Sustainable Supply Chain Management Programs In The 21st Century

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ABSTRACT

One of the most difficult challenges for an undergraduate supply chain management program at smaller universities is to create an environment of sustainability. Supply chain management is not at the tip of tongue for many graduating high school students and few undergraduate curriculums require a course in the content area. This research addresses undergraduate supply chain management programs, how best to develop a viable program (from a curriculum and operational perspective), and how to create a program that is sustainable with limited resources.

Keywords: Supply chain management; program development; major enrollment; Academic Department: Supply Chain Management

INTRODUCTION

*U*ndergraduate supply chain curriculums are as diverse as supply chain management itself. Of course, many institutions are examining ways in which they can create undergraduate exposure to supply chain management and several are opting for the development of supply chain major programs. Several of these are cross-disciplinary or are developed within the framework of existing functionalities, such as logistics, production and operations management, and even information systems.

Given the overarching relationship of supply chain management to other business disciplines, it makes sense that one should examine how best to create a supply chain management program that is valuable to students, valuable to industry, and feasible given the dynamics of our institutions of higher education. This paper examines how best to develop a viable program, from a curriculum and operational perspective, for undergraduate students.

THEORETICAL PROGRAM DEVELOPMENT

Differences in accountability requirements and the need to remain responsive to the competing demands of multiple constituencies means that supply chain management program and curriculum development will vary considerably across institutions. Therefore, important variations in curriculum delivery, including variations in program goals, objectives, and indicators are beyond the scope of this paper. However, in examining the development of any new program, it is important to understand that there are many perspectives on how a program is to be developed and what is in the best interest of the program. In addition, program development also has to be cognizant of the underlying desires of particular faculty and of existing programs, both of which have a significant impact on the overall outcome of the curriculum design.

Supply chain management program development encompasses multiple, overlapping philosophical, practical, and jurisdictional domains comprised of program level departments, the School (or College), administrative offices, and the larger business community. Olson (1965) suggests that "groups with common interests usually attempt to further those common interests (1)" but that there is a tendency for suboptimal provision of that common good. In the current case, while there was original agreement that a supply chain management program was "a common good", there were discipline specific hurdles that led the working group into unsustainable administrative structures, curriculum delivery, and course integration. Given the supply chain major's rather tenuous founding, Kaufman's (1985) theory that those organizations/ institutional structures that survive "for great

lengths of time is largely a matter of luck (67)" seems fitting and is perhaps more generally applicable to university policy and curriculum / program development than administrative rationalists might think.

 William Brewer (1987) suggests that how we shape our mental models depends on how well we understand the domain involved. For well – learned domains, the representation will usually rely on "precompiled generic knowledge structures" whereas for a new situation the representation "will have to be constructed from whatever relevant knowledge the individuals can bring to bear on the problem (180)."

For the current case, each of the departments involved interpreted supply chain management from the generic knowledge structures embedded in their respective disciplines. The marketing faculty lens was purchasing, distribution, and customer relations management, consistent with a "traditionalist" view of supply chain management as subset of purchasing (Larson and Halldorsson, 2002) while the management faculty lens was more logistically oriented, a view consistent with supply chain management as re-labeled logistics (Larson and Hilldorsson, 2004). What is interesting is that while all parties involved in the initial and medium phases of curriculum development publicly espoused what Larson and Hilldorsson label the inter-sectionist perspective (2004, 21) of supply chain management as strategically integrating elements from multiple disciplines, their "theories in use (Schon, 1983)" suggested a narrower discipline based interpretation of supply chain management. With this in mind, a viable supply chain management curriculum must be able to interpret supply chain management as a distinct discipline, consistent with delivering more general, global, and system wide aspects as well.

DEVELOPMENT OF SUPPLY CHAIN PROGRAM

One of the more enduring issues surrounding reorganization of both the curriculum and departmental responsibility for supply chain management concerns the ambiguous role associated with administrative directives as a tool for departmental based policy decision-making and as a means for improving managerial decision-making regarding the who, what, and where of curriculum activity. Part of this ambiguousness can be attributed to the general nature of the innovation and learning processes surrounding action-based curriculum development. In the current context, considerable uncertainty occurred over the integration of functional bodies of knowledge into a coherent and practicable curriculum. Therefore, it is important that any new program begin with a common direction of what the program is to achieve and how it is to service the students and the community. In order for this to happen, there needs to be a supportive structure where the program has a clear place and a clear administrative authority; otherwise, there are too many "chefs in the kitchen".

A primary driver of program development is improvement in the accountability, responsiveness, and capabilities associated with curriculum and faculty expertise in providing body of knowledge coursework and activities that meet the needs of both students and employers. Improving program accountability requires relevant, comparable data that measures student and program performance. Therefore, curriculum responsiveness requires feedback and learning about programmatic endeavors and why such accomplishments did or did not occur. Thus, supply chain management program development requires comparisons to a reasonably well-defined set of school, university, and body of knowledge goals, objectives, and performance standards.

Supply chain management is many different things to many different people; in both academia and industry. For some, it is simply the process of controlling inventory or the processes involved with the procurement function. Still, for others it is simply the processes involved in the logistics or distribution functions. Some organizations look at supply chain as a set of integrated activities and some even attempt to use integrative models; such as the Supply Chain Operations Reference model or the Global Supply Chain Forum Model (see Lambert, 2008).

Pyke and Johnson (2000), in their foundational research in teaching supply chain management, discuss twelve categories that should be present in a supply chain course. These twelve categories were developed as a result of the examination of course syllabi, the author's own experiences, and the experiences of other faculty. These twelve areas are still important today and should be representative in a well structured supply chain management program. Therefore, it is still possible to create a supply chain program that is focused on the systems approach, but yet gives the students the necessary skill sets needed to acquire an entry level position in an industry, that itself, is

sometimes unclear of what it needs to know to manage the supply chain.

We propose a curriculum with a core base of typical, yet ever important core business courses; followed by a core of supply chain management courses that are designed to give the students exposure to all facets of supply chain management from the perspective of industry and from the perspective of Johnon and Pike's (2000) twelve categories; followed by a set of courses that gives the students a specific skill set that will make the undergraduate student marketable to industry. It is in this last skill set for which we can take advantage of the cross-disciplinary nature of supply chain management while still giving faculty and specific departments some autonomy over the curriculum. Appendix A contains the supply chain management curriculum that was developed.

The program, as an entity within the business school, begins students with the typical business courses found in any AACSB accredited university. Of course, these concepts are of paramount importance especially to supply chain management majors who, in due time, will need to understand the integrative nature of all of these programs. As our institution is a member of the SAP university alliance, students can get exposure to understanding the integrative nature of business functions by using the SAP R/3 system. SAP is a wonderful software tool, even though primarily transactional, for the students to see the interdependence of all aspects of the organizations on decision making.

The next aspect of the program gives the students specific exposure to a wide variety of courses important in the supply chain arena – an area consisting of what we call the core of supply chain management. The fundamental outcomes associates with this area is to give the students and overall understanding of supply chain management from a systems perspective as well as to give them exposure to global issues in the management of a supply chain. The core of the supply chain management curriculum also requires an internship, which gives the student exposure to supply chain management in industry. This is a very important part of tying the curriculum back to industry.

Finally, tracks were developed in the areas of International Trade, Management Information Systems, Customer Relationship Management, and Logistics/Operations for the students to achieve a more focused education that would make them marketable at the undergraduate level. These areas were chosen due to their relevance in industry today and by matching the core competences of the individual departments that would have the bulk of the courses in that area. This track structure allows the competing viewpoints and objectives to still be introduced to our students under the control of the individual departments. This, in turn, helps dampen the challenges associated with the development of a program where competing objectives may be detrimental to its success.

PROGRAM SUSTAINABILITY

One of the largest challenges is to determine a way to make the program sustainable. According to Yew (2008), to increase student enrollment to the Management Information Systems major, offering an IT certification program, a student internship and co-op program, new courses, and recruitment strategies are important steps. For our supply chain program, we have tried to sustain student interest in the major by developing a service course in supply chain management, a course that is required for all students to take as part of their degree requirements. This will serve two primary purposes; one, guaranteeing the course has significant enrollment in the long term and two, peaking interest in the field of supply chain management to increase the number of students majoring in this area. Unfortunately, based on our experiences, it is not easy to change requirements within the business curriculum. What we were able to do was to make the course required for general business administration students (the largest major in our business school), but not for the other majors within the school of business. While the content is not being delivered to all majors, a large portion of students will get exposure to this area.

Another method we used to sustain the major was to take advantage of the global aspects of supply chain management. Recognizing that globalization (along with advances in technology) are significant drivers of the supply chain, we were able to take the global operations management course (a required course in the Supply Chain Management curriculum) and include it in a small list of courses that students can take to satisfy the international requirement for our business administration majors. This helps sustain the program for the same reason listed above.

Of course, to sustain any program you need to place your graduates in good jobs. The required internship requirement along with the development of an annual supply chain management conference focused on industry, are two ways through which our program is being marketed to industry. This gives the program exposure as well as credibility which leads to a long term reputation of quality – which more easily lends itself to increased student interest in the supply chain major.

LESSONS LEARNED

What have we learned from our four year, continuing, administrative and curriculum journey that might be of value to others either founding or strengthening a supply chain program? First, sufficient time and resources must be dedicated to the continuing implementation and future modification of supply chain management programs within schools of business to overcome the traditional "business school" personalities encompassing inertial tendencies and rational factionalism. The development of policies, programs, procedures, and systems consistent with the tenets of a particular school's mission are vital for successfully mounting a cross-disciplinary process oriented supply chain management curriculum in the silo leaning world of the 21st century business school. This may trigger a search for higher level and more meaningful constructs of program performance. Such a search can, in turn, generate both a consensus and a commitment to a general structure of curriculum planning, implementing, and assessing that meets the needs of multiple constituencies operating in a dynamic and changing system of interdepartmental relationships.

Second, experience with an inclusive, multi-partner, participatory approach can be reapplied to improving supply chain management programs in the future. In this sense of generative learning, everything that has occurred to this point can be viewed as a positive development, including the work of the original management and marketing departments, dean's office, community representatives, the evolved cross-disciplinary supply chain management group, and the subsequent core supply chain management department group. This is because the conversation within the system about the supply chain management development process continues to be fully engaged. Our central question continues to drive curriculum evolution: "what processes will be used to guide supply chain management program implementation and improvements within the curriculum in the future"?

Third, tensions between experts concerning differing assumptions, antecedent causes, and likely impacts and consequences of body of knowledge, curriculum structure, and student and employer needs continue to impact both the current case, and the broader, industry/academy dialogue about how best to deliver a robust supply chain curriculum within business schools. These differences are rooted in the highly differentiated mental models of faculty (experts) (e.g., see Kuhn, 1962 and Gardner, 1985 for example). In the case of interdepartmental and/or cross-functional program development in the academe, these differing perceptions and predispositions help to create conditions of social conflict among individuals and groups (departments) and to foster individual discomfort in the presence of rival perceptions, especially in settings that challenge a faculty member's core discipline identity.

Thus, deans, administrators, involved departmental faculty, and outside faculty may experience various decision dilemmas as their judgments bounce back and forth across programmatic and curriculum options, alternating between support and opposition for the program development activities. It is the general instability created by different views of reality that contributes to the programmatic conflicts mediated and acted upon by these same set of actors: each of whom operate from their own mental models, interpret reality in accordance with their particular sensitivities to philosophical, discipline, and political risks, costs, and consequences, and are guided by their own set of assumptions, presuppositions, and judgments.

Finally, policy and curriculum development at universities is a blended, iterative, and messy process. Akin to Kingdon (1995), who posits public policy formulation as a more chaotic but purposeful process in which random events and interventions of "organized anarchies" (i.e., fluid participation by a wider variety of interest group coalitions) alter the streams that produce choice opportunities, we can view (at least for this particular supply chain management program development) a similar scenario. Rival rationalities associated with discipline identification (e.g., marketing, management, operations) highlight fluid policy conflicts because 1) they possess requisite authority to influence, in this case, the supply chain management program development process; and 2) they are sufficiently well organized to oppose or support (Kingdon, 1995) one or more curriculum development options.

Hare and O'Neill's (2000) exploration of academic peer groups suggests that for internecine departmental conflicts, as described, over who should be primary in supply chain management delivery, what body of knowledge should be delivered, and where the core of the program should be housed, is a potential for continued unconstructive interaction and even apathy as expressed in the other, many times mundane aspects of professional relations and activity. Fortunately, for the current case, most of the actors pivotal in either founding and/or sustaining the supply chain major have moved beyond this form of practiced objectification.

CONCLUSION

In developing a supply chain program, it is important to take into account as many of the perspectives of supply chain management as possible. It is necessary to develop an undergraduate curriculum that meets the specific needs of industry; especially for a core development of a specific skill set which would be of value to them. It is also important to develop a curriculum that prepares students to mange a supply chain, after a few years of experience, as well as give them actual experience prior to graduation. By examining a curriculum from this perspective, several of the competing viewpoints, turf wars, and administrative barriers are reduced; helping to create a curriculum that is of value to all stakeholders as well as improving the buy-in from all constituents. Even with all this in mind, however, we must still be able to create a program that is sustainable, especially in the current economic climate.

AUTHOR INFORMATION

Brian D. Neureuther is a Professor of Supply Chain and Operations Management at the State University of New York, College at Plattsburgh. He received his Ph.D. in Production and Operations Management from Texas Tech University, his M.B.A. degree from Wright State University in Dayton, Ohio, with a concentration in management science and his B.A. in mathematics from the State University of New York, College at Geneseo.

His research interests include supply chain management, supply chain disruption, information technology in supply chains, simulation for production planning and control, and quality control. He has published over 30 peer reviewed journal articles and his work has appeared in journals such as the Journal of Integrated Design and Process Science, the International Journal of Production Economics, IEEE Transactions on Semiconductor Manufacturing, Production Planning and Control, the International Journal of Information Systems in the Service Sector, the Quality Management Journal, the International Journal of Information Systems and Supply Chain Management, and the Journal of Marketing Channels. He has been guest editor of the Journal of Marketing Channels and is on the editorial advisory board of the International Journal of Information Systems and Supply Management and the Journal of Marketing Channels. He has presented at over 35 international and national conferences on topic ranging from teaching pedagogy to managing supply chain risk and has consulted with companies such as Rider University, Neoteric Hovercraft, EDI Telecommunications, Southwestern Wire Cloth, and the Cleveland County Chamber of Commerce (North Carolina). He has also earned the prestigious Certified Supply Chain Professional (CSCP), the internationally recognized certification in supply chain management.

He is a member of the Production and Operations Management Society, APICS, the Society of Operations Management, and the Council of Supply Chain Management Professionals (CSCMP).

Kevin O'Neill, Ph.D., is Associate Professor and Chair, Department of Business and Supply Chain Management at SUNY Plattsburgh. He has helped organizations across the U.S., and internationally in TQM, leadership, visioning, strategic planning, and system dynamics. His research interests are supply chain pedagogy, risk as criticism, nonlinear dynamics and supply chains, and microworlds as learning platforms.

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APPENDIX A: Global Supply Chain Management Curriculum

A. SBE Core – 42 credits

1. Principles of Accounting I
2. Principles of Accounting II
3. Legal Environment of Business
4. Seminar in Professionalism
5. Introduction to Microeconomics
6. Introduction to Macroeconomics
7. Economic Statistics I
8. Business Statistics II
9. Principles of Finance
10. Business Applications and Information Technology – SAP Exposure
11. Principles of Management
12. Principles of Marketing
13. Quantitative Analysis
14. Strategic Management

B. Supply Chain Requirements – 18 credits

15. Global Operations Management
16. Supply Chain Management
17. Procurement
18. Transnational Issues in Supply Chains
19. Global Supply Chain Strategy
20. Global Supply Chain Internship

C. Electives – 9 credits

Students may choose three courses from a particular track or choose one course from each of three tracks

1. CRM Track

   o Marketing Channels Strategy
   o Interactive Marketing and E-Commerce
   o Cross Border Goods and Human Services
   o Business to Business Marketing
   o Selected Marketing Topics; Customer Relationship Management

     • With permission of B&SCM Chair

2. Logistics Track

   o Warehousing and Inventory Management
   o Systems Dynamics and Supply Chains
   o Quality Management
   o Project/Process Management
   o Lean Organizing and Manufacturing

3. IT Track

    Required:

    o   Management Information Systems

    Select two from the following:

    o   Business Data Communication and Networking
    o   Introduction to Business Application Programming
    o   Business Intelligence and Decision Support Systems
    o   Enterprise Systems

4. International/Import/Export Track

    o   International Business Management
    o   Comparative and Multinational Management
    o   International Marketing Operations
    o   Cross Border Goods and Human Services
    o   International Accounting
    o   International Uniform Commercial Code
    o   U.S. Customs Brokerage Law

Required Cognates include Business Ethics and Calculus