

Preface

PERFECT stands for: Purchasing Education Research for European Competence Transfer. This report on the outcomes of the European Purchasing Skills Survey is the result of *perfect* cooperation. Project members and practitioners in Germany and the Netherlands designed, helped and tested the survey. Eventually, the success of this survey depended on the participation level of purchasing and supply management professionals in organisations in Europe and other continents.

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Almost 600 participants were convinced of the importance for us as educators to verify the skills that are necessary in daily practice. Filling out the complete questionnaire of 250 questions took the participant on average 25 to 30 minutes of their time. Moreover, a number of private and public organisations had their own versions of the survey with the aim to benchmark the organisations results with participants from the same industry. As PERFECT project team, we are grateful and thank the testers, the participants and representatives of the cooperating private and public organisation for their patience, their advice and their effort.

Looking at the past: a survey of this kind and with scope was not yet performed before. Thanks to the large number of participants there is a better understanding of what universities (of applied sciences) should take in consideration when (re) designing learning objectives for purchasing and supply chain lectures, modules or tracks. The idea that universities need to design their study programs on job profiles seems logical. It is nevertheless embedded in the international agreements in higher education, the Bologna Process regulations as an obligation. The next step in our project is the design of empirical validated purchasing and supply management (PSM) curriculum modules.

In this era of changes, or some say it is even a change of eras, the newest developments are speeding up. Professionals in firms and organisation try to keep up with that speed. In the same stream, we as educators in the field of PSM have the task to accelerate and stay in touch with practitioners and we have the constant need to reinvent the content of PSM courses in higher education. Therefore, in the near future PERFECT will replicate this survey. The survey is still available for organisations in industry, service and public procurement for benchmarking. A condition however is that the number of possible respondents has to be substantial. For more information contact info@project-perfect.eu.

Klaas Stek
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1. Introduction to the research project

This survey study is the third intellectual output (IO3) in the PERFECT project (Purchasing Education and Research for European Competence Transfer) and aims to define what PSM knowledge, tasks and competencies are leading to professional PSM success. The survey connects 88 skills and competencies to the achieved successes on seven PSM objectives. The approach, the findings and the conclusions that can be derived out of the data analysis are outlined in this paper. After an introduction to the PERFECT project, an insight into the methodology and how research quality was assured is provided. This is followed by a series of findings and discussions on the survey results.

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PERFECT invited PSM professionals from all over Europe: operative, direct and indirect buyers, tactical and strategic buyers, purchasing engineers, innovation buyers, CPO's, contract managers etc., and were asked about:

- To rank the professional focuses costs, quality, delivery, innovation and sustained competitive advantage.
- On 88 skills items (knowledge areas and competencies) the survey asked about the competency level and importance of that skill.
- To state the level of PSM success the participant self-assessed the achieved individual success in costs reductions, quality improvement, securing safe delivery, ensuring to have access to the innovations of the supplier, enforcing supplier satisfaction, and to achieve sustained competitive advantage.

There is an increasing need for universities to prepare students for the labour market in the near future, which is an obligation coming from the Bologna Process regulations. In scientific literature, not much is known about the individual skills levels, what skills lead to success and about what institutes for higher education should consider as learning objectives. Therefore, this research is set up to facilitate the next step in this project: the design of harmonised academic PSM curriculum modules to answer the question what skills PSM professionals nowadays need to be successful on their jobs.

This leads to the main research question: ***Which knowledge, skills and competencies belong to the PSM success factors: costs reductions, quality improvement, securing safe delivery, ensuring to have access to the innovations of the supplier and to achieve sustained competitive advantage and supplier satisfaction?***

This third stage in the project contributes to the fourth intellectual output (IO4): the design of a set of relevant PSM modules in higher education. This leads to research sub question: ***Which knowledge, skills and competencies should academic PSM programs, modules or courses include?***

1.1 Background of the research project

The project PERFECT (Purchasing Education and Research for European Competence Transfer) was set up in 2015 and is funded by the European Union from 2015-2018 to become

the empirically validated pan-European PSM higher education curriculum. The aim is to establish an international studying program for universities for higher education in Purchasing and Supply Management (PSM).

The Project PERFECT is an international research group that exists of researchers from universities in different European countries (Technical University Dortmund and University of Applied Sciences Mainz, Germany; Lappeenranta University of Technology, Finland; Staffordshire University, Stoke-on-Trent, UK and University of Twente, Enschede, the Netherlands). The European Erasmus+ fund made this project possible. These survey results introduced in this paper will be the basis for designing the learning objectives of the European academic PSM curriculum. This PSM curriculum is (as all the outputs of this project) freely to use by interested organizations.

The value of the project is manifold and builds on current and future challenges in practice and academia. The PSM function in any organization is a key contributor to firm performance (Drake, 2012), as more than half of the total turnover of a modern industrial firm in Europe is directly transferred to suppliers (Van Weele, 2009). Moreover, the bulk of supplies is now no longer of domestic origin, but of a European and international nature. As a network with a low level of production and high reliance on international suppliers. This is a recent phenomenon that has emerged in the last two decades, companies that are still struggling to find effective and efficient ways to cope with these circumstances (Van Weele & Van Raaij, 2014). This highlights the need and request for employees to possess the necessary skills and competences in this field.

The PSM profession is getting more and more mature, however understanding what a PSM curriculum or lesson program in higher education must contain, is missing. The mostly desired impact of PERFECT is an increase in the number of highly qualified students who are suitable for entering the workplace in PSM related jobs. To achieve this goal, empirically validated European best practice modules for both a bachelor's and a master's program modules in PSM are developed. It intends to bring procurement education to an improved level for needs in the working field. On the research side, it leverages the participating institutions' strengths to anticipate future requirements for PSM professionals to be able to start educating tomorrow's workforce today.

Although buying organizations 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 agreed upon 'standard' PSM higher education curriculum, yet. This issue is seen at national, European and regional / international (e.g. North America) levels. This makes it easier for companies to acquire university degrees and graduates with other specializations.

For students, a significant challenge in finding appropriate university courses and matching them to their course portfolio during international exchanges. For the higher education institutions involved, the varying course content and depth in exchange programs is 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, student mobility in international programs could be increased significantly.

The question of this project is how a competence-building program, i.e. a pan-European purchasing and supply management curriculum, could be structured. To seize this opportunity, the overall objective or project PERFECT (Purchasing Education and Research for European Competence Transfer) is to develop an empirically validated European curriculum for 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 it would be disseminated through the relevant institutions and institutions of the European Union. The PERFECT project includes the following milestones:

- The project started 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
 - Study on trends and future requirements for PSM
- In addition to the theoretical analysis of the project conducted Case Study interviews with industry PSM best practice to identify required skills and competencies with current requirements and future trends.
- The insights gained will need to be successful and successful. PSM, which links 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 comprehensive compass 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 organizations to gauge the levels of the PSM skills.

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. Figure 1 identifies and shows the linkages between the work packages that reflect the milestones, called intellectual outputs (IO).

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 (for example by means of association 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 ideal international exposure ideal for later careers in the PSM field. The overall project packages and respective institutional leads can be seen in figure 2.

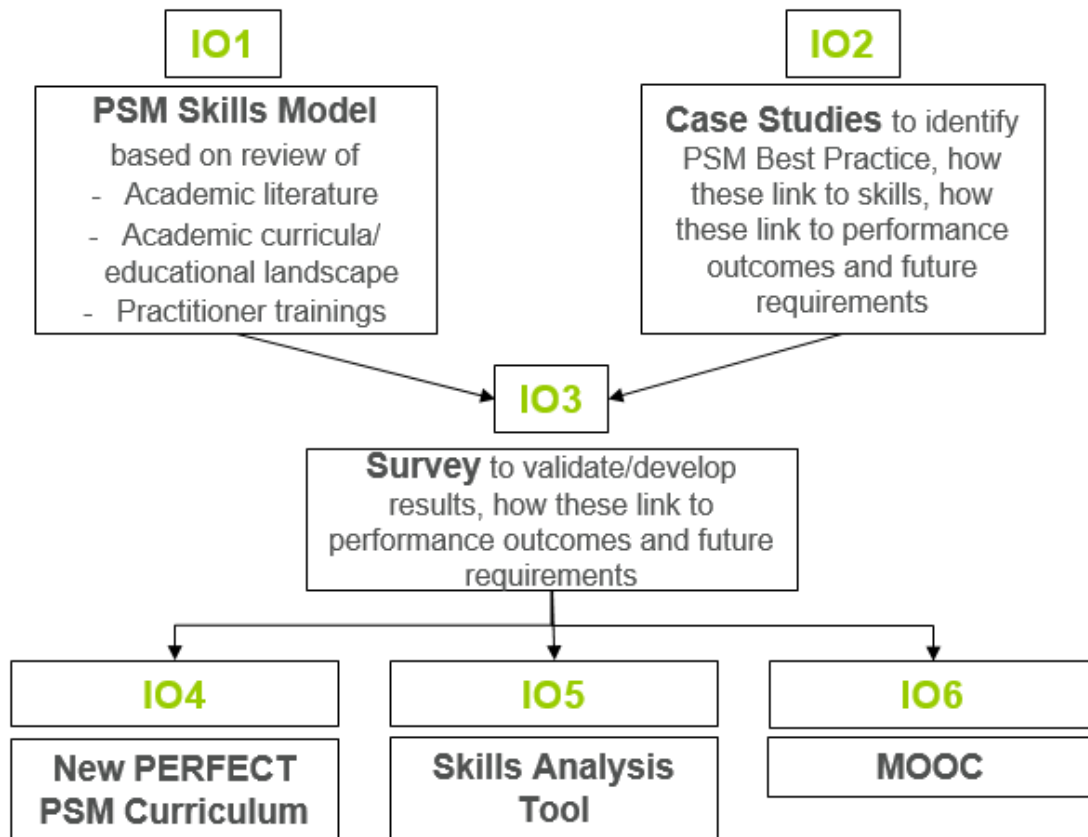


Figure 1 PERFECT intellectual outputs (own illustration)

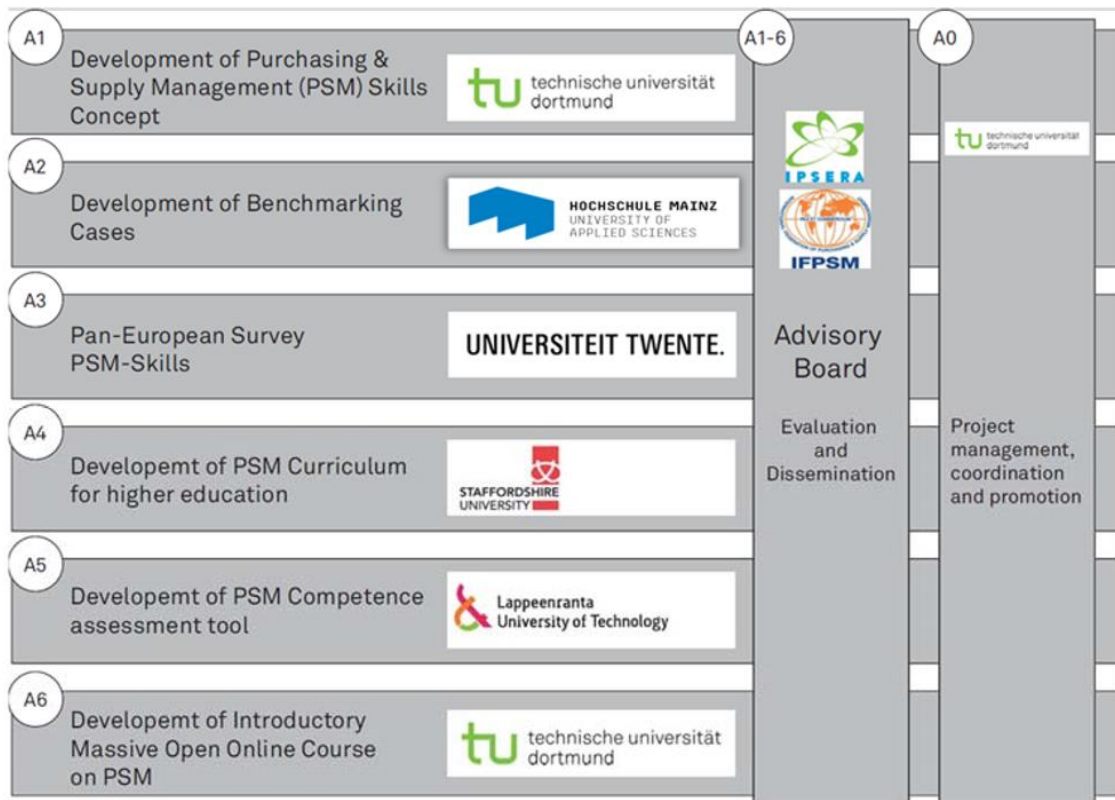


Figure 2 Project PERFECT overview of project leads

To ensure that the project meets the current and future needs of the industry, the project team conducted interviews with PSM professionals in selected companies in order to identify skills and competences for successful, effective and efficient Purchasing & Supply Management. The European Survey on Purchasing Skills builds further on the outcomes of earlier research by asking a broad audience (n > 580) about the importance of tasks, education, skills, focus, and success factors in PSM.

1.2 Executive summary – new findings of the survey are partly in line with PSM literature and PSM learning objectives

Takeaways are:

- Skills leading to purchasing success:
 1. Technical knowledge of products and production systems - Understanding the technical aspects of products/processes.
 2. Cross-cultural Awareness; Global Sourcing; Innovation Implementation; Solicit Offers (equal on the second place).
 3. Inventiveness; Leadership; Cost Reduction; Negotiation; Project Management; Supplier Relationship Management; Sustainability; Cooperate with R&D and Legal (equal on the third place).
- PSM professionals are ambivalent on the role of cost reductions and quality improvement.
 - The focus is first on 'quality' as the most important objective and second are costs reductions.
 - However, PSM professionals are better at reducing costs than in improving quality.
- The top-5 ranking of self-assessed characterisations of junior and senior PSM professionals are except one soft skills. Both mention: honesty, loyalty and conscientiousness Juniors add: learning motivation and social manners, whereas seniors state their purchasing knowledge and being proactive. Executives deviate and mention (accumulated) knowledge: purchasing knowledge, optimising processes, supplier relationship management, requesting quotations and evaluating offers.

To find out what skills and competencies to incorporate in a European PSM curriculum modules project PERFECT has taken three steps. First, the project mapped PSM skills landscape by performing a literature review, an analysis of learning objectives in universities and analysing 300 European PSM job advertisements. The second step -a qualitative research- interviewing 46 PSM higher management personnel on current and future skills. The core of the third step (research described here) is the European Survey on Purchasing Skills and the subsequent result analyses. The survey contains 88 skills items asking self-assessed competency and importance of the tasks. The results connect to efforts and successes reached in seven PSM focus area: costs, quality, delivery, innovation, sustainability, long-term competitive advantage, and suppliers' satisfaction (PERFECT, 2016, 2017).

The survey had 581 responses by November 2017. The White Paper is however based upon n=516, which was the set that was taken in September 2017. Participants come from three sectors: Industry (35%), Service (35%), and Public Procurement (30%). Juniors (40%), seniors (45%), and executives (15%) filled out the survey. About 68% of the participants is from the Netherlands, 9% is French, 7% is German, 2% is Finnish, 2% is Swiss and 12% is from multiple other countries. There is apparently a Dutch bias in this study.

It showed that 44 of the 88 skills were associated with one or more success factors. Technical knowledge of products and production systems or in other words the understanding the technical aspects of products/processes is the most important skill; it is necessary for five different objectives: costs, quality, delivery, innovation and long-term competitive advantage. It is striking that the top-10 consists of a mix of explicit knowledge and soft skills/tacit knowledge (see table 1). It means that the best purchasing professional has strong interpersonal communication abilities combined with strong substance understanding.

Skills that lead to purchasing success		DELIVERY	SUSTAINABILITY	SUPPL-SATISFACT.	LONGTERM COMP.	QUALITY	COSTS	INNOVATION	#
1	Technical knowledge of products and production systems	x			x	x	x	x	5
2	Cross-cultural Awareness Skills - The ability to become aware of cultural values		x			x		x	3
	Global Sourcing / Supplier Acquisition -	x			x	x			3
	Innovation Implementation - Implementing suppliers innovations		x			x		x	3
	Solicit Offers (RfQ / RfP / RfI) Request for Quotation (RfQ) / Proposal (RfP)	x	x		x				3
3	Inventiveness - Being imaginativeness.					x		x	2
	Leadership - Managing employees in teams.			x			x		2
	Cost Reduction Techniques	x					x		2
	Negotiation the Specific Terms		x				x		2
	Project Management Skills	x	x						2
	Supplier Relationship Management	x		x					2
	Sustainable purchasing		x		x				2
	Working together with the department Research and Development	x				x			2
Working together with the Legal department		x			x			2	

Table 1 the top-14 PSM skills that lead to success

The results of this survey are partly in line with literature and learning objectives in higher education. Literature recognises technical skills; however, subjects as innovation implementation, cross-cultural awareness, inventiveness, cost-reduction techniques, project management skills, supplier relation management and ‘sustainability’ seem not to appear in the same volume or not at all in purchasing skills literature. Universities are well organised for transmitting explicit knowledge and hard skills, but not for the transfer of tacit knowledge and soft skills.

2. Methodology – survey and analyses

The items in the skills and competencies of the survey were derived from the purchasing maturity model of Schiele (2007) and from the first two steps in this research project (PERFECT, 2016, 2017). The survey was constructed using pre-tested items for survey design (Presser et

al., 2004). Pre-established items were used to operationalize the skill constructs by presenting both offline and online versions of the survey to purchasing managers in Germany and in the Netherlands. As a result, items were rephrased and in two cases, items were added. The survey contained mainly questions at the individual level of analysis, but it also investigated organizational level choices. This kind of choices are concentration on cost reductions, quality improvements, securing safe delivery, ensuring the have access to the innovations of the supplier, to achieve sustained competitive advantage and supplier satisfaction. The survey was pretested with four organizations, taken together six individuals. These pre-tests were taken in order to increase clarity, ensure face validity and content validity. Utilising the feedback gained from these organizations and individuals, the survey was modified and then presented to the purchasing managers. A link to the online survey was delivered to potential respondents with several ways: by (company) email, by newsletters, and by social media.

European purchasing and supply oriented associations in Austria, Finland, Netherlands were sending forward the invitation to participate to the survey, which included the link to the survey. In addition, via LinkedIn about 5,500 PSM professionals were invited to connect. About 3,000 accepted the invitation and were subsequently asked to fill out the survey. Of them about 1,400 clicked the link to the survey and in total 516 filled out the complete survey by September 1st, 2017. Examples of reasons for declining participation include the length of survey and lack of time to respond. In an unknown population size the sample has to be at least 384 subjects according Krejcie and Morgan (1970). The number of observations has outreached this norm.

2.1 Dependent and independent variables

All of our survey items, response formats as well as sources from the literature are found in the appendices section. We conceptualised our independent variable, competences, as set of competencies, traits and knowledge which purchasing manager might have, based on our previous research in the project.

What is your competence for this task?	Is this task important for your current job?
No competence	not important
Basic competence	of little importance
Advanced competence	moderately important
Outstanding competence	important
Training others in this competence	very important

Table 2 Questionnaire design – answering possibilities

Ranking of the PSM objectives	
Costs	lowest (total) cost - buying supplies to the lowest possible costs
Quality	quality - buying supplies with an appropriate quality- sustainable - buying sustainable supplies (circular economy)
Delivery	in time delivery - ensuring safe, timely and sufficient supply - supplier has the capacity to deliver the desired volumes
Innovation	innovative buying - facilitating innovations from and with suppliers -
Competitive advantage	guarantying exclusive access to sources (competitive advantage)

Table 3 Questionnaire design – ranking the PSM objectives

The competencies are the independent variables in our analysis. Participants ranked their competencies on 88 skills on a 5-point Likert scale towards the question ‘What is your competence for this task?’ Next question ‘What is the importance of this task for your current job?’ In table 2. the answer possibilities are shown.

Participants ranked their professional focus and placed these purchasing objectives in ranking order: *costs, quality, delivery, innovation* and *long-term competitive advantage*; see table 3. After the questions about the competence level and importance of the skills, the participants answered questions about the level of success they achieved in the already mentioned *costs, quality, delivery, innovation* and *long-term competitive advantage* and in *supplier satisfaction* and *sustainability* performance fields. These levels of success in the different PSM successes function as dependent variables in this research. This happened on basis of the question ‘What is your competence for this task?’ and the question ‘Due to my actions we achieved more than average’ success per objective in purchasing & supply management: cost reductions, quality, sustainability and delivery improvements, access to suppliers’ innovations, improving supplier satisfaction, obtaining long-term competitive advantage and (table 4). We did not utilize any control variables directly in our model. Instead, post-hoc analysis were done to subgroups of distinct the working place (country), nationality, working level, educational level, study discipline, and years of experience were conducted to show if these trigger variance to the results.

Items on the success factors in PSM
Is your performance focussed on cost reductions?
Due to my actions we achieved higher than average cost reductions.
Compared with other departments, my department achieved higher than average reductions in costs.
The reductions in costs achieved in my department are considerably higher than our goals.
Is your performance focussed on quality?
Due to my actions we achieved a higher than average level of quality.
Compared with other departments, my department achieved higher quality goals.
The improvements in quality achieved in my department are considerably higher than our goals.
Is your performance focussed on sustainability?
Due to my actions we achieved a higher than average level of sustainability.
Compared with other departments, my department achieved higher sustainability goals.
The improvements in sustainability achieved in my department are considerably higher than our goals.
Is your performance focussed on delivery of supplies?
Due to my actions, we improved the supply delivery process.
We outperform in the benchmark with other departments, my department achieved higher supply delivery goals.
The improvements in delivery performance of suppliers achieved in our department are considerably higher than our goals.
Is your performance focussed on innovation?
Due to my actions, product and process improvements have been implemented.
Due to my actions, we achieved more product and process improvements than average.
Due to my actions, we identified more useful ideas with suppliers than the benchmark.
The product and process improvements achieved in my department/company are considerably better than expected.
Is your performance focussed on long-term competitive advantages?
Due to my actions, my organisation obtained long-term competitive advantage.
The long-term competitive advantage of my organisation is considerably better than those of competitors.
We do better than expected: the improvements in obtaining long-term competitive advantage of my organisation are considerably higher than expected.
Is your performance focussed on supplier satisfaction?
Due to my actions the suppliers sees the importance of cooperating with my company/department
Due to my actions the relationship with our most important supplier(s) is (are) improved significantly
Due to my actions my company has become a preferred customer of our most important supplier(s)

Table 4 Questionnaire design – items on success in PSM

2.2 Statistical analyses – cluster analyses & regression

With cluster analysis, performed on the set of questions on the competence level in the 88 skills, three distinct groups (or clusters) were recognized.¹ To find out the profile of the purchasing professional in each cluster the participants' years of experience in the field of purchasing and supply management, working place (country), nationality, working level, educational level, study discipline, and years of experience were analysed.² This study connects the same 88 skills to every individual success factors in PSM *costs, quality, delivery, innovation* and *sustained competitive advantage* and in *supplier satisfaction* and *sustainability* in a so-called stepwise regression model by entering and removing skills items step-by-step until there is no reason to enter or remove a skill item anymore.³

3. Results

The structure of the results section reflects the overall intention of this research, which is to discuss the outcomes of the survey on purchasing skills. Section 3.1 deals with the frequencies and shows participants' gender, studies, industries and nationality. After that a top-25 and 'minus'-25 are given of skills PSM score highest and lowest. Section 3.2 then looks at the results within the three clusters there are found: juniors, seniors and executives. Finally, section 3.3 elaborates on the level of success per item: *costs, quality, delivery, innovation* and *sustained competitive advantage* and in *supplier satisfaction*. Section 3.4 provides an overview and displays the findings in a table. Section 3.5 is an important paragraph containing the results of the skills leading to success.

3.1 Frequencies

Until September 2017 in total over 516 participants have filled out the 252 different items in the survey. 34,5 Percent of the respondents work at industry, manufacturing or construction, whereas 34,4 percent of respondents work at wholesale, retail, transport or services sectors and 29,1 percent are working for governments, in the public sector, in public health and public education. Although PERFECT designed the survey for purchasing skills in industry, the survey also attracted participants from service and public procurement (figure 1). One out of six from the participants has studied Science and two out three Business Administration or Economic Sciences (figure 4). Two third of the respondents come from the Netherlands, from France one out eleven and from Germany one out of fourteen (Figure 3.). About 70 percent is male, 20 percent is female and 10 percent did not fill out the gender (Figure 1).

¹ With IBM SPSS version 22 software - Ward's method with Squared Euclidian distance

² With IBM SPSS version 22 software - cross-tabulations and one-way analysis of variance (ANOVA) post-hoc Bonferroni-test

³ With IBM SPSS version 22 software - stepwise regression

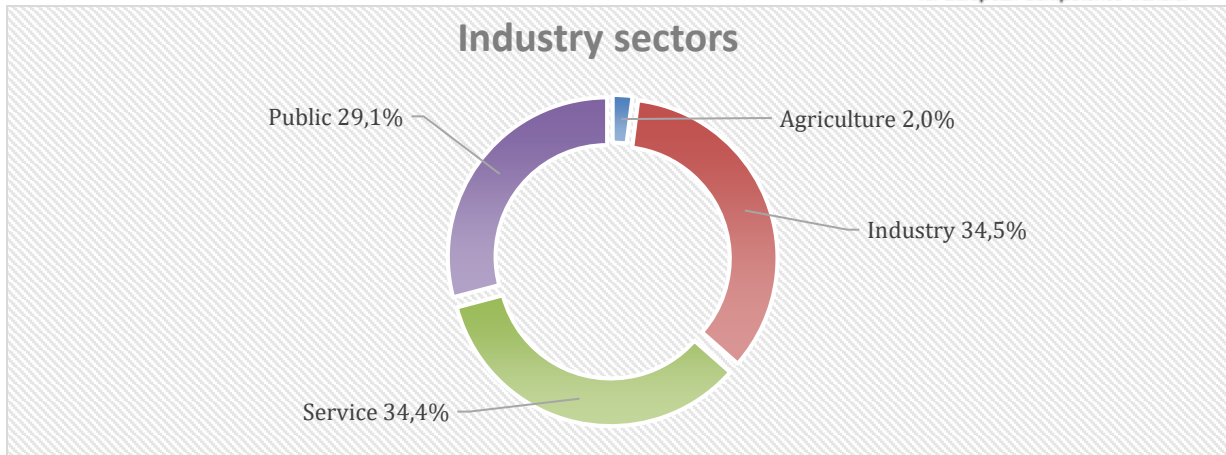


Figure 3. Descriptive statistics: Industry sectors of the respondents

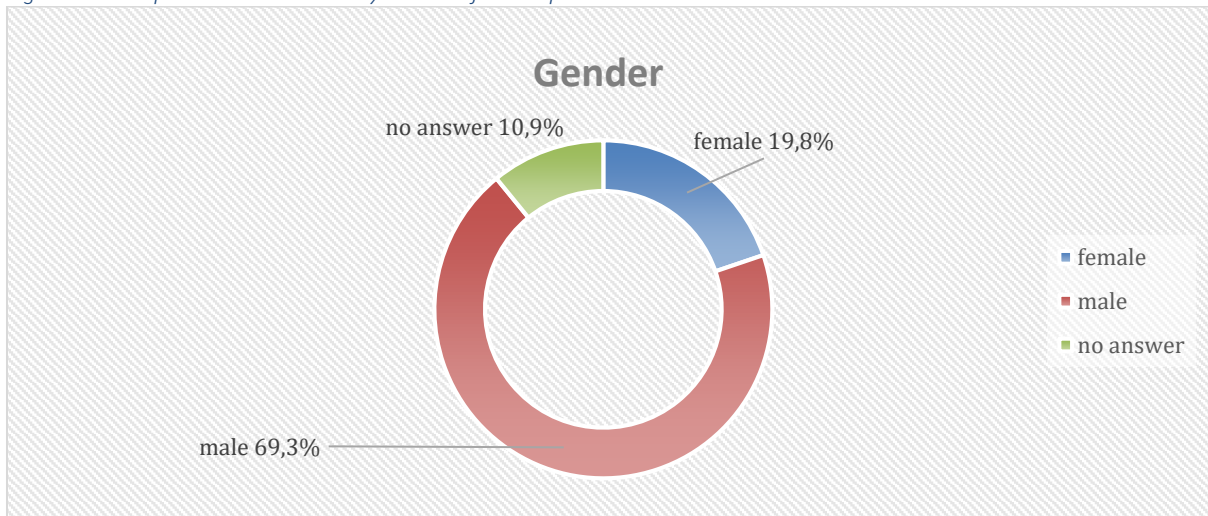


Figure 4. Descriptive statistics: gender of the respondents

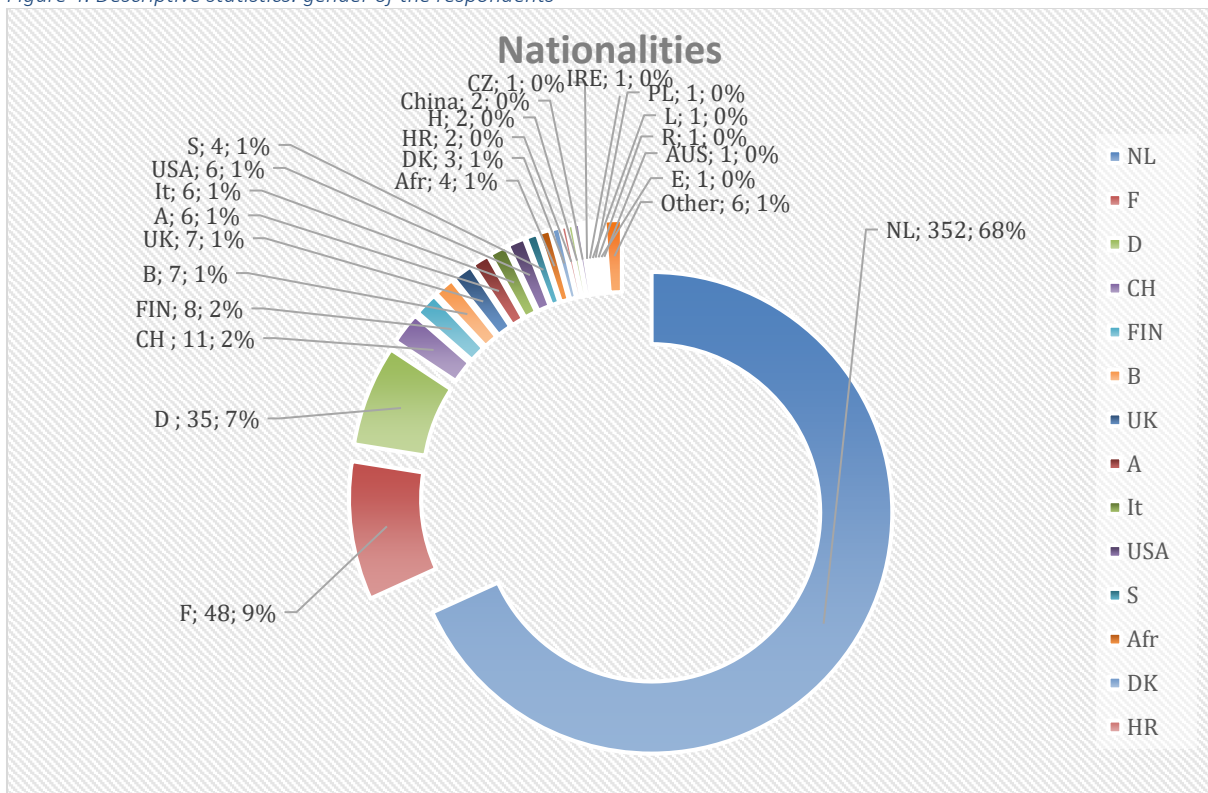


Figure 5. Descriptive statistics: Nationalities of respondents.

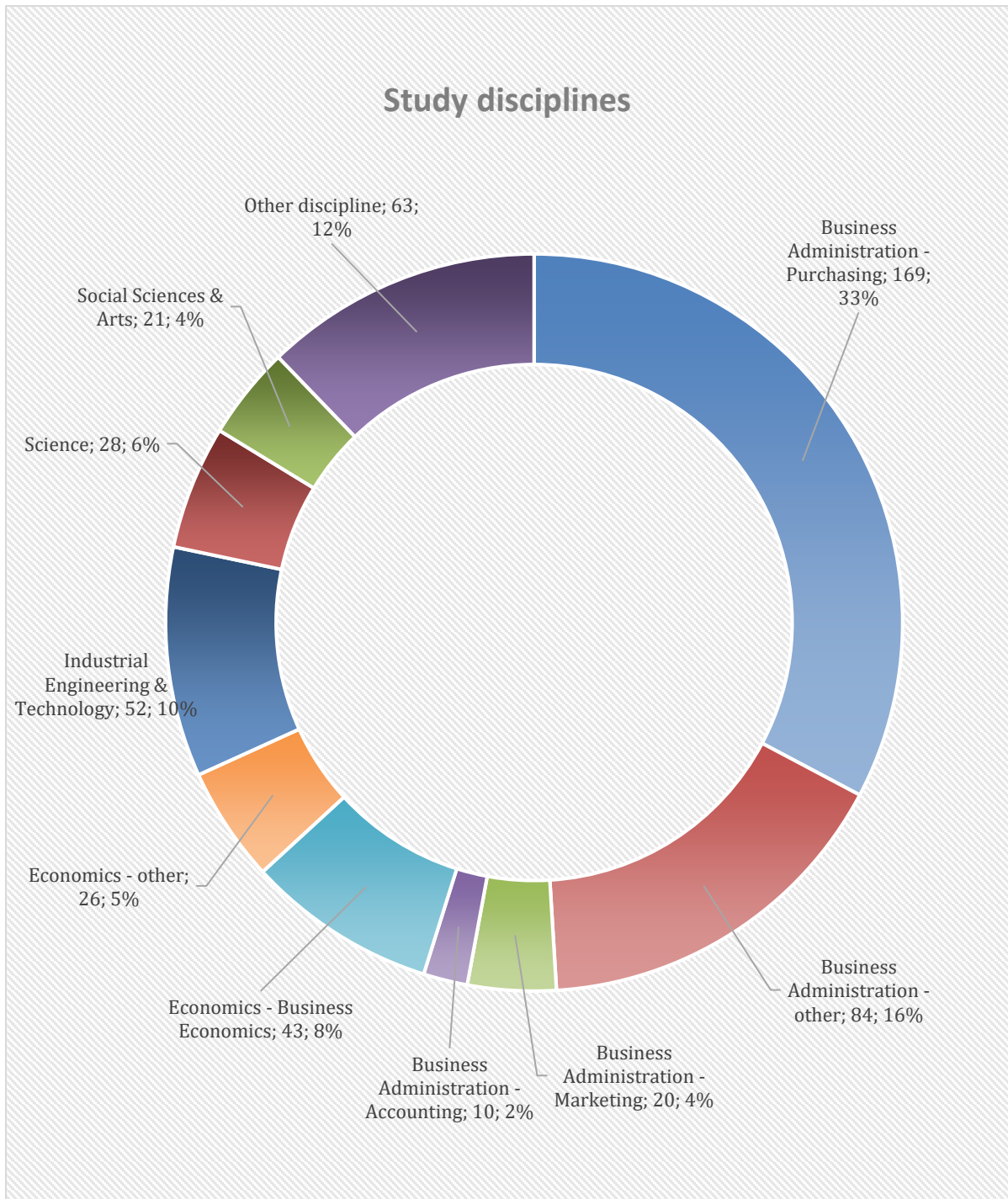


Figure 6. Descriptive statistics: Education background of respondents

Table 5 on the next page shows the means and standard deviations for the items: ‘*what is your competency for this task?*,’ in the left columns and ‘*what is the importance of this task for your current job?*,’ in the right columns. The questionnaire is designed this way to check whether the skill is necessary for the task (or not). However the answering possibilities on the 5-point Likert scale differ a little (see table 2 - a full list is available in the appendices.), the importance-values are on average 15 percent higher than the competency-values.

TOP-25 and the 25 least important skills -Participants' ranking of their self-assessed 'Competency for the task' and their perception of the 'Importance of the task'							
<i>n=516; 5-point Likert-scale (1 is lowest and 5 is highest)</i>							
	Competency for the task	Mean	Std. Deviation		Importance for the task	Mean	Std. Deviation
1	Honesty	3,84	,606	1	Honesty	4,32	,815
2	Loyalty	3,76	,653	2	Communication Skills	4,19	,824
3	Purchasing Knowledge	3,75	,947	3	Social Manners	4,16	,825
4	Problem Solving	3,65	,739	4	Proactivity	4,15	,782
5	Willingness to Learn	3,62	,670	5	Customer Orientation I	4,15	,966
6	Social Manners	3,62	,723	6	Loyalty	4,14	,856
7	Proactivity	3,62	,745	7	Stakeholder Relationship Management	4,14	,992
8	Conscientiousness	3,62	,680	8	Problem Solving	4,14	,771
9	Result Driven	3,59	,761	9	Customer Orientation	4,09	,922
10	Customer Orientation I	3,59	,806	10	Result Driven	4,06	,798
11	Customer Orientation II	3,54	,881	11	Networking	4,05	,861
12	Communication Skills	3,53	,779	12	Willingness to Learn	4,01	,867
13	Handling Complexity	3,53	,749	13	Conscientiousness	4,01	,849
14	Adding Value to the Organisation	3,52	,889	14	Handling Complexity	4,01	,806
15	Advice Skills	3,52	,910	15	Purchasing Knowledge	3,93	,936
16	Evaluation of Offers	3,51	,958	16	Advice Skills	3,91	,954
17	Organisational Position Purchasing	3,46	,908	17	Self-Assurance / self esteem	3,91	,791
18	Request for Quotations	3,46	1,088	18	Persuasion	3,90	,868
19	Team Ability Skills	3,45	,836	19	Empathy	3,85	,897
20	Process Management	3,44	,926	20	Team Ability Skills	3,85	1,006
21	Optimisation of Processes	3,44	,994	21	Adding Value to the Organisation	3,84	,986
22	Stakeholder Relation Management	3,44	,891	22	Poise	3,84	,810
23	Empathy	3,43	,808	23	Conflict Resolution	3,79	,919
24	Networking	3,43	,857	24	Organisational Position of Purchasing	3,78	1,056
25	Self-assurance / self esteem	3,39	,753	25	Evaluating Offers	3,78	1,114
25 least important skills:							
63	Training Personnel	2,82	1,194	63	Innovation Sourcing	3,06	1,110
64	Salesman Skills I	2,80	1,002	64	Portfolio Analysis	3,04	1,179
65	Cooperation with Logistics	2,79	1,086	65	eProcurement	3,04	1,190
66	Sustainability	2,78	,957	66	Early Supplier Integration	3,01	1,257
67	Statistical Analysis	2,77	1,000	67	Innovation Implementation	3,01	1,175
68	Early Supplier Integration	2,76	1,082	68	Automation	3,00	1,161
69	Strategic Management	2,76	1,199	69	Technical Knowledge	2,99	1,115
70	Technical Knowledge	2,72	,953	70	Statistical Analysis	2,98	1,125
71	eProcurement	2,72	1,090	71	Training Personnel	2,92	1,362
72	Automation	2,71	1,055	72	Global Sourcing	2,91	1,348
73	Describing Roles & Profiles	2,68	1,107	73	Make or Buy decisions	2,90	1,346
74	Cooperation with R&D	2,66	1,090	74	Claims Management	2,88	1,226
75	Claims Management	2,65	1,061	75	Salesman Skills II	2,86	1,259
76	Innovation Sourcing	2,63	,984	76	Cooperation with Logistics	2,83	1,326
77	Forecasting of the Demand	2,60	,977	77	Forecasting of the Demand	2,77	1,321
78	Innovation Implementation	2,58	1,033	78	Cooperation with Research & Dev.	2,73	1,329
79	Salesman Skills II	2,55	,991	79	Big Data Analysis	2,71	1,175
80	Cooperation with HRM	2,53	,990	80	Supply Chain Analysis	2,70	1,158
81	Personnel Selection	2,52	1,131	81	Technology Planning	2,66	1,112
82	Supply Chain Analysis	2,50	,994	82	Describing Roles & Profiles	2,66	1,286
83	Technology Planning	2,49	,998	83	Employee Performance Measurement	2,57	1,357
84	Cooperation with Marketing	2,46	1,005	84	Personnel Selection	2,56	1,380
85	Enterprise Resource Planning	2,41	,982	85	Cooperation with Human Resource M.	2,53	1,186
86	Employee Development	2,41	1,101	86	Employee Development	2,50	1,350
87	Employee Performance Measurment	2,40	1,101	87	Cooperation with Marketing	2,45	1,240
88	Big Data Analysis	2,19	,978	88	Enterprise Resource Planning	2,44	1,258

Table 5 Top-25 and the 25 least important skills – full list in the appendices

After examining the data and being acquainted with the features of the population an attempt was done to find distinct groups within the whole population. With the statistical program SPSS an analysis showed three groups, that were interpreted as juniors, seniors and executives.

3.2 Cluster analysis shows three distinct groups: juniors, seniors and executives

The result of cluster analysis lead to three clusters. Tables 6 to 9 display the information on the clusters. The tables are for the larger part self-explanatory.

Years of experience	junior cluster (n = 197)		senior cluster (n = 239)		executive cluster (n = 79)	
	#	%	#	%	#	%
0 – 5 years	91	46,2%	37	15,5%	2	2,5%
6 – 10 years	40	20,3%	63	26,4%	8	10,1%
11 – 15 years	29	14,7%	62	25,9%	17	21,5%
16 – 20 years	17	8,6%	43	18,0%	20	25,3%
21 – 25 years	10	5,1%	17	7,1%	17	21,5%
26 – 30 years	8	4,1%	12	5,0%	7	8,9%
31 – 35 years	1	0,5%	5	2,1%	6	7,6%
More than 35 years	1	0,5%	0	0,0%	2	2,5%
total	197	100%	239	100%	79	100%

Table 6 Years of experience in the three clusters.

Nationality	junior cluster	senior cluster	executive cluster
1	Netherlands (70,4%)	Netherlands (70,3%)	Netherlands (52,9%)
2	Germany (12,2%)	France (11,0%)	France (21,7%)
3	France (8,7%)	Germany (6,5%)	Italy (5,1%)
4	Austria (3,5%)	Finland (1,9%)	Germany (4,3%)
5	Belgium (1,7%)	United Kingdom (1,5%)	Finland (2,2%)

Table 7 Nationalities in the three clusters.

Study discipline	junior cluster	senior cluster	executive cluster
1	BA-PSM (28,8%)	BA-PSM (35,0%)	BA-PSM (41,2%)
2	BA-other (19,2%)	BA-other (18,7%)	Science – Engineer (18,0%)
3	Science – Engineer (14,0%)	Science – Engineer (9,9%)	BE (10,9%)
4	BE (8,7%)	BE (7,2%)	BA-other (12,3%)
5	Legal (8,0%)	Economics - other (5,7%)	Computer Science (3,6%)
6	Facility Management (6,1%)	BA - Marketing (5,7%)	Legal (2,8%)
7	Social science - other (4,4%)	BA-Account & Fin (2,3%)	Science - other (2,8%)
8	Economics - other (4,3%)	History/Literature (2,3%)	BA-Account & Fin (2,2%)
9	Science - Chemistry (2,6%)	Computer Science (1,9%)	Economics - other (1,9%)
10	BA - Marketing (2,6%)	Facility Management (1,5%)	Psychology (1,4%)

Table 8 Study disciplines in the three clusters.

‘Juniors’ form the group with the least experience and the lowest working level. They are focused on delivery tasks and are higher educated; they have more often a master’s degree than seniors or executives. Many juniors fulfil a role in public procurement. At the other hand the ‘executives’ have the most experience and the highest working level. They fulfil CPO roles and other strategic tasks.

The conclusions from the multiple comparisons (see appendices) between the means in Nationality, Working level, Educational level, Study discipline, and years of experience are

nationality or country of the workplace do not affect the results: the means for juniors, seniors and executives are equal. The working level however is significant lower for the juniors than for seniors and executives. The opposite is the case for the highest completed educational level. Juniors are significantly higher educated than seniors and executives. The years of experience are of course significantly higher for respectively executives and seniors. As expected, the juniors have the lowest years of experience. See for more detailed information table 8 on the next page (and the tables of the multiple comparisons in the appendices).

What is your competence for this task?			
	junior cluster (n = 197)	senior cluster (n = 239)	executive cluster (n = 79)
1	Honesty	Honesty	Purchasing knowledge
2	Loyalty	Purchasing knowledge	Optimising of purchasing process
3	Learning motivation	Loyalty	Supplier relation management
4	Social manners	Conscientiousness	Request for Quotation
5	Conscientiousness	Proactive	Evaluate offers
6	Problem solving	Result driven	Negotiation
7	Proactive	Problem solving	Adding value with Purchasing
8	Customer orientation	Adding value with Purchasing	Position of purchasing in org
9	Purchasing knowledge	Customer orientation	Problem solving
10	Result driven	Advice skills	Supplier evaluation
11	Communication	Customer orientation	Strategic business partner
12	Complexity	Learning motivation	Process Management
13	Empathy	Social manners	Supplier development
14	Customer orientation	Communication	Honesty
15	Self-assurance	Process Management	Proactive
16	Advice skills	Position of purchasing in org	Cooperation Production
17	Poise/confidence	Complexity	Stakeholder Rel. Management
18	Networking	Evaluate offers	Loyalty
19	Evaluate offers	Team ability	Advice skills
20	Team ability	Stakeholder Rel. management	Networking
21	Conflict resolution	Optimising of purchasing process	Category strategic development
22	Adding value with Purchasing	Request for Quotation	Contract management
23	Request for Quotation	Networking	Leadership
24	Stakeholder Rel. management	Empathy	Cost reduction techniques
25	Position of purchasing in org	Negotiation	Training staff
25 lowest competencies tasks			
64	Global Sourcing	Supplier development	Cooperation Logistics
65	Supplier development	Early supplier involvement	Personnel selection
66	Make or Buy?	Portfolio analysis	Specify requirements of supplies
67	Forecasting demand	Sustainability	Claims management
68	ERP	Cooperation R&D	Sustainability
69	Strategic business partner	Statistical analysis	Innovation implementation
70	Early supplier involvement	Technical knowledge	Cooperation R&D
71	Cooperation R&D	Cooperation Logistics	Employee development
72	Claims management	Defining purchasing roles	Personal development
73	Innovation sourcing	Innovation sourcing	Statistical analysis
74	Change management	Claims management	Pooling Planning
75	Supply Chain Analysis	Sales knowledge	Innovation sourcing
76	Leadership	Personnel selection	Cooperation Marketing
77	Defining purchasing role	Automation of purchasing process	Salesman skills
78	Technology planning	Procurement IT systems	Cooperation HRM
79	Sales knowledge	Innovation implementation	Automation of purchasing process
80	Innovation implementation	Cooperation HRM	Procurement IT systems
81	Training staff	Forecasting demand	Forecasting demand
82	Cooperation HRM	Technology planning	Sales knowledge
83	Big data analysis	Employee development	Supply Chain Analysis
84	Strategic management	Cooperation Marketing	Technical knowledge
85	Cooperation Marketing	Employee performance measure.	Technology planning
86	Personnel selection	Supply Chain Analysis	ERP
87	Employee development	ERP	Big data analysis
88	Employee performance measure.	Big data analysis	Forecasting demand

Table 9 Competence levels top-25 of juniors, seniors and executives

3.3 Ranking of the purchasing objectives

PSM professionals asked what their focus is answer unanimously 'quality', followed by 'costs'. Figure 5 and 6 are showing this.

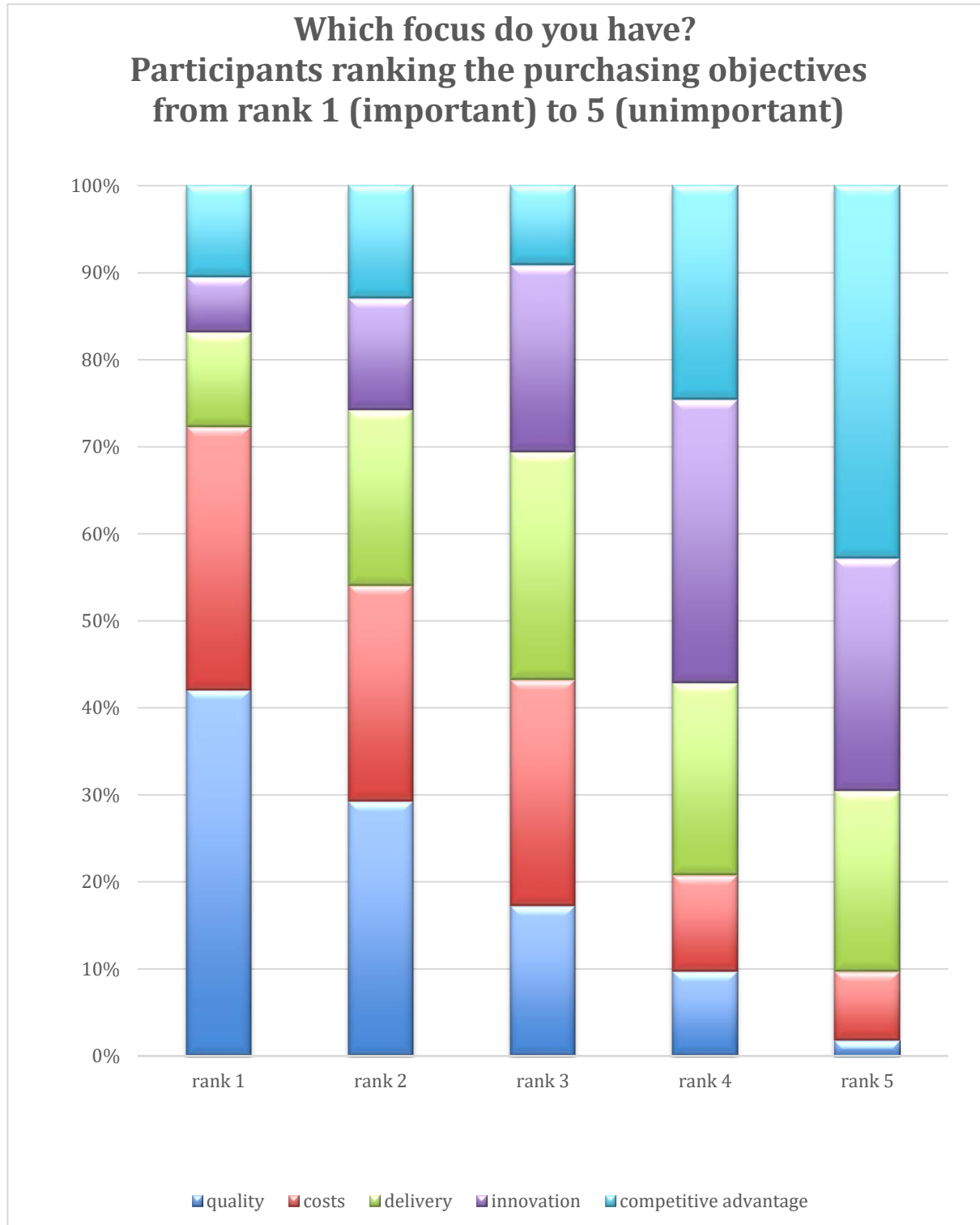


Figure 7 Ranking of the focus in purchasing

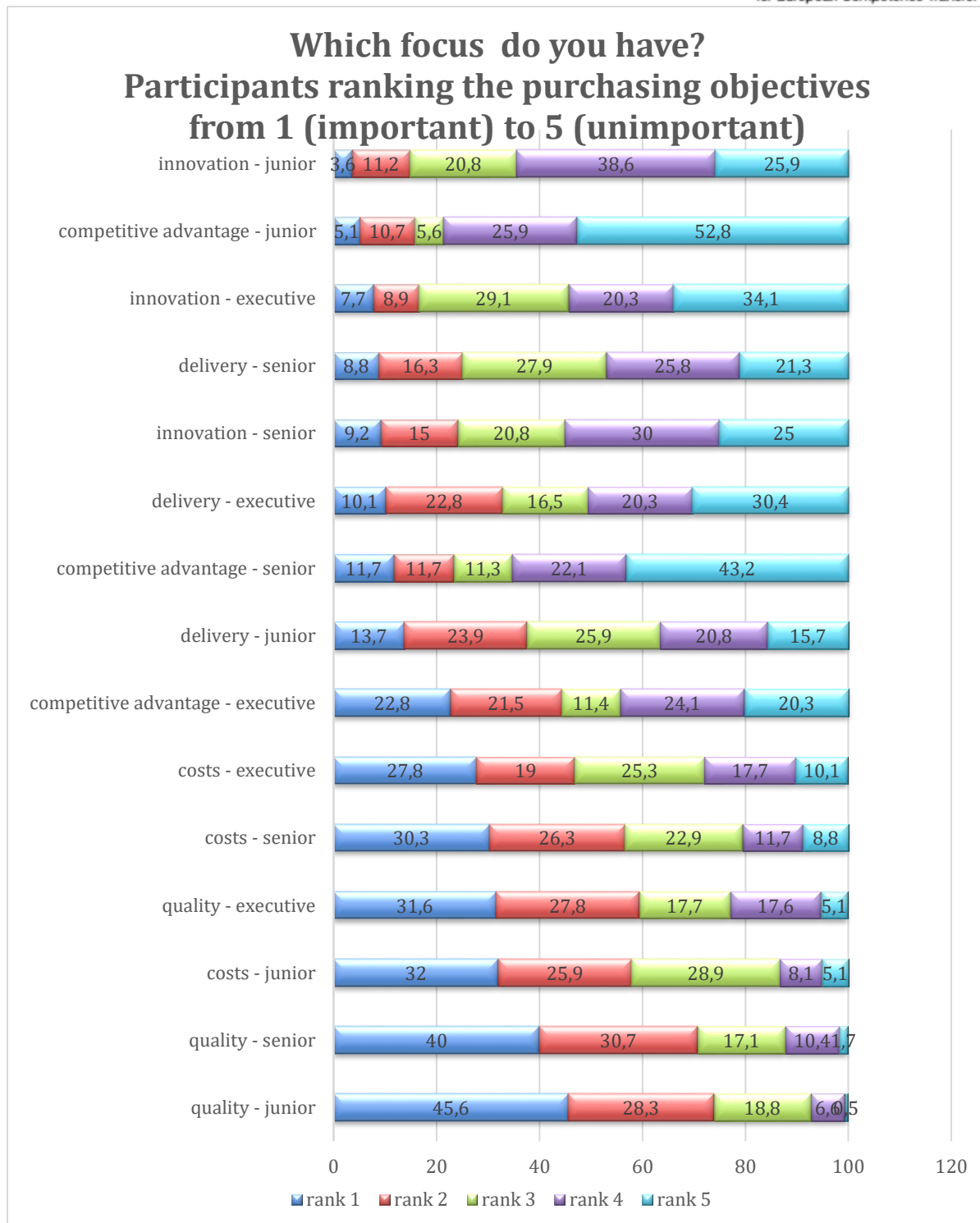


Figure 6 Ranking of the focus in purchasing

Participants ranked their professional focus and placed these purchasing objectives in the order of their choice: *costs*, *quality*, *delivery*, *innovation* and *sustained competitive advantage*. Participants in general and in all three clusters (junior, senior and executive) placed *quality* most of the times at rank 1 as the most important purchasing focus they have followed by *costs*. Seniors and executives, who have strategic task put *sustained competitive advantage* on a third place. Quality may be focus number one in the next table it appears that reducing costs is the best developed amongst PSM professionals (see figures 5 & 6 and compare with table 7).

3.4 Level of success in PSM objectives

Level of success in different objectives in Purchasing & Supply Management (1=strongly disagree; 2=disagree; 3= neutral; 4= agree; 5=strongly agree; n = 516)		junior	senior	executive	total
COSTS	Due to my actions we achieved a higher than average cost reductions.	3,50	3,88	4,13	3,77
	Compared with other departments, my department achieved higher than average reductions in costs.	3,35	3,68	3,92	3,60
	The reductions in costs achieved in my department are considerably higher than our goals.	3,06	3,33	3,81	3,31
QUALITY	Due to my actions we achieved a higher than average level of quality.	3,54	3,75	3,96	3,72
	Compared with other departments, my department achieved higher quality goals.	3,25	3,48	3,65	3,44
	The improvements in quality achieved in my department are considerably higher than our goals.	3,03	3,29	3,49	3,23
INNOVATION	Due to my actions, product and process improvements have been implemented.	3,08	3,24	3,59	3,67
	Due to my actions, we achieved more product and process improvements than average.	2,95	3,24	3,41	3,38
	Due to my actions, we identified more useful ideas with suppliers than the benchmark.	2,87	3,08	3,29	3,32
	The product and process improvements achieved in my department/company are considerably better than expected.	3,44	3,55	4,01	3,23
DELIVERY	Due to my actions, we improved the supply delivery process.	3,14	3,23	3,41	3,60
	We outperform in the benchmark with other departments, my department achieved higher supply delivery goals.	3,02	3,16	3,35	3,22
	The improvements in delivery performance of suppliers achieved in our department are considerably higher than our goals.	3,31	3,84	3,92	3,14
SUPPLIER SATISFACTION	Due to my actions, we achieved higher suppliers-satisfaction.	3,06	3,54	3,59	3,55
	Due to my actions the relationship with our most important supplier(s) is (are) improved significantly.	3,02	3,45	3,78	3,60
	My company has become a preferred customer of our most important supplier(s).	2,98	3,30	3,65	3,41
SUSTAINED COMPETITIVE ADVANTAGE	Due to my actions, my organisation obtained long-term competitive advantage.	3,25	3,57	3,82	3,47
	The long-term competitive advantage of my organisation is considerably better than those of competitors.	3,03	3,32	3,56	3,24
	The improvements in obtaining long-term competitive advantage of my organisation are considerably higher than expected.	2,97	3,20	3,44	3,15
SUSTAINABILITY	Due to my actions we achieved a higher than average level of sustainability.	3,45	3,54	3,86	3,22
	Compared with other departments, my department achieved higher sustainability goals.	3,47	3,63	3,95	3,15
	The improvements in sustainability achieved in my department are considerably higher than our goals.	3,22	3,51	3,80	3,01
Average		3,18	3,45	3,70	3,38

Table 10 Success levels in different PSM objectives

The participants stated their individual level of self-assessed success they achieved in the already mentioned *costs*, *quality*, *delivery*, *innovation* and *sustained competitive advantage* and in *supplier satisfaction* and *sustainability* (see table 10). As mentioned, the focus upon ‘quality’ does not lead to a first ranking of quality as a purchasing success. It is striking that obtaining that a buzzword as sustainability is the most unsuccessful focuses of PSM professionals. Nevertheless, in paragraph 3.5 it shows that ‘sustainability’ is necessary for a long-term competitive advantage in business.

3.5 Wrapping-up: overview of the features of juniors, seniors and executives

In table 11 the information in this chapter is wrapped-up. Cluster analysis shows three different types. First a highly educated job starter in a PSM job appears. Next, an experienced senior PSM professional in mid-career shows and finally an executive PSM professional with many years of experience and an executive working level. These three distinct working levels from junior, senior to executive have self-assessed themselves on 88 skills. On average the juniors rate themselves on a scale from 1 to 5 a 2,5, which is in fact 'insufficient' in school grade terms. The seniors 3,3 (sufficient) and the executives 4,0 (very good). The average rates for self-assessed PSM success are respectively: 3,4; 3,6 and 3,9. Juniors rate themselves lower than seniors do and seniors lower than executives. The next paragraph deepens further on the issue, which skills lead to success.

Overview of the features of juniors, seniors and executives			
	junior cluster (n = 197)	senior cluster (n = 239)	executive cluster (n = 79)
Profile:	Junior: <i>"Highly educated job starter in a PSM job"</i>	Senior: <i>"experienced PSM professional in mid-career"</i>	Executive: <i>"PSM professional with many years of experience and an executive working level"</i>
Nationalities (top-5)	Netherlands (70,3%), France (11,0%), Germany (6,5%), Finland (1,9%), United Kingdom (1,5%)	Netherlands (70,3%), Germany (12,2%), France (8,7%), Austria (3,5%), Belgium (1,7%)	Netherlands (52,9%), France (21,7%), Italy (5,1%) Germany (4,3%), Finland (2,2%)
Purchasing focus on rank 1	1 Quality (45,6%) 2 Costs (32,0%) 3 Delivery (13,7%) 4 Competitive advantage (5,1%) 5 Innovation (3,6%)	1 Quality (40,0%) 2 Costs (30,3%) 3 Competitive advantage (11,7%) 4 Innovation (9,2%) 5 Delivery (8,8%)	1 Quality (31,6%) 2 Costs (27,8%) 3 Competitive advantage (22,8%) 4 Delivery (10,1%) 5 Innovation (7,7%)
Purchasing successes:	Delivery	Costs, Quality, Innovation, Competitive advantage	Costs, Quality, Sustainability, Innovation, Competitive advantage, Supplier Satisfaction.
Education	Higher educated than 1 & 3		
Working level	Lowest	Middle	Highest
Experience	Least	Middle	Most
Roles significantly belonging to the clusters	Public Procurement, eProcurement,		CPO, Compliance, eProcurement, Supply Risk Management, Sourcing Analyst, Supplier Development, Systems Strategy
'Full-time' roles top-5 with % of total in the Clusters 1 to 3: (Selection of participants who state to spend more than 70% of the time on this role)	1. Public Procurement (34,2%) 2. Category Management (7,7%) 3. Operative (6,0%) 4. Indirect Materials: Services (6,0%) 1. Contract Management (6,0%)	2. Public Procurement (18,9%) 3. Category Management (9,7%) 4. Systems Strategy (7,4%) 5. CPO (7,4%) 6. Other (5,5%)	1. CPO (17,0%) 2. Public Procurement (10,3%) 3. Systems Strategy (9,3%) 4. Other (6,7%) 5. Supplier Development (5,7%)
Self-assessed average on 5 point scale on 88 skills	2,5 / Basic Competence	3,3 / Advanced Competence	4,0 / Outstanding Competence
Self-assessed average on 5 point scale purchasing success	3,4	3,6	3,9
	<i>score 3 = I not agree / not disagree that I had success on that topic</i> <i>score 4 = I agree that I had success on that topic</i>		
Skills that lead to success in cost reduction	Supply Market Analysis; Specify requirements of supplies; Negotiation skills; Cooperation with Production; Defining Roles & Profiles; Cross Cultural Awareness ;Leadership & managing personnel	Pooling Planning; Innovation implementation; Category Strategy Development; Make or buy decisions; Specify requirements of supplies; Leadership & managing	Sustainable purchasing; Cooperation with Marketing; Position of Purchasing in the organisation; Comprehension of Complexity.

		personnel; Training Personnel; Cost reduction techniques; Salesmanship skills.	
Skills that lead to success in quality improvement	Technology planning; Evaluate offers; Contract Development; Cross-Cultural Awareness; Salesmanship knowledge; eProcurement; Loyalty; Result Driven; Inventiveness.	Innovation implementation; Supply risk management; Cooperation with Quality; Cooperation with R&D; Cooperation with HRM; eProcurement; Creativity; Customer Orientation PS; Networking skills; Comprehension of Complexity.	Innovation implementation; Early Supplier Involvement; Contract Development; Corporate governance; Process Management; Cooperation with Legal department; Big Data Analysis; Proactive.
Skills that lead to success in improving sustainability	Innovation implementation; Sustainable purchasing; Negotiation skills; Supplier Evaluation; Supplier Development; Cooperation with Logistics; Cooperation with Legal department; Personality Development; Statistical Analysis; Cost Reduction Techniques; Persuasive skills.	Innovation implementation; RfQ; Making Cost Analysis; Sustainable purchasing; Project Management Skills.	Innovation implementation; RfQ; Sustainable purchasing; Contract Management; Performance Measurement and Follow-up; Big Data Analysis; eProcurement; Willingness to Learn; Ability to Resolve Conflicts.
Skills that lead to success in securing safe delivery	Technology planning; Category Strategy Development; Corporate governance; Cooperation with Logistics; Cooperation with Legal department; Creativity; Problem Solving.	Supply Chain Analysis; Innovation implementation; Making Cost Analysis; Optimisation of purchasing processes; Supplier Development; Purchasing Knowledge; Cooperation with Logistics; Cost reduction techniques; Self-Assurance; Empathy; Problem Solving	Negotiation skills; Claims Management; Early Supplier Involvement; Supplier relation management; Technology Knowledge; Cooperation with HRM; Automation; Networking; Empathy; Conscientiousness.
Skills that lead to success in having access to the suppliers innovations	Technology planning; Developing Specifications for Supplies; Technology Knowledge; Cooperation with Production; Strategic Management; Change Management; Cross-Cultural Awareness; Inventiveness; Customer Orientation PS; Problem Solving.	Customer Orientation; Innovation implementation; Contract Management; Process Management; Technology Knowledge; Change Management; Defining Roles & Profiles; Honesty; Loyalty; Self Assurance.	Sustainable purchasing; Strategic management; Technology Knowledge; Leadership; Personnel Selection; Big Data Analysis; Performance Measurement and Follow-up; Willingness to Learn; Inventiveness; Persuasive skills.
Skills that lead to success in achieving sustained competitive advantage	Supply Market Analysis; Customer Orientation PL; Developing Specifications for Supplies; Global Sourcing; Sustainable purchasing; Supplier relation management; Cross Cultural Awareness; KPI defining; Proactive; Empathy; Poise; Comprehension of Complexity.	Pooling Planning; Innovation Sourcing; RfQ; Global Sourcing; Sustainable purchasing; Add Value to the Organisation; Personnel Selection; Leadership; Team Member Skills; Proactive.	Enterprise Resource Planning; Supply Market Analysis; Evaluate offers; Contract Management; Cooperation with Legal department; Team Member Skill; Result Driven; Inventiveness; Conscientiousness.
Skills that lead to success in achieving supplier satisfaction	Commodity knowledge; Developing Specifications for Supplies; Making Cost Analysis; Supplier relation management; Leadership; Willingness to Learn; Poise; Willingness to take Risks; Inventiveness.	Commodity knowledge; Strategic Business Partner; Communication skills; Big Data Analysis; Ability to Resolve Conflicts.	Cooperation with Logistics; Creativity.

Table 11 Overview: wrap-up of significant distinctions between juniors, seniors and executives.

3.6 Skills that lead to purchasing success

Understanding the technical aspects of the own products and processes is most essential for PSM professionals. This goes along with implementing suppliers' innovations in the buyers' organisation. In order to be successful the purchasers need interpersonal skills like cross-cultural awareness skills, showing leadership, having cooperative skills et cetera.

Intrapersonal skills like inventiveness, poise, conscientiousness and self-assurance are indispensable.

Skills that lead to purchasing success	DELIVERY	SUSTAINABILITY	SUPPL.SATISFACT.	LONGTERM COMP.	QUALITY	COSTS	INNOVATION	#
Technical knowledge of products and production systems - Understanding the technical aspects of products/processes.	X			X	X	X	X	5
Cross-cultural Awareness Skills - The ability to become aware of cultural values, beliefs and perceptions of cultures.		X			X		X	3
Global Sourcing / Supplier Acquisition - Sourcing materials, processes, designs, technologies and suppliers global	X			X	X			3
Innovation Implementation - Implementing suppliers innovations in the own organization.		X			X		X	3
Solicit Offers (RfQ/ RfP / RfI) Request for Quotation (RfQ) / Proposal (RfP)	X	X		X				3
Inventiveness - Being imaginativeness.					X		X	2
Leadership - Managing employees in teams.			X			X		2
Cost Reduction Techniques - Act of cutting costs to improve profitability (by analysis/stats)	X					X		2
Negotiation the Specific Terms - The specific commercial and legal terms need to be settled in a satisfactory way		X				X		2
Project Management Skills - The discipline of initiating, planning, executing, controlling, and closing the work of a team to meet specific goals.	X	X						2
Supplier Relationship Management - The ongoing management of the suppliers after contracting / strategically planning for, and managing, all interactions with suppliers.	X		X					2
Sustainability - Sustainable purchasing: considering environmental, social, ethical and economic issues in the management of the organization's external resources.		X		X				2
Working together with the department Research and Development	X				X			2
Working together with the Legal department		X			X			2
Innovation Sourcing - External scan. This requires a systematic scan of the solutions available on the supply market.							X	1
Make or Buy Decisions - Choosing between manufacturing a product in-house or purchasing it from an external supplier.						X		1
Making cost analyses - For example: calculation of the total costs of ownership or other cost calculations.		X						1
Managing change processes - The ability to lead a team or group through change process.							X	1
Performance Measurement and Follow-up - Continuous monitoring of target achievement.			X					1
Poise - Being (self) confident.				X				1
Pooling Planning and Organising - Pooling is to bundle the entire demand of the (group of) organisation(s).						X		1
Procurement IT Systems / e-procurement applications - Knowledge of working of e-procurement system.			X					1
Self-assurance - Being assertive and having self-esteem.	X							1
Strategic Business Partner - Becoming a strategic (business) partner with your supplier.				X				1
Supplier Development - Collaboration with suppliers to improve their processes and product capabilities.		X						1
Supply Chain Analysis and Planning - Analysis and planning the entire supply chain.	X							1
Supply Market Analysis - Analysis of the supply market i.e. the suppliers of a good and their properties / relationships to each other. Analysis of competitive pressure and market power.				X				1
Supply Risk Management - The implementation of strategies to manage both every day and exceptional risks along the supply chain to deal with risks and uncertainties caused by, or impacting on, logistics related activities or resources		X						1

Willingness to take risks						X		1
Working together with the department Logistics and Storage	X							1
Working together with the department Marketing Management			X					1
Ability to Solve Problems	X							1
Add Value to the Organisation - Knowledge on the added value of purchasing to the organisation / importance of purchasing to the organisation.			X					1
Automation - Working on the automation of purchasing processes.	X							1
Big Data Analysis Uncovering hidden patterns, correlations and other insights from large amounts of data using specific statistical big data analyses methods.			X					1
Claims Management - Claims management is dealing with opportunistic suppliers who tend to increase their margin with extra work apart from the contract.			X					1
Commodity and Domain Specific Knowledge - Knowledge on a special purchasing domain, e.g. different industries, services, construction, purchasing of health etc.			X					1
Conscientiousness - Being trustworthy in professional life	X							1
Contract Management - Monitoring and enforcing the contracts when they have been signed.					X			1
Corporate Governance - Knowledge on how organisations are governed, including board, role of advisory board, stakeholders etc.	X							1
Defining Purchasing Roles and Job Profiles - The different roles of purchasers and job profiles.						X		1
Early Supplier Involvement - Inviting the supplier in the new product development process from a very early stage.			X					1
Enterprise Resource Planning - Material Requirements Planning / Advanced Planning and Scheduling / IT skills necessary to extract planning data from an ERP system.			X					1
Evaluate Offers & Supplier Selection – Know how to ensure that purchasing plays an adequate role in the organisation.							X	1
#	14	10	9	9	8	8	7	65

Table 12 Skills leading to PSM successes

4. Conclusions and discussions

4.1 Managerial implications

This research attracted different participants from industry, service and public procurement and at three working levels: juniors, seniors and executives. These nine levels have in common that all need (technical) knowledge, PSM experience (accumulated knowledge), and inter- and intrapersonal skills: communicating with other individuals is important.

- Skills leading to purchasing success:
 - Technical knowledge of products and production systems - Understanding the technical aspects of products/processes.
 - Cross-cultural Awareness; Global Sourcing; Innovation Implementation; Solicit Offers (equal on the second place).
 - Inventiveness; Leadership; Cost Reduction; Negotiation; Project Management; Supplier Relationship Management; Sustainability; Cooperate with R&D and Legal (equal on the third place).

- PSM professionals are ambivalent on the role of cost reductions and quality improvement.
 - The focus is first on 'quality' as the most important objective and second are costs reductions.
 - However, PSM professionals are better in reducing costs than in improving quality.
- The top-10 ranking of self-assessed characterisations of junior and senior PSM professionals are except one soft skills. Both mention first: honesty, loyalty and conscientiousness Juniors add: learning motivation and social manners, whereas seniors state their purchasing knowledge and being proactive. Executives deviate and mention (accumulated) knowledge: purchasing knowledge, optimising processes, supplier relationship management, requesting quotations and evaluating offers.

What is your competence for this task?			
	junior cluster (n = 197)	senior cluster (n = 239)	executive cluster (n = 79)
1	Honesty	Honesty	Purchasing knowledge
2	Loyalty	Purchasing knowledge	Optimising of purchasing process
3	Learning motivation	Loyalty	Supplier relation management
4	Social manners	Conscientiousness	Request for Quotation
5	Conscientiousness	Proactive	Evaluate offers
6	Problem solving	Result driven	Negotiation
7	Proactive	Problem solving	Adding value with Purchasing
8	Customer orientation	Adding value with Purchasing	Position of purchasing in org
9	Purchasing knowledge	Customer orientation	Problem solving
10	Result driven	Advice skills	Supplier evaluation

Table 13 Top-10 skills of juniors, seniors and executives

4.2 Theoretical contribution

The purpose of the project PERFECT is to find justifications for possible learning objectives of PSM curricula in higher education. This survey study aims to show how *costs, quality, delivery, innovation and long-term competitive advantage, supplier satisfaction and sustainability* are related to set of skills, traits and knowledge. The results of this study are empirically validated competence insights, three profiles of purchasing managers and these results truly strengthen the research, which is going on about this topic (Derwik and Hellström, 2017). This research shows what skills were found important and which were with less importance, filtered by position and by success factors. Participants set their view on PSM success factors, and set these in following order: cost reductions, quality, innovations, delivery, supplier satisfaction, long-term competitive advantage and sustainability. While prior studies have also taken look at these skills and importance of those, we conducted our analysis further. Since we are able to show three consistent clusters of profiles, which what kind of positions, as well as PSM success objects members of these clusters prefer. This study can offer a foundation for researchers in guiding future work in the area of purchasing manager's competence.

The results of this survey are only partly in line with literature. Literature recognises technical skills; however, subjects as innovation implementation, cross-cultural awareness, inventiveness, cost-reduction techniques, project management skills, supplier relation management and sustainability seem not to appear in the same volume or not at all in purchasing skills literature. Table 10 displays this literature review and repeats herewith the efforts of the 1st White Paper of project PERFECT of summer 2016 (Anderson & Katz, 1998;

Baily, Farmer, Crocker, Jessop, & Jones, 2008; Burt, Dobler, & Starling, 2003; Carr & Smeltzer, 2000; Carter & Narasimhan, 1996; Cavinato, 1987; Cousins, Giunipero, Handfield, & Eltantawy, 2006; Cousins & Spekman, 2003; Cruz & Murphy, 1996; Dowd & Liedtka, 1994; Eltantawy, Giunipero, & Fox, 2009; Faes, Knight, & Matthyssens, 2001; Giunipero, 2000; Giunipero, Denslow, & Eltantawy, 2005; Giunipero & Handfield, 2004; Giunipero & Percy, 2000; Keough, 1993; Kern, Moser, Sundaresan, & Hartmann, 2011; Killen & Kamauff, 1995; Knight, Tu, & Preston, 2014; Kolchin & Giunipero, 1993; McKeefry, 1998; Mulder, Wesselink, & Bruijstens, 2005; Muller, 2001; Murphy, 1995; Pagell, Das, Curkovic, & Easton, 1996; Tassabehji & Moorhouse, 2008; Tatham, Wu, Kovács, & Butcher, 2017; Trent & Monczka, 2003; Zawawi et al., 2014).

Percentages of articles mentioning specific skills								
1	PSM experience	83%	19	Curiosity	33%	37	Entrepreneurial attitude	10%
2	Business knowledge	73%	20	Industry knowledge	33%	38	Result driven	10%
3	Negotiation skills	73%	21	Creativity	33%	39	Consultancy Advisory skills	10%
4	Leadership skills	70%	22	Legal knowledge	33%	40	Power handling	10%
5	Relationship management	63%	23	Quality management	30%	41	Discipline	10%
6	Analytical thinking	63%	24	Process management	30%	42	Conscientiousness	10%
7	Holistic thinking	63%	25	Blue print reading	30%	43	Will to compromise	7%
8	Computer literacy	60%	26	Logistic knowledge	27%	44	Self-confidence	7%
9	Team ability	57%	27	Project management	27%	45	Perseverance	7%
10	Communication skills	57%	28	Written proficiency	27%	46	CAD	3%
11	Problem solving skills	53%	29	Tactfulness	27%	47	Own initiative	3%
12	Strategic thinking	53%	30	Motivate skills	27%	48	Empathy	3%
13	Decisiveness	47%	31	Time management	23%	49	ERP	3%
14	Organizational skills	43%	32	Information management	23%	50	Patience	3%
15	Risk management	43%	33	Presentation skills	20%	51	Common sense	3%
16	Persuasive skills	40%	34	Assertiveness	20%	52	Conference skills	3%
17	Conflict resolution	40%	35	Flexibility	17%	53	Loyalty	3%
18	Customer orientation	40%	36	Mathematics/numeral skills	13%	54	Pro-activity	3%

Table 14 PSM literature review

The results of this study contribute to the learning objectives of the PSM curriculum modules in the next step of this project. As the PSM function in organisation is evolving over the years, institutes for higher education are challenged to move along and to reinvent PSM curricula. Universities (of applied sciences) are perfectly organised to transfer book knowledge and theory, but it seems that there is a strong need for interpersonal and intrapersonal skills development, which require other techniques of those institutes like 'knowledge fairs, learning communities, study missions, tours, advisory boards, job rotation, stories, myths and task' Smith (2001, p. 317). Serious gaming could be solution in cases of complex learning that will provide students the access to develop personal skills (Hummel et al., 2011). Working on research papers and organising and joining company visits will give students understanding of the practices in companies (Cvetić, Vasiljević, & Danilović, 2017).

The more important objective in academia is the transfer of explicit knowledge, which is codified knowledge and theory. However, classical, frontal lecturing seems to be the dominant design for transferring explicit knowledge in higher education. This traditional technique keeps students in an inactive, listening mode, which is evidently the least effective manner of transferring knowledge in (higher) education (Masters, 2013). An active involvement of students in their learning process has a more comprehensive learning effect. Students that were actively involved in experiments had better learning results than students who passively observed a similar experiment performed by the lecturer (Bonwell & Eison, 1991). The obvious conclusion is that higher education needs an alternative knowledge transfer design for explicit knowledge and personal skills development.

4.3 Implications for the next intellectual outputs of PERFECT

Institutes for higher education that offer PSM tracks, need to develop a job profile competency set for the graduates of their tracks, which is structured in the Bologna Process regulations for the European institutions for higher education (Leoni, 2014). The idea is that the competency set of the graduates will match the needs of the employers that these graduates are encountering on the labour market. Universities and employers have respectively supplying and demanding roles on the labour market for competent PSM professionals. When (re-) designing learning objectives of PSM curricula, it is of importance that European (and foreign) universities consider the requirements that employers set. Universities can monitor the employers' requirements in different ways. This research provides a fundamental approach to the comprehension of the employers' needs and the skills that are necessary in daily PSM practice.

The results of the survey will serve as the basis or validation of the learning objectives of the modules that will be designed in the European PSM curriculum in the fourth intellectual output and subsequently to the sixth intellectual output (IO6). IO6 is the design of the massive open online course (MOOC), which will provide undergraduates, who missed the PSM classes at bachelor level, enough understanding and knowledge to follow courses at masters' level. The survey contributes directly to the fifth intellectual output the online skills tool. In this tool, PSM professionals on junior, senior and executive level from industry, service and public procurement can compare the skills level with the dynamic mean of their peers.

4.4 Limitations and further research

The results of this are coloured by the relative high participation rate in the whole survey of PSM professionals with the Netherlands nationality. The Dutch economy has a relative high share of service related value. Moreover, the Dutch population in this survey represents a larger part hailing from public procurement. The participants from Germany and France are more industry based PSM professionals. This may lead to a bias; however, the results are traceable per sector, per working level and per country.

This is the first European survey on purchasing skills of this scale, scope and this number of participants. The high amount of Dutch participants may possibly lead to a bias of features of Dutch cultural and structural distinctions. Nevertheless, this 500+ database is valuable; it will form the basis further analyses and publication. Two studies started from this research. The first is elaborating on the purchasing skills that lead to success in different sectors (industry, service and public procurement) per cluster (junior, senior and executive). It places these results within the context of the scientific literature. The second is focussing on the coherence of the general and PSM specific skills leading to success in implementing suppliers' innovations in the buyers' products or processes.

The Project PERFECT is a European, Erasmus+ funded project that finalises by September 2018. The project members have declared their intention to cooperate in the future. Extended plans to replicate the survey exist for instance. The survey will be adjusted to the latest insights. It is of the interest of industrial firms, service providers and public organisation as well as for institutes for higher education to keep track of the developments

within the purchasing and procurement function and accordingly the needed skills sets of the professionals in PSM.

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6. Appendices

6.1 Participants' ranking of their self-assessed competencies

Participants' ranking of their self-assessed 'Competency for the task' and their perception of the 'Importance of the task'

n=516; 5-point Likert-scale (1 is lowest and 5 is highest)

	Competency for the task	Mean	Std. Deviation	rank	Importance for the task	Mean	Std. Deviation
1	PSa_40_Honesty_c	3,84	,606	1	PSi_41_Honesty_i	4,32	,815
2	PSa_50_Loyalty_c	3,76	,653	2	HRI_111_CommUnSkills_i	4,19	,824
3	SOa_10_PurchKnow_c	3,75	,947	3	PSi_61_SocialManners_i	4,16	,825
4	PSa_210_ProblemSolving_c	3,65	,739	4	PSi_91_Proactivity_i	4,15	,782
5	PSa_10_Will2Learn_c	3,62	,670	5	PLi_31_CustOrient_i	4,15	,966
6	PSa_60_SocialManners_c	3,62	,723	6	PSi_51_Loyalty_i	4,14	,856
7	PSa_90_Proactivity_c	3,62	,745	7	PLi_41_SRM_i	4,14	,992
8	PSa_200_Conscientious_c	3,62	,680	8	PSi_211_ProblemSolving_i	4,14	,771
9	PSa_100_ResultDriven_c	3,59	,761	9	PSi_151_CustomerOrient_i	4,09	,922
10	PSa_150_CustomerOrient_c	3,59	,806	10	PSi_101_ResultDriven_i	4,06	,798
11	PLa_30_CustOrient_c	3,54	,881	11	PSi_161_Networking_i	4,05	,861
12	HRA_110_CommUnSkills_c	3,53	,779	12	PSi_11_Will2Learn_i	4,01	,867
13	PSa_220_Complexity_c	3,53	,749	13	PSi_201_Conscientious_i	4,01	,849
14	SOa_40_AddValue2Org_c	3,52	,889	14	PSi_221_Complexity_i	4,01	,806
15	PSa_130_AdviceSkills_c	3,52	,910	15	SOi_11_PurchKnow_i	3,93	,936
16	POa_50_EvalOffers_c	3,51	,958	16	PSi_131_AdviceSkills_i	3,91	,954
17	SOa_70_PosPurchInOrg_c	3,46	,908	17	PSi_71_SelfAssurance_i	3,91	,791
18	POa_20_RfQ_c	3,46	1,088	18	PSi_171_Persuasion_i	3,90	,868
19	HRA_90_TeamAbilSkills_c	3,45	,836	19	PSi_191_Empathy_i	3,85	,897
20	SOa_20_ProcMngt_c	3,44	,926	20	HRI_91_TeamAbilSkills_i	3,85	1,006
21	POa_80_OptimProcess_c	3,44	,994	21	SOi_41_AddValue2Org_i	3,84	,986
22	PLa_40_SRM_c	3,44	,891	22	PSi_81_Poise_i	3,84	,810
23	PSa_190_Empathy_c	3,43	,808	23	PSi_141_ConflictResolv_i	3,79	,919
24	PSa_160_Networking_c	3,43	,857	24	SOi_71_PosPurchInOrg_i	3,78	1,056
25	PSa_70_SelfAssurance_c	3,39	,753	25	POi_51_EvalOffers_i	3,78	1,114
26	SOa_80_CoopProduction_c	3,36	,932	26	SOi_81_CoopProduction_i	3,76	1,145
27	PSa_140_ConflictResolv_c	3,36	,864	27	SOi_141_CoopLegal_i	3,76	1,084
28	PSa_80_Poise_c	3,35	,773	28	POi_21_RfQ_i	3,65	1,246
29	POa_90_Negotiation_c	3,33	1,054	29	POi_81_OptimProcess_i	3,63	1,063
30	POa_130_SRM_c	3,32	1,005	30	POi_131_SRM_i	3,62	1,176
31	PSa_30_Creativity_c	3,32	,850	31	SOi_21_ProcMngt_i	3,60	,967
32	PSa_170_Persuasion_c	3,29	,856	32	PSi_31_Creativity_i	3,60	,985
33	PSa_20_HolisticThink_c	3,23	,921	33	POi_91_Negotiation_i	3,56	1,163
34	PSa_120_Inventiveness_c	3,23	,864	34	HRI_81_ProjMngtSkills_i	3,54	1,115
35	SOa_140_CoopLegala_c	3,21	,976	35	PSi_21_HolisticThink_i	3,51	1,027
36	HRA_120_CrossCultAwar_c	3,21	,975	36	PSi_121_Inventiveness_i	3,51	,906
37	HRA_80_ProjMngtSkills_c	3,18	,970	37	POi_111_ContrManagm_i	3,50	1,188
38	PLa_120_CategStratDev_c	3,16	1,119	38	POi_101_ContrDevelopm_i	3,46	1,123
39	PSa_110_Will2TakeRisks_c	3,16	,858	39	HRI_121_CrossCultAwar_i	3,46	1,189
40	POa_110_ContrManagm_c	3,15	1,021	40	COi_11_KPIdefining_i	3,44	1,087
41	POa_150_SupplEvaluat_c	3,15	1,030	41	PLi_121_CategStratDev_i	3,41	1,253
42	POa_100_ContrDevelopm_c	3,12	1,012	42	COi_21_PerformMeasure_i	3,39	1,094
43	COa_10_KPIdefining_c	3,07	,947	43	POi_11_Specify_i	3,38	1,257
44	COa_20_PerformMeasure_c	3,05	,944	44	PLi_61_MarkAnalys_i	3,36	1,200
45	POa_40_CostAnalys_c	3,03	1,037	45	POi_41_CostAnalys_i	3,35	1,201
46	POa_10_Specify_c	3,03	,978	46	POi_151_SupplEvaluat_i	3,34	1,134
47	POa_60_CSR_c	3,00	1,024	47	POi_61_CSR_i	3,32	1,151
48	PLa_60_MarkAnalys_c	2,98	1,024	48	PSi_111_Will2TakeRisks_i	3,29	,966
49	SOa_90_CoopQuality_c	2,98	,983	49	PLi_81_CommKnow_i	3,28	1,138

50	PLa_80_CommKnow_c	2,98	1,051	50	POi_141_SupplyRiskMg_i	3,28	1,193
51	COa_60_CostReducTechn_c	2,98	1,060	51	SOi_91_CoopQuality_i	3,27	1,206
52	POa_180_StratBusPartn_c	2,96	1,107	52	COi_61_CostReducTechn_i	3,27	1,216
53	SOa_60_CorpGov_c	2,94	1,047	53	POi_71_Sustainable_i	3,24	1,150
54	POa_140_SupplyRiskMg_c	2,90	1,005	54	PSi_181_SalesmanSkills_i	3,24	1,104
55	HRa_50_Leadership_c	2,89	1,144	55	SOi_61_CorpGov_i	3,23	1,175
56	PLa_50_Pooling_c	2,88	,990	56	POi_181_StratBusPartn_i	3,21	1,260
57	HRa_70_ChangeMngt_c	2,87	1,110	57	HRi_131_PersonalityDev_i	3,21	1,137
58	POa_30_GlobSourc_c	2,86	1,178	58	HRi_71_ChangeMngt_i	3,18	1,304
59	POa_160_SupplDevelop_c	2,85	1,066	59	PLi_51_Pooling_i	3,11	1,209
60	HRa_130_PersonalityDev_c	2,85	,922	60	SOi_51_StratMngt_i	3,10	1,317
61	PLa_130_MakeBuy_c	2,83	1,123	61	HRi_51_Leadership_i	3,09	1,421
62	COa_50_PortfolAnalySa_c	2,83	1,014	62	POi_161_SupplDevelop_i	3,09	1,186
63	HRa_60_TrainPersonneLa_c	2,82	1,194	63	PLi_101_InnoSourc_i	3,06	1,110
64	PSa_180_SalesmanSkills_c	2,80	1,002	64	COi_51_PortfolAnalys_i	3,04	1,179
65	SOa_110_CoopLogist_c	2,79	1,086	65	COi_71_eProcurement_i	3,04	1,190
66	POa_70_Sustainable_c	2,78	,957	66	POi_171_ESI_i	3,01	1,257
67	COa_30_StatAnalys_c	2,77	1,000	67	PLi_111_InnoImpl_i	3,01	1,175
68	POa_170_ESI_c	2,76	1,082	68	COi_81_Automation_i	3,00	1,161
69	SOa_50_StratMngt_c	2,76	1,199	69	SOi_31_TechKnow_i	2,99	1,115
70	SOa_30_TechKnow_c	2,72	,953	70	COi_31_StatAnalys_i	2,98	1,125
71	COa_70_eProcurement_c	2,72	1,090	71	HRi_61_TrainPersonneLi_i	2,92	1,362
72	COa_80_Automation_c	2,71	1,055	72	POi_31_GlobSourc_i	2,91	1,348
73	HRa_10_PolesProfiles_c	2,68	1,107	73	PLi_130_MakeBuy_i	2,90	1,346
74	SOa_120_CoopRD_c	2,66	1,090	74	POi_121_ClaimsManagm_i	2,88	1,226
75	POa_120_ClaimsManagm_c	2,65	1,061	75	HRi_101_SalesmanSkills_i	2,86	1,259
76	PLa_100_InnoSourc_c	2,63	,984	76	SOi_111_CoopLogist_i	2,83	1,326
77	PLa_10_Forecasting_c	2,60	,977	77	PLi_11_Forecasting_i	2,77	1,321
78	PLa_110_InnoImpl_c	2,58	1,033	78	SOi_121_CoopRD_i	2,73	1,329
79	HRa_100_SalesmanSkills_c	2,55	,991	79	COi_41_BigDataAnalys_i	2,71	1,175
80	SOa_130_CoopHRM_c	2,53	,990	80	PLi_71_SCAnalys_i	2,70	1,158
81	HRa_20_PersSelection_c	2,52	1,131	81	PLi_91_TechPlan_i	2,66	1,112
82	PLa_70_SCAnalys_c	2,50	,994	82	HRi_11_RolesProfiles_i	2,66	1,286
83	PLa_90_TechPlan_c	2,49	,998	83	HRi_41_EmplPerfMeas_i	2,57	1,357
84	SOa_100_CoopMarketing_c	2,46	1,005	84	HRi_21_PersSelection_i	2,56	1,380
85	PLa_20_ERP_c	2,41	,982	85	SOi_131_CoopHRM_i	2,53	1,186
86	HRa_30_EmplDevelop_c	2,41	1,101	86	HRi_31_EmplDevelop_i	2,50	1,350
87	HRa_40_EmplPerfMeas_c	2,40	1,101	87	SOi_101_CoopMarketing_i	2,45	1,240
88	COa_40_BigDataAnalys_c	2,19	,978	88	PLi_21_ERP_i	2,44	1,258
	average	3,07			average	3,39	

6.2 Codebook

PLa_10_Forecasting_c	Forecasting demand - competence
PLa_20_ERP_c	ERP - competence
PLa_30_CustOrient_c	Customer orientation - competence
PLa_40_StakeholdRelMgmt_c	Stakeholder Rel. Mgmt - competence
PLa_50_Pooling_c	Pooling Planning - competence
PLa_60_MarkAnalys_c	Supply Market Analysis - competence
PLa_70_SCAnalys_c	Supply Chain Analysis - competence
PLa_80_CommKnow_c	Commodity knowledge - competence
PLa_90_TechPlan_c	Technology planning - competence
PLa_100_InnoSourc_c	Innovation sourcing - competence
PLa_110_InnoImpla_c	Innovation implementation - competence
PLa_120_CategStratDev_c	Category strat. developm - competence
PLa_130_MakeBuy_c	Make or Buy? - competence
SOa_10_PurchKnow_c	Purchasing knowledge - competence

SOa_20_ProcMngt_c	Process Management - competence
SOa_30_TechKnow_c	Technical knowledge - competence
SOa_40_AddValue2Org_c	Adding value with Purchasing - competence
SOa_50_StratMngt_c	Strategic management - competence
SOa_60_CorpGov_c	Corporate governance - competence
SOa_70_PosPurchInOrg_c	Position of purchasing in org - competence
SOa_80_CoopProduction_c	Cooperation Production - competence
SOa_90_CoopQuality_c	Cooperation Quality - competence
SOa_100_CoopMarketing_c	Cooperation Marketing - competence
SOa_110_CoopLogist_c	Cooperation Logistics - competence
SOa_120_CoopRD_c	Cooperation R&D - competence
SOa_130_CoopHRM_c	Cooperation HRM - competence
SOa_140_CoopLegal_c	Cooperation Legal - competence
POa_10_Specify_c	Specify requirem. of supplies - competence
POa_20_RfQ_c	RfQ - competence
POa_30_GlobSourc_c	Global Sourcing - competence
POa_40_CostAnalys_c	Cost analysis - competence
POa_50_EvalOffers_c	Evaluate offers - competence
POa_60_CSR_c	CSR - competence
POa_70_Sustainable_c	Sustainability - competence
POa_80_OptimProcess_c	Optimisation of purch process - competence
POa_90_Negotiation_c	Negotiation - competence
POa_100_ContrDevelopm_c	Contract development - competence
POa_110_ContrManagm_c	Contract management - competence
POa_120_ClaimsManagm_c	Claims management - competence
POa_130_SupplierRelMngt_c	Supplier relation mngt - competence
POa_140_SupplyRiskMg_c	Supply risk mngt - competence
POa_150_SupplEvaluat_c	Supplier evaluation - competence
POa_160_SupplDevelop_c	Supplier development - competence
POa_170_ESI_c	Early supplier involvem - competence
POa_180_StratBusPartn_c	Strategic business partn - competence
HRa_10_RolesProfiles_c	Defining purch role - competence
HRa_20_PersSelection_c	Personnel selection - competence
HRa_30_EmplDevelop_c	Employee developm - competence
HRa_40_EmplPerfMeas_c	Employee perform. measure - competence
HRa_50_Leadership_c	Leadership - competence
HRa_60_TrainPersonnel_c	Training staff - competence
HRa_70_ChangeMngt_c	Change mngt - competence
HRa_80_ProjMngtSkills_c	Project mngt - competence
HRa_90_TeamAbilSkills_c	Team ability - competence
HRa_100_SalesKnowledge_c	Sales knowledge- competence
HRa_110_CommuniSkills_c	Communication - competence
HRa_120_CrossCultAwar_c	Cross-cultural aware - competence
HRa_130_PersonalityDev_c	Personal developm - competence
COa_10_KPIdefining_c	KPI defining - competence
COa_20_PerformMeasure_c	Performance measure - competence
COa_30_StatAnalys_c	Statistical analysis - competence

COa_40_BigDataAnalys_c	Big data analysis - competence
COa_50_PortfolAnalys_c	Portfolio analysis - competence
COa_60_CostReducTechn_c	Cost reduction techn - competence
COa_70_eProcurement_c	Procurement IT systems - competence
COa_80_Automation_c	Automation of purch proc - competence
PSa_10_Will2Learn_c	Learning motivation - competence
PSa_20_HolisticThink_c	Holistic thinking - competence
PSa_30_Creativity_c	Creativity - competence
PSa_40_Honesty_c	Honesty - competence
PSa_50_Loyalty_c	Loyalty - competence
PSa_60_SocialManners_c	Social manners - competence
PSa_70_SelfAssurance_c	Self-assurance - competence
PSa_80_Poise_c	Poise/confidence - competence
PSa_90_Proactivity_c	Proactivity - competence
PSa_100_ResultDriven_c	Result driven - competence
PSa_110_Will2TakeRisks_c	Will to take risks - competence
PSa_120_Inventiveness_c	Inventiveness - competence
PSa_130_AdviceSkills_c	Advice skills - competence
PSa_140_ConflictResolv_c	Conflict resolution - competence
PSa_150_CustomerOrient_c	Customer orientation - competence
PSa_160_Networking_c	Networking - competence
PSa_170_Persuasion_c	Persuasion - competence
PSa_180_SalesmanSkills_c	Salesman skills - competence
PSa_190_Empathy_c	Empathy - competence
PSa_200_Conscientious_c	Conscientiousness - competence
PSa_210_ProblemSolving_c	Problem solving - competence
PSa_220_Complexity_c	Complexity - competence

6.1 Bonferroni posthoc test – personal information

Multiple Comparisons – personal information

Bonferroni

Dependent Variable	(I) cluster PLa-COa minus 2 items multicollinearity	(J) cluster PLa-COa minus 2 items multicollinearity	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
My workplace is based in this country (most of the time):	1 senior	2 junior	,523	,697	1,000	-1,15	2,20
		3 executive	-,576	,745	1,000	-2,36	1,21
	2 junior	1 senior	-,523	,697	1,000	-2,20	1,15
		3 executive	-1,099	,857	,601	-3,16	,96
		3 executive	1 senior	,576	,745	1,000	-1,21
My	1 senior	2 junior	1,099	,857	,601	-,96	3,16
		2 junior	1,078	,645	,285	-,47	2,63

nationality is (country):		3 executive	,375	,688	1,000	-1,28	2,03
	2 junior	1 senior	-1,078	,645	,285	-2,63	,47
		3 executive	-,703	,792	1,000	-2,61	1,20
	3 executive	1 senior	-,375	,688	1,000	-2,03	1,28
2 junior		,703	,792	1,000	-1,20	2,61	
My working level is:	1 senior	2 junior	,691*	,086	,000	,48	,90
		3 executive	-,394*	,092	,000	-,61	-,17
	2 junior	1 senior	-,691*	,086	,000	-,90	-,48
		3 executive	-1,084*	,106	,000	-1,34	-,83
	3 executive	1 senior	,394*	,092	,000	,17	,61
		2 junior	1,084*	,106	,000	,83	1,34
My highest completed educational level is:	1 senior	2 junior	-,295*	,114	,030	-,57	-,02
		3 executive	,085	,122	1,000	-,21	,38
	2 junior	1 senior	,295*	,114	,030	,02	,57
		3 executive	,380*	,140	,021	,04	,72
	3 executive	1 senior	-,085	,122	1,000	-,38	,21
		2 junior	-,380*	,140	,021	-,72	-,04
I studied this discipline:	1 senior	2 junior	-2,027	1,181	,260	-4,86	,81
		3 executive	1,716	1,261	,523	-1,31	4,75
	2 junior	1 senior	2,027	1,181	,260	-,81	4,86
		3 executive	3,743*	1,450	,030	,26	7,23
	3 executive	1 senior	-1,716	1,261	,523	-4,75	1,31
		2 junior	-3,743*	1,450	,030	-7,23	-,26
I have this many years of experience in the purchasing profession:	1 senior	2 junior	3,977*	,832	,000	1,98	5,97
		3 executive	-5,801*	,888	,000	-7,93	-3,67
	2 junior	1 senior	-3,977*	,832	,000	-5,97	-1,98
		3 executive	-9,778*	1,021	,000	-12,23	-7,32
	3 executive	1 senior	5,801*	,888	,000	3,67	7,93
		2 junior	9,778*	1,021	,000	7,32	12,23

*. The mean difference is significant at the 0.05 level.

6.2 Bonferroni posthoc test – purchasing successes

Multiple Comparisons – purchasing successes

Bonferroni

Dependent Variable	(I) cluster PLA-COa minus 2 items multicollinearity	(J) cluster PLA-COa minus 2 items multicollinearity	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
Due to my actions we achieved higher than average cost reductions.	1 senior	2 junior	,459*	,089	,000	,25	,67
		3 executive	-,217	,095	,069	-,45	,01
	2 junior	1 senior	-,459*	,089	,000	-,67	-,25
		3 executive	-,676*	,110	,000	-,94	-,41
	3 executive	1 senior	,217	,095	,069	-,01	,45
		2 junior	,676*	,110	,000	,41	,94
Due to my actions we achieved a higher than average level of quality	1 senior	2 junior	,247*	,077	,004	,06	,43
		3 executive	-,182	,082	,078	-,38	,01
	2 junior	1 senior	-,247*	,077	,004	-,43	-,06
		3 executive	-,429*	,094	,000	-,65	-,20
	3 executive	1 senior	,182	,082	,078	-,01	,38
		2 junior	,429*	,094	,000	,20	,65
Due to my actions we achieved a higher than average level of sustainability.	1 senior	2 junior	,034	,088	1,000	-,18	,24
		3 executive	-,401*	,094	,000	-,63	-,18
	2 junior	1 senior	-,034	,088	1,000	-,24	,18
		3 executive	-,435*	,108	,000	-,69	-,18
	3 executive	1 senior	,401*	,094	,000	,18	,63
		2 junior	,435*	,108	,000	,18	,69
Due to my actions, we improved the supply delivery process.	1 senior	2 junior	,209*	,085	,042	,01	,41
		3 executive	-,263*	,090	,011	-,48	-,05
	2 junior	1 senior	-,209*	,085	,042	-,41	-,01
		3 executive	-,472*	,104	,000	-,72	-,22
	3 executive	1 senior	,263*	,090	,011	,05	,48
		2 junior	,472*	,104	,000	,22	,72
Due to my actions product and process improvements have been implemented	1 senior	2 junior	,520*	,089	,000	,31	,73
		3 executive	-,157	,095	,290	-,38	,07
	2 junior	1 senior	-,520*	,089	,000	-,73	-,31
		3 executive	-,677*	,109	,000	-,94	-,42
	3 executive	1 senior	,157	,095	,290	-,07	,38
		2 junior	,677*	,109	,000	,42	,94
Due to my actions, my organisation obtained long-term competitive advantage.	1 senior	2 junior	,401*	,085	,000	,20	,61
		3 executive	-,204	,091	,075	-,42	,01
	2 junior	1 senior	-,401*	,085	,000	-,61	-,20
		3 executive	-,605*	,104	,000	-,86	-,35
	3 executive	1 senior	,204	,091	,075	-,01	,42
		2 junior	,605*	,104	,000	,35	,86
Due to my actions the relationship with our most important supplier(s) is (are) improved significantly.	1 senior	2 junior	,281*	,081	,002	,09	,48
		3 executive	-,094	,087	,833	-,30	,11
	2 junior	1 senior	-,281*	,081	,002	-,48	-,09
		3 executive	-,376*	,100	,001	-,61	-,14
	3 executive	1 senior	,094	,087	,833	-,11	,30
		2 junior	,376*	,100	,001	,14	,61

*. The mean difference is significant at the 0.05 level.

6.3 Bonferroni posthoc test – purchasing roles

Multiple Comparisons –purchasing roles

Bonferroni

Dependent Variable	(I) cluster PLa-COa minus 2 items multicollinearity	(J) cluster PLa-COa minus 2 items multicollinearity	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
Operative buyer	1 senior	2 junior	-,067	,083	1,000	-,27	,13
		3 executive	,130	,089	,432	-,08	,34
	2 junior	1 senior	,067	,083	1,000	-,13	,27
Direct materials purchaser - sourcing for production	1 senior	2 junior	,032	,094	1,000	-,19	,26
		3 executive	-,073	,100	1,000	-,31	,17
	2 junior	1 senior	-,032	,094	1,000	-,26	,19
Indirect materials purchaser - investments	1 senior	2 junior	-,048	,080	1,000	-,24	,14
		3 executive	-,042	,085	1,000	-,25	,16
	2 junior	1 senior	-,048	,080	1,000	-,24	,14
Indirect materials purchaser - maintenance repair operations	1 senior	2 junior	-,161	,070	,064	-,33	,01
		3 executive	-,104	,074	,483	-,28	,07
	2 junior	1 senior	,161	,070	,064	-,01	,33
Indirect materials purchaser - services	1 senior	2 junior	-,018	,100	1,000	-,26	,22
		3 executive	-,065	,107	1,000	-,32	,19
	2 junior	1 senior	,018	,100	1,000	-,22	,26
Category (group) manager	1 senior	2 junior	,146	,111	,567	-,12	,41
		3 executive	-,106	,119	1,000	-,39	,18
	2 junior	1 senior	-,146	,111	,567	-,41	,12
Chief Purchasing Officer (CPO)	1 senior	2 junior	,209	,115	,207	-,07	,48
		3 executive	-,946*	,122	,000	-1,24	-,65
	2 junior	1 senior	-,209	,115	,207	-,48	,07
Compliance officer in purchasing	1 senior	2 junior	-,085	,076	,801	-,27	,10
		3 executive	-,316*	,082	,000	-,51	-,12
	2 junior	1 senior	,085	,076	,801	-,10	,27
Contract manager / legal	1 senior	2 junior	,053	,112	1,000	-,22	,32
		3 executive	-,024	,120	1,000	-,31	,26
	2 junior	1 senior	-,053	,112	1,000	-,32	,22
Controller	1 senior	2 junior	,025	,053	1,000	-,10	,15
		3 executive	,015	,056	1,000	-,12	,15
	2 junior	1 senior	-,025	,053	1,000	-,15	,10
		3 executive	-,010	,065	1,000	-,17	,15

	3 executive	1 senior 2 junior	-,015 ,010	,056 ,065	1,000 1,000	-,15 -,15	,12 ,17
Procurement Engineer	1 senior	2 junior 3 executive	,052 -,129	,078 ,083	1,000 ,358	-,13 -,33	,24 ,07
	2 junior	1 senior 3 executive	-,052 -,181	,078 ,095	1,000 ,173	-,24 -,41	,13 ,05
	3 executive	1 senior 2 junior	,129 ,181	,083 ,095	,358 ,173	-,07 -,05	,33 ,41
	eProcurement specialist	1 senior	2 junior 3 executive	-,018 -,196*	,069 ,074	1,000 ,025	-,18 -,37
	2 junior	1 senior 3 executive	,018 -,178	,069 ,085	1,000 ,112	-,15 -,38	,18 ,03
	3 executive	1 senior 2 junior	,196* ,178	,074 ,085	,025 ,112	,02 -,03	,37 ,38
Supply Chain Finance	1 senior	2 junior 3 executive	,021 -,054	,037 ,040	1,000 ,534	-,07 -,15	,11 ,04
	2 junior	1 senior 3 executive	-,021 -,075	,037 ,046	1,000 ,306	-,11 -,18	,07 ,03
	3 executive	1 senior 2 junior	,054 ,075	,040 ,046	,534 ,306	-,04 -,03	,15 ,18
	HR agent	1 senior	2 junior 3 executive	,006 ,012	,020 ,022	1,000 1,000	-,04 -,04
	2 junior	1 senior 3 executive	-,006 ,006	,020 ,025	1,000 1,000	-,05 -,05	,04 ,07
	3 executive	1 senior 2 junior	-,012 -,006	,022 ,025	1,000 1,000	-,06 -,07	,04 ,05
Logistics	1 senior	2 junior 3 executive	-,012 -,138	,065 ,070	1,000 ,147	-,17 -,30	,14 ,03
	2 junior	1 senior 3 executive	,012 -,125	,065 ,080	1,000 ,356	-,14 -,32	,17 ,07
	3 executive	1 senior 2 junior	,138 ,125	,070 ,080	,147 ,356	-,03 -,07	,30 ,32
	Public Procurement	1 senior	2 junior 3 executive	-,574* -,161	,160 ,171	,001 1,000	-,96 -,57
	2 junior	1 senior 3 executive	,574* ,413	,160 ,197	,001 ,108	,19 -,06	,96 ,89
	3 executive	1 senior 2 junior	,161 -,413	,171 ,197	1,000 ,108	-,25 -,89	,57 ,06
Supply Risk manager	1 senior	2 junior 3 executive	,049 -,289*	,066 ,070	1,000 ,000	-,11 -,46	,21 -,12
	2 junior	1 senior 3 executive	-,049 -,338*	,066 ,081	1,000 ,000	-,21 -,53	,11 -,14
	3 executive	1 senior 2 junior	,289* ,338*	,070 ,081	,000 ,000	,12 ,14	,46 ,53
	Sourcing Analyst	1 senior	2 junior 3 executive	,071 -,306*	,074 ,079	1,000 ,000	-,11 -,50
	2 junior	1 senior 3 executive	-,071 -,376*	,074 ,091	1,000 ,000	-,25 -,60	,11 -,16
	3 executive	1 senior 2 junior	,306* ,376*	,079 ,091	,000 ,000	,11 ,16	,50 ,60
Supplier Development engineer	1 senior	2 junior 3 executive	,078 -,258*	,060 ,065	,585 ,000	-,07 -,41	,22 -,10
	2 junior	1 senior 3 executive	-,078 -,337*	,060 ,074	,585 ,000	-,22 -,52	,07 -,16
	3 executive	1 senior 2 junior	,258* ,337*	,065 ,074	,000 ,000	,10 ,16	,41 ,52
	Systems & Strategy	1 senior	2 junior 3 executive	,171 -,408*	,109 ,116	,349 ,001	-,09 -,69
	2 junior	1 senior 3 executive	-,171 -,579*	,109 ,134	,349 ,000	-,43 -,90	,09 -,26
	3 executive	1 senior 2 junior	,408* ,579*	,116 ,134	,001 ,000	,13 ,26	,69 ,90
Other	1 senior	2 junior 3 executive	-,019 -,218	,096 ,103	1,000 ,103	-,25 -,47	,21 ,03
	2 junior	1 senior 3 executive	,019 -,199	,096 ,118	1,000 ,279	-,21 -,48	,25 ,09
	3 executive	1 senior 2 junior	,218 ,199	,103 ,118	,103 ,279	-,03 -,09	,47 ,48

*. The mean difference is significant at the 0.05 level.

6.4 Competencies leading to different purchasing successes

COSTS SUCCESS – ‘Due to my actions we achieved higher than average cost reductions.’
Cost Reduction Techniques - Act of cutting costs to improve profitability (e.g. by analysis and statistics)
Negotiation the Specific Terms - To make a contract the specific commercial and legal terms need to be settled in a satisfactory way for your organisation.
Pooling Planning and Organising - Pooling is to bundle the entire demand of the (group of) organisation(s). Pooling requires careful planning, demand identification and the application of organisational solutions (lead
Defining Purchasing Roles and Job Profiles - The different roles of purchasers and job profiles.
Leadership - Managing employees in teams.
Willingness to take risks
Technical knowledge of products and production systems - Understanding the technical aspects of the own products and production processes.
Make or Buy Decisions - Choosing between manufacturing a product in-house or purchasing it from an external supplier.
QUALITY SUCCESS – ‘Due to my actions we achieved a higher than average level of quality.’
Innovation Implementation - Implementing suppliers innovations in the own organization.
Inventiveness - Being imaginativeness.
Contract Management - Monitoring and enforcing the contracts when they have been signed.
Global Sourcing / Supplier Acquisition - Sourcing materials, processes, designs, technologies and suppliers from global market / acquiring new global suppliers.
Technical knowledge of products and production systems - Understanding the technical aspects of the own products and production processes.
Cross-cultural Awareness Skills - The ability to become aware of cultural values, beliefs and perceptions of yourself and other cultures.
Working together with the Legal department - Knowing basics about legal aspects, like contracts, compliance and legal consequences and knowing how to establish/maintain the relationship.
Working together with the department Research and Development - Knowing basics about Research & Development and knowing how to establish/maintain the relationship.
SUSTAINABILITY SUCCESS – ‘Due to my actions we achieved a higher than average level of sustainability.’
Sustainability - Sustainable purchasing: considering environmental, social, ethical and economic issues in the management of the organization’s external resources.

Solicit Offers (RfQ / RfP / Rfl) Request for Quotation (RfQ) / Proposal (RfP) / Information (Rfl) - Inviting suppliers to submit a bid, which meets the requirements as laid down in the request.
Innovation Implementation - Implementing suppliers innovations in the own organization.
Negotiation the Specific Terms - To make a contract the specific commercial and legal terms need to be settled in a satisfactory way for your organisation.
Working together with the Legal department - Knowing basics about legal aspects, like contracts, compliance and legal consequences and knowing how to establish/maintain the relationship.
Making cost analyses - For example: calculation of the total costs of ownership or other cost calculations.
Supplier Development - Collaboration with suppliers to improve their processes and product capabilities.
Supply Risk Management - The implementation of strategies to manage both every day and exceptional risks along the supply chain to deal with risks and uncertainties caused by, or impacting on, logistics related
Cross-cultural Awareness Skills - The ability to become aware of cultural values, beliefs and perceptions of yourself and other cultures.
Project Management Skills - The discipline of initiating, planning, executing, controlling, and closing the work of a team to meet specific goals.
DELIVERY SUCCESS – ‘Due to my actions we improved the supply delivery process.’
Working together with the department Logistics and Storage - Knowing basics about Logistics and Storage and knowing how to establish/maintain the relationship.
Cost Reduction Techniques - Act of cutting costs to improve profitability (e.g. by analysis and statistics)
Corporate Governance - Knowledge on how organisations are governed, including board, role of advisory board, stakeholders etc.
Global Sourcing / Supplier Acquisition - Sourcing materials, processes, designs, technologies and suppliers from global market / acquiring new global suppliers.
Solicit Offers (RfQ / RfP / Rfl) Request for Quotation (RfQ) / Proposal (RfP) / Information (Rfl) - Inviting suppliers to submit a bid, which meets the requirements as laid down in the request.
Supplier Relationship Management - The ongoing management of the suppliers after contracting / strategically planning for, and managing, all interactions with suppliers.
Working together with the department Research and Development - Knowing basics about Research & Development and knowing how to establish/maintain the relationship.
Self-assurance - Being assertive and having self-esteem.
Supply Chain Analysis and Planning - Analysis and planning not only of the immediate supply market, but consideration of the entire supply chain.
Technical knowledge of products and production systems - Understanding the technical aspects of the own products and production processes.
Automation - Working on the automation of purchasing processes.
Ability to Solve Problems

Conscientiousness - Being trustworthy in professional life
Project Management Skills - The discipline of initiating, planning, executing, controlling, and closing the work of a team to meet specific goals.
INNOVATION SUCCESS – ‘Due to my actions product and process improvements have been implemented.’
Managing change processes - The ability to lead a team or group through a change process.
Technical knowledge of products and production systems - Understanding the technical aspects of the own products and production processes.
Inventiveness - Being imaginativeness.
Innovation Implementation - Implementing suppliers innovations in the own organization.
Cross-cultural Awareness Skills - The ability to become aware of cultural values, beliefs and perceptions of yourself and other cultures.
Evaluate Offers & Supplier Selection - Knowledge on how to ensure that purchasing plays an adequate role in the organisation.
Innovation Sourcing - External scan. This requires a systematic scan of the solutions available on the supply market.
LONG-TERM COMPETITIVE SUCCESS – ‘Due to my actions my organisation obtained long-term competitive advantage.’
Strategic Business Partner - The process of becoming a strategic (business) partner with your supplier.
Supply Market Analysis Analysis of the supply market i.e. the suppliers of a good and their properties / relationships to each other. Analysis of competitive pressure and market power.
Sustainability - Sustainable purchasing: considering environmental, social, ethical and economic issues in the management of the organization’s external resources.
Add Value to the Organisation - Knowledge on the added value of purchasing to the organisation / importance of purchasing to the organisation.
Solicit Offers (RfQ / RfP / RfI) Request for Quotation (RfQ) / Proposal (RfP) / Information (RfI) - Inviting suppliers to submit a bid, which meets the requirements as laid down in the request.
Global Sourcing / Supplier Acquisition - Sourcing materials, processes, designs, technologies and suppliers from global market / acquiring new global suppliers.
Poise - Being (self) confident.
Technical knowledge of products and production systems - Understanding the technical aspects of the own products and production processes.
Working together with the department Marketing Management - Knowing basics about Marketing Management (or Public Relations) and knowing how to establish/maintain the relationship.
SUPPLIER SATISFACTION SUCCESS – ‘Due to my actions we achieved a higher supplier satisfaction.’
Supplier Relationship Management - The ongoing management of the suppliers after contracting / strategically planning for, and managing, all interactions with suppliers.

Early Supplier Involvement - Inviting the supplier in the new product development process from a very early stage.
Leadership - Managing employees in teams.
Procurement IT Systems / e-procurement applications - Having knowledge on the working of a computerized designed e-procurement system.
Enterprise Resource Planning - Material Requirements Planning / Advanced Planning and Scheduling / IT skills necessary to extract planning data from an ERP system.
Commodity and Domain Specific Knowledge - Knowledge on a special purchasing domain, e.g. different industries, services, construction, purchasing of health etc.
Claims Management - Claims management is dealing with opportunistic suppliers who tend to increase their margin with extra work apart from the contract. The negotiated price is obviously too low and the margin
Big Data Analysis Uncovering hidden patterns, correlations and other insights from large amounts of data using specific statistical big data analyses methods.
Performance Measurement and Follow-up - Continuous monitoring of target achievement, incl. project controlling (Performance of suppliers is part of supplier evaluation).