
7-1-2019

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Recommended Citation

Rightmer, Jeff A. (2019) "Teaching Supply Chain Management: A Proposal for Future Research on Using Real World Sports and Other Analogies," *Journal of Transportation Management*. Vol. 30: Iss. 1, Article 6. DOI: 10.22237/jotm/1561953960
Available at: <https://digitalcommons.wayne.edu/jotm/vol30/iss1/6>

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TEACHING SUPPLY CHAIN MANAGEMENT: A PROPOSAL FOR FUTURE RESEARCH ON USING REAL WORLD SPORTS AND OTHER ANALOGIES

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ABSTRACT

Teaching supply chain management (SCM) to undergraduates that are not Supply Chain Management majors can be difficult. This often is the case when teaching a business school core course that all majors must take. The motivation of these non-SCM students is sometimes just to pass and move on to their major course of study. Using a number of cases and examples from the real world that the students can relate to may help increase attention and learning. The increased interest level may give students a better understanding of supply chains. This article discusses approaches to teaching the core course with real world applicability, and suggests future research to examine the possible benefits.

TEACHING SCM TO NON-MAJORS

A customer drives up to a local fast food restaurant orders lunch and drives off. As long as the transaction happens without any issues, such as the restaurant is out of soda or potatoes for French fries, the customer does not think about what has to happen for everything to be in place to satisfy the demand. For those of us that have worked in or taught Operations and Supply Chain Management (OSCM), we have a passion for the field which leads us to think about all the behind the scene activities that happen to provide products and services to customers. It is sometimes difficult to translate our interest to the students that we see in our classes. Especially when those students are non-SCM majors taking a required business school wide core course in Operations and Supply Chain Management.

After spending 20 plus years in the OSCM field, one can see the value of the field. Often students believe that supply chain management (SCM) and supply chains (SC) are only found in manufacturing industries and are not part of service industries or non-profit organizations. Yet, as supply chain instructors and professionals, we know that this could not be further from the truth. All organizations have some sort of supply chain and by extension need a form of supply chain management. For example, McDonald's has a very extensive SC that

is needed to provide a product and a service. Museums such as the Detroit Institute of Arts have unique and very precise logistics functions, e-lending companies like Quicken Loans have extensive indirect purchasing functions, and Internet services companies like Google and Facebook also have very significant overall supply chain management functions. Students also do not often realize how extensive and important the purchasing (merchandising) role is in large retail chains, along with the extensive supply chains of suppliers that are required.

MAKING SCM CONTENT MORE RELEVANT TO STUDENTS

I taught Integrated Supply Chain Management at a large Midwestern University for several years. At this school supply chain management is one of three classes along with Integrated Marketing Management and Integrated Financial Analysis that make up the integrated undergraduate business core curriculum. All students in the College of Business must take all three of these classes at exactly the same time regardless of their major. For some of these students it will be the only time they will be exposed to SCM, Marketing and Finance. The students in these three courses are arranged into groups and each group chooses a company to study and develop a growth strategy. The strategy must be operationalized across all three disciplines if it is going to be accepted. This allows for students to

gain a better understanding of the way the three disciplines interact in the real world.

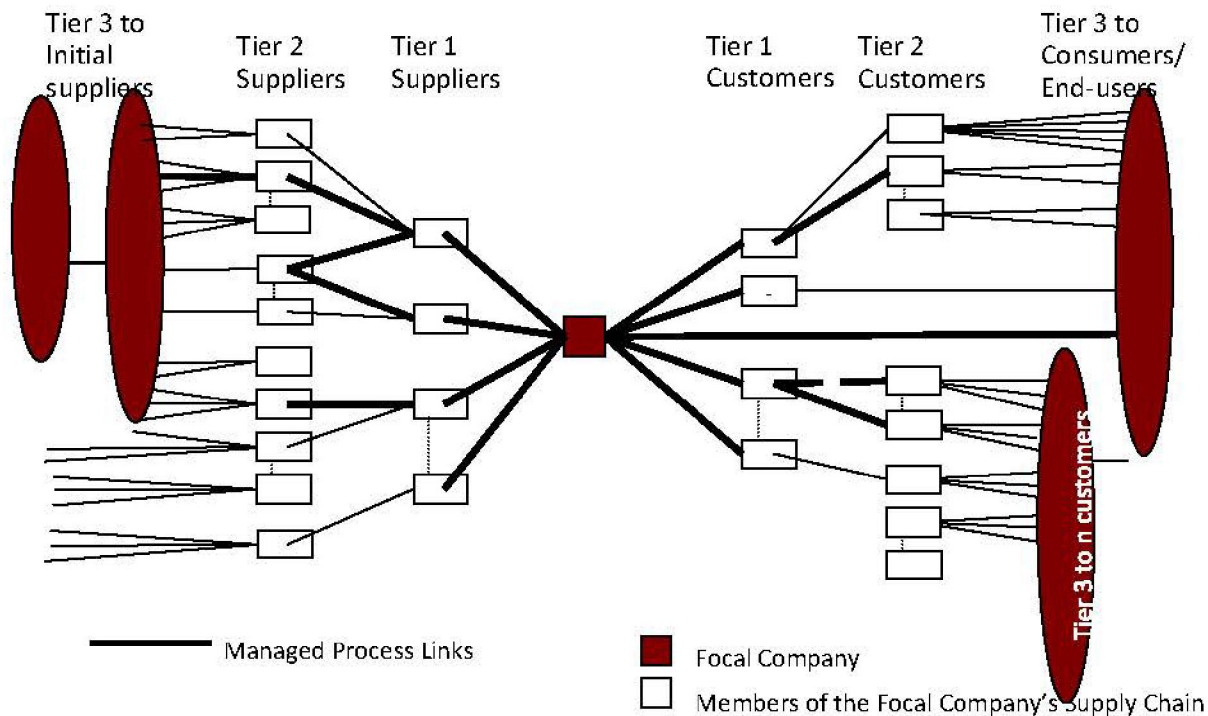
With a large number of students taking the Supply Chain Management course to fill their degree program requirements, I have used variety methods to keep their interest and get a number of supply chain management points across. I have used videos that illustrate examples of supply chains and supply chain management. One video from Arizona State University illustrates the making of Bottled Water, describing needs in terms of materials, facilities, transportation and cash (2010). Another shows Wal-Mart's response to market changes and information flow to suppliers (Galletta, 2012). I also use products to demonstrate the concept of a supply chain. For example, I have brought in to class a yoyo to get the students to think about everything that goes into the manufacturing of the yoyo, e.g., the plastic, string, and packaging. This is followed by a discussion of the logistics of getting the product to customers using through direct selling, distributors, and retailers. We also discuss the placement of inventory, how much, who holds it, and where it is held. These examples help, but I still

have trouble getting through to the students that are not going to pursue a degree in Supply Chain Management.

Figure 1 illustrates a typical supply chain with a focal company or Original Equipment Manufacturer. The suppliers at the various tiers provide products and services to the Original Equipment Manufacturer. The solid black lines depict the management of the suppliers by the buyers. Each buyer manages its suppliers; Tier 1 suppliers manage the Tier 2 suppliers, and the Tier 2 suppliers manage the Tier 3 suppliers. From this model a definition of Supply Chain can be derived. A supply chain consists of sourcing material, manufacturing a product or providing a service, and delivering the product or service to the customer. There is also the flow of information up and down the supply chain and then the flow of funds in terms of payments from the customers and payments to the suppliers.

There are a lot of tools that faculty have used over the year. I am suggesting several. These include for instance the MIT beer game, which helps students see the need for an integrate supply chain with

**FIGURE 1
TYPICAL SUPPLY CHAIN**



communication across the nodes in order to balance manufacturing and minimize swings in inventory (MIT Beer Game, 1992). The Association for Business Simulation and Experiential Learning has also had many papers on teaching SCM topics over the years (Seethamraju, 2012; Pasin, 2011). Another approach that has been used involves Eli Goldrat's book "The Goal," which has been used very successfully to help teach theory of constraints approaches to SCM majors and non-majors alike (Goldratt, 1984).

However, even with the simulations, books, games, explanations, videos, and product examples many students still have a hard time understanding Operations and Supply Chain concepts. As mentioned earlier, for some students this is the only exposure to the concepts and perhaps their primary goal is to pass the class and move on to more specialized coursework in their majors. But the standard text material is very dry and hard for students to relate to, especially if they are not Supply Chain Management Majors.

A PROPOSED REAL WORLD ANALOGY APPROACH TO TEACHING CORE SCM

One way to make the material more relevant to students is to discuss it in a context they are more familiar with. One example of this developed from an interest in baseball and provided an opportunity to talk about supply chain tiers in a sports medium. While I was watching game 7 of the 2016 World Series I thought about how both teams, Cleveland and Chicago constructed their teams to compete in the Fall Classic, and how they were really involved with multiple tiers and a supply chain they had to manage. The point of this example is to put supply chain concepts into terms that most students can relate to. From here the various concepts and approaches to supply chain management can be discussed in the context of this baseball enterprise. The result in my classes, and hopefully it will be found on a broader scale, will be that students pay more attention to the material and are more likely to learn the basic concepts of supply chain management.

The sports analogy is also useful when discussing supply chain metrics. For example, the New England Patriots have the most wins in the last 10 years with 122, the Indianapolis Colts (110 wins) and the Pittsburgh Steelers (101 wins). The teams with the least wins are the Cleveland Browns (53 wins), St. Louis Rams (49 wins) and the Oakland Raiders (47 wins). (Chase, 2015). Measuring the SC performance in terms of wins, playoff appearances, and Super Bowl wins is an indicator of success. This complements the typical SC metrics of inventory turns, inventory-carrying costs and on time delivery.

The performance of sports teams leads into the discussion of the use of Big Data to measure the effectiveness and efficiency of supply chains. For example, for several years the use of data analytics has improved the performance of many baseball teams. The term sabermetrics is the analysis of baseball games, especially the in game activities to measure performance. By describing the use of the metrics in baseball it is then easier to translate SC metrics, inventory turnover, and on time delivery for example. The students see a real world application, use of data in baseball to improve the performance of teams. It also helped that this year's World Series teams use of sabermetrics is very aggressive. The Los Angeles Dodgers have one of the largest analytics departments and the Houston Astros one of the most aggressive teams in using analytics (Fink, 2017).

It is also may prove to be useful to use an example of a service supply chains, and this example has worked for me. For example, McDonald's is providing a service with a physical product. The McDonald's supply chain needs the raw material, hamburger meat, potatoes, and bread for example. We also have the management of the service side with the number of employees scheduled and the logistics of delivering the product to the customer. The service industry is still using inputs as a transformation process to provide an output. In some cases the input is the information provided by the customer. If one goes to the Doctor, the patient provides information about his/her symptoms so that the Doctor can make a diagnosis and provide

treatment. The preferred output in this case is a healthy patient. The same can be true when enlisting the service of an Accountant to complete your taxes. Data regarding income, investments, and receipts enable the Accountant to complete taxes for filing. As a professor, I can also be thought of in terms of supply chain. Students are the inputs and the transformation process is the teaching and providing the information for them to learn about a particular topic. The output for me has been that students learned the concepts of a particular subject and can apply those concepts, and hopefully this will be found to be the case in a broader sample with future research.

COMPARISON OF APPROACHES AND PROPOSED FUTURE RESEARCH TO TEST THE CONCEPT

Comparing test scores from one semester when I did not use the sports examples, vs. when I did, scores went from 23.51 to an average of 24.54. The small sample size indicates improvement in the sections I teach the results indicate statistical significance. An improvement but perhaps a better indicator is comments from my colleagues that teach in the Core program. Over the last several semesters both the Finance and Marketing faculty have expressed an improvement in the quality of the applications in supply chain sections of the Core projects. While this is very qualitative, it does show that my colleagues recognize that students are gaining a deeper understanding of the concepts of supply chains and the application of the concepts.

This paper reports on the experiences at one school with one faculty member. The approach is presented as a concept that requires extensive testing in a broader setting during future research. The concept could be tested over two semesters with a set of 5-6 faculties from several schools participating. The approaches mentioned could be used in one semester and not in the second semester. The experiences across several schools and faculty would allow for a

better understanding of the value, or lack thereof of this approach.

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BIOGRAPHY

Dr. Rightmer has 22 years of industry experience in Operations/Supply Chain Management. He was awarded his Doctorate of Business Administration in 2012 from Lawrence Technological University. Currently he is teaching in the 25th ranked Global Supply Chain Management at Wayne State University.