

TEACHING SUPPLY CHAIN MANAGEMENT BY CONNECTING WITH INDUSTRY: EXPERIENCES AND CHALLENGES

Harm-Jan Steenhuis, Eastern Washington University, 668 N. Riverpoint Blvd., Suite A,
Spokane, WA 99202 hsteehuis@mail.ewu.edu, 509 358 2283
Erik J. de Bruijn, University of Twente, PO Box 217, 7500 AE Enschede, the Netherlands
e.j.debruijn@bbt.utwente.nl, +31 53 489 3531

ABSTRACT

This paper describes an approach to teaching supply chain management that is very much integrated with local industry. More than half of the time, students were interacting with companies in company visits and small projects. The approach has many challenges but is considered useful by industry, students and instructor.

INTRODUCTION

When the first author took over an undergraduate supply chain management course at Eastern Washington University (EWU) in 2002, several conclusions were reached. First, although cases were used, the students had difficulty with identifying practical value of the material. Second, students had, in general, a negative idea about industry in the Spokane area and did not believe there were many local job opportunities. These two reasons were partly causing challenges in the operations management major in particular low enrollments, i.e. typically around 2% in the presence of 10 other majors. Third, the course was traditionally oriented on materials management and did not include logistical aspects of supply chains.

As a consequence of these findings a plan was developed to counter some of these findings. The plan was to create interaction with industry in the course to 1) make the course, and operations management major, more appealing to students. 2) Make students aware of industry and practical value of the course content. 3) Through the interaction with industry create more awareness industry awareness of EWUs operations management major and in particular the supply chain course with the intent to lead to local supply chain management jobs and internships. 4) To improve course content through creating a dialogue with industry.

This paper discusses the changes implemented in the last two years, the feedback on those changes, the plans for next year (Fall 2005 quarter) and the main challenges in teaching the course in its current form.

CHANGES FOR FALL 2003

In 2003, twelve students enrolled in the four credit course which was taught in the Fall quarter containing 21 class sessions of 100 minutes. First, to introduce students to the practical value of the course, it was decided to introduce students to local industry. Since this type of exercise required knowledgeable students it was decided to arrange the industry visits towards the end of the quarter. Visits were arranged during the last two weeks of the quarter leading to four company visits. These companies were in different industries and had different supply chain

positions. The visits typically included a company tour of 40 minutes up to an hour followed by 20 – 30 minutes of questions and discussions. To provide the students with some directions for the company visits, a final exam was scheduled the last day of class before the visits started. This exam was an open book exam which had only one question aimed at triggering the students into planning for the company visits:

Second, to include the logistics side of supply chain management, the book was changed from the materials/purchasing oriented [1] to [2].

Third, as a consequence of the choices described above, a challenge arose because the class time was reduced to 14 meetings. Therefore, there was pressure to deal with the material in fewer class sessions than in earlier years. It was decided to that a quick start needed to be made with the material. To accomplish this, a ‘comprehensive’ exam was given during the second lecture in the quarter. This test served several purposes; 1) It allowed students to become quickly familiar with the essentials of supply chain management 2) It served as practice for the students to learn to identify the most important topics in a timely manner 3) It served the subsequent sections because students would have an initial broad overview that would allow better case discussions. The test was extensively discussed the next class meeting so that everybody was aware of the main issues in supply chain management.

FEEDBACK FROM STUDENTS AND COMPANIES

Student evaluations revealed that students considered the course very valuable; the average and median scores for the course overall were respectively an 8.3 and a 9 on a 9 point scale. Comments showed that the students liked the company visits and case discussions. Although many students were initially shocked when told about the early comprehensive test, informal conversations with students showed that many appreciated it. Most students considered it a challenge and worthwhile experience. The average and median scores on the early comprehensive test were respectively 22 and 23 out of 30. This was considered quite a good result given the short time period allowed for studying.

The companies also valued the experience. The companies indicated that they appreciated to get in touch with students and that the students had good questions. The companies were also asked about what they look for in supply chain management candidates, in other words what skill set is important to cover in the classroom. In general, the feedback showed that the class should focus on a combination of purchasing and logistics issues and that the companies were especially interested in people with analytical skills, who are able to make decisions, are comfortable with spending a lot of time on the phone (particularly for buyer-positions), and who are able to handle large amounts of data. As a consequence of these class visits the supply chain management instructor was approached about an internship available at one of the companies that was subsequently filled with an EWU operations management major.

REFINEMENTS FOR 2004

Based on the feedback from students and companies several changes were made to the course for 2004. This time 18 students were enrolled although they were not necessarily aware of the approach followed in the previous year.

First, it was decided to have more company visits and start them earlier in the quarter. This time, nine companies were visited between the third week and the tenth week of the quarter. Three of the companies had been involved in the 2003 visits as well. The new companies included a hospital and an airport to emphasize service oriented organizations. Furthermore, a freight airline was included to serve as an example of a transportation element in the supply chain.

There was no time for guest speakers so these were not used. However, to facilitate students with their job search, it was decided to introduce them to professional societies (APICS and ISM) where they could learn about job demands and job opportunities. These were scheduled towards the end of the quarter.

Company feedback clearly indicated that supply chain management positions in the local industry had to deal with purchasing as well as logistics aspects. After reviewing several books, a choice was made to use [1] for the purchasing perspective and to use a trade-oriented book [3] to highlight the logistics aspects. Since some difficulty was expected with teaching based on this applications oriented book, it was decided that instead of lecturing on this material, it would probably be much more valuable to actually apply these techniques. Hence the idea was formed to have small group projects within the companies based on these techniques. The projects were scheduled towards the end of the quarter, i.e. after the companies had been visited. The results of all groups were orally presented during the final day of class. Company representatives as well as operations management colleagues, the department chair and college dean were invited for these presentations.

The early comprehensive test approach was again applied and was followed by an in-depth discussion in the next class meeting followed by the lecture on the main aspects in supply chain management.

A second comprehensive test, similar to the first, was given at the end of the quarter. It contained a new element to take the 'gambling' element out of it. For each test question the student had to provide two answers. One answer indicated the answer to the question. The second answer indicated whether they were sure about their answer or not. The following schema was applied: correct answer and sure: 2 points; correct answer but unsure: 1 point; incorrect answer and unsure: 0 points; incorrect answer but sure: -1 point. As a result test scores could range between -20 and +40, this was adjusted for grading purposes so that no student could actually achieve a negative score.

FEEDBACK FROM STUDENTS AND COMPANIES

Student evaluations revealed that students again considered the course excellent. The average and median scores were respectively a 4.5 and a 5 on a 5 point scale. Some comments from

students indicated that from their viewpoint not all companies were equally prepared for our visit and that some of the visits were too general.

Informal conversations with students showed that, similar to 2003, they appreciated the early comprehensive test. After the test, it was immediately noticeable that for the students receiving these types of scores on a comprehensive test so early in the quarter contained a very powerful message about their capabilities but also about studying/working in a smart way.

To get a more formal evaluation from the companies, an evaluation form was developed which contained nine questions regarding their opinion about what should be taught in supply chain management courses, their experiences with the student projects, their opinion about the course format, and their hiring practices. The company comments suggest that they consider this type of course with company visits and projects to be very valuable. Some indicated that they would like a more extensive research project. Furthermore, they would consider the graduates for their entry-level supply chain positions.

REFINEMENT PLAN FOR 2005

Since the students and companies are satisfied with the company visits, the company visits will be used again. Consequently, there is still a need to make a quick start in the course and therefore the 'early comprehensive test' will be used.

Since the projects were deemed valuable, these are also included. However, the time available for the projects was too limited in 2004. Therefore, more extensive projects are scheduled for 2005.

With regard to the combination of purchasing and logistics aspects, another textbook was found that combines both views. The book [4] is more superficial in its discussion than the combination of for example [1] and [2] but the advantage is that theory is provided in a combined view in one textbook. Class meetings, e.g. lectures, can focus on more in-depth issues and if student projects deal with more in-depth issues students can use the other more specialized books.

The presentations from APICS and ISM were only marginally successful in 2004. Despite the message of the importance of networking etc. the students did not seem to take this message seriously or forgot about it at the end of the quarter. Therefore, in 2005, the APICS and ISM presentations are planned for very early in the quarter so that students have a chance to attend subsequent APICS or ISM meetings during the quarter.

CHALLENGES AND TRADE-OFFS

Although the experiences with the course illustrate usefulness and satisfaction for student, companies and the instructor, there are several major trade-offs in teaching a course in this manner.

- 1) There is a trade-off between theoretical exposure and practical exposure. Practical exposure is nice and gives the students a much better sense of potential jobs and the skills required to perform those jobs but it can't serve as a complete replacement of learning theories. Lowering the number of company visits reduces the exposure to local companies and the ability to develop a network for job and/or internship placements. But increasing the number of company visits clearly reduces the available time for theory discussions.
- 2) There is a trade-off between company visits and company projects. The advantage of the visits is that they are short and provide the students with broader knowledge, i.e. they get to see many companies. The advantage of the projects is that students can delve in deeper. At this point in time a mix of these two approaches is sought.
- 3) Because the course has been offered several years, there is a trade-off between having the same companies involved each year versus including new companies. The advantage of the same companies is that it allows the establishment of relationships and a better understanding between the company and the university. The advantage of including new companies is that it broadens the network. So far, the emphasis has been on continued relationships with the existing companies although others have been added.

Aside from the trade-offs, there are also several challenges or issues to deal with.

- 1) When company visits are included in the course, how should this aspect be graded? One issue is that it would probably be better to include some kind of grading element from the companies as well.
- 2) When projects are conducted, how big should they be? Bigger projects, i.e. more meaningful projects, are more challenging because they have to start earlier. Starting earlier means that students will be less knowledgeable about the topics and will be less familiar with the range of companies and their approaches.
- 3) Should projects be split over several small student groups that each deal with a different company? Or for example several small student groups that work in one company? One company allows in-depth knowledge about the company and multiple teams of students working on some issues may provide more benefits to that company. However, it takes a much bigger commitment from that particular company and it limits the development of extensive contacts with multiple companies.
- 4) Balancing the different topics in supply chain management in one course is another challenge. In the course a balance was sought in combining logistics and purchasing aspects.
- 5) Another question is to determine the type of companies to get involved with. One approach is to select random manufacturers, i.e. rely on those that are willing to work with the university. Another approach is to approach companies that are in separate positions in the supply chain, for example different levels of suppliers, a manufacturer, wholesaler, retailer, transportation company etc. A third approach can be to analyze one specific supply chain, i.e. use companies that are each others suppliers and customers. A fourth approach is to use companies that illustrate specific aspects of supply chain management, e.g. use a company that has no internal manufacturing in combination of a company that mostly manufactures in-house or a company that works with low inventory levels versus a company that works with high inventory levels.

- 6) The number of companies showing up for the final presentation was disappointing. With their own existing responsibilities, the question is whether and how companies can be motivated to attend these types of events.
- 7) Another practical challenge is to schedule the visits. It requires extensive communications with companies and last minute changes from companies may alter the course design. The timing of making the appointments is also an issue. Making the appointments very early in the quarter, maybe too early for some companies, but leaving them 'open' until late in the quarter leads to uncertainty whether these visits will actually be achieved.

CONCLUSIONS

This paper describes an approach to a supply chain management course that has a high level of industry interaction through company visits and company projects. Overall, the approach has been evaluated positively by students, industry and faculty. However, teaching a course in this manner involves a number of important trade-offs such as between theory coverage and practical application. There are also several challenges and issues that have to be dealt with and that should be considered when following this type of approach.

REFERENCES

- [1] Burt, D.N., Dobler, D.W. and Starling, S.L. 2003. *World class supply management, The key to supply chain management*. Boston: McGraw-Hill.
- [2] Simchi-Levi, D., Kaminsky, P. and Simchi-Levi, E. 2003. *Designing and managing the supply chain, Concepts, strategies and case studies*. Second edition. Boston: McGraw-Hill Irwin.
- [3] Frazelle, E. 2002. *Supply chain strategy, The logistics of supply chain management*. New York: McGraw-Hill.
- [4] Leenders, M.R., Johnson, P.F., Flynn, A.E. and Fearon, H.E. 2006. *Purchasing and supply management*. 13th edition. Boston: McGraw-Hill Irwin.

N.B. A complete version of this paper can be obtained from Harm-Jan Steenhuis