

What are we teaching our Operations and Supply Chain Students?

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Received: Aug 30, 2018; Accepted: Sep 07, 2018; Published: Sep 10, 2018

Abstract

Supply chain management is a new but ever evolving field, which results in an ongoing gap between what the field requires and those possessing the skills necessary to meet the field's requirements. While academic preparation of supply chain management professionals is one critical way to address this gap, research suggests that such academic programs possibly are contributing to, rather than closing, that gap. As noted, by Birou et al. [1] though, there are few studies that have examined the substance of the undergraduate supply chain management curriculum. Using a mixed methods approach, this study is the largest analysis of undergraduate syllabi of introductory supply chain management courses by looking at seventy-eight introductory supply chain management syllabi from both Gartner Top 25 Schools and those not on the Gartner list, as well as job announcements for entry level supply chain management position. The syllabi revealed that inventory management and procurement/contracting were the most frequently listed topics, however, the syllabi analysis also revealed a number of courses containing a large content of traditional operations management topics. This gave credence to the claims of Alakin et al. [2] that some courses were operations management courses that had their titles changed to supply chain management. The syllabi of the Gartner Top 25 Schools when compared to the frequency distribution for the job announcements revealed an 88% match between what is being asked for and what is reflected in the syllabi. The syllabi for the non-Top 25 Schools revealed a 41% match after doing a thematic grouping of similar topics. The thematic groupings were created by using the APICS Dictionary and APICS Body of Knowledge for related terms. The thematic grouping helped to link related terms into related groupings of key terms and helped to compare the terms from the syllabi to the groupings used by Johnson et al. [3] in their initial supply chain management education framework. My research removed the modules of location analysis and product design and relocated these topics to a module or grouping titled "Operations Management Topics" with the understanding that some operations management understanding is necessary for teaching supply chain management. The new framework also moved the Johnson and Pyke grouping of service and after sales support to a new grouping titled "Customer Support." The new framework also added modules or groupings for supply chain management basics and terminology, professional development and emerging supply chain management concepts. The 2000 framework also included a module for marketing which is a separate business discipline and while students need to understand the link between marketing and supply chain management, eliminating this module frees up classroom time for other critical topics.

I recently completed a detailed analysis of what the Gartner Top 25 Supply Chain Programs are teaching in their introductory supply chain management courses compared to the Supply Chain Management programs that were not listed in the Gartner Research' Top 25 Programs. This study was undertaken because of a drop off in the number of companies that were recruiting at my school. The decrease in companies concerned me and even more so when I started reaching out to companies that were no longer recruiting our students. Several companies told me that they quit recruiting because we were not "teaching the students what was needed in the real world." The top schools are providing students with an education that is resulting in up to six job offers per student. Is there a correlation between what we are teaching and what industry is asking for? Does this lead to more opportunities for the graduates from the top programs? Does the data indicate that we may be harming the students' professionally by not teaching what industry wants?

The research started with a detailed literature review focused on supply chain education, supply chain curriculum development and supply chain management talent gaps. The literature review revealed:

- The literature and trade magazines confirm the reality of the talent gap based on growing skill requirements [4-6], growth in the supply chain industry [7,8] and a shortfall in the quality of what is being taught in university programs [9,10].

The review of literature concerning supply chain management talent and supply chain management curriculums to meet the needs

of the talent shortage reveals that while there has been a great deal written about supply chain management, there has been very little focus on the topic of supply chain management curriculum development. Jordan et al. [11] confirmed this in their review of 24 studies over 15-year period. Their research led them to the conclusion that there is a need for future research into supply chain management curriculums. This was confirmed by Birou et al. [1] when they reported "There are relatively few studies which have been focused on SCM (supply chain management) curriculum" (p. 73).

The literature review reveals several concerns within academia and industry about supply chain management education and the quality of the education process for students applying for jobs. There are concerns about what is taught, what is not taught, what should be taught, how supply chain management is taught and how often classroom materials are updated, if ever. This research project only focused on what is being taught and what should be taught.

Research points to the gap between industry needs regarding competencies within supply chain management and the acquired competencies/skills/knowledge sets of baccalaureate graduates [1].

The APICS Basics of Supply Chain Management Exam Book [12] contains a list of four hundred and forty-nine key terms approved by industry as critical for understanding supply chain management and required understanding for taking the Basics of Supply Chain Management exam as part of the APICS certification process. This list of terms served as the foundation for the first coding of the syllabi and job

announcements. In addition, the Gartner Top 25 Supply Chain Schools (2016) identifies supply chain competencies and leading and trailing programs based on the Gartner model. This report has a high level of credibility with industry leaders, as they are part of the research survey respondents. As a result, the study looked at the topics taught by the Top 25 Schools for 2016.

The APICS Certified in Production and Inventory Management Exam Bulletin lists words that are considered Operations Management terms [14]. This listing helped identify topics covered in SCM classes that were actually operations management topics. The purpose for looking for operations management terms was based on claims by Alakin et al. [2] that some supply chain management courses were actually operations management courses that had their titles changed to supply chain management without changing the curriculum or topics covered.

Study background

Over a period of two years syllabi were collected from schools around the world for supply chain management classes. As of August 2018 this data base contained over 400 syllabi. The focus of the study was to compare the written curriculums for introductory supply chain management courses. The rationale or basic assumption for this start point was that the introductory course should provide a foundation for supply chain management majors for follow on courses and at the same time provide all business majors with an understanding of supply chain management and the relationship of supply chain management to other business disciplines. Another basic assumption built into the analysis was that what was reflected in a syllabus as the written curriculum matched what was actually taught in the classroom.

The syllabi were collected through a variety of sampling techniques. Some were captured through a simple online search for “supply chain management syllabus,” a note was sent to colleagues in the supply chain management education field asking for submission of supply chain management syllabi, this resulted in some colleagues forwarding the message to other colleagues resulting in a snowball effect sampling. Other syllabi were captured through convenience sampling and the final data capture technique involved a search of CourseHero.com for “supply chain management syllabus.”

The database of 400 syllabi were narrowed down for analysis by eliminating any syllabus for international courses (the initial research focus was on US schools), the elimination of graduate course syllabi, the elimination of any course syllabus that was tied to a course that I taught or developed to try to maintain objectivity in the analysis and prevent skewing the database, and the elimination of upper level supply chain management courses or courses that were specific to a portion of the supply chain such as procurement courses, warehouse management courses, and transportation courses.

During the same time frame a sample of seven different data captures for job announcements was conducted. The search criterion was for “introductory supply chain management” positions using the major search engines of Indeed.com, Careerbuilder.com, Monster.com and JobsinLogistics.com. The data capture for job announcements focused on the major fall recruiting period for upcoming college graduates. This search used a simple random sampling technique by selecting every fifth job announcement from each of the websites during each data capture session. The duplicate announcements were discarded and jobs with specific industry requirements as well as jobs requiring graduate degrees. This produced a database of 140 job announcements across a five month time frame in the Summer/Fall of 2017.

Methodology

The study was a mixed methods approach to analyzing the syllabi and the job announcements that employed both qualitative and quantitative approaches.

The syllabi were coded first for key words from the APICS Basics of Supply Chain Management certification handbook and the APICS Body of Knowledge. From these key words a frequency distribution was created. The syllabi were also coded for the type of textbook used to determine if Alakin et al. [2] were correct in their conclusion that some courses simply changed their name from operations to supply chain without changing the topics. The syllabi were analyzed for all of the 78 introductory supply chain syllabi as a whole and separating out the Top 25 compared to the non-Top 25 programs to see if there was a difference in what was being reported as being taught [15].

The job announcements were coded similarly to the syllabi in respect to coding for key words from the APICS Certification Handbooks and APICS Body of Knowledge. This produced a frequency distribution for both what was reflected as desirable in the job announcements and the actual frequency of how often the terms were used in the job announcements.

Analysis

The frequency distributions for the syllabi were compared to the frequency distributions for the job announcements. The goal of the analysis was to determine if there was a difference between what industry wants and what academia is teaching [14]. Further analysis was conducted to determine if there was a significant difference between what was being taught compared to the job announcements at the Top 25 Schools compared to what was being taught at the non-Top 25 Schools. There was also a thematic analysis and coding performed that linked common terms such as environment and sustainability or purchasing and contracting to help link the syllabi topics with the job announcement topics.

What the analysis showed was that the Top 25 Schools were more closely aligned with the needs of industry. There was a 71.7% match between the topics of the top schools to the job announcement topics. However, when using the thematic analysis, the top schools match of what was being taught compared to what was being asked for by industry rose to 88.7%. When looking at the schools that were not listed in the Gartner Top 25, the match was much lower at 41.5% after the thematic analysis and comparison.

The results of the analysis and comparison would indicate that the Top 25 schools are better meeting the needs of industry in educating their students. A further step in the analysis to try determine if we are teaching what industry needs was to look at the top 25 topics in the syllabi for all of the schools compared to the top 25 topics in the job announcements.

While there is no assumed causation between what is represented in the syllabi and the key topics in the job announcements, there is a correlation coefficient of 0.566 between the some of the top thirty topics in the job announcements and the top thirty topics in the syllabi as shown in Table 1 below. A correlation coefficient of only 0.566 does not indicate a strong relationship between the syllabi terms and the job announcement terms; this would seem to point to a gap between what is being asked for in the job announcements and what is being taught according to the syllabi.

What does all of this mean? The research and analysis of introductory supply chain management courses when compared to the job announcements for introductory supply chain management jobs shows that as a whole, universities are not doing a good job of preparing their students to be successful in the job market which may be a factor in the large talent gap that industry is facing. If we regularly review

	syllabi	job announcements
syllabi	1	
job announcements	0.56607	1

our curriculums and update our supply chain management courses accordingly to meet the needs of industry we may very well help fill talent gap and at the same time make our students more competitive in the job market.

Limitations

The research only looked at the introductory supply chain management course syllabi and not the entire supply chain management curriculum. Future research should focus on the entire curriculum as well as regional differences based on the needs of local industries.

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