

# Using a Simulation Game Approach to Teach Pull and Push Production System Concepts

Sakun Boon-itt<sup>1</sup>

<sup>1</sup> Thammasat Business School, Bangkok, Thailand

Correspondence: Sakun Boon-itt, Thammasat Business School, 2 Prachan, Rd. Pranakorn Bangkok 10200, Thailand. Tel: 66-2-613-2201. E-mail: sboonitt@tu.ac.th

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## Abstract

The main objective when teaching the Production and Operations Management (POM) course is to provide students with the understanding and ability to apply theories and principles to real-world production. However, the teaching of this course is clearly different from some other courses in which students can apply theories to laboratory simulations; for example, the Plant Design course. This paper proposes game simulation for the POM course on production using Pull system and Push system, assuming situations of television production applied from Hongyi Sun's method. The main materials are white paper, color pens, and production order cards. The main purpose was to provide students with a clear and factual visualization of overall production planning systems. The game simulation was tested with students of the POM course in the Industrial Management and Operations Program, Thammasart University. This game simulation study was compared with normal lecturing. It was found that students were mostly satisfied with the simulation and found it to be an interesting approach, providing the opportunity for problem-solving, creating a better understanding of both production-planning principles.

**Keywords:** game simulation, production and operations management, teaching

## 1. Introduction

Teaching the concepts underlying a production planning and control is a difficult task. Many students have very little technical experiences to which they can relate both business and technical aspects together. They may have acquired business experience, but many of them have only limited understanding of the operational or technical aspects. Modern educational games are considered to be effective tools in management education, using action instead of explanation to provide an interactive decision-making context (Kebritchi and Hirumi, 2008). A number of authors have suggested the use of simulations game as an innovative pedagogical approach to teach business concepts (Aldrich, 2003; Prensky, 2001; Anderson and Lawton, 2009). Simulation games replicate the complexity of a real-life environment, giving the students experience with a particular phenomenon. For instance, Cronan et al. (2012) compared objective measures and perceptions of cognitive learning in an ERP simulation game and found the different results between using game and traditional training.

POM is one of the fundamental courses in the Management faculty, but most students who take the course do not demonstrate much interest in its content. One main reason is that students do not see the importance of the content because it is different from other Business Administration courses, such as Accounting or Finance, where students can clearly understand the application of the content to their future career. Another reason is that the content is very complex as a result of the interrelationships among the three main parts: Engineering, such as Processing, Production and Machine Technology; Resource Management, such as Planning, and Project and Capital Management, as well as Resource and Quality Management; and Operations Research as a tool for Production Management.

In other words, the course in POM is difficult to teach effectively in a purely theoretical setting. From teaching experience it can be observed that the course is not very popular among Business Administration students because its content mainly relates to Engineering and Operations Research. Students need some way to directly experience the issues related to operating a production system. To solve this problem it is important to encourage students to engage with and understand the content, especially Engineering Processes and Operations Research,