Chapter 39
Teaching Supply Chain Management Using an Innovative Practical Game

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ABSTRACT

This paper presents a new practical game which helps undergraduate students to understand how the concept of supply chain management (SCM) works. The game uses a simple supply chain structure incorporating three entities of the supply chain: supplier, plant, and customer. The game employs a set of toy building blocks such as LEGO® blocks and has the rules of the game, responsibility of each player, product descriptions and bill of materials. This competitive game is used supply chain cost as the measuring to determine the winner team of the game and the Bloom's taxonomy as guidelines to develop the assessment testing based on the learning objectives of courses. This proposed board game has been tested by many undergraduate students who are taking SCM and Logistics Management courses. The results show that the students who played the game reached the higher scores of assessment testing than students who didn't play the game. Furthermore, most students have also positive view about this game.

INTRODUCTION

The development of a teaching method for supply chain management (SCM) courses is an issue that has been raised in the academic SCM community. This issue has been discussed in several academic meetings such as the INFORMS meeting in 1995 and the14th Annual North American Research and Teaching Symposium on Purchasing and Supply Chain Management in 2003. Moreover, it has become a special issue in several academic journals, such as Production and Operation Management (POMS) Journal in 2000, INFORMS Transactions on Education in 2006, Operations and Supply Chain Management: An

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International Journal (OSCM) in 2009. Many lecturers in business and engineering schools using the supply chain (SC) games (e.g., Beer Games and Supply Chain Simulator) to support their teaching and learning for SCM courses.

Some SC games can be played on computer, or with a board and physical components (Zeng and Johnson, 2009). The Beer Distribution Game (Beer Game) is arguably the most famous teaching method of the SC game. It simulates material and information flows by computer among four entities in a serial supply chain: factory, distributor, wholesaler, and retailer. Lee et al (1997) believe that the main benefit of the Beer Game is to help students understand the existence and characteristics of the 'bullwhip effect'. Other SC games are predominantly computer based and usually need relevant knowledge and from pre-requisite courses (Zeng and Johnson, 2009). However, for undergraduate students who have never been explored the SCM subject find difficultly correlating SCM knowledge with its practical usage as it tends to be complex and uncertain. Therefore, it is still necessary to develop new SC games for the undergraduate level.

The game presented in this paper was played in some classes in SCM and a logistics management course at Industrial Engineering departments in one of Indonesia's public universities which was certified by AUN and ABET accreditation. The motivation behind the development of this game was to provide 'real work' as a player in supply chain entities for undergraduate students who did not have experience of handling SCM practices. The LEGO® toy building blocks as well as paper forms such as purchase and delivery orders, and others forms, are used to play the game. The Bloom's taxonomy a popular learning and assessing taxonomy is also used to create the learning objectives of the game and its assessment testing.

In section 2, literature review is presented. Sections 3 is the game design to explore the game's descriptions, player's responsibilities, products descriptions, and bill of materials, the rubric for measuring team performance, the rules of the game, and the learning objectives. In section 4, the game's usage in class and its validity are presented to show the scores of learning assessment for all students (both those who played the game and those who did not play the game), the perceptions and comments of students who played the games, and interview results for the winning and losing teams. Finally, the discussions and conclusions are presented in section 5.

LITERATURE REVIEW

The use of games as experiential educational tools to support learning in some university courses including supply chain management and logistics management is becoming accepted by lecturers. Kolb (1984) believes that an experiential learning approach could be used to support transition from conceptual theories to practice and reflection. Ruben (1999) pointed out that games as experience-based learning have the potential to 'make up' for traditional learning. Courses using board games can be beneficial to lecturers both giving immediate student feedback as well as allowing students the freedom to explore the concepts of the SCM theory (Gee (2003); Squire (2003); and Echeverria (2011)).

Many discussions for improving SCM courses, to revise the contents and to develop teaching methods and tools have been conducted. Much research has been carried out to evaluate and design innovative ways for teaching SCM. Table 1 shows 24 articles related to teaching method for SCM based on the purpose and focus. The focus is either on (A) the curriculum (content) or (B) teaching method. A curriculum is the content of a course, whereas teaching methods are the methods and equipment (hardware