Teaching and assessment reform of the *Supply Chain Management* course in a logistics engineering major

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ABSTRACT: The *Supply Chain Management* course is an important course for students in a logistics engineering major. This course design focuses on the process of teaching, particularly on the application of appropriate methods to inspire interest in self-learning of students, improve the teaching efficiency through various methods, as well as developing the actual work capability of students in logistics engineering majors. Student satisfaction with the course is a crucial factor in the course design and delivery, and it has been investigated through a questionnaire. Improvements to the existing course assessment are proposed to ensure that assessments are objective, comprehensive and understood by students.

INTRODUCTION

Economic globalisation and knowledge economy development result in the individualisation and increasing uncertainties of user needs, both of which intensify market competition. At the same time, modern business management has entered the era of supply chain management. In consideration of this background, raising the interest of students in a logistics engineering major and the learning effect of the course on supply chain management, deepening their understanding about supply chain theory, and combining the theory with practice, are all highly important.

On the basis of different teaching experiences, the author of this article explored and used various teaching methods to teach students the latest knowledge about supply chain management, and to develop their abilities for problem analysis and problem-solving. Their ability to practice was examined as well, however, within the limited classroom teaching time available.

TEACHING STATUS OF SUPPLY CHAIN MANAGEMENT

Supply chain management is one of the key major courses offered within logistics engineering. This inter-disciplinary course encompasses a wide scope of knowledge and puts emphasis on strong practicality. It covers various disciplines, such as management science, operations research, production operations, logistics engineering and marketing. Such comprehensive knowledge is abstract and difficult for students to understand [1].

In China, the majority of courses related to supply chain management focus mainly on theoretical knowledge and research. No practical training or teaching material for undergraduates is available as yet. Moreover, existing teaching materials have similar content, without unique features. They use outdated cases, most of which illustrate successful experiences of large transnational enterprises, for example, *Fortune 500* ranking list of companies. Only a few cases are related to practical situations in China and relate to small- and medium-sized enterprises.

The prescribed textbooks' characteristics for the *Supply Chain Management* course also indirectly influence its teaching programme. The course emphasises theoretical knowledge and uses basically a single teaching method, although case study and multimedia teaching are also employed. To examine and reflect the practical teaching aspect of this course, the author conducted a questionnaire survey of students from the Logistics Engineering Department at the Fujian Agriculture and Forestry University in 2012. A total of 70 questionnaires were sent and 59 were collected, showing a valid return rate of 84.3%. According to the survey results, only 41.7% of students were satisfied with the diversity of teaching methods, while 25 % and 33.3% answered *general (i.e. neutral*) and *unsatisfied*, respectively.

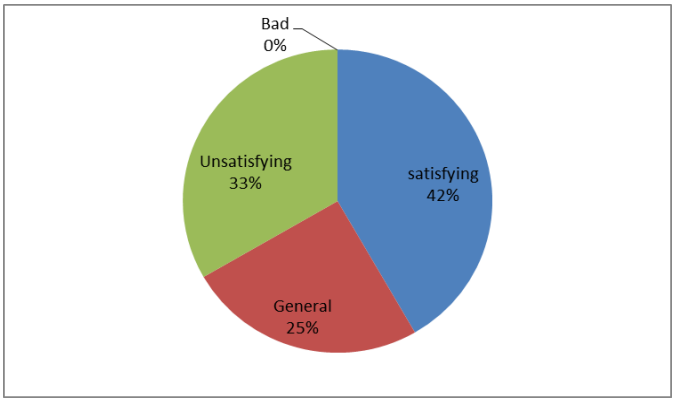

Figure 1: Student satisfaction with teaching methods - questionnaire results.

Hence, existing, traditional teaching methods could not adequately stimulate the enthusiasm of students. An appropriate teaching method had to be applied according to different teaching contents. This method had to be beneficial in developing the analytical and problem-solving abilities of students.

REFORM OF THE TEACHING METHOD

Motivating Learning Autonomy and Encouraging Autonomous Learning

Passive learning of students should be turned into active learning and teachers should fully utilise their leading role. Teachers' role is to stimulate the inner learning motivation of students according to practical teaching conditions and guide these students to learn and explore actively. The learning motivation of students generally comes from interest, engagement in problem-solving and a sense of achievement.

Students become active learners when they discover by themselves the significance of the things they have learned. Learning groups led by students with a high learning focus and awareness should be established. These groups can create a good learning atmosphere among students and help them learn how to learn in a peer environment.

Changing the Classroom Teaching Model and Inspiring Creative Thinking

Cramming is still the most common and basic classroom teaching method in China. As the word implies, teachers impart knowledge into students blindly and mechanically. When this teaching method is used, students have memories of what they have heard, impressions of what they have seen and feelings about the exercises performed. Knowledge is memorised through repetition, but it will gradually be forgotten. Students lose their learning enthusiasm without teacher supervision and cannot master the true learning method. In this context, the author of this article has tried the following methods in practical teaching, instead of relying on the traditional approach:

Teacher as a guide: students are guided by the teacher, and through video watching or image-text reading develop interest and inspiration from the course. This method can broaden the horizons of students and improve their problem-solving and analytical skills. For instance, while teaching the concept of a supply chain, the author of this article showed the students images from the 9/11 attack or the violent earthquake of 2011 in Japan.

In this way, the main concepts of chain supply are introduced through real-life, vivid examples, and are effectively connected with the attack and the earthquake. This teaching method attracts the attention of students and makes them understand the effect of terrorist activities or *force majeure* on the supply chain. In another example, the author showed the students the production process of a BMW car, while teaching about the supply chain of the auto industry. The practice proved that this method can stimulate the enthusiasm of students to learn and deepen their theoretical understanding [2].

Classroom discussion: the teacher guides students to discuss specific or general illustrative topics to stimulate discussion. However, the limited classroom time restricts how deeply students can get involved in the discussion. For example, when partner selection within the supply chain was being taught, the author asked the students to discuss the following problem: *If you are a general manager of a company and there are two enterprises with different purchase demands, which of the two will you choose as your partner after comparison? Please state your reasons.* During the discussion, students thought positively and engaged in a heated discussion, thus creating a lively classroom atmosphere.

Case-based teaching: students improved their abilities by analysing the experiences and lessons of typical and representative case companies [3]. The author exerted a huge effort to organise students to study the supply chain management of Honda, 7-11 and Dell companies. When global purchasing under the supply chain management was being analysed, key attention was paid to the Sudan red incident of KFC (in 2005, KFC was found using banned dye Sudan I). Also, the students were directed to collect, discuss and compare the data of melamine incidents in China (in

2008, milk and infant formula from Sanlu Milk, Mengniu Milk, Straight-A series of Yili, and others sources were adulterated with melamine, which caused kidney damage resulting in thousands of hospitalisations and some cases of death). Later, the students were asked to analyse the purchase characteristics of the milk supply chain to stimulate their independent thinking.

Promoting Experimental Teaching and Training Practical Ability

Although supply chain management is mainly a theoretical course, students without practical experience often have only partial and abstract understandings of its content. In practice, operation management of enterprises is based on appropriate computer application software. Therefore, experimental teaching should be adopted to complement and support the theoretical part. Experimental teaching brings students into contact with technical resources and management methods of enterprises during college teaching.

For example, the so-called beer distribution game (or beergame) helps students to comprehend the concept, causes and effective preventive measures of the bullwhip effect in supply chain management. The simulation study of supply chain illustrates and reinforces the point that supply chain management is vital to the survival of enterprises in fierce market competition. Experimental teaching can deepen the understanding of the basic theory of supply chain management and helps students to combine theory with practice [2].

REFORM RESULTS ANALYSIS

Upon completion of the course, student satisfaction in the aforementioned teaching methods was gauged through a questionnaire with ratings on a 3-point scale. The results are listed in Table 1.

Table 1: Questionnaire results of student satisfaction with teaching methods.

Topic	Options	Results	Percentage
Classroom discussion	Good	48	81.4%
	Just so so	11	18.6%
	Bad	0	0
Degree of interest	Interesting	38	64.4%
	Just so so	19	32.2%
	Uninteresting	2	3.4%
Experimental teaching	Benefited a lot	46	78.0%
	Benefited somewhat	13	22.0%
	No benefit	0	0
Teaching quality	Good	44	74.6%
	Just so so	15	25.4%
	Bad	0	0

Table 1 shows that: 1) *classroom discussion* earned high satisfaction from students, indicating that the organisation of case study and discussions were reasonable. However, student satisfaction could be further increased by choosing more illustrative cases; 2) *degree of interest* was relatively low. This finding implies that further improvements in several aspects of the course should be made including the teaching programme, methods, organisation of the teaching content, etc; 3) in regard to *experimental teaching*, 78% of students thought that they had benefited significantly. This finding confirms the high level approval of experimental teaching by students, but with some students still not convinced about the full benefit of it; and 4) in regard to *teaching quality*, 74.6% of students reported that it was *good*, which was indicative that most students were satisfied with the teaching methods as applied by the teacher. However, the 25.4% that reported *some benefit*, implied that the reform and innovation of teaching methods had gone not far enough or not in the entirely right direction for them.

REFORM OF ASSESSMENT MODE

Course assessment is an important part of a teaching programme. Evaluating the academic achievements of students, examining the teaching effect and improving the teaching process are essential parts of the overall quality assurance of education. In the past, supply chain management was often evaluated by measuring student achievement through closed-textbook examinations. This method of assessment focuses on one factor only, i.e. student scores, and it forces students to memorise the course content mechanically before the final examination. Such an assessment mode does not evaluate the acquired knowledge in relation to practical and problem-solving abilities [4].

On this basis, the author has tried to diversify course assessment, including paper writing, case analysis and closed-textbook final examination. These methods create a fuller picture of student comprehension of the core subject knowledge and related topics, and the ability to analyse and solve problems by using the acquired knowledge. The proportions of these assessment modes are shown in Table 2.

Table 2: Assessment contents, indexes and proportions.

Assessment content	Proportion	Evaluation factors	Proportion of sub-items
Attendance	0.05	Class attendance check	0.05
Case analysis	0.30	Attendance of group members	0.07
		Oral defence (group discussion, language expression, behaviours and response)	0.15
		Material standard and completeness	0.08
Paper writing	0.15	Novelty and importance of topic	0.05
		Reasonability of opinions and contents	0.08
		Format specification and completeness	0.02
Final examination	0.50	The final examination focuses on key contents of supply chain management. It basically covers all the contents in the prescribed textbook with main emphasis on purchasing management, inventory management and customer relation management in the supply chain management.	0.50

CONCLUSIONS

The author deployed case analysis, classroom discussion and presentations in the teaching process to stimulate the learning interest of students in supply chain management, and to encourage their active thinking and exploration spirit. The implemented changes improved the course in regard to theoretical teaching and practical aspects. However, according to the questionnaire results gauging student opinions of the course, further discussion and improvements are still required, especially arousing more interest in the subject taught requires more attention.

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