

Benchmarking Study SCM Syllabi: Topics, Reading Assignments, Assignments and Course Requirements

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Abstract

This paper provides a report on a benchmarking study conducted to evaluate and analyze the content and nature of supply chain management curricula in universities across the US and Europe. The focus of this paper is on the operations management elements of supply chain curricula.

Introduction

“Dantotsu,” is a Japanese word which means striving to be the “best of the best,” the basic philosophy of benchmarking (Camp 1989, pg. 3). Benchmarking, utilized as a performance improvement strategy by Xerox starting in 1979, was the driving force behind the company’s goal to regain market leadership. Led by CEO David T. Kearns, benchmarking was defined within Xerox as, “the continuous process of measuring products, services, and practices against the toughest competitors or those recognized as industry leaders” (Camp 1989, pg. 10). The goal of the benchmarking process is to be leading-edge, and proactively seek continuous improvement in the value delivered to the customer, whether it is a product, service or the process of delivering the product or service.

In 1991, Kearns was appointed Deputy Secretary of the U. S. Department of Education in an effort to improve the performance of the K-12 educational system in the United States.

Benchmarking was recommended for adoption by Jeffrey W. Alstete, of The George Washington University, as a means of improving the quality of higher education (Alstete 1995, pg. 5). Alstete recognized the future of higher education marked by higher competition for students, and increasing expectations from society, for value from the educational process. With this premise of deriving higher value from the educational process, and the desire to search for excellence in the field of Supply Chain Management (SCM) education, this study will benchmark SCM syllabi

from around the world. The objective of this research is to provide a forum for sharing best practice with regard to the delivery of SCM education globally.

With the rapid growth in the field of Supply Chain Management (SCM) over the past 20 years, coupled with the proliferation of degree programs and courses offered globally in a variety of formats, a need exists to critically examine this growth and benchmark the value delivered to the customers. This study will provide academics the ability to benchmark their individual courses with the aggregated results of the study. In addition, participants new to the academic profession will have a database of information to draw on when developing their own courses. The results of this study will also be of interest to professional trainers, as they can utilize the data as a reference for corporate development programs in the area of SCM. In addition, corporate recruiters can evaluate the curriculum content of the programs which they are recruiting from, to assess the alignment of the competency requirements of their organization, with those of the SCM program. This process is intended to be an on-going effort, and is designed to promote the continuous improvement of the field of SCM education.

The research project encompassed all of the subject matter considered to be under the umbrella of SCM including purchasing, operations, logistics and supply chain management. This manuscript will focus on the findings relating to the operations aspect of SCM education. The following section will provide a brief review of the prior research involving education in the field of SCM, followed by the research methodology, results and conclusions.

Evolution of Supply Chain Management

The term *supply chain management* was first used most probably by Oliver & Weber (1982), then received more attention through the work of Houlihan (1984, 1985, 1988) in his series of

articles describing the management activities to coordinate the flow of materials across organizational networks. The development of theoretical concepts of supply chain management emerged in the 1990s (Handfield & Nichols 1999, Christopher 1992, Lamming 1993, Ellram 1991, Harland 1994).

Coupled with this increased attention to the concepts, commentators began to argue that supply chains are a critical component of organizational strategy, reflecting, as Christopher (1992), Macbeth & Ferguson (1994) and others authors have succinctly claimed - '*...that today ... competition takes place between Supply Chains rather than between individual companies*' .

Whilst supply chain management (SCM) is an increasingly important topic, a diverse, yet growing body of literature has resulted in a wide body of knowledge with divergent views regarding the scope and nature of the discipline (Thomas & Griffin, 1996; Copacino, 1997; Cooper et al., 1997; Babbar & Prasad, 1998; Narasimhan & Jayaram, 1998; De Toni & Nassimbeni, 1999; Narasimhan & Das, 1999; Lummus & Vokurka, 1999; Croom et al., 2000; Lamming et al, 2000; Frohlich & Westbrook, 2001; Tan, 2001; Ho et al, 2002; Svensson, 2002a & b; Mentzer et al, 2001; Giannakis & Croom, 2004). Furthermore, the majority of the published work in SCM has been identified to be rather empirical and descriptive in nature, adding little to its conceptual and theoretical development (Croom et al.; 2000).

Researchers in the field of SCM (Ellram & Cooper, 1993; Harland; 1994, 1996, Saunders; 1995, Cooper et al.; 1997; Monczka & Morgan, 1997; Lumus & Vokurka, 1999; Lambert & Cooper, M, 2000; Mouritsen et al 2003) note that SCM has evolved largely through an increasing trend towards the 'externalisation' of performance measurement in the field of operations management (Harland; 1994). We also see that the literature in SCM has evolved from its core concerns around logistics / operations processes to incorporate theoretical concepts and research from strategic management, industrial organization, institutional and production

economics (transaction costs), inter-organizational relationships, knowledge management and systems theory.

Giannakis & Croom (2004) conducted a study of the literature and clarified the multivariate nature of the content of supply chain management research, but with a dominant emphasis on the operational activities of supply chains. However, this emphasis is not a unified one across the academic community. Their analysis by location of researcher showed that North American researchers emphasized the importance of operations/activities management as the primary problem domain for supply chain management; Europeans respondents gave equally emphasis to the relationships issues and operations activities. Figure 1 provides the profile for European, North American and the total samples in terms of the emphasis on either operational, relational or 'holistic' studies of supply chain.

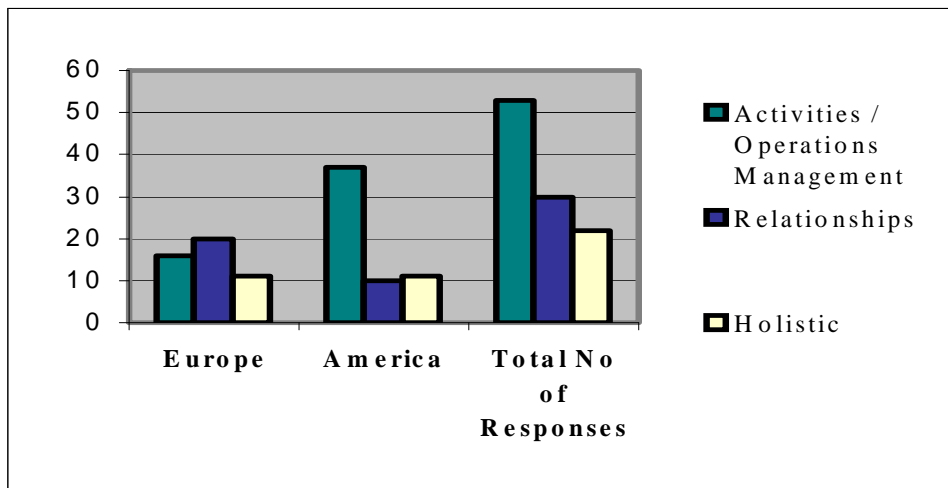


Figure 1. Differences of perception of SCM focus between American and European Academics (from: Giannakis & Croom, 2004)

Studies into Curricula in SCM

A few previous studies into curricula in SCM include Larson & Halldorsson's (2004) survey of educators which set out to define the scope of SCM, evaluate and then classify the topics taught

within SCM courses. The popularity of the terms 'supply chain management' was reflected in their study. They concluded that there are strong distinctions amongst educators relating to the extent to which supply chain management and logistics curricula are simply renamed course, expanded courses or courses that are reoriented to incorporate SCM topics. The variation in the approach adopted in developing SCM curricula most often reflecting the biases and heritage of the educator. Wu (2007) also analyzed curricula of logistics courses using publically available (Internet) syllabi and summarized previous studies into logistics curricula. He found some significant variation in the content of logistics curricula, of interest to this paper being the difference in emphasis of operations management in different countries' logistics programs, although the need for a content analysis of logistics curricula was highlighted as a major shortfall and need for future research.

In an earlier study, Johnson & Pyke (2000) analyzed eight course syllabi in order to construct a topic list and provide an outline of resources (including case studies) used in teaching SCM. Our paper adopts a similar approach in reviewing operations syllabi, but on a larger scale, seeking a global scope of syllabi for the benchmarking process. The next section is devoted to a review of the methodology employed for this study.

Methodology

Content analysis was used to analyze syllabi for operations classes. The goal was to identify commonality and uniqueness among the syllabi. Content analysis is a research methodology that uses a set of procedures to make valid inferences from material. It allows for the systematic evaluation of communication at many levels (Kolbe and Burnett 1991). Since syllabi are a written plan of study for the course, the syllabus represents the overall view of the course

content. Although faculty may vary from the schedule, the syllabus identifies the key topics that are important in that class.

Data Collection

A global search was undertaken to find supply chain programs. An initial list of schools with supply chain programs was generated from ISM's list of Institutions offering programs and curriculum in SCM. Schools that offered a Bachelor's, Master's or Doctoral degree in supply chain management were included in our sample. The web-site of each school was visited to verify the program offered and to identify a contact person, either a department chair and or lead professor in SCM. A total of 121 in the United States were contacted and asked to provide syllabi for all supply chain classes. To date, 20 respondents have responded to our request, which represents a response rate of 18% for this group.

The initial list did not include any international schools. Therefore, a second list was generated by identifying the attendees of the International Purchasing and Supply Education and Research Association (IPSERA) conference in 2005. 192 attendees were contacted by email with a request for syllabi. It should be noted that some IPSERA attendees were not academics. To date, this list has generated 27 responses, or a 14% response rate.

The overall response rate is 15.5% from both list combined. The authors have collected 147 syllabi from 43 different universities. Eight of these universities are international and represent schools in Australia, the United Kingdom, Germany, Italy, and the Netherlands. The percentage of syllabi from US universities is 89%. A preliminary analysis of the syllabi attempted to group the syllabi by class topic. This resulted in 35 classes being identified as logistics, 26 as operations

focused, and 48 as supply chain focused. The remaining classes covered many topics such as sourcing, negotiations, project management and management science courses.

For the purposes of this research, strictly focusing on the operations oriented syllabi, the sample size is 38 syllabi from 21 different US universities. These syllabi are composed of 2 doctoral classes, 20 graduate classes, and 16 undergrad classes. This sample was identified from a first pass of all syllabi where the topic was identified as operations.

Data Entry

All the syllabi received have been coded into a database. General demographic information for each class has been identified including: the university, class number, and focus area. The information gathered also included professor, textbooks, and the assessment methods utilized in the classes. In addition, class topics, and degree of coverage of those topics, were identified. The pool of total topics included 156, which was created based upon a previous pilot study.

The following tables present the top 10 topics for both undergraduate and graduate programs. Topics identified in italics for the graduate programs are those topics which are not included on the undergraduate syllabi. The percentage courses column (% Courses) identifies the percentage of the undergraduate or graduate syllabi that cover that topic. For example, 11 out of the 16 undergraduate courses devote time for course introduction.

Undergraduate Programs		
Topic	# Syllabi	% Courses
Introduction	11	68.8%
Forecasting	9	56.3%
Quality Management	7	43.8%
Location Analysis	6	37.5%
Scheduling	6	37.5%
Strategy	6	37.5%

Inventory Management	5	31.3%
Layout Design	5	31.3%
Material Requirements Planning	5	31.3%
Process Design	5	31.3%

Graduate Programs		
Topic	# Syllabi	% Courses
Introduction	11	55.0%
Strategy	11	55.0%
Quality Management	6	30.0%
<i>Process Analysis</i>	6	30.0%
Inventory Management	5	25.0%
<i>World Class / Benchmarking</i>	5	25.0%
Material Requirements Planning	4	20.0%
<i>Project Management</i>	4	20.0%
<i>Statistical Process Control</i>	4	20.0%
<i>JIT</i>	4	20.0%
<i>Negotiations</i>	4	20.0%

A breakdown of class readings and assessment is presented. This table demonstrates the use of cases is more prolific in graduate classes. Surprisingly, there are less projects or papers utilized in our sample in graduate classes.

Level	Assigned Readings	Additional Readings	Cases	Midterm	Final	Project / Paper
Grad	50%	40%	60%	10%	70%	55%
Undergrad	25%	25%	44%	75%	87.5%	87.5%

In examining the recommended course materials for the sample we found 35 of the 38 courses used a core (required) text, with a total of 26 different titles being used.

Title	Authors	Count
Operations Management	Heizer & Render	3
Purchasing & Supply Management	Monckza, Trent & Handfield	3
Supply Chain Management	Chopra & Meindl	3
The Management & Control of Quality	Evans & Lindsay	3
World Class Supply Management	Burt, Dobler & Starling	2
A Revolution in Manufacturing: The SMED System	Shigeo Shingo	1
Demand Management: Best Practices	Crum and Palmatier	1
Foundations of Behavioral Research	Kerlinger and Lee	1
Introduction to Operations and Supply Chain	Bozarth & Handfield	1

Matching supply with demand	Cachon & Terwiesch	1
Negotiation	Lewicki, Barry & Saunders	1
Operations Management	William J. Stevenson	1
Operations Management	Markland, Vickery & Davis	1
Operations Management	Schroeder	1
Operations Management	Krajewski & Ritzman	1
Operations Management: Meeting Customers' Demands	Knod & Schonberger	1
Product / Operations Management	W.J. Stevenson	1
Production & Operations Analysis	Steven Nahmias	1
Project Management	Pinto	1
Purchasing and Supply Management	Leenders, Johnson, Flynn & Fearon	1
Retailing Management	Levy & Weitz	1
Six Sigma and Minitab		1
Strategic Negotiations Planning	Penfield	1
The Goal	Eli Goldratt	1
Value-Driven Operations Management	Melnyk & Swink	1
Winning	Welch & Welch	1

Results / Conclusions

In Giannakis and Croom (2004) perceptions of SCM between Europe and the US indicated some significant differences in emphasis between operations, relationship and 'holistic' perspectives in the field of SCM. In this paper we have focused on the nature of the *operations* curricula in universities in Europe and the US. Future papers will provide analysis of the total database of our study into SCM syllabi.

A significant difference can be seen between undergraduate and graduate course – not surprisingly strategy and improvement play a more dominant part in graduate courses whilst techniques and models for operations management dominate undergraduate syllabi. This could of course be explained by the relative differences in experience between graduate and undergraduate. This distinction is further illustrated by the higher incidence of case based assessment in graduate classes which illustrates the emphasis in graduate course of the practical application of operations concepts compared to undergraduate classes.

In both Larson & Halldorsson's (2004) and Wu's (2007) studies the implication of faculty preferences/biases was noted as a significant factor in curricula design. This is perhaps a self evident truth, but one that initial examination of our data seems to hold to be the case. We found that a significant proportion of courses used faculty authored texts, articles and cases. The applied and 'experience-rich' nature of OM is greatly enhanced by faculty expertise and thus we should not be surprised by this observation. It may, however, underline one of the challenges of cross program comparison that Larson & Halldorsson (2004) note in their recognition of faculty biases in curricula design.

Our next phase in this study is to conduct a wider analysis across the range of supply chain curricula.

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