

## Proper skills of procurement professionals

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### Summary

As part of standing up a purchasing concentration within the SCM undergraduate degree at the University of North Texas, we surveyed purchasing professionals in the Dallas-Fort Worth Metroplex about the importance of various knowledge, skills, and abilities (KSAs) to identify new content that needed to be added to meet the needs of purchasing professionals. KSAs are ranked by proficiency needs and differences between entry-level and experienced supply management employees are explored. Other universities may utilize the results to consider adding purchasing specializations, tracks, or concentrations to their degrees and to better match the content of those courses to the needs of purchasing professionals.

**Keywords or phrases:** supply management, purchasing skills, purchasing degree, knowledge

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### Introduction

In his 1983 article, Peter Kraljic stated, “... *many purchasing managers’ skills and outlooks were formed 20 years ago ... To meet the demands of the new supply strategy, the company must also upgrade the skills and experience it requires of purchasing people ... An attitude of “purchasing as usual” will make the company vulnerable to competitive pressure ...*” Even though progress has certainly been made, could the same be said today? What are the current knowledge, skills, and abilities (KSAs) required of purchasing professionals today? How much demand is there for purchasing professionals with those skills? How do those requirements change at various stages of a career in purchasing? These are some of the research questions we sought to answer as part of standing up a purchasing concentration within the Supply Chain Management undergraduate degree at the University of North Texas.

At the University of North Texas, a Carnegie Tier 1 research institution with more than 44,000 students, we have historically had two Supply Chain Management degrees. One of which was a Logistics and Supply Chain Management degree that evolved within the Marketing department and one of which was an Operations and Supply Management degree inside the Management department. Several years ago, we merged these two degrees into what then became the Marketing, Logistics, and Operations Management department. More recently the Logistics and Operations Management part was split off into its own department. Starting in Fall 2024, the two separate degrees will be merged into one Supply Chain Management degree with a track or concentration for Logistics, a track or concentration for Operations Management, an Aviation Logistics track, and a proposed track in Purchasing.

Prior to this newly merged degree with tracks, students have placed in purchasing jobs but only had one purchasing class (the introductory level class required of all of our supply chain management-related students), while logistics students and operations management students had multiple classes focusing on their functional areas. Thus, we felt that the students taking

purchasing jobs were not as prepared for those jobs as they could or should have been. Additionally, the local DFW Metroplex market, with a population of over 7.6 million, has over 20 competing schools of higher education (university and community colleges; public and private) none of which offer a formal purchasing degree. Consequently, we are excited about this opportunity to stand up a purchasing-specific track within our newly merged supply chain management degree to meet local demand.

## **Literature Review**

The evolution of purchasing and supply management (PSM) skills over the years reflects the shifting landscape of global business practices, technological advancements, and the strategic importance of the purchasing function. The literature from various scholars and researchers provides a rich tapestry of insights into what constitutes world-class purchasing skills, how these skills are developed, and their impact on organizational success. Some of the key publications are briefly mentioned below.

- Giunipero and Percy (2000) initiated the discussion by identifying key competencies that define world-class purchasing professionals, emphasizing strategic thinking, negotiation skills, and the ability to manage relationships both internally and with suppliers. Their empirical investigation underlines the importance of continuous learning and adaptability in a rapidly changing business environment.
- Feisel, Hartmann, and Schober (2007) looked into the future of purchasing professionals, positing that evolving business models and technological advancements will require a new set of competencies, including digital literacy, sustainability awareness, and innovation management.
- Zheng et al. (2007) contributed to the discourse by analyzing future directions in PSM research, pointing out the need for empirical studies that link purchasing skills directly to organizational performance outcomes, thus providing a clearer roadmap for skill development.
- Humphreys, McIvor, and McAleer (2000); Tassabehji and Moorhouse (2008); and Tu and Knight (2012) examined the changing role of procurement, suggesting that the function is moving away from transactional activities towards a more strategic role that contributes to a competitive advantage and value creation.
- Stinenbosch (2017), Bals et al. (2019), and Klézl et al. (2018 & 2022) delved into the specific competencies required in the job market, using job advertisements and industry surveys to pinpoint the most sought-after skills. Their findings consistently emphasize the importance of strategic sourcing, category management, and stakeholder engagement.
- Karttunen (2018) extended this discussion through a comprehensive literature review, identifying a broad set of skills ranging from technical expertise in procurement processes to soft skills such as communication and teamwork. Karttunen's analysis suggests a growing convergence between traditional purchasing skills and broader business acumen, highlighting the need for purchasing professionals to possess a strategic outlook towards supply chain management.
- Stek and Schiele (2021) focused on the educational and training aspects necessary for developing successful supply managers. They argue for a curriculum that balances theoretical knowledge with practical application, ensuring that purchasing professionals are well-equipped to handle the complexities of modern supply chains.

- Delke, Buchholz, and Schiele (2022); Kim and Kwon (2019); and Zhang (2018) explored the impact of technological advancements, such as Industry 4.0, on purchasing skills, underscoring the need for digital skills, data analytics proficiency, and the ability to manage technological innovations within the supply chain.
- Marton (2023) provided a case study in the automotive industry, showcasing how Industry 4.0 is reshaping purchasing roles and skills, with a particular focus on digital transformation, supplier collaboration, and risk management.

This literature collectively illustrates a dynamic field where purchasing and supply management professionals must continually evolve their skill sets to meet current and future challenges. The emphasis is on strategic, technological, and interpersonal skills that enable professionals to navigate complex global supply chains, foster innovation, and contribute to sustainable business practices.

### **Methodology**

Data were collected via online, anonymous survey. The survey instrument was reviewed and approved by the Institutional Review Board at the University of North Texas. Measurement of knowledge, skills, and abilities (KSA) was conducted using scales adapted from Gammelgaard and Larson (2001). The specific KSAs examined were compiled from multiple sources. First, the literature was canvassed to develop a list of KSAs both (a) previously measured (Gammelgaard and Larson, 2001) and (b) theoretically identified from a literature review as important to the discipline of supply management (Karttunen, 2018). Second, the essential competencies published by the Institute for Supply Management in the “ISM Mastery Model” (ISM, n.d.) were used to supplement the list of KSAs from the literature. The compilation of KSAs from these sources resulted in a list of 51 KSAs. The unit of analysis for the survey was a supply management professional working in the Dallas-Fort Worth (DFW) Metroplex comprised of 405 zip codes representing 13 counties around Dallas and Fort Worth, Texas. Respondents were asked to answer the survey questions based on the needed KSAs at their employing firm.

### *Pretest*

As a pretest of the survey, we sought input from the stakeholder communities and from academics. Three academicians and two practicing supply managers reviewed the survey. Feedback was solicited regarding whether the survey items: (1) were unambiguous, (2) were simple to understand, (3) were consistently interpretable (Dillman, 2000), and (4) fully represented the essential KSAs needed by supply management professionals. The feedback was used to improve the instructions and item wording where necessary.

### *Pilot Test*

The survey was first pilot tested on a subset of the sample. It was distributed via email to 100 supply management professionals. These individuals were identified by a list of supply management professionals acquired from a marketing research firm. The representatives were senior supply management leaders at the level of manager or above classified by the marketing research firm as working in the domains of: procurement, purchasing, sourcing, buyer, contracting, category manager, or supply manager. The population was constrained to firms and public procurement organizations with 50 or more employees and to supply management professionals working in the DFW Metroplex. Fifteen email addresses were identified as invalid. One follow-up reminder was sent. Of the 100 invited, nine responded resulting in a response rate of 10.6 percent. There were no indicators of survey fatigue, and no comments

were offered regarding the validity of the survey instrument. As such, no changes were made to the survey, and the nine responses were retained in the full sample (below)

### *Sample*

The online survey invitation was then presented to 1,534 additional supply management professionals from the same list used for the pilot test. Fifty-four potential respondents were not reached due to organizational server policies that rejected the survey invitation email. An additional 332 emails were invalid. Thus, 1,302 supply management professionals were invited to participate in the study. After the initial deployment, follow-up reminders were sent two times. We received 54 usable responses resulting in a response rate of 4.3 percent. Of the 84 potential respondents who accessed the survey, 25 stopped at the first question (a matrix of 51 KSAs) suggesting that survey length may have been a deterrent. Nevertheless, the sample demographics show representation across many dimensions such as firm size, industry, number of direct reports, and duty titles.

### *Results of proficiency needs*

Table 1 shows the KSAs for new hires ranked in order of their need for more proficiency for both the new hires (in rank order) and for the existing employees.

### *Differences between needs of new hires and needs of existing employees*

There are significant differences in the needed KSAs between new hires and existing employees. The needs for existing employees was significantly higher than that for new hires in the following KSAs: sourcing organization metrics (means NH: 4.11; EX: 4.98,  $p = .02$ ) innovation in sourcing (means NH: 4.33; EX: 5.67,  $p < .001$ ), foreign currency risk management (means NH: 2.87; EX: 3.58,  $p = .02$ ), change management (means NH: 4.83; EX: 5.83,  $p < .01$ ), sourcing leadership and management (means NH: 5.24; EX: 6.48,  $p < .01$ ) sourcing information technology (means NH: 4.76; EX: 5.67,  $p < .02$ ), and supply segmentation/portfolio analysis (means NH: 4.09; EX: 5.15,  $p < .01$ ). There was only one KSA that was needed more for new hires than for existing employees, communication (means NH: 7.39; EX: 6.8,  $p < .05$ ).

### *Factor Analysis*

In an effort to better understand how the various KSAs grouped together to help in determining how many and which classes should be incorporated into, we performed an exploratory factor analysis. The results of that analysis are shown in Table 2.

### *General support for a concentration in supply management*

In addition to providing feedback about the need for more proficiency in the various KSAs, survey respondents were also asked about their general level of support for a concentration or track in supply management and its students. Table 3 summarizes their responses.

We were pleased to see that a combined 83 percent of respondents answered yes or maybe to the question about whether their organization would be interested in hiring undergraduates with a concentration in supply management with a slightly higher (84 percent) combined response of yes or maybe for graduate students with a specialization in strategic supply management. Since our supply chain management degrees have required internships of students for well over a decade, we were also pleased to see a combined 73 percent of respondents expressing interest in hosting paid internships in supply management-related work. There appears to be some moderate support for executive education and collaborating with faculty on research. There was mixed, and apparently very bimodal, results on guest

lecturing and serving on an advisory board and very minimal support for paying for a membership on an advisory board or donating to scholarships for students.

*Table 1 – Proficiency needs for new hires*

KSA	New Hires (A)			Existing Employees (B)			Difference P<.05
	Mean	Std Dev.	Rank	Mean	Std Dev.	Rank	
Communication	7.39	1.85	1	6.8	2.33	3	A>B
Critical Thinking & Problem Solving	7.33	1.96	2	6.96	2.19	1	
Negotiation	6.78	2.03	3	6.61	1.99	4	
Decision Making	6.54	2.07	4	6.48	2.38	7	
Stakeholder Mgmt	6.43	2.38	5	6.54	2.71	6	
Presentation	6.43	2.19	6	6.81	2.1	2	
Strategic Sourcing/Category Mgmt	6.34	1.75	7	6.37	2.28	9	
Sourcing Strategy	6.3	1.81	8	6.59	2	5	
Cost & Price Analysis	6.28	2.26	9	5.98	2.18	12	
Supplier Relationship Mgmt	6.24	2.2	10	6.3	2.38	10	
Sourcing Ethics	6.04	2.46	11	5.41	2.95	24	
Spend Analysis	6.04	2.21	12	5.81	2.31	15	
Supplier Selection	6.04	1.68	13	5.59	2.37	22	
Requirements Def/Specifications	5.78	1.7	14	5.43	2.51	23	
Sourcing Data Analytics	5.78	2.19	15	5.7	1.91	19	
Supply Market Intel/Research	5.74	2.15	16	5.7	1.73	18	
Total Cost of Ownership	5.65	2.72	17	5.96	2.67	13	
Project Mgmt	5.61	2.21	18	6.02	2.45	11	
Supplier Risk Analysis	5.57	2.37	19	5.72	1.82	17	
Supplier Performance Mgmt	5.35	1.72	20	5.81	2.22	16	
Contract Types	5.24	2.26	21	4.91	2.69	34	
Sourcing Leadership & Mgmt	5.24	2.49	22	6.48	2.31	8	B>A
Contract Law	5.19	2.65	23	5.35	2.48	25	
Incentives	4.89	2.01	24	5.3	1.97	26	
Change Mgmt	4.83	2.45	25	5.83	2.38	14	B>A
Sourcing IT	4.76	2.35	26	5.67	2.23	21	B>A
Make vs. Buy	4.7	2.19	27	4.98	2.79	30	
Forecasting	4.69	2.39	28	5.04	2.46	28	
Quality Mgmt	4.65	1.77	29	5.02	2.42	29	
Supplier Development	4.52	2.25	30	4.94	2.36	33	
Disputes, Claims, Terminations	4.44	2.42	31	4.89	2.54	35	
ESI	4.44	2.16	32	4.57	2.51	38	
Supplier Financial Viability Analysis	4.36	2.17	33	4.96	2.4	32	
Demand Mgmt	4.36	2.18	34	4.72	2.3	36	
Innovation in Sourcing	4.33	2.37	35	5.67	2.37	20	B>A
Transportation	4.3	2.45	36	4.22	2.28	43	
CSR/ESG/Sustainability	4.25	2.24	37	4.56	2.81	39	
Sourcing Org Metrics	4.11	2.21	38	4.98	2.15	31	B>A
IP Rights	4.11	2.52	39	4.62	2.44	37	
Buying Services	4.09	2.26	40	4.37	2.23	40	
Supply Segmentation/Portfolio Analysis	4.09	2.05	41	5.15	2.21	27	B>A
Inventory Mgmt	4.07	2.35	42	4.28	2.39	42	
SC Design	3.96	2.03	43	4.35	2.6	41	
Int'l Sourcing	3.81	2.61	44	3.94	2.77	45	
Warehousing	3.79	2.32	45	3.91	2.37	46	
Subcontract Mgmt	3.73	2.14	46	4.19	2.39	44	
Import/Export	3.57	2.34	47	3.52	2.68	50	
Reverse Auctions	3.33	2.19	48	3.57	2.56	49	
Gov't Contracting	3.17	2.72	49	3.26	2.81	51	
Reverse Log	3.17	2.04	50	3.67	2.31	47	
Foreign Currency Risk	2.83	2.35	51	3.58	2.71	48	B>A

Table 2 – Exploratory factor analysis

**Rotated Component Matrix<sup>a</sup>**

	Component											
	1	2	3	4	5	6	7	8	9	10	11	12
Sourcing Ethics								.810				
CSR/ESG/Sustainability						.449				-.590		
Strategic Sourcing/Category Mgmt	.586					.445						
Make vs. Buy									.790			
Requirements Defi/Specifications										.598		
Spend Analysis	.585											
Supply Market Intel/Research	.716											
Supplier Risk Analysis	.762											
Sourcing Data Analytics	.527										.475	
Sourcing Strategy	.738											
Incentives	.800											
Supplier Selection	.709											
Negotiation	.766											
Cost & Price Analysis	.581		.403									
Reverse Auction					.685							
Contract Law	.535				.402							
Subcontract Mgmt	.494				.515							
Supplier Performance Mgmt	.534											
Supplier Relationship Mgmt	.471	.616										
Import/Export						.769						
Disputes, Claims, Terminations	.514											
Int'l Sourcing						.689						
Gov't Contracting					.779							
Sourcing Org Metrics				.505	.514							
Innovation in Sourcing					.637							
Buying Services					.569		.461					
Contract Types		.426										
Supplier Financial Viability Analysis	.408											
TCO	.456											
IP Rights	.405							.415				
Foreign Currency Risk						.725						
Project Mgmt		.658										.541
Quality Mgmt				.401								
Forecasting							.856					
Demand Mgmt			.467				.636					
ESI				.746								
Supplier Development				.822								
SC Design			.587	.461								
Transportation			.691									
Inventory Mgmt			.861									
Warehousing			.905									
Reverse Log			.617									
Change Mgmt		.404		.518								
Communication		.856										
Decision Making		.862										
Stakeholder Mgmt		.758										
Sourcing Leadership & Mgmt												
Presentation		.604									.544	
Critical Thinking & Problems Solving		.790										
Sourcing IT		.500			.528							
Supply Segmentation/Portfolio Analysis				.641								

Extraction Method: Principal Component Analysis.  
 Rotation Method: Varimax with Kaiser Normalization.  
 a. Rotation converged in 15 iterations.

### Conclusions/Implications

In a metroplex with a population exceeding 7.6 million there are over 1,000 job openings in purchasing/procurement/supply chain management in our target market listed on job websites such as Indeed.com. We are in a highly competitive market with many local higher education schools as well as representing an attractive target for outside programs to enter

into the educational space through on-line offerings. As we shape our program it is prudent to identify the knowledge, skills, and abilities (KSAs) relevant to our potential industrial customers; not only to offer a high value degree fitting an unfilled need, but also developing a strong offering protecting us from the competition. The implication to the reader outside of our market is that replication of our effort will be time well spent.

Our survey focused on the needs of purchasing professionals within the DFW metroplex. And is a potential limitation of our research. We believe the findings are generalizable for the development or improvement of programs outside of DFW but recommend the reader consider that there may be potential differences in their target market.

*Table 3 – Support for supply management concentration/track*

Survey Question	Yes	No	Maybe	Omitted
Would your organization be interested in: - Hiring UNT graduates with an undergraduate degree concentration in supply management?	33%	7%	50%	9%
Would your organization be interested in: - Hiring UNT graduates with an MBA specialization in strategic supply management?	30%	7%	54%	9%
Would your organization be interested in: - Hosting paid interns in supply-management-related work?	19%	19%	54%	9%
Would your organization be interested in executive education on supply management topics for your employees? - Selected Choice	2%	24%	57%	9%
Would your organization be interested in collaborating with faculty on supply-management-related research? - Selected Choice	2%	19%	67%	9%
Would you be interested in guest lecturing at UNT on supply management topics?	43%	48%	0%	9%
If UNT stood up a Center for Strategic Supply Management, would you or your firm commit to: - Serving on an advisory board?	43%	48%	0%	9%
If UNT stood up a Center for Strategic Supply Management, would you or your firm commit to: - Paying a modest annual membership fee (~\$5,000)?	4%	87%	0%	9%
Would your organization be interested in donating to a supply management scholarship fund to attract students to the discipline and help meet their financial needs?	4%	87%	0%	9%
At your organization, are you involved in the hiring process for supply management personnel?	56%	28%	0%	17%

Our plans are to develop a purchasing track of multiple courses instead of trying to fit everything into the limited space of a single course. Table 4 shows our tentative plan for which content from the ISM Mastery Model will go in which of the courses in the purchasing track. Our findings are expected to help us develop specific blocking-and-tackling courses coupled with a flexible track to allow our students flexibility to customize their own skills. For example, our overall supply chain management program requires each student to complete a paid internship. Armed with the basic blocking-and-tackling skills each student may use their internship to target a specific industry (such as petroleum or aerospace).

Our analysis segments the perceived needs of new hires and exiting employees. Not only may this information allow us to shape our new purchasing track targeting new college graduates but also highlight key areas for us to explore for development of executive education courses and graduate education offerings. Finally, our survey may be used to partner with other researchers to administer a similar survey to their local market. Doing so may result in future work considering the differences between markets.

Other universities may utilize the results of this research to 1) consider adding purchasing specializations, tracks, or concentrations to their degrees and 2) better match the content of those courses to the needs of purchasing functions within organizations. Purchasing-focused academics may also consider replicating this research approach in their local, regional, or

national sphere to identify unique differences in their area to be addressed through changes to their curriculum.

Table 4 – Tentative class structure

ISM Mastery Model	PRCH 4810 Purchasing	PRCH 4835 B2B Negotiation	PRCH 4825 Sourcing Strategy and Supplier Relationship Management	PRCH 4845 Cost and Price Analysis
<b><u>Business Acumen</u></b>				
Business Intelligence				
Building Relationships	■		■	
Change Management/Transformation				
Communication	■			
Decision Making	■			
Leadership				
People Development/Coaching	■			
Results Focused				■
Stakeholder Engagement	■		■	
Strategy Development	■	■		
<b><u>Category Management</u></b>				
Category/Commodity Market-Specific Knowledge		■		
Category Strategy		■		
Internal and External Collaboration	■		■	
<b><u>Corporate Social Responsibility (CSR and Ethics)</u></b>				
Business Conduct	■			
Diversity and Inclusiveness - Workforce and Supply Base			■	
Global Citizenship	■			
Health and Safety				
Sustainability and Environment			■	
<b><u>Cost and Price Management</u></b>				
Cost	■			■
Portfolio Analysis				■
Price	■			■
TCO	■			■
<b><u>Financial Analysis</u></b>				
Analyze Supply Chain Costs	■			■
Financial Appraisal				
Financial Health of Suppliers	■		■	
Foreign Currency				
Market Analysis	■			■
<b><u>Legal</u></b>				
Contracting (Contract Development and Administration)	■			
Dispute Resolution			■	
Intellectual Property	■			
Legal Considerations (Knowledge of Law)	■			
Terms and Conditions	■			
<b><u>Logistics Management</u></b>				
Distribution/Transportation Management				
Import/Export				
Inventory Management	■			
Reverse Logistics Management				
Warehouse Management	■			



Table 4 (continued) – Tentative Class Structure

ISM Mastery Model	PRCH 4810 Purchasing	PRCH 4835 B2B Negotiation	PRCH 4825 Sourcing Strategy and Supplier Relationship Management	PRCH 4845 Cost and Price Analysis
<b><u>Negotiation</u></b>				
Competitive Leverage /Market Intelligence				
Conditioning and Information Control				
Conducting Negotiations				
Planning and Preparation (BATNA, etc.)				
<b><u>Project Management</u></b>				
Project Management Best Practices				
Project Management and Supply Chain Integration				
<b><u>Quality Management</u></b>				
Quality Control and Assurance				
Quality Improvement				
Quality Planning				
Supplier Quality Management				
<b><u>Risk</u></b>				
Compliance				
Manages Risk				
Risk Analysis				
<b><u>Sales and Operations Planning</u></b>				
Budgeting				
Demand Management and Planning				
Forecasting				
Needs Identification (Supply Planning)				
Product Development				
Specification				
<b><u>Sourcing</u></b>				
Sourcing Strategy				
Supplier Selection				
<b><u>Supplier Relationship Management</u></b>				
Contract Management				
Early Supplier Involvement				
Supplier Development				
Supplier Innovation and Collaboration				
Supplier Performance/Continuous Improvement				
<b><u>Supply Chain Planning</u></b>				
Supply Chain Analytics				
Supply Chain Design				
Supply Network Design and Optimization				
<b><u>Systems Capability and Technology</u></b>				
Application of Technology				
Big Data (Use of Data)				
Knowledge of Procurement Technology Systems				
	Introductory			
	Application			
	In-depth			

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