Maturity model	Classification and clustering of skills based on a Supply Management Maturity Model (Schiele)	10
3	PSM Education Landscape gap analysis	An initial gap analysis between output 2 (PSM Skills/Maturity model) and selected courses from input 5 (PSM Education Landscape) to establish which skills were not adequately represented in the current education provision	12

Table 3: IO1 outputs

This structure has been graphically represented as follows:

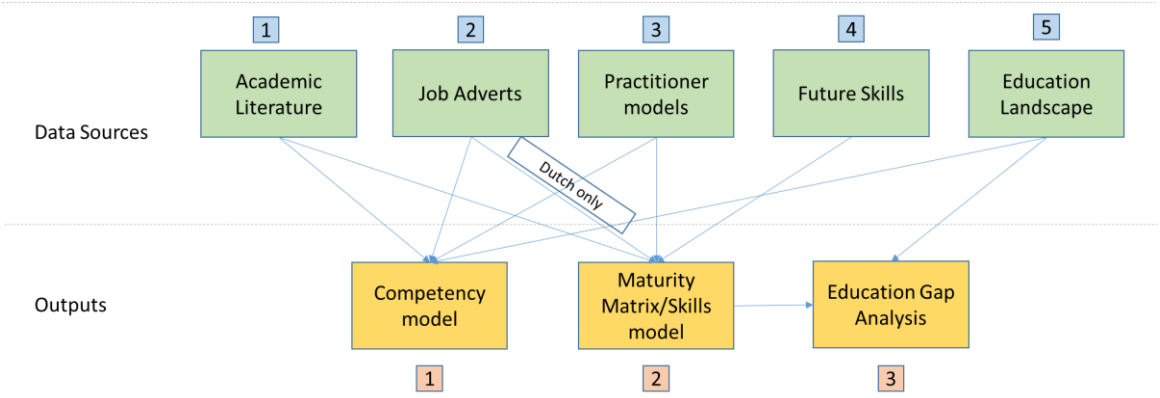

Figure 1: Structure of Intellectual Output 1 (own illustration)

The paper is structured to deal first with each of the inputs in turn, with each chapter covering a methodology, a presentation of the findings, followed by a brief discussion. This is followed by a chapter dealing with each of the outputs before finishing with a conclusions chapter, further outputs for this IO and then a brief discussion of how this work links to the other IOs on Project PERFECT.

4. The Concept of Skills - Skills, Capabilities and Related Concepts

Many areas of literature deal with skills frameworks, but the Human Resource Management (HRM) literature is a fruitful area of initial investigation, as this practitioner and academic field is specifically concerned with building organisational capability (Holbeche, 2007) and a turn in the last two decades in the more recent HRM agenda focuses on how the management of people can contribute to organisational performance (Ulrich, 1998). This turn is also reflected in an increasing focus in other areas of literature on the importance of human capital: "…the value-creating skills, competencies, talents and abilities of its workforce – as an essential component in gaining competitive advantage" (Elias, 2004: 21).

To further these goals, the HRM field witnessed a growth in the development and use of management-based competency models in the 1990s, mainly influenced by Boyatzis's (1982) more integrated approach to management education (Caldwell, 2008). Boyatzis defined competency 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" (1982: 21). The importance of this work was that it allowed for: "…competencies to be objectified, analytically disaggregated and grouped into skills, knowledge, self-concepts, traits and motives [and] competences to be hierarchically defined by levels of proficiency, position and performance" (Caldwell, 2008: 278) and a link developed: "to organisational performance and competitive success" (Caldwell, 2008: 278).

This refining work continued in the 1990s and an oft-used and cited framework used in the HRM literature is that of Ulrich and colleagues, which conceptualized and developed a competency assessment instrument consisting of five primary competencies: strategic contribution (active involvement in strategic activities), personal credibility (achieving results, effective relationships, and communication skills), HR delivery (ability to design and deliver basic and innovative HR practices), business knowledge (understanding the company and the industry in which it operates), and HR technology (applications of technology to improve efficiency and effectiveness) (Brockbank & Ulrich, 2003; Ulrich & Brockbank, 2005). Other examples of competency and skills frameworks include the identification of three clusters of core competencies: personal integrity, ambition and drive, and team skills (Blancero, Boroski, and Dyer, 1996) and core capabilities of business knowledge, human resource functional knowledge, mind-set (e.g., thinks strategically and analytically), interacting with others, and individual performance (e.g., focus on results, acts with integrity) (Walker & Reif, 1999).

What is noted in the review of the academic HRM literature is that, although there has been research done on the identification of specific managerial competencies, there is less literature on the relationship between these competencies and managerial or organizational effectiveness (Semeijn et al., 2014). This is show in studies such as Hagan, Konopaske, Bernardin and Tyler (2006), which validated a six-competency, 360-degree assessment to assessment-centre criteria but did not relate them to managerial or organizational effectiveness outcomes.

In addition, there is another strand of relevant literature (Knowledge Management) which focuses on an individual's interpretation of information based on personal experiences, skills, and competencies (Bollinger & Smith, 2001). This paradigm distinguishes between the concept of tacit knowledge, which is closely related to the concept of skills (Nelson & Winter, 1982; Polanyi, 1969) and is constituted of cultural beliefs, values, attitudes, mental models, as well as skills, capabilities and expertise (Botha et al., 2008) and can be considered as “know-how” (Brown & Duguid 1998) and explicit knowledge as being formalized and codified, and can be considered as “know-what” (Brown & Duguid 1998).

It is this link between the deployment of skills (as knowledge), decision making and organisational performance that will be explored further in the empirical work of the project, specifically IO2 (a series of case studies on organisations) and IO3 (surveys of organisational skills). Further, this review of the skills concept has ensured that we have captured the wide array of what is meant by skills and that the reach goes beyond specific technical requirements to perform a job to cover managerial and “soft” skills that are also necessary. We therefore use the word “skill” to cover all the requirements an individual needs to perform their job in an efficient and effective manner.

5. PSM Skills from the Academic Literature

The aim of this analysis was to review the current academic literature that discussed the skills and competencies necessary for PSM professionals to perform their work in the challenging environment they find themselves in. A systematic and rigorous approach was undertaken to identify these key academic sources to ensure that a wide variety of sources were identified and that the skills set represents the full scope of these skills.

The process undertaken was along established academic research lines and a search was made in "Scopus"[2] and "Google Scholar"[3] using the following search terms:

Purchasing, Purchasing + Professional, procurement, buyer AND competence, competencies, skill, education.

These search terms were selected because these have been used as keywords or in abstract in well-known and cited articles on the subject of purchasing skills and to obtain the most complete results possible (e.g. Knight et al. 2014; Carr and Smeltzer 2000).

This search resulted in the identification of 29 key academic papers, from a wide variety of journals and these papers are listed in Appendix 1. These have been further refined to establish a key set of skills, which is shown below:

[2] Elsevier's Scopus is the largest abstract and citation database of peer-reviewed literature: scientific journals, books and conference proceedings.
[3] Google Scholar is an online, freely accessible search engine that lets users look for both physical and digital copies of articles. It searches a wide variety of sources, including academic publishers, universities, and preprint depositories

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Literature	Cavinato	Keough	Kolchin and Giunipero	Baily et al.	Down and Liedtka	Killen and Kamauff	Murphy	Carter and Narasimhan	Cruz and Murphy	Pagell et al.	Anderson and Katz	McKeefry	Giunipero	Carr and Smeltzer	Giuinipero and Pearcy	Faes et al.	Muller	Burt and Dobler	Cousins and Spekman	Trent and Monczka	Giuinipero and Handfield	Giuinipero et al.	Mulder et al.	Giuinipero et al.	Tassabehji et al.	Eltantawy et al.	Kern et al.	Knight et al.	Zawawi et al.	
	1987	1993	1993	1994	1994	1995	1995	1996	1996	1996	1998	1998	1999	2000	2000	2001	2001	2003	2003	2003	2004	2005	2005	2006	2008	2009	2011	2014	2014	Total
Negotiation		x	x	x		x	x		x				x		x				x		x	x	x		x	x		x	x	16
Problem-solving			x	x	x					x	x		x	x	x		x				x	x			x	x		x		14
Leadership			x	x	x	x				x			x		x	x					x	x		x		x		x		13
Analytical			x		x							x	x		x		x				x	x				x				9
Influencing		x	x										x		x						x	x		x	x			x		9
Strategic thinking								x	x				x		x			x			x	x			x			x		9
Technical	x						x					x	x		x		x				x	x				x				9
Blueprint reading													x	x	x						x	x			x			x	x	8
Supply chain management						x		x	x		x						x	x							x	x				8
Conflict resolution			x							x			x		x						x	x						x		7
Cost analysis		x		x						x	x			x											x			x		7
Decision-making				x								x									x			x	x	x		x		7
Product knowledge	x			x		x				x		x													x			x		7
Project management							x				x			x							x				x	x		x		7
Ability to work on a team													x	x	x						x	x						x		6
Computer literacy			x							x			x		x							x						x		6
Computers	x				x			x									x	x								x				6
Creativity			x										x		x	x					x	x								6
Customer focus			x										x		x							x				x		x		6
Interpersonal communication			x										x		x				x		x	x								6
Managing internal customers													x		x						x	x			x			x		6
Supplier evaluation							x				x						x								x	x		x		6
Time management			x										x		x						x	x			x					6
Ability to make decisions			x										x		x						x	x								5
Communication					x	x		x									x									x				5
Forecasting				x										x									x		x			x		5
Listening				x		x															x			x	x					5
Managing change			x										x		x						x	x								5
Organization													x		x							x			x	x				5
Persuasion			x							x			x								x							x		5
Specification development													x		x						x	x						x		5
Strategic supplier selection					x		x										x	x								x				5
Tactfulness in dealing with others			x										x		x						x	x								5
Understanding business conditions													x		x						x	x						x		5
Analytical skills		x								x				x														x		4
Materials mgt. inv.JIT	x							x				x																		4
Research				x			x																		x	x				4
Risk management												x													x	x		x		4
Structuring supplier relationships													x		x						x	x								4
Supplier cost targeting													x		x							x						x		4
Supplier relations	x								x								x									x				4
Supply base research													x		x							x						x		4
Written communication													x		x						x	x								4
Change Management																									x	x		x		3
Computational															x						x	x								3
Computer skills							x					x		x																3
Conflict management						x																			x	x				3
Creative thinking				x																					x	x				3
Inquisitiveness													x		x							x								3
International buying								x																	x	x				3
Interpersonal					x			x																		x				3
Mathematical skills														x											x			x		3
Planning			x	x																	x									3
Professional presence/bus perspective					x							x														x				3
Quality	x							x				x																		3
Quality management														x												x		x		3
Salesmanship															x						x	x								3
Team building facilitation								x										x								x				3
Technology planning													x		x							x								3
Analytical skills Investigation																			x						x					2
Communication skills														x														x		2
Coordinating skills														x														x		2
Educational background					x				x																					2
Financial management																					x		x							2
Global sourcing development										x															x					2
Integral thinking						x																	x							2
Integrity						x										x														2
Knowledge/supply management Items	x																	x												2
Negotiating										x	x																			2
Organizational skills — paperwork			x											x																2
Presentation skills														x							x									2
Production systems	x																									x				2

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	1987	1993	1993	1994	1994	1995	1995	1996	1996	1996	1998	1998	1999	2000	2000	2001	2001	2003	2003	2003	2004	2005	2005	2006	2008	2009	2011	2014	2014	Total
Risk taking										x												x								2
Risk taking/entrepreneurial													x		x															2
Sales interface																									x	x				2
Supplier relationship management																									x			x		2
Team-based working						x													x											2
Technical writing																									x			x		2
Total cost analysis	x																									x				2
A total systems cost mindset		x																												1
Ability to be flexible														x																1
Ability to develop global contracts																				x										1
Ability to follow up														x																1
Ability to handle multiple tasks simultaneously														x																1
Ability to listen																x														1
Ability to negotiate																				x										1
Ability to think holistically beyond a site or region																				x										1
Accounting skills																					x									1
Adaptability																x														1
Advising (The purchaser is able to effectively communicate relevant advice on purchasing.)																							x							1
An understanding of strategy development																				x										1
Analysis and strategic sourcing																									x					1
Analytical abilities																							x							1
Assessing ethical situations																					x									1
Be able to get to the root cause of a situation														x																1
Be patient														x																1
Be proactive														x																1
Being organized																					x									1
Belief in product and company																x														1
Broad business perspective											x																			1
Broad-based business skills																					x									1
Business analysis skills																													x	1
Business case analysis											x																			1
Business management knowldege						x																								1
Business skills																									x					1
Buyer–supplier relationship management																											x			1
Calculation				x																										1
Category management																									x					1
Challenging materials specifications		x																												1
Close linkage with marketing and sales functions											x																			1
Collecting information about purchases in a common format		x																												1
Commercial awareness																			x											1
Commercial education																x														1
Common sense																				x										1
Communicate and sell message/strategy internally																									x					1
Communicates well						x																								1
Company business knowledge				x																										1
Competitive bidding		x																												1
Compromises						x																								1
Compromising																								x						1
Computer compatible				**x**																										1
Computer literacy in using popular application software packages																					x									1
Computing skills																									**x**					1
Computional													**x**																	1
Conceptual thinking				x																										1
Contract Design skills																													x	1
Contract management																					x									1
Contract management skills																													x	1
Contract writing																					x									1
Contracting											x																			1
Cost accounting and making the business case																								**x**						1
Cost analytic skills																				**x**										1
Cost driver																									**x**					1
Cost driver analysis																									**x**					1
Creative contract writing											x																			1
Cross-cultural awareness																									x					1
Cross-functional integration																											x			1
Cross-functional teams																					x									1
Cross-functional teamwork		x																												1
Cultural awareness																									x					1

Literature	Cavinato	Keough	Kolchin and Giunipero	Baily et al.	Down and Liedtka	Killen and Kamauff	Murphy	Carter and Narasimhan	Cruz and Murphy	Pagell et al.	Anderson and Katz	McKeefry	Giunipero	Carr and Smeltzer	Giuinipero and Pearcy	Faes et al.	Muller	Burt and Dobler	Cousins and Spekman	Trent and Monczka	Giunipero and Handfield	Giuinipero et al.	Mulder et al.	Giunipero et al.	Tassabehji et al.	Eltantawy et al.	Kern et al.	Knight et al.	Zawawi et al.	
	1987	1993	1993	1994	1994	1995	1995	1996	1996	1996	1998	1998	1999	2000	2000	2001	2001	2003	2003	2003	2004	2005	2005	2006	2008	2009	2011	2014	2014	Total
Customer focus (on final customers)																					x									1
Customer orientation (The purchaser is able to determine the needs of the internal customer and is able to cater to or to anticipate on these needs.)																							x							1
Data analysis				**x**																										1
Decisonmaker						x																								1
Delegationg				x																										1
Demand forecasting skills																													x	1
Demonstrate ability to add value throughout the organisation																									x					1
Design liaison				x																										1
Design/Technical Skills																													**x**	1
Detail-oriented														x																1
Disassembling the components		**x**																												1
Drafting skills (CAD)														**x**																1
Economic literacy																					x									1
Effective communication																				x										1
Effectively managing change										x																				1
Effectively managing internal and external relationships										x																				1
Ego-drive																x														1
Eloquence																x														1
Empathy																x														1
End market business knowlege				x																										1
Entrepreneurial behavior																					x									1
Environmental awareness																x														1
Environmental/sustainability skills																													**x**	1
E-procurement																									**x**					1
Ethics																					x									1
E-tools																											**x**			1
Evaluating				x																										1
Execution																								x						1
Extraversion																x														1
Facilitation and team building											x																			1
Finance												**x**																		1
Financial analysis				**x**																										1
Financial engineering skills																													**x**	1
Functional credibility		x																												1
General business skills		x																												1
Generalising (The purchaser is able to draw a conclusion at a general level from some specific actions or decisions.)																							x							1
Goal-setting																								x						1
Good appearance																x														1
Good report and letter writer						x																								1
Government regulations										x																				1
Group dynamics										x																				1
Honesty																x														1
Human capital skills																													x	1
Human relationship				x																										1
Identifying and solving problems						x																								1
Incentive system																											x			1
Influence										x																				1
Information management																							x							1
Initiator																x														1
Innovation management																					x									1
Inquisitive nature																					x									1
Interest in different cultures																x														1
Internal motivation																									x					1
Internatinal cultural awareness										x																				1
Interviewing				x																										1
Investigative nature			x																											1
Is able to analyze various strategic options and their direct potential and indirect impact on the organization						x																								1
Is knowlegeable about the organization´s business						x																								1
Knowledge management																											x			1
Knowledge/supply management Items																										x				1
Legal-solving abilities																							x							1
Legislation																									x					1
Life-cycle costing skills																													**x**	1
Likes to research						x																								1
Logical thinking				x																										1

Literature	Cavinato	Keough	Kolchin and Giunipero	Baily et al.	Down and Liedtka	Killen and Kamauff	Murphy	Carter and Narasimhan	Cruz and Murphy	Pagell et al.	Anderson and Katz	McKeefry	Giunipero	Carr and Smeltzer	Giuinipero and Pearcy	Faes et al.	Muller	Burt and Dobler	Cousins and Spekman	Trent and Monczka	Giunipero and Handfield	Giuinipero et al.	Mulder et al.	Giunipero et al.	Tassabehji et al.	Eltantawy et al.	Kern et al.	Knight et al.	Zawawi et al.	
	1987	1993	1993	1994	1994	1995	1995	1996	1996	1996	1998	1998	1999	2000	2000	2001	2001	2003	2003	2003	2004	2005	2005	2006	2008	2009	2011	2014	2014	Total
Man management				x																										1
Manage external advisers																													x	1
Manage strategic alliances/partnerships																									x					1
Management							x																							1
Managing internal relations			x																											1
Managing others																					x									1
Managing risk																					**x**									1
Managing strategic partnerships																												x		1
Managing the supply base																					x									1
Market analysis										**x**																				1
Market knowlege						**x**																								1
Meeting management				x																										1
Modelling				x																										1
Monitoring compliance with national or		x																												1
Motivating				x																										1
Motivating others																					x									1
Motivational principles																					x									1
Motivator						x																								1
MRP understanding, computer/manual														x																1
Negotiating multi-site agreements		x																												1
Negotiating skills (cost)														x																1
Negotiating skills (issues/problems)														x																1
Networking																							x							1
Oral communication																									x					1
Organisation wide financial skills																									**x**					1
Organizational												x																		1
Output specification skills																													x	1
Passing on information																									x					1
Pays attention to details						x																								1
People skills (work with suppliers)														x																1
Performance tracking																											x			1
Perseverance																x														1
Personal learning/self development																					x									1
Persuading																									x					1
Persuasive speaker						x																								1
Persuasiveness						x																								1
Planning and organizational skills										x																				1
Preparation				x																										1
Presentation																								x						1
Principles of purchasing						x																								1
Process management											x																			1
Process mapping																					**x**									1
Production systems and processes																									**x**					1
Program management														x																1
Project planning																									x					1
Project scoping																								x						1
PSM authority																											x			1
PSM tools																											x			1
Public speaking																								x						1
Purchasing																							x							1
Purposeful						x																								1
Quality requirements						**x**																								1
Questioning				x																										1
Questioning products and their package designs		x																												1
Quick response capability											x																			1
Regulatory governance skills																													x	1
Relationship building											x																			1
Relationship influencing skills																									x					1
Report writing				x																										1
RFx tools (RFx – request for proposal, information, or quotation)																											x			1
Risk identification and mgt skills																													**x**	1
Sector knowledge																													**x**	1
Selection				x																										1
Self confidence																x														1
Self-discipline																x														1
Self-esteem						x																								1
Self-motivation					x																									1
Selling skills													x																	1
Skills management																											x			1
Skills needed to identify and distinguish between strategic and non-strategic activities		x																												1
Sophisticated technical knowlede											**x**																			1
Sourcing strategy development											x																			1

Literature	Cavinato	Keough	Kolchin and Giunipero	Baily et al.	Down and Liedtka	Killen and Kamauff	Murphy	Carter and Narasimhan	Cruz and Murphy	Pagell et al.	Anderson and Katz	McKeefry	Giunipero	Carr and Smeltzer	Giuinipero and Pearcy	Faes et al.	Muller	Burt and Dobler	Cousins and Spekman	Trent and Monczka	Giunipero and Handfield	Giuinipero et al.	Mulder et al.	Giunipero et al.	Tassabehji et al.	Eltantawy et al.	Kern et al.	Knight et al.	Zawawi et al.	
	1987	1993	1993	1994	1994	1995	1995	1996	1996	1996	1998	1998	1999	2000	2000	2001	2001	2003	2003	2003	2004	2005	2005	2006	2008	2009	2011	2014	2014	Total
Stakeholder management skills																													x	1
Stakeholder mapping proficiency																									x					1
Strategic management				x																										1
Strategic supplier management																											x			1
Stress management														x											x					1
Supplier negotiation management																											x			1
Supplier performance management																											x			1
Supplier selection				x																										1
Supply base strategy																											x			1
Supply market business knowledge				x																										1
Supply risk management																											**x**			1
Tactical supplier management																											x			1
Takes appropriate risks						x																								1
Takes initiative						x																								1
Talent management																											x			1
Target management																											x			1
Target setting system																											x			1
Team working				x																										1
Team-building																									x					1
Technical business writing														**x**																1
Technical education																x														1
Technical expertise																**x**														1
technical knowledge				**x**																										1
Technical product or service knowledge											**x**																			1
Thinking in the abstract						x																								1
Time management — prioritize														x																1
Tool capacity																									x					1
Total Quality Management																									**x**					1
Total quality managemnt										**x**																				1
Understand continuous inventory review system														x																1
Understand manufacturing processes, terminology														x																1
Understand other departments														x																1
Understanding																									**x**					1
Understanding general business			**x**																											1
Understanding manuf. process																												**x**		1
Understanding manuf. terminology																												**x**		1
Understanding materials (e.g., plastics)														x																1
Understanding tool capability, tool life														x																1
User liaison				x																										1
Using the Internet																					**x**									1
Web-enabled research and sourcing analysis																								x						1
Work in cross-functional team																									x					1
Work planning				**x**																										1
Working effectively with other cultures																				x										1
Working with internal customers/other functions														x																1
Works well with department members, other departments and suppliers						x																								1
Writing																								x						1
Written and oral communication										x																				1

Table 4: PSM Skills from Academic Literature

This analysis of the occurrence and frequency of the skills taken into account in the literature table is applied further in the section of intellectual outputs 1 and 2.

As the literature in this area is constantly developing, the systematic literature review will be regularly expanded further to include more up-to-date papers and to establish an even broader literature base for the next working packages of the project. These updates will be presented on the Project PERFECT website and be done on a modular basis.

6. PSM Skills from Job Advertisements

To complement the academic review contained in Chapter 5, a select number of job advertisements were reviewed to establish what skills current PSM employers feel that their prospective employees should demonstrate in order for them to perform their jobs.

This was analysis was done in the Austrian job market and 100 PSM job advertisements were selected at a snapshot in time using available online platforms and were in a wide variety of industrial sectors to ensure that sector specific bias did not materialise. In addition, a variety of organisational levels were contained in the study to ensure that, for example, entry level positions were not just focused on. These sectors and organisational levels were as follows:

Automotive & aviation	25
Mechanical engineering	25
Industrial companies	14
(Plant) construction	11
ICT / electrical engineering	10
Unknown / other	15
	100
Strategic Buyer	32
Technical Buyer	26
Purchasing management	17
Buyer	14
Project management	8
Operational Buyer	3
	100

Table 5: Job Advertisement sectors

To ensure that there was no bias from looking at one country, this search was extended into the Dutch PSM job market and a similar search was done resulting in 38 Dutch PSM job advertisements. The Dutch online PSM job adverts where found on the online job platforms www.monsterboard.nl and www.intermediair.nl/vacature with the search term "*senior inkoper*" (senior buyer/purchaser). In

total 38 unique jobs where found on the two sites: 25 on monsterboard.nl and 13 on intermediair.nl on March 31, 2016.

The skills identified in both of these searches are contained below in an aggregated overview:

Austria – P/SM skills demanded	A & NL - P/SM skills demanded	The Netherlands - P/SM skills demanded
Personal Competencies:		
• *Reliable*	Personal Competencies: • *(Sole-)Responsibility* • *Independent* • *Holistic thinking*	Personal Competencies: • *Open towards change* • *Persistence* • *Social manners* • *Humour* • *Honesty* • *Diplomatic* • *Overview*
Activity and Action Competencies:		
• *Mobility (will to travel)* • *Ability to succeed* • *Commitment* • *To motivate*	• *Ability to handle stress* • *Result-orientated*	• *Decisive* • *Creative* • *Flexibility*
Socio-communicative Competence		
• *Fondness of Experimenting*	• *Speaking foreign languages* • *Negotiating* • *Ability to be on a team* • *Customer-oriented* • *Power of Persuasion* • *Ability to Advise* • *Ability to Communicate*	• *Capacity to Manage Personnel* • *Ability to Solve Problems* • *Relation Management*
Methods and Professional Competence		
• *Process management*	• *Analytical Talent/Ability* • *Talent for Organizing* • *Project management* • *Experience in the P/SM field* • *Education in Business Administration* • *Education in P/SM specific knowledge.* • *Computer literacy (i.e. MS Office, ERP, SAP, eProcurement)*	• *Networking (MS)*

Table 6: differences and similarities in Austrian and Dutch online PSM job advertisements

7. Practitioner Models of PSM Skills

To complement a review of the different academic literature in Chapter 5 and the job advertisement analysis in Chapter 6, a representative and international set of practitioner skills models and common themes were identified. An initial literature review in the HRM field identified that there were a number of terms and criteria used to fundamentally assess whether an individual is capable of performing work. Having reviewed the HRM literature, a set of common wording was established and therefore a Google search was done using the following search terms: “Procurement” and “Purchasing” in addition to the following search terms “Capabilities”, “Competencies”, “Skills” and “Human Capital”.

This search focused on coherent and systematic models of procurement/purchasing skills, rather than discussions of such skills and 19 relevant practitioner models were identified. These were taken from multiple countries to get a truly international perspective. These different models are shown below:

1	APICS (American Production and Inventory Control Society)
2	AT Kearney
3	Australasian Procurement & Construction Council
4	British Columbia
5	CEB
6	Chartered Institute of Purchasing & Supply (CIPS)
7	Danish Purchasing & Logistics Forum
8	Department of Defense’s (DOD) Acquisition, Technology, and Logistics (AT&L)
9	Future Purchasing Consultancy
10	Hays
11	IFPSM
12	ISM
13	Morgan McKinley
14	National Association of Educational Professionals
15	NEVI

16	PMMS
17	Scottish Government
18	UK Government
19	UK Ministry of Justice

Table 7: Practitioner models of PSM Skills

This review showed that there were a number of detailed PSM practitioner models in place by differing organisations across different geographical locations. Although the list of these models is not exhaustive, the broad coverage of different organisation types from public to private sector, type of organisation and including both in-house, PSM associations and also governmental examples provides a robust view of what models modern PSM practitioners themselves use. The individual skills from these models were distilled and can be found at Appendix 2.

8. Output 1 - PSM Competency Model Using the KODE®X Analysis Tool

The intention of this output is to draw together the inputs from Chapters 5, 6 and 7 and map what skills and competencies does the modern practitioner need to be successful in the challenging work environment in which they operate.

The inputs from the following sources results in a set of data that can be categorized as sources of the supply and the demand side of PSM competencies (similar to Birou et al. 2016).

- The academic PSM literature – 29 scientific articles
- Learning goals of PSM Associations and (in-house) PSM training – 19 entities
- Learning goals of PSM Academic Education in the Netherlands – 5 universities
- PSM Job Ads in Austria – 99 job ads.
- PSM Job Ads in the Netherlands – 38 job ads

The literature in general is considered a "neutral" source, as it contains several perspectives on the PSM function and related skills. Literature that study the employer's needs belongs to the demand and research in learning objectives would be a supply side study.

Supply side

Learning goals of PSM Associations and (in-house) PSM training – 18 entities.

Learning goals of PSM Academic Education in the Netherlands – 5 universities.

Demand side

PSM Job Ads in Austria – 99 job ads.

PSM Job Ads in the Netherlands – 38 job ads.

"Neutral"

The academic PSM literature – 29 scientific articles.

In the literature between 150 and 200 different skills names were found and the learning goals covered about 250 and 300 different skills names. It is not feasible to work with this huge amount of different skills titles in comparing the one source with another, so there was need for a structure. A solution was found by using an existing skills model: KODE®X.

Kuhlmann, A. M., & Sauter, W. (2008). Innovative Lernsysteme. Kompetenzentwicklung mit Blended Learning und Social Software, Berlin/Heidelberg.]

The KODEX competence model consists of 4 main groups:

P - Personal Competences

A - Activity and Action Competences

S - Socio-communicative Competences

M - Methods and Professional Competences

These 4 main groups are all split into 16 sub-groups, mainly containing combinations of always two of the main categories. They are listed here with -in *italics*- the most eye-catching findings in the 5 source-groups:

- **P** 'Personal Competencies'. Most found are *ethics & integrity* and *sustainability & responsibility.*
- **PA** 'Personal / Activity and Action Competencies'. Important: *devotedness,* and *change driven.*
- **PS** 'Personal / Socio-communicative Competencies': *Honesty, diplomacy*, *trustworthiness* and *openness*.
- **PM** 'Personal / Methods and Professional Competencies'. *Holistic Thinking*, *Having Overview*, *Willingness to Learn* and *Continuous learning*.
- **AP** 'Activity and Action / Personal Competencies'. *Innovation Propensity, Creative Will* and the *Capacity to make decisions*.
- **AS** 'Activity and Action / Socio-communicative Competencies'. *Capacity for Enthusiasm, Quick-wittedness, Flexible Thinking* and *To give impulse.*
- **A** 'Activity and Action Competency'. *Mobility* and *proactive*.
- **AM** 'Activity and Action / Methods and Professional Competencies'. *Persistence, Result-orientated action-taking* and *Goal-oriented Management.*
- **SP** 'Socio-communicative / Personal Competencies'. *Ability to be on a team, Team Spirit, Open in Communication, Interpersonal Skills* and the *Ability to Resolve Conflicts.*
- **SA** 'Socio-communicative / Activity and Action Competencies'. *Capacity to Manage Personnel* and *Ability to Solve Problems.*
- **SM** 'Socio-communicative / Methods and Professional Competencies'. *Language Proficiency* and *negotiation*.
- **S** 'Socio-communicative Competencies'. '*Ability to Communicate and to Conform*, *Relation Management* and *Capacity to Cooperate*.
- **MS** 'Methods and Professional / Socio-communicative Competencies'. Being '*down-to-earth'*, *having talent for presentations* and *project management.*
- **MP** 'Methods and Professional / Personal Competencies'. *Analytical Talent/Ability.*
- **MA** 'Methods and Professional / Activity and Action Competencies'. *Proceeding in a systematic-methodical manner, having Technical knowledge* and *Conceptual Strength.*
- **M** 'Methods and Professional Competency'. *Market(able) & Marketing Knowledge, Performance Know-How, Procurement Knowledge, Multidisciplinary, Specialized Knowledge, Know-How Orientated, Comprehension of Complexity, Knowledge about Production* and *Processes, Product* and *Expert Knowledge* and *Analytical Expertise.*

These 16 groups can also be divided in four groups to 64 sub-sub-groups with mostly 3 synonym notations per sub-sub-group.

The skills that were found in the 5 source-groups were coded into the 16 KODEX subgroups (in a Microsoft Excel sheet), which means that each skill that was found in one of the sources was linked to one of the 16 KODE®X skills.

In table 8 the frequencies and percentage are shown. It is interesting to see that the percentages of the source-groups per KODE®X skills deviate from each other in several cases. Even the skills and competencies that are mentioned in the online Austrian P/SM job advertisements differ importantly from those that were found on Dutch job portals. Apparently the Austrian and Dutch employers deviate towards the question what skills a successful purchaser needs.

KODE®X	Neutral		Demand side				Supply side				Total	
	Scientific Literature		Dutch Job Ads		Austrian Job Ads		Academic Learning Goals – NL		Learning goals PSM assoc. etc.			
	(n = 29)		(n = 38)		(n = 99)		(n = 5)		(n = 19)		(n = 189)	
	#	%	#	%	#	%	#	%	#	%	#	%
P	*13*	2%	*6*	1%	*12*	1%	*1*	2%	*10*	2%	*42*	*2%*
PA	*6*	1%	*18*	4%	*37*	4%	*0*	0%	*9*	2%	*70*	*3%*
PS	*4*	1%	*19*	4%	*1*	0%	*0*	0%	*7*	2%	*31*	*1%*
PM	*9*	2%	*11*	3%	*14*	1%	*0*	0%	*9*	2%	*43*	*2%*
AP	*22*	4%	*16*	4%	*27*	3%	*1*	2%	*13*	3%	*79*	*3%*
A	*19*	3%	*16*	4%	*138*	14%	*0*	0%	*1*	0%	*174*	*7%*
AS	*24*	4%	*17*	4%	*18*	2%	*0*	0%	*5*	1%	*64*	*3%*
AM	*23*	4%	*29*	7%	*58*	6%	*0*	0%	*12*	3%	*122*	*5%*
SP	*66*	11%	*37*	9%	*51*	5%	*4*	9%	*37*	8%	*195*	*8%*
SA	*40*	7%	*32*	8%	*8*	1%	*4*	9%	*42*	9%	*126*	*5%*
S	*31*	5%	*26*	6%	*38*	4%	*3*	7%	*21*	5%	*119*	*5%*

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SM	*34*	6%	*18*	4%	*173*	17%	*0*	0%	*2*	0%	*227*	*9%*
MP	*22*	4%	*17*	4%	*17*	2%	*8*	19%	*18*	4%	*82*	*3%*
MA	*67*	11%	*12*	3%	*22*	2%	*6*	14%	*4*	1%	*111*	*4%*
MS	*17*	3%	*11*	3%	*8*	1%	*1*	2%	*7*	2%	*44*	*2%*
M	*194*	33%	*139*	33%	*376*	38%	*15*	35%	*257*	57%	*981*	*39%*
total	*591*	*100%*	*424*	*100%*	*998*	*100%*	*43*	*100%*	*454*	*100%*	*2510*	*100%*

Table 8: Skills derived from five source-groups mapped in the sixteen KODE®X subgroups *(top rankings in blue)*

In order to find out which KODEX skills would fit together and as a means of data reduction, factor analysis was performed (below in red, blue and green italics). In a next step a Cluster Analysis was done and found four clusters, which divide some categories. For instance, the Austrian job adverts are clustered over two groups: those with many skills mentioned and those with a lesser amount of skills demanded. Frequencies of skills were examined and percentages of 16 KODEX subgroups over the 5 source-group were counted. The data was put into SPSS analytics software to check the reliability. An analysis in the statistical program SPSS was done to find out which KODE®X skills 'belong to each other' or in other words: which skills are mentioned most often together? In addition, similarities and difference between the five groups on the 16 KODEX's were analysed.

The factor analysis of the *academic P/SM literature* resulted in the following three archetypes:

Type 1: *A communicative, result-driven experimental personality. (In 30% in this category.)*

Type 2: An intelligent, systematic thinking team player with professional knowledge of the profession and the market. (60%).

Type 3: *A responsible, ethical person with 'spirit'. (9%).*

The factor analysis of *The Learning goals of PSM Associations plus PSM Academia* resulted in the following three archetypes:

Type 1: *A decisive, result-driven, innovative & creative, team player, analytical & down-to-earth, project & personnel management. (19%)*

Type 2: An intelligent, systematic thinking with professional knowledge of the profession and the market. (66%)

Type 3: *A responsible, ethical person with 'spirit'. (6%)*

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The factor analysis of the *online job advertisements from Austria and the Netherlands* resulted in these archetypes:

Type 1: *A team-oriented, communicative negotiator & adviser (15%)*

Type 2: A multi-disciplinary professional with knowledge of the profession and the market. (48%).

Type 3: *Result-orientated, bilingual, proactive, mobile, devoted decision maker. (37%)*

Table 8 shows already some difference between the source-groups and table 9 is confirming that deviation. Table 9 shows the percentages of the skills that 'belong to each other'. Literature – type 1 and Goals – type 1 show the most similarities.

	KODEX skills *(percentages)*																
archetypes	**P**	**PA**	**PS**	**PM**	**AP**	**A**	**AS**	**AM**	**SP**	**SA**	**S**	**SM**	**MP**	**MA**	**MS**	**M**	***tot***
Literature																	
Literat.- type 1	0	0	0	0	4	0	0	4	0	7	5	6	4	0	0	0	*30*
Literat.- type 2	0	0	0	2	0	0	0	0	11	0	0	0	0	11	3	33	*60*
Literat.- type 3	2	0	0	0	0	3	4	0	0	0	0	0	0	0	0	0	*9*
Learning Goals																	
Goals - type 1	0	0	1	0	3	0	0	2	8	9	0	0	5	0	2	0	*30*
Goals - type 2	0	0	0	2	0	0	1	0	0	0	5	0	0	0	0	55	*63*
Goals - type 3	2	2	0	0	0	0	0	0	0	0	0	0	0	2	0	0	*6*
Job ads																	
jobs - type 1	0	0	1	0	0	0	0	0	6	3	5	0	0	0	0	0	*15*
jobs - type 2	1	0	0	2	0	0	2	0	0	0	0	0	2	2	1	36	*46*
jobs - type 3	0	4	0	0	3	11	0	6	0	0	0	13	0	0	0	0	*37*

Table 9: skills that 'belong to each other' in the different groups

The conclusions from this analysis using KODE®X were the comparison of the skills and competencies that were mentioned in every source and source-group. The percentages of the mentioned skills per source-group illustrate that there probably is disagreement within the P/SM field on what skills and competencies a purchaser needs to be successful. When the skills are analysed on the question 'which skills belong to each other' a common pattern cannot be found.

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This means that there are probably gaps between the skills mentioned at the demand side (the job advertisements), the supply side (the learning objectives) and the contemplative, neutral side (the scientific P/SM literature).

Multiplier Event Input

IPSERA To further explore the archetypes identified in this analysis, a workshop was run at the 2016 IPSERA conference, in which a group was tasked with discussing what skills could be taught to develop individuals to fulfil the requirements of the personality types:

1. *Type 1:* A communicative, result-driven experimental personality (27%).
2. *Type 2:* An intelligent, systematic thinking team player with knowledge of the profession and the market. (63%).
3. *Type 3:* A responsible, ethical person with 'spirit'. (8%)

The group discussed the different attributes of these different types of purchasing person. Firstly, it identified the following skills in relation to the first personality type:

1. Needs a structure and a desire to follow pre-defined policies, guidelines and checklists.
2. Being a risk taker and not being adverse to risk.
3. Creative thinking (outside the box).
4. When activities have been performed, the individual asks for forgiveness (see comment below about "asking for permission").
5. Sees activities and work as an opportunity to make a name for themselves (aspects of self-promotion).

In relation to the second personality type:

1. Possess up-to-date knowledge (this links to point 3 of this section).
2. Be able to collaborate.
3. Be continually motivated to learn in a life-long manner.

In relation to the third personality type:

1. Rule follower (being more risk adverse).
2. Similar to an accountant.
3. Asks for permission (rather than for forgiveness as per the first personality type).

In addition, there were some overarching factors that the group felt might influence these individual skills. These were as follows:

- National culture.

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- Whether teams would benefit from a "mix" of personality types. This is in line with team dynamic literature (such as Belbin).
- Whether senior management (specifically those tasked with employing staff) actually wanted their staff to demonstrate risk taking or creativity traits even though these may be seen to be asked for in job adverts or interviews. It was felt that organisations (specifically larger, more bureaucratic ones) may stifle such character traits through their rigidly defined processes and ways of working.
- Whether age effected how creative or risk taking an individual would be, specifically if they have worked in the same organisation for any length of time.
- Whether gender influenced how an individual fits into these personality types.

These phrases contain ideas and suggestions for future research. Some of the aspects are to be studied in the project, as it moves forward.

The workshop was an opportunity to get feedback from the participants of the IPSERA Educator's Conference in relation to a number of different parts of the project and the following have been identified as being particular relevant to the furtherance of the project:

- A number of these skills, competencies and characteristics relate to some of the "softer" set, such as dealing with risk (i.e. rather than those of a more technical nature) and it is important that these are adequately represented in the outputs of all IOs and specifically that these flow through to the developed curriculum. There is a tendency in PSM education (particularly professional courses) to focus on the technical skills (i.e. learning how to put together an invitation to tender) required, but the area of soft skills is more limited.
- Providing future students with the ability to be a self-motivated and lifelong learner is also an area that needs to be addressed by the IOs. Many HE courses actively embed lifelong learning into their curriculum and this approach needs to be tailored to a specific PSM focus.
- As the overarching themes developed (e.g. age) it may be useful to link some of these characteristics in the survey of IO3 to see if there is any effect.

9. Trends and Future Requirements in PSM

1. Methodology

In order to find out about current economic or technological trends and, therefore, future requirements for purchasing organisations and skills purchasers will need in the future, it has been searched for up-to-date studies and articles on the internet. As German and English search terms, such as “trends in purchasing”, “purchasing requirements” and “purchaser of the future”, are used, German and English results appeared. The texts are read and scanned regarding developments, trends, future requirements in PSM and required skills/competences/characteristics/know-how are derived. As can be seen in appendix 4, several English keywords are named for all sources to summarise the important aspects.

These key findings are categorised as follows:

- Technology:
  - Expert in technology and management
  - E-procurement: e-auctions, e-tenders
  - New technology (e.g. 3D-printing)
  - Adjust structures and processes to digitalization/automation x4
  - Early integration of procurement for new technologies/new product development x2
  - Electronic buying systems
  - Technical understanding
  - Open to new technologies and changes (change management)
  - Digital reporting
  - Cloud based computing
  - Mobile technologies
  - Virtual reality
  - Handling of digital, smart information
  - Digital procurement portfolio
- Social skills/communication:
  - Social networks
  - Language skills, Communication skills in several languages x2
  - Negotiations
  - Internal communication
  - Moderation
  - Working in teams
  - Increasing level of supplier collaboration
  - Restructuring existing supplier relationships
  - Cross-functional teams
  - Collaborative Optimization, collaboration tools
  - Focus on strategic value of relationships
  - Share knowledge
  - Networking
  - Manage internal and external interfaces
  - Collaborate with 3rd party stakeholders
  - Build and improve beneficial cooperation in all directions
- International Relations:

  - Global Connectivity
  - International alliances (standards, global markets/language/culture knowledge)
  - Shift in buying regions (less in regional markets, more in China, India, Eastern Europe)
  - Know-how in international business
  - Global competition
  - Outsourcing
  - Deal with growing regions
  - Monitor geopolitical developments
- Ways of thinking: open to change/adaptable:
  - Open-minded
  - Change management (organisation, awareness, structures, processes, leadership)
  - Agility, flexibility
  - Adaptability
  - Openness
  - Multi-divisional
  - Interdisciplinary qualifications
  - Complex organisations
  - Increasing complexity (e.g. cost controlling)
  - Obsolescence Management (e.g. effected by 3D-printing replacing procurement and warehousing)
  - Reaction to market changes
- Costs Management:
  - Planning and managing currency and cost risks x2
  - Cost reduction
  - Consolidating spend
  - Spend analysis
  - Cost management (methods, TCO)
  - Transparency of costs x2
- Strategy/Analytical thinking
  - Data analyst
  - Complexity
  - Analytical thinking x3
  - Statistics
  - Modern analytics (e.g. regression analysis, predictive modelling)
  - Strategic thinking, think ahead
  - Integration in strategic decisions
  - Thinking in processes
  - Visualisation
  - Cross-functional integration
  - Scenario analysis
  - Connectivity and efficient use of data for collaborations and to manage supply chains more intelligent
- Risk Management:
  - Professional risk management x3
  - Failure management
  - Identify/analyse/evaluate risks and opportunities, Best Cost
  - Early warning systems for risk management
  - Awareness of quality and supply risk by global sourcing x2
- Awareness/knowledge:
  - Awareness of open and ongoing topics
  - Far-reaching knowledge about products, markets
  - Business and economical knowledge
  - Basic knowledge of logistics/SCM
  - Expert knowledge
  - Environmental awareness

  - Further qualification/training (e.g. methods for cost reduction Design to Cost and Target Costing, strategic and tactic negotiation, culture, international contract and insolvency law)
  - Permanent training
  - Forecasting, market research
- Innovation:
  - Open innovation
  - Out-of-the-box thinking
  - Innovation-/ Crowd-Sourcing
  - Creativity
  - Product innovation
  - Drive innovation with suppliers x2
  - Intrapreneurship
  - Thinking in alternatives
  - Growth driver
  - Value creation
  - Trend-setter
  - Increase in efficiency
- Initiative:
  - Initiate
  - “Entrepreneurship”
- Miscellaneous:
  - Growing education requirements and career opportunities
  - Initiative
  - Talents shortage
  - Controlling
  - Guidelines
  - Discipline
- Specific PSM/SCM/Logistic practices:
  - Interface logistic service providers
  - Crowdsourcing x2
  - Inventory management
  - Manage supply chains
  - Inter-divisional: purchasing, R&D, production
  - Quality management x2
  - Verify offers, tenders
  - Supplier development
  - Cyclic forecasting, cooperate with sales dept.
  - SWOT analysis
  - Frame and optimise global supply chains (transparency, Country concept)
  - Sustainability, compliance, marketing of such activities proactive
  - Early warning systems
  - KPIs
  - Procurement controlling
  - Cross-silo-optimisation
  - Collaborative Network Sourcing
  - SRM
  - Scenario technique
  - Variable planning processes
  - Standardise processes
  - Differentiate strategic and operational purchasing
  - Growing importance of procurement
  - Reduction of Maverick Buying
  - Procurement of integrated solutions
  - Responsibility for industry 4.0 implementation

- Dealing with big data, assistance systems, augmented reality x2
- Outside-in view
- Contract management
- Combination of procurement and R&D
- Long-term financial planning
- Scarce resources
- Dynamic, volatile markets
- Sustainability relevance
- Supply networking

2. Results

After an analysis of a variety of sources dealing with economic and technical development, a list of trends was established. These trends can be separated into eight main categories, with each category closely connected to the others. They are as follows: adaptability, new technology and practices, innovation, social skills and communication, international relations, strategy and analytical thinking, cost and risk management, and awareness/knowledge.

The first of the groups, adaptability, is arguably the most important. It is essential that professionals in a purchasing position are able to be open-minded and adaptable to whatever obstacles they encounter in their job. These challenges could come from a variety of avenues, including organizational changes, technological advances, changes in leadership, market changes, or improvements in processes. Through all of these variations it is essential that a manager remains flexible and is able to continue to be an effective worker. This is increasingly important in organizations that utilize complex methods to complete tasks such as cost controlling.

Closely related to the aforementioned topic is new technology and practices. While it is important to be able to react to these new improvements, it is also important to be educated on these changes as they are developed. Such developments include the utilization of the internet for procurement, tenders, and transactions. Additionally, digital reporting, cloud based computing, virtual reality, 3D-printing, and mobile technologies are just some of the other technological advances that are currently being established. Being able to understand these new technologies and their importance, as well the ability to integrate them into the purchasing company's existing practices is increasingly important.

Not only is it useful to be able to react to changes, it is also important to actively seek them, as well. Out-of-the-box thinking and creativity are greatly valued in purchasing, as they often lead to the creation of these new technologies and practices. Thinking in alternatives, intrapreneurship, and value creation are all skills that a manager can utilize in order to help the company work more effectively

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and efficiently. Beyond just the individual purchasing company, however, it is important to be able to drive innovation with suppliers, as well.

With this innovation, a degree of strategic thinking is required to be able to integrate it with existing practices. Being able to work with a high degree of complexity and employ analytical thinking at all times is of the utmost important for an effective purchasing professional. The capability to analyse possible scenarios early on using methods such as visualization, regression analysis, and predictive modelling is very useful. With that said, a deep understanding of statistics is essential.

More specifically, analytical thinking is especially important in the areas of risk management and cost reduction. The ability to identify, analyse, and evaluate risks is a skill that successful purchasing firms value. In addition, being able to consolidate and reduce spending can be a great asset to a purchasing company. The capability to perform spending analyses and manage currency and cost risks is very useful in this regard. And finally, the ability to maintain a degree of transparency with costs is another asset that purchasing firms can take advantage of in the future.

Especially related to cost and risk management is the growing importance of international relations. The acknowledgement of global connectivity and the value of international alliances is essential. With that, it is helpful to be able to understand how international business is conducted. Also, relating to a previously mentioned set of skills, being able to adapt to global changes such as shifts in buying regions, international growth, global competition, the utilization of outsourcing, and geopolitical developments is of the utmost importance.

In order to participate in these international exchanges, it is also important to possess excellent social skills. Being able to communicate effectively in several languages makes it much easier to participate in negotiations, networking, and the general exchange of knowledge. Even more prominent than in international relations, however, is the ability to work collectively domestically. Firms that take advantage of cross-functional teams are able to collaborate both within and outside of the company quite effectively. Fostering relationships between 3rd party stakeholders and suppliers is beneficial to the firm, as well.

And, finally, a general skill that can be applied to each of the categories that have already been mentioned is awareness. A manager with basic knowledge in a variety of areas can be quite beneficial to a purchasing firm. The ability to understand a wide range of products, markets, and business/economic structures cannot be undermined. This knowledge can come from a variety of sources, from formal training to research to just general knowledge. The capability to learn and the desire to continue learning are crucial skills that a purchasing manager should possess.

As was discussed above, the valued skills and abilities of future purchasing organizations are all related. The ability to adapt to new technology and improvements fosters an environment where innovation can occur. Then, the ability to strategically integrate these new practices into the company can lead to more effective cost and risk management. Of course, none of this would be possible without growth and collaboration that is generated through positive international and domestic communication. But, above all, it is the ability to constantly learn and be aware of what is happening within the company and around the world that makes a purchasing professional so effective.

Multiplier Event Input

IPSERA In addition to the analysis shown above, participants the 2016 IPSERA Educator's Conference were involved in a workshop which was tasked with iidentifying future challenges in PSM. This discussion was broken down into a number of sub- discussion points as follows:

1. 2030 Scenario 1: best case ("the green economy")
2. Common ground between both scenarios
3. 2030 Scenario 2: worst case
4. Any other material/ideas

The results of this discussion were as follows:

1. 2030 Scenario 1: best case ("the green economy")

In the green economy, procurement will have a diverse stakeholder understanding and will procure for the "common good". The lifetime value of what is procured will be assessed. International trade will be eased by a worldwide authority and supplier management will be key (e.g. to get access to resources). Procurement employees have common interfaces, integrated IT systems at their disposal and have a balanced set of incentives. Telework has become much more accepted and a norm. New financial services providers have come up (e.g. peer to peer finance).

2. Common ground between both scenarios

In 2030, procurement employees have to be able to handle big data analytics. In a world of increasing scarcity and power concentration (e.g. M&A leading to near or actual monopolies), and political instability, the ground for negotiations deteriorates. Moreover, new legislation needs to be understood (e.g. if cyber-physical systems create new potential liabilities; e.g. autonomous vehicles' components – who is liable for an accident?). Compliance gets an ever increasing topic, as conversations are under constant surveillance and might be easily misunderstood and scrutinized later. As machine intelligence increases, some PSM core activities might erode (e.g. the negotiation).

3. 2030 Scenario 2: worst case

In scenario 2 we have >2 degree Celsius global warming. Therefore, coastal territories are under water, the world faces severe overpopulation, >100 million refugees, increased housing/wealth/income inequality, air issues and food shortages. This has become a sellers' market and supply chains are highly disrupted. Also, multinational companies (MNCs) get increasingly anonymous with very limited liability.

4. Any other ideas/material

- To look at the ethical/philosophical side behind automation/increasing machine usage: What do we want as a society?
- Consider CIPS program in the UK as inspiration for curriculum.
- Consider whether private/public procurement topics might be taught together or separate (one participant mentioned that it is great to mix private/public procurement students).
- Consider how procurement internships, mentoring and placements might fit into curriculum.
- Consider how higher education (HE) and training can go seamlessly hand in hand.

There are a number of developments in technology, the political environment and natural resources that will affect procurement 2030 in any case, whereas the "best" versus "worst" highlights specific additional components.

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10. Output 2: PSM Maturity Based Skills Model

The inputs out of the former chapters have been used to cluster the PSM skills identified into a PSM Maturity Model (Schiele, 2007) to provide interested parties with a view of what skills relate to a specific stage of development level a purchasing organisation has reached. The skills, that were found in different sources (described earlier in chapters 5, 6, 7 and 9), were included into the maturity model in order to structure and cluster them.

The model is divided into the 5 dimensions

- Planning and Strategy,
- Organisation & Structure,
- Processes,
- Human resources and Leadership,
- Controlling.

This structure is based on the supply management maturity model by Schiele (2007).

The skills and competences are listed in a table that is structured into the five categories according to the supply management maturity model manually. They are put in the section that fits best, even though a distinct classification is not simple for every item. The matching to the maturity model dimensions often is not clear, as many terms fit into more than one category. Some even do not fit into any specific dimension, they are notes in an additional column.
If a skill was already included, it was not added to the list again but multiple nominations were noted at concerned aspect to be able to consider the weighting in the ongoing and subsequent analysis.

A first matching of skills into the maturity model leads to the following overview:

Maturity Model Dimensions and classified skills/competences

Planning and Strategy	Organisation and Structure	Processes
strategic thinking (14)	add value to the organisation (3)	supply base research (2)
ability to implement business strategies	structure supplier relationships (5)	supplier negotiation (5)
technology planning (4)	change management (19)	supplier acquisition (3)
supplier relationship management (16)	multi-divisional, cross-functional (6)	SCM (13)
manage strategic partnerships (2)	managing internal customers (7)	global sourcing (3)
customer focus (12)	internal negotiation	international buying (5)

business/management knowledge (8)	understand manufacturing systems and processes (7)	IT enabled sourcing
CAD skills (4)	legal, regulatory aspects (6)	passing on/share information (4)
ERP/MRP/APS (7)	category management (5)	blueprint reading (11)
market trends (4)	interdisciplinary understanding (4)	E-procurement (6)
product knowledge (11)	operations management (2)	inventory management (9)
stakeholder mapping/management (5)	enterprise economics (2)	TQM (2)
ethical issues (8)	plant maintenance	supplier evaluation (8)
sustainability (8)	intellectual property rights (2)	research (8)
diversity (5)	INCOTERMS (3)	investigation (2)
corporate governance	technology application (5)	continuous process improvement (3)
social justice principles (2)	procurement systems	six sigma
business management (3)	position procurement in organisation	lean management
materials management (6)	technology know-how (8)	tender evaluation (3)
planning and organising (4)	organisational agility (2)	supplier management (8)
scheduling techniques	manage internal relationships (5)	supplier development (4)
product design	make or buy decisions	negotiation preparation
collaborative partnerships (8)	outsourcing (3)	conduct negotiation (2)
specification development (7)	centralised procurement	international finance
contract management (12)	management information systems	quality management (13)
set objectives	handling complexity (4)	distribution (4)
commodity specific knowledge (3)	foreign currency (3)	transportation (4)
strategy development (7)	product development	storage/warehouse management (4)
market analysis (7)	early supplier involvement (2)	process management (5)
business case development (4)	interdisciplinary qualifications	solicit offers (3)
corporate social responsibility (3)	suppliers linked to IT	evaluate offers (3)
implement policies (2)	alliances (3)	evaluate internal processes
customer relationship management (6)	insolvency law	logistics (3)
best practice knowledge	differentiate strategic and operational	capacity planning
strategic sourcing (4)	guidelines	interface to logistics service providers (2)
contract law (4)	buy integrated solutions	obsolescence management (2)
strategic agility (2)	industry 4.0 implementation	price negotiation
supplier development (4)	assistance systems	contract administration (3)
supply base research (2)	augmented/virtual reality (2)	manage performance (2)
contract development (3)	cloud based computing	accounting (2)
risk management (19)	mobile technologies	claims
holistic thinking (5)	combination procurement + R&D	disposal (2)
target-oriented (3)	sales interface (2)	incoming goods
(open) innovation (6)		project plan
crowdsourcing (4)		business administration
global connectivity (3)		import/export
EU procurement regulations (3)		reverse logistics
demand management (2)		supplier selection (8)

market knowledge (5)		procurement technology systems
strategic industry management		marketing (2)
results focused (2)		3D printing (2)
category strategy		handle digital information (2)
global citizenship		e-auctions, e-tenders
health		digitalisation (5)
safety		e-business
market intelligence (2)		efficiency
compliance (2)		variable processes
SC design		early procurement involvement in development (2)
SC analysis		standardise processes
trend-setter		internal communication
growth driver		process thinking
scenario analysis (2)		reduction of Maverick buying
SWOT analysis		automation (4)
monitor political developments		internal and external interfaces
growing regions (2)		modelling
outside-in view		understand business conditions (4)
supplier-enabled innovation		contract writing (2)
long-term financial planning		bidding
scarce resources		technical knowledge (13)
global competition		
dynamic, volatile markets		
Knowledge/supply management Items (3)		
manage external advisors		
preparation (2)		
commercial awareness		
sector knowledge		
category management		
PSM tools (e.g. RFx) (3)		
planning & scheduling (4)		
innovation management		

Human Resources and Leadership	Controlling	further
leadership (20)	follow-up (2)	Email system Lotus Notes
time management (11)	target costing (3)	MS Office
project management (17)	cost analysis (17)	SAP
conflict management (15)	cost reduction techniques (2)	MS Navision (ERP)
problem solving (22)	understand computational techniques (5)	PSI (solution production management, logistics)
goals setting (2)	finance knowledge (11)	job experience
teamwork (15)	forecasting (9)	driving licence
salesmanship (5)	analytical skills (24)	mobility

cross-cultural awareness (6)	mathematical skills (5)	social networks
computer and internet literacy (8)	statistics (2)	popular software packages
interpersonal communication skills (16)	data analysis (3)	computer skills (9)
risk taking (9)	benchmarking (4)	computing skills (2)
entrepreneurship (3)	life cycle costing (3)	e-tools
creativity (13)	audit	
curiosity (7)	KPIs (4)	
written communication (11)	measure performance (4)	
listening (7)	reporting (3)	
presentation skills (6)	data management	
stress management (5)	data control	
persuasive (4)	TCO (6)	
multi-tasking (2)	evaluate contractor	
patience (4)	handle big data, smart data (4)	
flexibility (5)	price analysis (2)	
proactive (5)	portfolio analysis	
detail-oriented (4)	critical path analysis	
integrity (5)	financial health suppliers	
continuous learning (5)	information control	
effective communication (10)	quality control	
reading	risk analysis (2)	
decision making (18)	budgeting	
develop oneself and others (5)	supply base analysis (5)	
responsibility (5)	procurement controlling (2)	
support staff (2)	cost controlling	
train staff (3)	cost transparency	
association contacts	early warning systems (2)	
certifications	regression analysis	
prioritise work (2)	predictive modelling	
business conduct standards (3)	spend analysis	
delegate (2)	calculation	
initiation (6)	cost driver analysis	
moderation (2)		
influencing (2)		
self-development		
team building (8)		
trust (2)		
oral communication (5)		
dynamic		
coordination (2)		
intrapreneurship		
language skills (esp. English) (3)		
resilience		

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assertiveness		
motivation (oneself and others) (9)		
commitment		
thoroughness		
intercultural competences (3)		
reliable		
open-minded (3)		
inter-disciplinary qualifications		
honesty (2)		
technology capability		
negotiation skills (28)		
professionalism (7)		
adaptability (2)		
networking (5)		
coaching		
expert knowledge		
visualisation		
thinking in alternatives		
discipline		
share knowledge		
openness		
critical thinking		
talents shortage		
selection		
well educated (2)		
credibility		
conceptual thinking		
logical thinking		
abstract thinking		
commercial education		
generalising		
relationship building		
HR management (4)		
self-discipline		
empathy		
quick response capability		
talent management		
skills management (3)		
performance tracking		
common sense		
compromise		
give advice		
extraversion		
interview		

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incentives		
organisational skills (10)		
persuasive (8)		
good appearance		
tactful (5)		
knowledge management		
self-confidence (3)		
technical education		
technical writing (2)		

Table 10: PSM Maturity Based Skills Model (numbers in brackets stand for multiple nominations) based on Schiele (2007)

When putting the skills into this structure, multiple notations of single skills are marked by putting the number of nominations behind the term, so that the relevance of each skill compared to the others is easily visible. A ranking of the skills appearing most frequently shows that negotiation and analytical skills are most important in the wide range of all considered sources, followed by the ability to solve problems, leadership as well as change and risk management and making decisions. Other aspects of high importance are cost analysis, project management and interpersonal and relation-oriented competences like communication, supplier relationship management, conflict management and teamwork.

Ranking: Skills list according to frequency of nomination (only skills with 5 or more nominations):

Negotiation skills	(28)
Analytical skills	(24)
Problem solving	(22)
Leadership	(20)
Change management	(19)
Risk management	(19)
Decision making	(18)
Cost analysis	(17)
Project management	(17)
Interpersonal communication skills	(16)
Supplier relationship management	(16)
Conflict management	(15)
Teamwork	(15)
Strategic thinking	(14)
Creativity	(13)
SCM	(13)
Technical knowledge	(13)
Quality management	(13)
Contract management	(12)
Customer focus	(12)
Blueprint reading	(11)
Finance knowledge	(11)
Product knowledge	(11)

Time management	(11)
Written communication	(11)
Effective communication	(10)
Organisational skills	(10)
Computer skills	(9)
Forecasting	(9)
Inventory management	(9)
Motivation (oneself and others)	(9)
Risk taking	(9)
Business/management knowledge	(8)
Collaborative partnerships	(8)
Computer and internet literacy	(8)
Ethical issues	(8)
Persuasive	(8)
Research	(8)
Supplier evaluation	(8)
Supplier management	(8)
Supplier selection	(8)
Sustainability	(8)
Team building	(8)
Technology know-how	(8)
Curiosity	(7)
ERP/MRP/APS	(7)
Listening	(7)
Managing internal customers	(7)
Market analysis	(7)
Specification development	(7)
Strategy development	(7)
Understand manufacturing systems and processes	(7)
Cross-cultural awareness	(6)
Customer relationship management	(6)
E-procurement	(6)
Initiation	(6)
Legal, regulatory aspects	(6)
Materials management	(6)
Multi-divisional, cross-functional	(6)
(Open) innovation	(6)
Presentation skills	(6)
TCO	(6)
Category management	(5)
Continuous learning	(5)
Develop oneself and others	(5)
Digitalisation	(5)
Diversity	(5)
Flexibility	(5)
Holistic thinking	(5)
Integrity	(5)
International buying	(5)
Manage internal relationships	(5)
Market knowledge	(5)
Mathematical skills	(5)
Networking	(5)
Oral communication	(5)
Proactive	(5)
Process management	(5)
Responsibility	(5)

Salesmanship	(5)
Stakeholder mapping/management	(5)
Stress management	(5)
Structure supplier relationships	(5)
Supplier negotiation	(5)
Supply base analysis	(5)
Tactful	(5)
Technology application	(5)
Understand computational techniques	(5)

Table 11: Ranking of PSM Maturity Based Skills mentioned 5 times or more (numbers in brackets stand for the number of multiple nominations)

Within each category, the skills have been clustered (as shown in Table 12) to summarize them and to reduce data and this analysis is shown in table 12. This analysis is also used as a basis for the educational landscape gap analysis, which compares the total skills set out of this maturity analysis with existing PSM study programs in chapter 12.

Clusters:

	Management Function	**Description**
PL	**Planning and Strategy**	
PL1	Demand Planning	
	Forecasting and Demand Planning	Planning of annual demands based on the sales forecast and past experience as input for annual negotiations
	Spend Cube Analysis	
	Obsolescence Management	
	Demand Management	
	Enterprice Resource Planning / Material Requirements Planning / Advanced Planning and Scheduling	IT skills necessary to extract planning data from employed ERP system
PL2	Pooling Planning	
	Pooling Planning and Organising	One of the most powerful tools of purchasing is to bundle the entire demands of the firm / group of companies. Pooling requires careful planning, demand identification and the application of organisational solutions (lead buyer concept, centralisation, purchasing councils)
	Supply Chain Analysis	
	Supply Chain Design	
PL3	Market Analysis and Planning	
	Supply Market Analysis	Analysis of the supply market i.e. the suppliers of a particular good and their properties / relationships to each other. Analysis of competitive pressure and market power.
	Commodity Analysis	
	Supply Base Research	
	Market Trends	
	Market Analysis	
	Market Knowledge	
	Market Intelligence	
	Research	
	Investigation	

	Supply Chain Analysis and Planning	Analysis and planning not only of the immediate supply market, but consideration of the entire supply chain
	Commodity and Domain Specific Knowledge	Knowledge on a special purchasing domain, e.g. automotive industry, construction, purchasing of health etc.
PL4	Innovation Analysis and Planning	
	Technology Planning	Contribution to innovation is one of the novel tasks purchasing has to fulfil. This requires knowledge on the technological requirements of its own company, as well as systematic scans of the solutions available on the supply market
	Product Knowledge	
	Product Design	
	Collaborative Partnerships	
	Open Innovation	
	Technology Know-how	
PL5	Sourcing Strategy Planning	
	Category Strategy Development	Development of the sourcing strategy for a particular category or family of purchasing goods, including strategic analysis and category classification (e.g. Kraljic)
	Strategy	
	Structure Supplier Relationships	
	Ability to Implement Business Strategies	
	Business Case Development	
	Strategic Agility	
	Strategic Industry Management	
	Category Strategy	
	Strategic Sourcing	
	Make or Buy Decisions	
	Mob	
	Outsourcing	
SO	**Structural Organisation**	
SO1	Organisational Structure and Mandates	
	Purchasing Organisation Knowledge	Purchasing follows distinctive organisational models
	Procurement Systems	
	Organisational Agility	
	Centralised Procurement	
	Best Practice Knowledge	
	Process Management	The design of processes and the updating as well as reading and understanding processes.
SO2	Strategic Integration with Board	
	Add Value to the Organisation / Importance of	
	Strategic Management	Strategic integration refers to the preparation of purchasers to work as a board member. Sourcing strategy development is covered is covered above in planning.
	Change Management	
	Business Knowledge	
	Enterprise Economics	
	Strategic Thinking	
	Corporate Governance	Knowledge on how organisations are governed, including board, role of advisory board, stakeholders etc.
	Business Management	
	Position Procurement in Organisation	How to ensure that purchasing plays an adequate role in the organisation.
	International Finance	
	Business Administration	
	Implement Policies	
	Holistic Thinking	

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	Target-oriented	
	Stakeholder Mapping/Management	
SO3	Purchasing Involvement with other Functions	
	Passing on/Share Information	
	Cross-functional Teams	Explicit training in how to function and run cross-functional teams
	Managing Internal Customers	
	Internal Negotiation	
	Interdisciplinary Understanding	
	Operations Management	In order to collaborate with other functions, purchasers profit from a) knowing basics about the other function and b) knows about how to specifically design the interface
	Plant Maintenance	
	Manage Internal Relationships	
	Understand Manufacturing Systems and Processes	
	Lean Management	
	Quality Management	
	Total Quality Management	
	Marketing	
	Distribution	
	Customer Focus	
	Customer Relationship Management	
	Logistics	
	Capacity Planning	
	Interface to Logistic Service Providers	
	Reverse Logistics	
	Transportation	
	Storage/Warehouse Management	
	Incoming Goods	
	Materials Management	
	Scheduling Techniques	
	Inventory Management	
	Supply Chain Management	
	Research and Development	
PO	**Process Organisation**	
PO1	Supplier Selection	
	Request for Quotation - Solicit Offers	
	Specification Development	
	Project Plan	
	Global Sourcing / Supplier Acquisition	
	Supplier Acquisition	
	Foreign Currency	
	Import/Export	
	INCOTERMS	
	International Buying	
	EU Procurement Legislation	
	EU Procurement Regulations	
	Global Connectivity	
	Evaluate Offers	
	Diversity	
	Ethical Issues	
	Cost / Price Analysis	

	Decision Making	
	Supplier Selection	
	Tender Evaluation	
	Corporate Social Responsibility	
	Social Justice Principles	
	Sustainability	
PO2	Negotiation	
	Negotiation	
	Negotiation Preparation	
	Negotiation Skills	
	Price Negotiation	
	Conduct Negotiation	
	Supplier Negotiation	
PO3	Contract Development and Management	
	Contract Development	Designing of contracts, application of standard vs. customised contracts
	Contract Law	
	Legal Issues	
	Contract Management	Once the contract has been signed, it has to be monitored and enforced
	Contract Administration	
	Disposal	
	Legal, Regulatory Aspects	
	Claims	A novel form for suppliers to increase their margin is claims management, according to which the product is sold below its price and the margin comes from subsequent extra charges. Purchasers react by limiting the contractual potential for claims management.
	Compliance	
	Supplier Relationship Management	Here the focus is on the ongoing management of the suppliers after contracting. Sometimes SRM is also defined as strategically planning for, and managing, all interactions with suppliers. Most of the planning is covered before, though.
	Manage Strategic Partnerships	
	Supplier management	
PO4	Supplier Risk Management	
	Risk Management	
	Financial Health Suppliers	
	Risk Analysis	
	Risk Management	
PO5	Supplier Evaluation	
	Supplier Evaluation	
	Evaluate Contractor	
PO6	Supplier Development	
	Continuous Process Improvement	
	Six Sigma	
	Supplier Development	
PO7	Early Supplier Involvement	
	Blueprint Reading	
	Early Supplier Involvement	
	Technical Knowledge of Purchaser	
	CAD Skills	
	Product Development	
	Technology Application	

	Intellectual Property Rights	
HR	**Human Resources and Leadership**	
HR1	Job Descriptions and Competences	
	Purchasing Roles and Job Profiles	
HR2	Personnel Selection and Integration	
	Personnel Selection Process	
	Employee Integration and Development Plan	
HR3	Performance Appraisal and Career Development	
	Employee Performance Measurement	
	Train Staff	
	Develop Oneself and Others	
	Coaching	
	Leadership	
	Continuous Learning	
HR4	Soft Skills Development (Explicit Training)	
	Project Management	
	Goals Setting	
	Time Management	
	Team Ability	
	Conflict Management	
	Team Building	
	Salesmanship	
	Communication Skills	
	Interpersonal Communication Skills	
	Written Communication	
	Oral Communication	
	Language Skills (esp. English)	
	Cross-cultural Awareness	
	Personality	
	Persuasive	
	Creativity	
	Entrepreneurial	
	Academic Skills	
	Trustful / Integrity	
	Adaptability	
HR5	Soft Skills Development (No EC, Indirectly Acquired)	
	Project Management	
	Goals Setting	
	Time Management	
	Team Ability	
	Conflict Management	
	Team Building	
	Salesmanship	
	Communication Skills	
	Interpersonal Communication Skills	
	Written Communication	
	Oral Communication	
	Language Skills (esp. English)	
	Cross-cultural Awareness	
	Personality	
	Persuasive	

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	Creativity	
	Entrepreneurial	
	Academic Skills	
	Trustful / Integrity	
	Adaptability	
CO	**Controlling**	
CO1	Controlling Target System	
	Set Objectives / KPI's	Definition of KPI's and their implementation
	KPI's	
	Data Management	
	Data Control	
	Quality Control	
	Manage Performance	
	Set Objectives	
	Finance Knowledge	
CO2	Purchasing Controlling Process and Structure	
	SAP	
	Performance Measurement and Follow-up	Continuous monitoring of performance and target achievement, degree of implementation logic, incl. Project controlling. Performance of the purchasing function. Performance of suppliers is part of "supplier evaluation".
	Follow-up	
	Measure Performance	
	Reporting	
	Budgeting	
	Accounting	
CO3	Methods and Tools Support	
	Data Analysis	
	Benchmarking	
	Handle Big Data, Smart Data	
	Price Analysis	
	Portfolio Analysis Support	
	Critical Path Analysis	
	Supply Base Analysis	
	Cost Reduction Techniques	
	Analytical Skills	
	Mathematical Skills	
	Statistics	
	Supplier Cost Targeting	
	Cost Analysis	
	Life Cycle Costing	
	TCO	
	Lever Analysis Support	
CO4	Supportive IT	
	Procurement IT Systems	
	E-procurement	
	Understand Computational Techniques	
	Information Control	
	Automated Tools	
	Management Information Systems	
	IT Enabled Sourcing	

Table 12: Purchasing skills clusters in maturity model structure (grey: sup-categories to black terms)

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The next step is to compare the purchasing skills overview with the already existing purchasing study programs in Europe in order to find out about gaps programs are missing to teach and the one hand and to find out about possible over-supply on the other hand. Chapter 12 deals with these investigations.

To give an outlook towards curriculum design, professional knowledge transfer and soft skills should be put across simultaneously by teaching via team work, case studies, workshops and the usage of other innovative teaching and learning methods.

11. The PSM Education Landscape

The specific focus of this chapter is to explore the PSM education landscape to further the overall project aims in establishing the need for a pan-European HE PSM curriculum. This analysis therefore includes UG, PG and Professional courses to establish a full picture of what this landscape looks like.

The education landscape of the UK is established by a Google search using the following terms:

- Purchasing degree
- Procurement degree
- Supply Management degree
- Higher Education Purchasing course

In addition, some specific course search engines were used (specifically using procurement and purchasing as search terms):

- www.bachelorsportal.eu (pan European and worldwide perspective). – purchasing yielded 252 results, but the majority of these are general Business programmes, or Logistics programmes with an individual purchasing module. Procurement yielded 142 results. Supply Management yielded 613 results.
- www.hotcourses.com (UK) – procurement yielded 48 results, which are mainly CIPS courses or individual specific modules on specific areas. Purchasing yielded 28 courses, which are mainly CIPS courses or individual specific modules on specific areas.
- university.which.co.uk/courses (UK) – purchasing yielded 2 courses. Procurement yielded 0 courses.
- www.ucas.com (UK) - purchasing yielded 5 courses (not all relevant). Procurement yielded 1 course.

Finally, to ensure that as wide a coverage as possible was undertaken, participants of the 2016 IPSERA Educator's Conference, who represent many of the leading education institutions in Europe were asked to provide information on their own courses and this resulted in the courses shown in Appendix 3.

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A wide variety of courses have been listed, also covering Supply Chain Management (SCM) to show that there are points of difference between them and more focused PSM course. It is important to note that not every SCM course has been identified, but rather this is a representative sample to show what subjects/modules have been covered. In addition, not all short courses have been included as these are not fully comparable with the UG offerings. In summary, the PSM education landscape is characterised by the following:

1. Short courses.
2. Professional courses (post-graduation, for individuals already working in the PSM field).
3. Mainly SCM course.
4. Heavy emphasis on post-graduate (PG) courses in this area.

This establishes that there is a need for an UG PSM focused curriculum that will allow organisations to get graduate employees that are ready and prepared to cope with current and future requirements of PSM rather than expending considerable resources training them accordingly as these organisations are currently hiring university graduates with other specifications than PSM and spend much time and financial means to build up the needed PSM related skills This will also ensure that students are provided with the knowledge and learning to join a purchasing department of any size of organization and in different industrial settings. This will allow PSM to remain as, and increase its role in being a key contributor to overall firm performance recognising that there is a high reliance of European industries on international suppliers.

Multiplier Event Input

IPSERA Whilst the preceding discussion focuses largely on content, it is also important to consider the teaching methods deployed by educators in the field. Traditional, didactic, teaching methods such as lecturing still have a role to play in the education of PSM, but is important that the field embraces more innovative techniques to engage with millennial learners and to develop an understanding of the different innovative practices involved in PSM education, a workshop was run at the Educator's Conference at IPSERA 2016, which was tasked with identifying such novel practices, as follows:

E-Learning	Lecture	Seminar
Discussion online	Guest lectures	Tutorial skills training
MOOC	Make students use software	Industry classroom
Youtube videos (videos combined with lecture material/sheets; high effort)		Company cases
Webinar (boring for the lecturer as no feedback)	Software demonstrations	
Cross-discipline lecture		
Video recorded classes, video streaming		Consultancy project
	Industry project in every semester	
	Cases/presentations/papers instead of exams	
	Business games, simulations (physical or electronical)	
	Start lecture with case study (material to be provided and student preparation in advance)	Skype tutorials
		Develop strategies for different commodities

Table 13: Learning Methods

In addition to these practices, a number of other aspects emerged:

- ➔ Not all of these methods are highly “innovative”
- ➔ Methods highly dependent on student numbers
- ➔ A combination of different learning/teaching methods is important
- ➔ Culture plays an important role

These factors will be carefully considered in the later IOs of the project, specifically those that relate to the curriculum and MOOC development (IO4 and IO5).

12. Output 3 - Education Landscape Gap Analysis

Having established in chapter 11 what the current UG PSM education landscape looks like, an initial gap analysis between the Skills Maturity Model from chapter 10 and the Education landscape from chapter 11 was undertaken on a selected number of Dutch PSM courses to identify which skills were either taught or not by the relevant courses. This was done by allocating a percentage value of the content they teach (i.e. how much of a lecture is given) against each skill area. In addition, skills they may develop tacitly (i.e. that do not explicitly and specifically form part of the content of a lecture), but rather from other means such as participating in group debates or presentations were recorded. This was important to establish the full skill set that education providers are offering in their curriculum. Although some of this content information is available via documents such as module descriptors, individual course leaders were contacted and interviewed or asked to complete a spreadsheet to more accurately establish the content percentages. This initial analysis is also used to establish and test the suitableness of the methodology for a full pan-European analysis that will be performed for IO4 (Development of the pan-European Curriculum), as well as providing an initial indication of potential gaps between PSM skills required and what the PSM landscape is currently providing.

An analysis has been made on the Dutch Education landscape and this has been established by course guides collected from universities. Most of these guides were online accessible, a request was sent to teachers in these courses in order to receive the guides. This request, via e-mail, asked the teachers to send their course guides of courses teaching PSM. The database included 30 universities, 103 universities of applied sciences and the NEVI.

The second phase of the analysis involved a descriptive analysis of the database. Courses that included purchasing should be separated from the ones not including purchasing. Supply Chain Management (SCM) was covered also, to point the differences between SCM courses including and not including PSM. The final database included 23 PSM courses (7 UG, 16 G), taught at six different universities and one university of applied sciences. The NEVI offers seven full educations and seventy courses, that are taken into account as a benchmark of the Dutch HE PSM curriculum. This descriptive analysis included gathering information on the programme level, name, duration, course contents and goals, education method, evaluation criteria, and amount of ECTS.

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The third phase of the analysis is mapping the courses in the Purchasing Education Content Mapping Model (PECMM) and was done via interviews with teachers at the participating institutions. The course can be mapped after explaining how the model works. It took approximately twenty minutes to complete one course to map, including explanations.

The final phase is the data analysis after mapping all courses. This data is going to be descriptively analysed in Microsoft Excel. All information gathered of the institutions in PECMM is combined in one document to compare the topics covered in each course. The NEVI data is not mapped yet, but will be used to benchmark the Dutch HE PSM education. Each mapped course is translated into quantitative descriptive data. Content analysis is done in the research phase on the institutions, because it allows the researcher to make valid inferences from the online information and to systematically evaluate at many levels. Data mapped with the PECMM is quantitatively descriptively analysed in order to find the topics covered in each course. This technique allowed to list the most frequent covered topics in courses and describes it quantitatively. Moreover, when NEVI is going to be mapped, the results will be used as a benchmark for the purchasing courses of the institutions. The final database will be descriptively compared in order to examine differences that exist between institutions and NEVI courses.

An initial analysis of Dutch PSM education provision has been completed and the initial results show that the following 5 skills areas were given the **most average hours of content**:

Skill area	*Maturity Area*	*# courses*	*% of class time*		
			Average	*Min*	*Max*
Commodity and Domain Specific Knowledge	Planning and Strategy	8	11,8	1,3	33,8
Category Strategy Development	Planning and Strategy	13	8,0	2,5	13,0
Forecasting and Demand Planning	Planning and Strategy	5	7,9	3,2	18.7
Global Sourcing / Supplier Acquisition	Process Organisation	10	7,5	1,9	32,3
Technology Planning	Planning and Strategy	8	7,1	1,7	16,1

Table 14: Top 5 skills areas in terms of PSM education content most covered

The analysis shows that the following 5 skills areas were **most covered in the courses**:

Skill area	*Maturity Area*	*# courses*	*% of class time*		
			Average	*Min*	*Max*

Category Strategy Development	Planning and Strategy	13	8,0	2,5	13,0
Corporate Social Responsibility	Process Organisation	13	6,0	0,6	16,1
Supplier Relationship Management	Process Organisation	12	4,8	0,7	15,4
Make or Buy Decisions	Planning and Strategy	11	6,2	0,8	13,5
Supplier Selection	Process Organisation	11	4,4	1,4	7,7

Table 15. Top 5 skills areas covered in PSM education

Table 14 shows that Commodity and Domain Specific Knowledge is covered on average most percentage of class time, whereas Category Strategy Development covered on average 8 percent of class time. However, table 15 shows that Category Strategy Development (#1) is covered more than Commodity and Domain Specific knowledge (#25). Thus, the amount of courses covering a specific skill does not directly say something about the amount of time being taught in a course and these aspects should be taken into account.

The following areas were **not** covered in the contents of the courses analysed:

Skill area	*Maturity Area*
Storage/Warehouse Management	Structural Organisation
Personnel Selection Process	Human Resources and Leadership
Employee Performance Measurement	Human Resources and Leadership
Train Staff	Human Resources and Leadership
Salesmanship (explicit training)	Human Resources and Leadership
Salesmanship (indirectly acquired)	Human Resources and Leadership

Table 16. Six skill areas in terms of PSM education that are not covered

The soft skills that are indirectly acquired are sorted on the most covered skill in a course.

Soft skill	*% of all courses teaching skill*
Communication Skills	62,5
Team Ability	43,8
Project Management	43,8
Personality	31,3
Cross-Cultural Awareness	31,3
Salesmanship	-

Table 17. Most indirectly acquired soft skill

The soft skills that are explicitly taught are shown in table 18, sorted by percentages of all courses.

Soft skill	*% of all courses teaching skill*	*Part of top 10 identified PSM skills*
Communication Skills	25,0	Yes (Interpersonal Communication Skills)
Team Ability	12,5	Yes (Problem solving)
Project Management	12,5	Yes
Personality	6,3	No
Cross-cultural Awareness	6,3	No
Salesmanship	-	No

Table 18. Most explicitly taught soft skill

This data shows that the PSM Education content analysed has a clear focus on the more processual aspects of PSM, but is lacking in Structural Organisation and particularly Human Resources & Leadership aspects. Although, Salesmanship was found as a content area in tacit content, the others were not.

The findings of the PSM maturity based skill model show top 10 skills identified. The mapped courses show that least attention is paid to soft skill development, either direct or indirect. The most explicitly taught soft skill is communication skills, being part of the top 10 in the PSM Maturity based skill model as well. Although, communication skills are explicitly taught, only 25% of all courses cover this skill. The other skills are covered 6,3% to 12,5%. Moreover, only three skills that are taught are part of the PSM Maturity based skill model, showing a gap between the skills that are identified and the skills that are covered in the courses. It is not clear yet whether there might be a difference in master and bachelor courses and the amount of teaching hours on soft skills. It might be that the low courses covering these skills are related to being a bachelor or a master course, since master courses might expect students to have a certain skill level already.

The selected skills in bottom found by the PSM maturity based skill model are: category management, international buying, supply base analysis, structure supplier relationships and process management. Table 19 shows the terms that are used in the PSM maturity based skill model in comparison to the PSM education model. Portfolio Analysis Support is covered once, whereas the other skills are covered in at least 40 percent of the courses, with a maximum of 82 percent.

PSM Maturity based skill model	Skill Area	Maturity Area
Category Management	Category Strategy Development	Planning and Strategy

International Buying	Global Sourcing / Supplier Acquisition	Process Organisation
Supply Base Analysis	Portfolio Analysis Support	Controlling
Structure Supplier Relationships	Category Strategy Development	Planning and Strategy
Process Management	Process Management	Structural Organisation

Table 19. Terms PSM Maturity based skill model and Dutch PSM education analysis

The initial PSM education content analysis show that the Dutch PSM education focus on the Process Organisation of PSM, but lacks in Structural Organisation and even more in Human Resources and Leadership. The PSM maturity based skills model shows that there is a greater focus on the soft(er) or non-technical skills over those more traditionally associated with PSM. However, the PSM education analysis shows the opposite: the hard(er) skills are more taught than the soft(er) skills.

One of the key aims of the PSM profession undertaken over the last 20 years is to assert the importance of PSM within the organisational context and this analysis suggests that the current educational provision is not adequately preparing graduating students with the skills they need to further these goals and become more entrepreneurial, creative business leaders. Whilst not underestimating the importance and necessity of technical PSM skills, the development of particularly IO4 (the pan-European PSM curriculum), IO5 (Skills assessment tool) and IO6 (PSM MOOC) will need to ensure that this broader skill set is adequately represented.

13. Conclusions and Further Work

1. Summary

The purpose of this White Paper was to explore the PSM skills concept and provide readers with a set of findings that they will find useful. In summary it has used multiple and varied data sources to produce the following outputs, which are described in detail in previous sections of this white paper:

- PSM Competency Model using the KODE®X analysis tool
- PSM Maturity Based Skills Model
- Establish a picture of the current PSM HE education landscape and provide an initial gap analysis of these skills against the current PSM pan-European Higher Education landscape.

2. Vision Workshop Results and Feedback

A vision workshop was held via Skype on July 4th, 2016. In addition to eight PERFECT associates representing all five institutions, there were four outside participants (Jorma Ruikka, Donna Marshall, Hervé Legenvre, and Jörg Tiemann) that joined the meeting. The focus of the workshop was on the results of Intellectual Output 1. The consortium wanted to discuss some of the topics included in this white paper, verify the findings and ask for feedback. The vision workshop is summarized in the next paragraphs.

The emphasis of the first session of the workshop was on the discrepancies found between skills that are present in job adverts and the skills that are deemed important by purchasing and supply management academia.

The first question that was posed was if senior managers prefer employees who are risk takers. This was a trait that was valued by academia but rarely asked for in job adverts. The first assumption was that risk taking may be left for higher positions. Depending on the type of position the job advert was for, risk taking may not be a valued trait. It was suggested that additional job adverts for other countries, different industries and business cultures, and different positions should be evaluated in order to compare and draw more conclusions about the gaps. In particular, it would be useful to compare different positions within the same company, as there may be HR filters or a generic advert used for multiple positions. Generic skills may be asked for in the adverts and more specific ones can rather be fostered in later training.

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The next question posed was why a person with 'spirit' was deemed important in the literature, but not asked for in actual job adverts. The initial comments were that there may be a lag between research/academics and industry explaining some of the found discrepancies. In addition, it was stated that it may be difficult to write a job advert that looks for "softer skills". A final thought was that maybe the job adverts only asked for skills that would "make a difference", assuming that most applicants already possessed the most basic ones.

The final question that was discussed in the first session was whether employers preferred an employee that was more internally or outwardly focused. It was stated that many companies seem to be shifting from an internal to an outward focus, but it would be ideal if employees were able to have both. It would be best if purchasing managers were able to think on multiple different levels at the same time. The extent of an internal or outward focus could also depend on the industry.

The second session was focused on "soft skills" and how they are incorporated into the hiring process. The first question was how softer skills are assessed when selecting new employees as well as monitoring the performance of existing employees. It was discussed that employees are generally chosen based on their education, experience, and personality. In addition, it is easier to hire technically qualified individuals because it is easier to determine their level of qualification. With regard to evaluations after the hiring process, many assessments are more focused on the "hard skills" of employees (actual figures/numbers) - especially those that are used to calculate salary bonuses.

The second question was related to the effect that technology and automation will have on the skills required of purchasing managers. One participant said that many of the same skills will be required, but in a different way. Risk management, for example, will still be important, but will be done differently due to the greater access to information that practitioners are beginning to have. Collaboration skills are increasingly important, as collaboration is often the basis for new technological advances. Also, new skill sets will be required in order to interact more effectively with automated machines and new technology in general.

The final question of the session was concerning the retention rate of purchasing positions (and therefore the retention of supply management knowledge). This is a big issue in industry and some proposals were discussed. For example, it is important to engage employees in projects and responsibilities, but not to overwhelm them. In addition, the idea of mixing more experienced employees with newer ones in order to facilitate the transfer of knowledge is a possible solution. A final thought was that it is possible for companies to prefer that their employees move around within the organization in order to have teams with a variety of viewpoints.

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The last session was regarding the curriculum of purchasing students. What skills students are taught and how they can be assessed were some of the major topics discussed. The first question of the session was whether less tangible skills can be taught and if so what teaching methods are the most effective. It was overall decided that learning does not only happen through training - networking and other means of education are also important. The discussion shifted to the so called “entrepreneurial skills” that many companies want and what that actually means. An important distinction was made between entrepreneurship and intrapreneurship: companies want employees who will help to improve their current organization, but they do not want them to start an entirely new business. Additionally, it was added that entrepreneurial skills could refer to the ability to respond to challenges and/or be innovative.

The second question addressed how softer skills can be assessed by employers when hiring students. While it was stated that it can be difficult to remain objective in the evaluation of soft skills, there could be a “trial” period included in the onboarding process during which these skills are able to be assessed.

The final question was how employers are able to adjust to changing competencies that students are bringing to the workplace. It was stated that additional skills may be needed beyond what has been traditionally taught and that university programs are always changing in order to adjust to industry demands.

Furthermore, the team has received feedback advising to pay attention to the aspects risk management and sustainability. They are crucial for procurement and supply management topics and will be kept in the back the minds throughout the whole project period and beyond.

It was also informed from a procurement professional perspective that the key aspects of required competences have shifted from analytical and negotiation skills to more inter-discipline collaboration within the company and with other network partners.

3. IO Links

As this IO is the first one in the PERFECT Project timeline, the work done feeds in to subsequent IOs of the project and these can be graphically represented as shown in Figure 2 and provides a robust platform for the furtherance of the main project objective, which is the development of a pan-European PSM curriculum. In parallel to the more desk based research of IO1, IO2 (company case studies) pursues an explorative approach by investigating the current and future requirements in

practice via case studies. The results of IO1 and IO2 will lead into IO3 (Survey), where the skills models are validated and explore empirically the link to organisational effectiveness and performance. The first three IOs will then be used to inform the development of a pan-European PSM curriculum (IO4), an online skills analysis tool (IO5), which practitioners can use to establish their PSM skills level and an online MOOC (IO6), which will provide learning opportunities in PSM fundamentals.

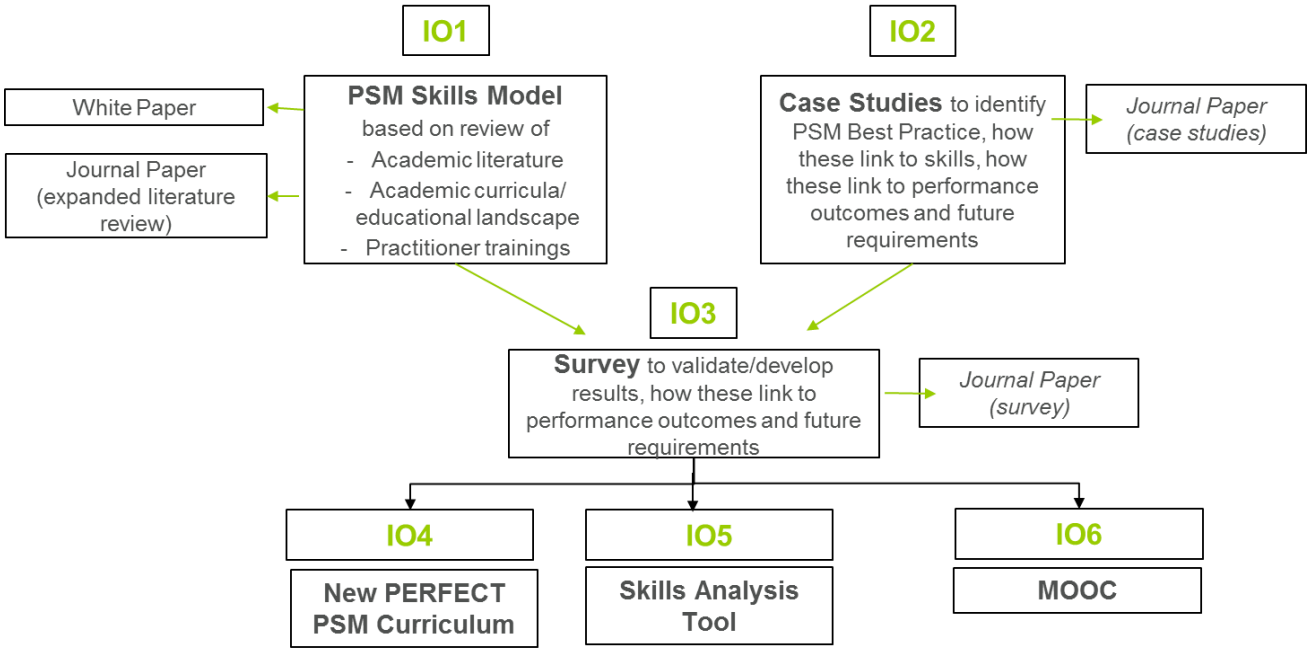

Figure 2: PERFECT IO links (own illustration)

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15. Appendix 1 – list of academic journal papers on PSM skills

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16. Appendix 2 – practitioner based competency models

Organisation	Location	Brief Description	Source
APICS (American Production and Inventory Control Society)	**US**	Competency models developed as actionable tools to allow professionals to rank their skills against other professionals and identify areas for improvement and also to assist hiring managers as they evaluate and compare candidates. These models follows guidelines set by the Employment and Training Administration of the United States Department of Labor.	http://www.apics.org/careers-education-professional-development/careers/competency-models
Scottish Government Procurement Competency Framework	**UK**	Developed by the Cross-Sectoral People and Skills Working Group in response to recommendations from the Review of Public Procurement in Scotland (2006). Has been endorsed by each of the Centres of Expertise for use in their sectors – Advanced Procurement for Universities and Colleges (APUC) for Scotland's universities and colleges, NHS National Procurement the centre of procurement expertise for health, and Scotland Excel for the local government sector. Identifies the skills and competency levels required by all staff involved in the procurement process and helps people take ownership of their personal development through a skills assessment, identifies training and development needs, and career planning.	www.gov.scot/Topics/Government/Procurement/Capability/proccompfw
Danish Purchasing & Logistics Forum	**Denmark**	Compass is a comprehensive competency assessment solution for procurement. Individuals assess their competencies against ideal role profiles, these assessments are compared with managers views, gaps against the ideal profile are identified and prioritised, and personal development plans produced.	www.dilf.dk/dk/arrangementer/kurser/kompetenceprofiler/competence-purchasing/
NAEP (National Association of Educational Purchasers)	**US**	Since the 1920's, NAEP has been the non-profit professional Association primarily dedicated to serving higher education purchasing officers in the U.S. and Canada. NAEP's mission is to facilitate the development, exchange and practice of effective and ethical procurement principles and techniques within higher education and associated communities, through continuing education, networking, public information and advocacy.	http://c.ymcdn.com/sites/www.naepnet.org/resource/resmgr/NAEPInfo/NAEP_Competency_Model.pdf
New Zealand Procurement Competency Review	**New Zealand**	Designed to assist public procurers and their managers determine where individuals currently sit within their profession and to provide a basic roadmap for further professional development. It combines international and local best practices and is the result of extensive input from senior procurement practitioners across the public sector.	http://www.business.govt.nz/procurement/news/archived-news/try-our-new-procurement-competency-framework
Department of Defense (DOD) Procurement Competency Review	**US**	In response to tasking from the Director of Human Capital Initiatives (HCI) for the Department of Defense's (DOD) Acquisition, Technology, and Logistics (AT&L), CNA is working with HCI and workforce representatives to develop competency models for each of the major career fields within the AT&L workforce. This report contains CNA's analysis of the Purchasing career field.	https://dap.dau.mil/workforce/Documents/Comp/DoD%20ATL%20Defense%20Acquisition%20Workforce%20Competency%20Model%20-%20Purchasing.pdf
British Columbia	**Canada**	Three-E Training Inc. along with its sub-contractor, Schmidt & Carbol Consulting was contracted by the	http://www2.gov.bc.ca/assets/gov/government/services-for-government-and-

Procurement Analysis		Learning Centre of the BC Public Service Agency to undertake a review and validation of the Procurement Competency Model and Framework. The contractors were also asked to pay particular attention to the learning and training needs of executives in relation to procurement.	broader-public-sector/buy-goods-services-and-construction/support-services/procurement_competency_model_report.pdf
OGC UK Government Procurement Review	**UK**	The integrated Procurement Profession Skills and Competency Framework sets out the skills, new behaviours and competencies which Civil Service procurement professionals should demonstrate in delivering highly efficient, dynamic and professional procurement and commercial operations that deliver value for money to the taxpayer. This Framework is an essential component of driving up organisational and individual capability as part of the procurement reform agenda.	
Ministry of Justice Procurement Competency	**UK**	This competence framework sets out the technical skills procurement practitioners are expected to have and the professional competence profile for every procurement post in the organisation. It complements the *Ministry of Justice* Core Competence Framework and ensures that each activity can be undertaken to a required level depending on the post.	
Chartered Institute of Purchasing & Supply (CIPS)	**UK**	Used by individuals and organisations to enhance performance, the Global Standard in Procurement and Supply sets the benchmark for what good looks like in procurement and supply at all levels and across all sectors. It helps individuals to identify current operating skills and abilities and what is needed to progress. Organisations of all types can benchmark their procurement professionals against the competencies in the Standard and identify any skills and capability gaps.	http://globalstandard.cips.org/?utm_source=CIPSwebsite&utm_medium=webpage&utm_campaign=AccessTheInteractiveToolScreenshotStep1
NEVI	**Netherlands**	NEVI, the Dutch Association for Purchasing Management, was founded in 1956. Since then NEVI has grown to become one of the world's leading Purchasing Management organisations. With over 6.000 members, working in the private and public field, NEVI is the principal authority for matters concerning Purchasing in the Netherlands.	www.supplymanagementcongres.nl/files/StreamFile109254/handout-nevi-purspective-slides-ismc-follow-up.pdf
AT Kearney	**Global**	Consultancy Company	www.atkearney.com/procurement/capabilities
Australasian Procurement and Construction Council	**Australia**	Until recently, procurement professionalism in Australia and New Zealand has not been clearly recognised or defined. Too often, public procurement has been undertaken without professional support and procurement people have focused on the process rather than the desired outcome. To ensure that public sector agencies are able to deliver on their objectives and to mitigate the potential risk of poorly executed procurement and lost opportunities, urgent action is needed to attract and develop procurement capabilities across government.	www.apcc.gov.au/ALLAPCC/APCC%20PUB_Building%20Government%20Procurement%20Capabilities%20Guide%20-%20May%202008.pdf
Morgan McKinley	**Global**	Professional Services Recruitment Company	www.morganmckinley.ie/article/top-10-competencies-procurement-professionals
CEB	**Global**	Best practice insight and technology company	www.cebglobal.com/blogs/six-procurement-competencies-key-to-strategic-success/

Future Purchasing Consultancy	**Global**	Consultancy Company	www.futurepurchasing.com/
Hays	**Global**	Recruitment company	www.hays.co.uk/features/HAYS_057675
Institute for Supply Management (ISM)	**US**	With more than 48,000 active members worldwide, ISM is the largest global organization dedicated to advancing the practice of procurement and supply management. ISM is the leader in supply chain, driving value to its members with its two widely renowned certifications, the Report On Business®, countless educational resources and extensive networking events around the globe.	http://ism.files.cms-plus.com/2015/MasteryModel/images/Mastery%20Model%20brochure.pdf
PMMS	**Global**	PMMS Consulting Group are procurement specialists, providing intelligent and practical solutions to organisations operating across the private, public and third sectors.	http://arcblue.com.au/assets/PDF/procurement-skills-assessments1.pdf
International Federation of Purchasing & Supply Management (IFPSM)	**Global**	The International Federation of Purchasing and Supply Management (IFPSM) is the union of 48 National and Regional Purchasing Associations worldwide. Within this circle, about 250,000 Purchasing Professionals can be reached. IFPSM facilitates the development and distribution of knowledge to elevate and advance the procurement profession, thus favorably impacting the standard of living of citizens worldwide through improved business practices. Global standard - A Quality Standard for Supply Chain Educational Programs – The Global Standard sets out the mix of knowledge, learning and skills against which educational programs in purchasing and supply management of an intellectual equivalence of at least first degree equivalence level can be assessed and accredited.	www.ifpsm.org/global-standard/the-standard/

17. Appendix 3 – European education landscape

Institution	Country	Programme	Level	Content	Course aims or Learning Outcomes
Robert Gordon University (Aberdeen)	UK	Purchasing & Supply Chain Management	MSC	Stage 1 Purchasing Principles and Law Finance for Managers The Economics of Business Managing People Stage 2 Operations Management Supply Chain Management Strategic Purchasing Research Methods Stage 3 Dissertation in Purchasing and Supply Chain Management	This course is suitable for professionals who wish to develop knowledge, understanding and business management skills in the fields of Purchasing and Supply Chain Management. It is accredited by The Chartered Institute of Purchasing and Supply (CIPS) and provides a more specialist focus in line with CIPS. The core subject areas develop transferable management skills enabling organisational and contextual linkage with the specialist areas of Procurement and The Supply Chain. The specialist subject areas aim to develop an understanding and application of the concepts and frameworks which could be taken back into the workplace. The dissertation stage enables in-depth research to be undertaken investigating organisations' challenges in this field.
Salford University	UK	Procurement, Logistics and Supply Chain Management	MSC	Semester 1 Operations & Information Management Strategic International Business Management Semester 2 Project Risk & Procurement Global Supply Chain Management Semester 3 Business Innovation Project	This course is informed by the very latest academic research and provides you with an in-depth understanding of procurement, warehousing, stores management, transportation and shipping, inventory planning and contract management. You will review these topics in a supply chain context and benefit from a programme fully accredited by the Chartered Institute of Purchasing and Supply (CIPS). Full membership is available to you on graduation.
Aston University	UK	Logistics with Purchasing Management	BSC	Year 1 Research Skills (EC113A) Enhancing Employment Skills (EAS1ES) Introduction to Logistics (LT1301) Company and Contract Law (LT1305) Principles of Economics (LT1307) Literature Review Project (LT1312) Transport Fundamentals (LT1314) Facilities Design and Management (LT1315) Air Transport (LT1319) Principles of Financial Accounting (BF1101) Introduction to Business Management (SE1500) Year 2 Inventory Control (LT2102) Operations and Process Management (LT2316) Project Management (LT2306) Road Transport (LT2317) Modelling Simulation and Optimisation (LT2318)	Purchasing has an overwhelming impact on the bottom line of any organization. It generally accounts for over half of an organisations spend and has a direct impact on the two forces that drive the bottom line: sales and costs. In a world-class organisation therefore it is essential that Purchasing becomes a core competency of the firm, finding and developing supplers and bringing in highly valued expertise. The course includes a thorough grounding in all the key subjects one would expect in a Logistics or Operations Management degree. In addition specialist modules cover the strategic, operation and practical techniques used to select, develop, contractually engage and monitor suppliers. The application of technology, management of supply risk, methods of costing and accquisition, importance of corporate social responsibility and many more important topics are studied within the context of maximising supply chain functionality, performance and ultimately value.

				International Logistics and Purchasing (LT2319) Maritime Transport (LT2311) Database Management (LT2312) Rail Transport (LT2315) Services Marketing (LT2320) Purchasing, Principles and Process (LT2321) Final Year Final Year Project (EC310A) Leadership and Human Resource Management (LT3306) International Trade Law and Policy (LT3315) Developing the Purchasing and Supply Functions (LT3105) Technology Applications in Supply Chains (LT3321) Strategic Financial Management (LT3322) Supply Chain and Procurement Strategy (LT3104) Management of Strategic Contracts and Suppliers (LT3106) Contemporary Issues in Supply Chains (LT3320)	
University of Westminster	UK	Purchasing & Supply Chain Management	MSC	Core Modules Purchasing Management Logistics and the External Environment Sustainable Supply and Procurement Research Methods and Project Preparation Financial Analysis for Managers Business Process Integration with SAP Retail Supply Chain Management Supply Chain Management Project Option modules Project Management International Aspects of Business Law	The course addresses the strategic role of purchasing and supply chain management. It also examines the impact of changes in the regulatory and policy environment, and the effect of new technologies and techniques on current and future problems within the supply chain. The course will develop your knowledge of best practice in this field, and enhance your understanding of the importance of business process and activity integration.
VIA University College (Herning)	Denmark	Purchasing Management Fashion	BA		The programme qualifies you to work with purchasing in an independent manner through research and development. You will be able to make an estimate of the financial and logistic parts of a company in the fashion and lifestyle sector and to handle both the internal and external negotiations. You will acquire a profound knowledge of commercial and financial theories and learn how to put the business concept and strategy of a company into practice in an international market.
University of Greenwich	UK	Business Purchasing & Supply Chain Management	BA	YEAR 1: Personal and Professional Development 1; Introduction to Business Processes; Business Planning and Development – Quantitative Methods 1; Introduction to Economics for Business; Organisation Behaviour 1: Managing the Performance of Individuals. Optional Erasmus Exchange Programme. YEAR 2: Personal and Professional	Every organisation procures materials and resources, so procurement and purchasing skills are much sought after by employers. This specialist Business programme gives a well-rounded approach to business management and allows students to specialise in the purchasing and supply chain management functions of business, including retail, service, manufacturing, fashion.

				Development 2; Project Management; Creativity and Decision Making – Quantitative 2; Purchasing and Distribution; Operations Management: Processes and Value Chains. Further course information is available on our website. Optional Sandwich Year (Work Placement). FINAL YEAR: Advanced Project Management; Managing Strategy; Sustainable Business Development; International Purchasing and Supply Chain Management; One option from: Consultancy Project; Thematic Independent Study. Further course information is available on our website.	In this programme, students will be equipped with knowledge on the functions of purchasing and supply chain management and comprehend their impact in the overall efficient management of a business. These functions will be studied within the context of the changing global environment and taking into account the societal requirements for sustainable management and reduced carbon footprint from business operations. The programme is accredited by the Chartered Institute of Purchasing and Supply (CIPS), the leading professional body in the field of purchasing and supply chain management. Students completing the programme gain partial exemption from the CIPS, giving them accelerated entry into this professional body (subject to approval).
Plymouth University (run through Supply Solutions)	UK	International Supply Chain & Procurement Management	BSC	Level 5 Core units Managing Supply Markets Price & Cost – 20 credits Managing Procurement – 20 credits This unit is tailored and offered as 'Managing Procurement in the Public Sector' – 20 credits, for Public Sector Organisations Level 5 options Buying Assets & Outsourcing Services Category Management & E-Commerce in Supply Chain Management Negotiation Theory & Practice Procurement in Project Based Environments Sustainability In the Supply Chain Contracting in the Public Sector Logistics Systems & Techniques Marketing & the Supply Chain Function Work Based Project & Dissertation Risk Management In the Supply Chain Warehouse Management & Inventory Control Level 6 core Research Skills for International Business Managing & Leading the Supply Chain Function Work Based Project & Dissertation Level 6 Option International Supply Chain Management International Logistics Management Finance for Supply Chain Managers International Shipping Legal Aspects of Contracting Strategic Relationship Management Ports & Inter-Modalism Advanced Negotiation Techniques Strategic Management & Governance	

				Strategic Management of the Procurement Function Strategic Management of the Procurement Function in the Public Sector	
Wayne State University (in Cooperation with AIAG)	USA	Auto Industry Certificate in Purchasing and Supply Chain Management	Non-degree certificate program	Intro/ SCM Strategy in the Vehicle Industry Globalization and Vehicle SCM SCM Finance ERP and Decision Support Tools Forecasting and Demand Planning In the Vehicle Industry Negotiation and Purchasing Legal Buyer/Seller Relations and Innovation Procurement Strategy Supplier Development and Risk Management Manufacturing/Scheduling/Capacity In the Vehicle Industry Plant Tour Six Sigma and Quality Management and First Half Wrap-Up Company Project Global SCM and Logistics Strategy In the Vehicle Industry Global Sourcing and Total Enterprise Cost Global Customs/Security Management Warehousing/Sequencing/ Cross-Dock/Pooling Strategy and Operations Supplier/Sequencing Center Tour Inventory Management Strategy Materials Management/Beer Game Transportation Mgt, 3PL's, Packaging Returnables, and Safety/Legal Component Transportation Management Finished Vehicle Transportation	
Irish Institute of Purchasing & Materials Management	Ireland	Part Time Degree in Procurement	QQI Accredited	Fundamentals of Accounting Economics Business Organisation and Information Technology Marketing and Business Communications Principles of Procurement Purchasing and the Commercial Environment Statistics and Quantitative Methods (15 credits) Fundamentals of Management (10 credits) Introduction to Supply Chain (10 credits) Storage and Distribution (15 credits) Commercial Relationships (10 credits) Financial Management (10 credit) Operational Supply Management (10 credit) Business Law (10 credit) Operations Management (15 credit)	

				Logistics Management (15 credit) Business Policy Advanced Supply Management Strategic Procurement Research Assignment Project All 15 credits.	
University of Strathclyde	UK	Supply Chain & Procurement Management	MSC	Core Strategic Supply Chain Management Supply Chain Operations Enterprise Resource Planning Postgraduate Individual Project Management of Total Quality & Continuous Improvement Product Costing & Financial Management Advanced Project Management Business Operations & Supply Chain Strategy Case Studies in Supply Chain Management Specialism Organisational Buying Behaviour Strategic Procurement Management Various elective classes	You'll gain an in-depth understanding of strategic, tactical and operational issues relating to the management of supply chains. You'll be equipped with state-of-the-art concepts, methods, techniques and tools to contribute towards the competitiveness of industrial and commercial organisations worldwide. The course comprises compulsory modules and specialist modules as well as a Masters dissertation. The specialisation allows you to choose an area of interest, Operations Management, Logistics Management or Procurement Management. You will choose this at registration.
Kaplan University (Augusta)	USA	Business Administration – Procurement Focus	BSC	Additional modules in: Management of Information Systems Operations Management Quality Management Financial Statement Analysis	Careers in management are available in nearly every industry, offering diverse opportunities for job applicants with the right knowledge, skills, and credentials. If you are ready to advance your career in management, earning a degree in business administration at Kaplan University may prepare you with knowledge and skills relevant to today's competitive business environment.*
London Corporate Training Ltd	UK		Short courses	Advanced Procurement, Contract Management and Effective Negotiation IOSCM Procurement and Managing Suppliers IOSCM	
Chartered Institute of Purchasing & Supply (CIPS)	UK (International)		Level 4 (Diploma in Procurement & Supply)	Contexts of procurement and supply Business needs in procurement and supply Sourcing in procurement and supply Negotiating and contracting in procurement and supply Managing contracts and relationships in procurement and supply	The Diploma addresses planning and forecasting for future demand, forward planning for contract development, negotiating volumes, margins and standards, creating and controlling specifications, and contract management. It also covers the supply market and chain, negotiating with suppliers, conflict resolution and performance review
Chartered Institute of Purchasing & Supply (CIPS)	UK (International)		Level 5 (Advanced Diploma in Procurement & Supply)	COMPULSORY UNITS Management in procurement and supply Managing risks in supply chains Improving the competitiveness of supply chains OPTIONAL UNITS Category management in procurement and supply Sustainability in supply chains Operations management in supply chains	The Advanced diploma focuses on cost reduction and added value of purchases and supplies, improving timescales and stock control, management and innovation in the procurement and supply process, and developing legal and risk management expertise.

Chartered Institute of Purchasing & Supply (CIPS)	UK (International)		Level 6 (Professional Diploma in Procurement & Supply)	COMPULSORY UNITS Leadership in procurement and supply Corporate and business strategy Strategic supply chain management OPTIONAL UNITS Supply chain diligence Programme and project management Legal aspects in procurement and supply (UK)	The Professional diploma focuses on giving you the strategic acumen to align functional, organisational and supply chain strategies, and to devise and implement change management. The course develops your skills in areas including leadership of stakeholders, the procurement function, teams and relationship management, and project and financial management.
Institute of Supply Chain Management (IOSCM)	UK		Short courses	Purchasing Management: Roles of management in purchasing/Purchasing legislation/Supplier relationships/Effective negotiation Supply Chain: Management and control/Physical and information flows/Barriers to effective operations/Supply chain planning/Technology in supply chain Inventory: Inventory management/fixed period and fixed quantity models/minimising stock levels/impact of inventory on the supply chain/stock performance systems	The Level qualification is intended for students with extensive experience working at a management level within the supply chian sector and looking to progress to a senior management role. The course allows students to develop management skills and sector specific knowledge to support career development and operational efficicency.
CP Training			Short courses	Strategic Procurement Skills	
RIPA International			Short courses	A modern approach to procurement: A strategic perspective The complete procurement cycle	
University of South Wales	UK	Strategic Procurement Management	MSC	Stage One Purchasing Principles & Management (20 credits)* Compare and contrast the strategic links between procurement, purchasing and the notion of supply chain management, this module is aimed at developing your ability to effectively and ethically manage supply as a holistic process. Strategic Operations Management (20 credits)* Develop your ability and skills in strategic operational management tools and techniques with an appreciation of operational processes, planning and control systems. Sustainable Supply Chain Management (20 credits)* Explore the strategic need, role and value for logistics, purchasing and supply chain research within organisations in order to achieve sustainable supply chain networks in the future. Stage 2	If you want a career in procurement management, this specialist masters programme offers high-level strategic teaching in all areas of this growing field. In an increasingly competitive environment, purchasing and supply chain managers need to develop and demonstrate a variety of key competencies. Graduates from this Masters course have the specialist knowledge to co-ordinate and adapt their purchasing and supply chain activities, and respond to the dynamic needs of a modern business. This course is accredited by the sector's professional body – the Chartered Institute of Purchasing and Supply (CIPS). Upon successful completion, you will gain the MCIPS (with three years' work experience)*. The University has a long and distinguished history of research, training and education in procurement and supply chain management and is one of the largest CIPS Centres of Excellence in the UK. Working in partnership with procurement professionals, the University has established its very own Procurement Best Practice Academy to identify, develop and disseminate best practice in procurement

				Commercial Relationships (20 credits)* Gain a critical understanding of the contribution of strategic accounting information to decision making in business. You'll be introduced to major-themes underlying trading law with commercial and consumer contracts. Advanced Procurement (20 credits) Examine the strategic internal and external relationships required to manage procurement and purchasing and supply, and the new and innovative cutting-edge procurement and purchasing principles and philosophies. Research Methods (20 credits) Develop your understanding and research skills in a management and/or professional development context; critically reviewing a range of research methodologies and methods of providing management information for decision making. Stage 3 Dissertation in Purchasing, Logistics, Supply Chain (60 credits)	and supply chain management. This informs our teaching, so you will benefit from a course that embodies the latest industry thinking.
University of Birmingham	UK	Strategy & Procurement Management	MBA	Semester 1 Core modules: Accounting for Managers Finance for Managers (MBA) Human Resource Management Marketing Concepts and Practice Strategic Analysis of Business Operations Management Semester 2 Core modules: Developing Leadership Practice Global Business Development Strategic Purchasing and Supply Chain Management Choose ONE optional module from the list below: Ethical Finance and Sustainability International Cooperative Strategy Business Communication Corporate Governance Entrepreneurial Finance Ethics in Global Business Global Marketing Leadership Implementing Strategies and Managing Change Infrastructure and Project Finance International Banking: Regulation and Supervision International Business International Business Experience International Business Finance The Effective Director	The programme offers a range of specialist professionally oriented modules designed for managers with procurement responsibilities across a range of sectors and industries. It provides an opportunity for those involved in procurement to develop their general management knowledge and skills, and to gain access to leading-edge thinking and research in procurement and supply management. Those teaching the specialist components of this programme have had substantial practical and consultancy experience of the modern procurement function in a range of manufacturing, service and public sector organisations.

				Students must also take one of the following: Dissertation Type A: Management Challenge Dissertation Type B	
ECP (Paris)	France	Purchasing Master	Masters	Besides teaching the basics of purchasing, the course will also include specialised subjects such as: innovation and technology monitoring the analysis of the product's life cycle managing business and industrial projects involving purchasing in the creation of products and the supply chain global sourcing and logistics the development of suppliers strategic alliances risk management financial engineering supply chain management	The Advanced Master aims at training science and technology graduates, engineering graduates or students with an engineering degree or a Science degree (at least bachelor of engineering, preferably graduated from Masters programs) in the use of the most advanced techniques in purchasing and familiarise them with an industrial, technological and international environment. This Advanced Master has been created in response to requests from numerous purchasing managements which needed a purchasing program training very high-level buyers.
Rome	Italy	Public Procurement Management	International Masters	Course List 1 Negotiation and Team Building 2 Economics of Procurement 3 Legal Background 4 Organization and Strategy 5 Economic Analysis of the Market 6 Contract Complaints and Disputes 7 Quality Management and Green Procurement 8 Integrity and Anticorruption in Public Procurement 9 Strategic Procurement 10 Law and Economics of PPP 11 IFI's Procurement Procedures 12 E-Procurement	The qualification programme is a full-time, advanced level, one-year postgraduate Master programme with classroom lectures running from March to July in Rome, Italy, followed by distance-learning and a mandatory professional internship in a company or institution, which can be in Italy, in the student's home country or elsewhere. The programme is characterised by its interdisciplinary content and it is meant to attract purchasers with relevant experience in procurement as well as students interested in preparing for a career in procurement, whether in state or local government, publicly-owned enterprises or multilateral international organisations. Classes are all taught in English, therefore language proficiency is required to successfully attend the courses and to actively participate in all the learning activities.
AFUM (Akademie für Unternehmensmanagement)	Germany	Procurement Management	MSC	Need a translation of the modules International Procurement Management Logistics and Supply Chain Operations Management Warehousing and Inventory Management	Generelles Ziel dieses MSc-Studiums ist es, Supply Chain Management modellieren, analysieren und bewerten zu lernen sowie das Verstehen von Beschaffungspraktiken, -taktiken,- strategien und deren elektronische Variante (E-Procurement). Die Entwicklung von Fähigkeiten zum effektiven Warehousing und Stores Management sowie das Verstehen von IT-Prozessen im Beschaffungsumfeld runden die Themengebiete des Studiengangs ab. Durch die fundierte Ausbildung auf Managementniveau sind Sie in der Lage, Procurement-Geschäftseinheiten auf Grundlage ökonomischer Ziele zu führen.
SKEMA Business School	France	Supply Chain Manageme	MSC	SEMESTER 1 Mandatory courses, 22 credits	The MSc in Supply Chain Management and Purchasing (SCMP) provides a unique opportunity for acquiring a specialist

		nt & Purchasing		Supply Chain Strategy and SCOR model, 3 credits Introduction to Purchasing & Risk Management, 3 credits Pre-requisites of Procurement and Purchasing, 3 credits Advanced Sourcing, 4 credits Practice of MS Project, 3 credits Fundamentals of Procurement & Purchasing, 3 credits PRINCE2, 3 credits Transversal courses, 4 credits Globalisation, 3 credits Personal & Professional Development, 1 credit Elective courses – 2 courses to be chosen among: (4 credits) Supplier Relationship Management, 2 credits Research Methods & Critical Thinking, 2 credits Managerial & Communication Skills, 2 credits TOTAL Semester 1: 32 credits SEMESTER 2 Mandatory courses, 23 credits Fundamentals of Production Planning, 4 credits Transportation & International Logistics, 3 credits Supply Chain Information Technology and Tools (SAP), 4 credits Lean Manufacturing, 4 credits Supply Chain Audit, 4 credits Purchasing Negotiation, 4 credits Elective courses – 2 courses to be chosen among: (4 credits) SCOR, 2 credits Human Resource Management in the Supply Chain, 2 credits Finance in the Value Chain, 2 credits Advanced Managerial & Communication Skills, 2 credits Transversal courses, 3 credits Personal and Professional Development, 1 credit Strategy, 2 credits TOTAL Semester 2: 30 credits Dissertation, 30 credits 90 credits in total for the year	qualification in the area of supply chain management, combined with a 82pecialized one in project management. This MSc programme is designed for 82pecialize professionals, mid-career managers and graduates seeking 82pecialized training in the complementary fields of purchasing, supply chain management and project management at managerial level.

EIPM	France	EMBA	Specialising in Procurement	Details not available on the website	Details not available on the website
EIPM	France	MSC	Strategic Sourcing & Supply Chain	Details not available on the website	Details not available on the website
Lappeenranta University of Technology (Lappeenranta)	Finland	Supply Management (MSM)	MSC	The Master's Programme in Supply Management is a two-year programme. Core studies (48 ECTS credits) include courses on strategic supply management, global sourcing and sub-contracting, relationship management and supply chain improvement. Specialisation studies (42 ECTS credits) include courses on topics such as external resource management and project courses. Minor studies (minimum 24 ECTS credits), include courses on either international marketing, knowledge and innovation management, sustainability, or business analytics. Academic skills, 6 ECTS credits. Language studies, 6 ECTS credits. The Master's thesis and seminar, 30 ECTS credits, is a part of specialisation studies. The thesis is an advanced research project, which requires approximately six months of full-time work.	After completing the Master's programme you will understand the strategic role of supply management and purchasing in global business and value creation know the main theories of managing supply, suppliers and value networks apply relevant methods and skills to manage logistical business processes and supplier relationships utilise strong analytical skills and apply tools required for professional practices recognise the risks and challenges of a global supply network be able to follow the principles of responsible business and maintain high business ethics
LOGY	Finland	Purchasing and supply management	Further training to everyone; International Federation of Purchasing & Supply Management:Certified Purchaser -	-Basic course: Purchasing -Financial control of purchasing -Bidding practices -Measurements and monitoring of purchasing -Contracts and legal issues - Management and development of purchasing function -Category management -Supplier management -Course fee	To understand how purchasing function can create competitive advantage to the organization.

			degree		
University of Twente	NL	Business Administration: Purchasing and Supply Management	Master	Purchasing Management Healthcare Purchasing Purchasing Strategy and Systems Stochastic Models in Production and Logistics Global Sourcing and Organization Supply-Chain Management and Innovation Public Procurement B2B Marketing Sourcing Game	
AERCE (Asociación Española de Profesionales de Compras)	Spain	UNIVERSITY MASTER IN PROCUREMENT, UNIVERSITY MASTER IN PUBLIC & ADMINIST. PROCUREMENT	Master	78 modules: Public procurement (PP) Statistical aspects of PP Expediente PP ? Follow up PP Organisation models PP IT systems PP European directives Negotiation in English Coaching Time management Conflict solving Work development Business intelligence Economics & procurement International contracts Contract financing Cost vs. price Foreign trade financials Knowledge management International negotiation Communication New skills in procurement Team management Leadership Intermediation Electronic sourcing Contracts International contracts International purchasing Labour risks Outsourcing, BPO Forecasting KPI management Procurement of services Procurement of marketing Market analysis EFQM (European Foundation for Quality Management) model International logistics Electronic trade Lean Six Sigma Procurement Leadership Strategic management Category management Supplier relationship management Financials & procurement Performance Category management case analysis	Adapted to the different procurement profiles QUALITY FLEXIBILITY ADAPTED TO THE NEEDS OF THE COMPANIES AND THE STUDENTS The experience and knowlegde needed to became an expert in procurement Developing knowledge and skills for the future C.P.O.s Assuring the knowledge in procurement in administrations Offering those professionals the knowledge, tools and proccess to get the excellence in their work The most flexible university training experience worldwide Assuring the excellence and quality deployment in procurement

				Travel management Value analysis Foreign trade Logistics management Spend analysis Global sourcing Quality & procurement E-procurement Negotiation Risk management Continuous improvement Corporate social responsibility Norms CWA ? Procurement compliance Ethics in procurement Intermodal Incoterms 2010 ERP & procurement Procurement function Planning Supplier evaluation Relationship management Procurement at different industries Contract management Stuck management Case analysis Process improvement MS project Electronic billing Excel for procurement Procurement IT tools	
HS Niederrhein (developed with BME)	Germany	Strategisches Beschaffungsmanagement	MBA	Ganzheitliches Beschaffungsmanagement Ziele und Basisstrategien Organisation in der Beschaffung Personalführung Vertragsmanagement Special: Englisch für Beschaffungsmanager Materialgruppenmanagement Lieferantenmanagement Supply Chain Management Innovations- und Qualitätsmanagement Global Sourcing Special: Kaminabende mit Diskussionsfokus Kostenmanagement Beschaffungscontrolling Personalführung Verhandlungs- und Konfliktmanagement Trends in der Beschaffung Special: Exkursion zum BME-Symposium Einkauf und Logistik Möglichkeit zur internationalen Exkursion	Fachliche, strategische und führungsorientierte Weiterbildung Ausgewogener Mix aus Fachwissen und praktischer Umsetzung Top-Dozenten aus Wissenschaft und Praxis Parallel zum Beruf International anerkannter akademischer Abschluss (MBA) Neue Berufs- und Führungsperspektiven Hoher Praxisbezug durch Simulationen, Fallstudien und Firmenbesichtigungen sowie auf Wunsch durch ergebnisorientierte Bearbeitung von Projekten aus dem eigenen Unternehmen Der Erfahrungsaustausch mit den Kommilitonen ermöglicht einen Einblick in andere Unternehmen Neues, aktuelles Wissen kann bereits während des Studiums in das Unternehmen eingebracht werden und zu besseren Arbeitsergebnissen führen Kleine Jahrgangsgrößen, individuelle Sprechstunden, Kaminabende sowie Prüfungsvorbereitungskurse garantieren eine persönliche Betreuung Neun von zehn Abschlussarbeiten werden in Kooperation mit Partnern aus der Wirtschaft erstellt Die Chance auf neue Verantwortungsbereiche und

					anspruchsvollere Tätigkeitsfelder erhöht den persönlichen Ehrgeiz des Mitarbeiters – die Motivation und die emotionale Bindung an das Unternehmen steigen Qualifizierter Nachwuchs aus den eigenen Reihen lässt Einarbeitungszeiten sowie kostspielige und zeitraubende Auswahlverfahren entfallen Die enge Zusammenarbeit mit dem BME sowie eine mögliche Exkursion zum 51. Symposium Einkauf und Logistik öffnen die Tür zum Netzwerk des BME
TH Ingolstadt	Germany	Beschaffungsmanagement	MBA	Angewandte methodische und organisatorische Aspekte des Beschaffungsmanagements Angewandte Prozesse und Instrumente des Beschaffungsmanagements Studiengangspezifische Methodenkompetenz Selbst- und Sozialkompetenz am Arbeitsplatz, laterale Führung und Steuerung externer Partner Operatives Management Strategisches Management Internationales Supply Chain Management Strategisches Beschaffungsmanagement Leadership Beschaffungscontrolling und Cost Engineering Veränderungs-/Prozessmanagement Qualitäts- und Innovationsmanagement Internationales Projekt im Ausland	
FH Hof	Germany	Einkauf und Logistik/Supply Chain Management	M.A.	Einführung, Supply Strategie und Beschaffungsmarktstrategien Lieferantenmanagement und Beziehungsmanagement Make or Buy Ausschreibungen und Auktionen (inklusive e-Sourcing) C-Teile-Management E-Katalogeinkauf / Dienstleistungseinkauf SCM-Materialflüsse / Global Sourcing Entwicklungspartnerschaften (advanced purchasing) Qualitätsmanagement in der Supply Chain Balanced Scorecard und Einkaufscontrolling Rechtliche Aspekte in der Supply Chain Re-Engineering in der Supply Chain Strategien der Logistik Optimierung von logistischen Prozessen Informationstechnik in der Logistik Transportstrategien	Dieser Masterstudiengang ist eine praxisorientierte, berufsbegleitende Weiterbildung für erfahrene Fach- und Führungskräfte aus dem Aufgabenfeld der Supply Chain operative und strategische Einkäufer operative und strategische Logistiker erfahrene Mitarbeiter aus weiteren Aufgabenfeldern der Supply Chain, insbesondere Qualitätsmanagement, Auftragsabwicklung und Disposition Führungsnachwuchskräfte in den Bereichen Einkauf und Logisitik Potenzialträger.

				Umschlags- und Kommissionierstrategien Lager- und Bestandsstrategien Planung und Modellierung von Logistikprozessen Wertschöpfungsmanagement Logistik-Controlling Outsourcing und Dienstleistermanagement Ersatzteillogistik Logistikrecht	
Milano, Nantes	Italy France	Supply Chain and Purchasing Management	Master		Development of fundamental skills, tools, and techniques required for supply chain and purchasing professionals. Exposure to international perspectives on supply chain and purchasing management by spending at least a semester in both France and Italy and by learning from the international faculty at each school. Exposure to supply chain and purchasing management practices in leading industries, especially those focusing on core supply chain and purchasing issues including manufacturing, transport, and logistics.
BMÖ Akademie, Middlesex University /KMU-Akademie Linz	Austria	Business Administration + Strategic Purchasing & Supply Chain Management	MBA	Management [Fernlehre] Volkswirtschaftslehre/Allgemeine Betriebswirtschaftslehre Organisation und Management Finanzmanagement Personalmanagement Wirtschaftsrecht Marketing Strategic Purchasing & Supply Chain Management [Präsenzmodule] Strategisches Supply Chain Management Strategisches Einkaufs- und Lieferantenmanagement & Sourcing Managementkompetenz Rechtliche Grundlagen für Einkauf und SCM Controlling im Einkauf Operations & Logistics IT- und Informationsmanagement in Einkauf und SCM	

18. Appendix 4 – PSM future requirements

Study	Keywords
German sources	
Beschaffung aktuell 03 2015: Einkauf 4.0 und die vierte industrielle Revolution Teil 1, S. 20-21	Open-minded Multi-divisional Change management (organisation, awareness, structures, processes, leadership) Initiate Expert in technology and management Interface logistic service providers open innovation crowdsourcing inventory management Obsolescence Management (e.g. effected by 3D-printing replacing procurement and warehousing) awareness of open and ongoing topics interdisciplinary qualifications
Beschaffung aktuell 03 2015: Einkauf 2020 – powered by eSolutions, S. 22-23	Global Connectivity Handling of big data, smart data Reaction to market changes Handling of digital, smart information Collaborate with 3rd party stakeholders e-procurement: e-auctions, e-tenders manage supply chains controlling forecasting, market research connectivity and efficient use of data for collaborations and to manage supply chains more intelligent
PWC: Einkauf – Die neue Macht in den Unternehmen, Juli 2014	Intrapreneurship Inter-divisional: purchasing, R&D, production Quality management Product innovation New technology (e.g. 3D-printing) Expert knowledge Digitalisation (e-business, suppliers linked to IT-systems) Increasing complexity (e.g. cost controlling) Planning and managing currency and cost risks Verify offers, tenders
polariXpartner: Die Zukunft des Einkaufs (2013 – 2015)	Supplier development Global sourcing increase in efficiency trend-setter growth driver cost management (methods, TCO) transparency of costs awareness of financial risks (currency, raw material prices) cyclic forecasting, cooperate with sales dept. scenario analysis SWOT analysis International alliances (standards, global markets/language/culture knowledge) Frame and optimise global supply chains (transparency, identify/analyse/evaluate risks and opportunities, Best Cost Country concept) Early warning systems for risk management Further qualification/training (e.g. methods for cost reduction Design to Cost and Target Costing, strategic and tactic negotiation, culture, international contract and insolvency law) Sustainability, compliance, marketing of such activities proactive
ATKearney: Procurement 2020+, 10 Mega-Trends, die den Einkauf verändern werden	Permanent training Transparency Digitalisation, automation Statistics Visualisation Early warning systems KPIs Procurement controlling Modern analytics (e.g. regression analysis, predictive modelling) Collaborative Optimization, collaboration tools Cross-silo-optimisation Collaborative Network Sourcing Cross-functional integration Social networks SRM

	Professional risk management Innovation-/ Crowd-Sourcing Out-of-the-box thinking Agility, flexibility
Lünendonk: Procurement Excellence 2011, Die Zukunft des Einkaufs	Strategic thinking, think ahead Szenario technique Monitor geopolitical developments Variable planning processes Early integration of procurement for new technologies/new product development Quality management Risk management Language skills, Communication skills in several languages Standardise processes Differentiate strategic and operational purchasing Analytical thinking Negotiations Far-reaching knowledge about products, markets Internal communication Moderation Working in teams Business and economical knowledge Thinking in processes Basic knowledge of logistics/SCM Deal with growing regions Build and improve beneficial cooperation in all directions Thinking in alternatives
Spring Procurement GmbH/Wirtschaftsuniversität Wien: Studie Zukunft Einkauf - Trends in der Beschaffung	Growing importance of procurement integration in strategic decisions growing education requirements and career opportunities reduction of Maverick Buying guidelines discipline involvement in product development electronical buying systems shift in buying regions (less in regional markets, more in China, India, Eastern Europe) awareness of quality and supply risk by global sourcing language skills know-how in international business environmental awareness
Studie Einkauf 4.0 – Digitalisierung des Einkaufs, 2016	Digitalisation, Automation of functional processes Complexity Procurement of integrated solutions Manage internal and external interfaces Technical understanding Data analyst Responsibility for industry 4.0 implementation Share knowledge Networking Open to new technologies and changes (change management) Failure management Adjust structures and processes to digitalisation Dealing with big data, assistance systems, augmented reality Digital procurement portfolio Outside-in view
English sources	
The Deloitte Global CPO Survey 2016	consolidating spend increasing level of supplier collaboration restructuring existing supplier relationships cognitive analytics crowdsourcing digital reporting cloud based computing mobile technologies spend analysis contract management cost reduction risk management/mitigation Drive innovation with suppliers
Procurement Leaders: Interview: Josh Ghaim, Johnson & Johnson's chief technology officer	combination of procurement and R&D supplier-enabled innovation value creation openness long-term financial planning focus on strategic value of relationships

Handfield et al.: An organizational entrepreneurship model of supply management integration and performance outcomes, 2008	"Entrepreneurship"
World Economic Forum: New Vision for Education: Fostering Social and Emotional Learning through Technology, 2016 ➔ good source for learning methods	Creativity Initiative Adaptability Virtual reality Advanced analytics
L. Schneider, C.M.Wallenburg: 50 Years of research on organizing the purchasing function: Do we need anymore? Journal of Purchasing & Supply Management 19 (2013) 144–164	Cross-functional teams Complex organisations Talents shortage Scarce resources Global competition Dynamic, volatile markets Sustainability relevance Supply networking outsourcing