The International Journal of Management Education 15 (2017) 60–66

Contents lists available at ScienceDirect

The International Journal of Management Education

journal homepage: www.elsevier.com/locate/ijme

Research Notes

Impact of an ERP simulation game on online learning

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ARTICLE INFO

Article history:
Received 24 July 2016
Received in revised form 7 January 2017
Accepted 10 January 2017

Keywords:
Online learning
Asynchronous online teaching
ERP
ERP simulation
SAP

ABSTRACT

The ever increasing use of online education dictates that the use of traditional face-to-face tools for students be expanded into the virtual classroom. Business students in online MBA courses at two universities are tasked with making decisions using SAP's ERPSim Manufacturing Game. The students are polled before and after their simulation experience on five dimensions including attitude toward SAP and several dimensions in Enterprise Resource Planning (ERP) knowledge. Students were found to have increased their attitudes toward SAP and knowledge of ERP upon completing the three-period simulation game. These results are significant for business educators of online courses because it shows that increased learning due to ERPSim not only takes place in face-to-face education classrooms but in an asynchronous environment as well. A comparison of our results with those reported in prior studies involving traditional classes revealed additional insights and potential topics for future research.

1. Introduction

The smooth operation of modern enterprises requires employees to engage in business processes that cut across functional silos. Breakdown in a process can result in lost revenues or fines and lawsuits as illustrated in several recent product defect scandals at various automobile companies (Tabuchi, 2014). In the last twenty years most large organizations have implemented Enterprise Resource Planning (ERP) systems to support integrated business processes. Potential benefits of these systems include efficiency and more transparency and compliance with laws and regulations. However, just like the business processes that they are designed to support, ERP systems are highly complex. Consequently, inadequate employee training can prevent the full acceptance of an ERP system or the realization of its major benefits (Monk & Wagner, 2008).

In response to the need to train tomorrow's business professionals to be effective users of ERP systems, many business schools have incorporated ERP software into their curriculum. However, while teaching keystrokes is easy, teaching ERP concepts remains a daunting challenge, even when an integrated software package is used. Because the software is highly complex, most exercises are designed to complete tasks contained in individual modules rather than cross-functional. Students rarely have a chance to "experience" the integration aspect of business processes as a result. To address this deficiency a simulation game using SAP ERP (ERPsim) developed by faculty at HEC Montreal (Léger, 2006) has been adopted by over 100 universities around the world. In recent years Cronan and colleagues have shown that the ERPsim game is effective in helping students better understand and embrace ERP concepts in traditional face-to-face classes (Cronan & Douglas, 2012, 2013;

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http://dx.doi.org/10.1016/j.ijme.2017.01.004
1472-8117/

Cronan, Douglas, Alnuaimi, & Schmidt, 2011). The purpose of this research is to test for the same results in asynchronous online classes.

2. Literature review

2.1. Growth of online course demand

Learning venues are changing with asynchronous online courses gaining in popularity. The lure for many students is the ability to fit college courses around work and life schedules. Today's students require more diversity in class availabilities due to family and work schedule demands. Online offerings, also known as distance education, allow students to work asynchronously, thereby, programs with both fully online and blended components have shown dramatic enrollment increases over the years (Redpath, 2012).

In 2000 eight percent of the total students enrolled in higher education in the United States were classified as full-time, online students in the pursuit of either a two or four year degree with another two percent taking at least one online course for a total of ten percent of all higher education students involved in an online class. By 2013 over twenty-six percent of all higher education students pursuing a two or four year degree took at least one online course (Department of Education, accessed December 9, 2015). As shown in Table 1, the number of online students has increased to over a quarter of all two and four year higher education students. Although the shift has been away from the full-time online population to part-time, the increase dictates that educators not only keep pace with enrollment but continually develop quality online courses.

The U.S. Department of Education projects that by the year 2024 total enrollment in two and four year institutions will be approximately 23,135,000 students. Following the linear increases in percentage of students enrolled in at least one online course, the percentage of students in an online class would be approximately 39.82% or 9,212,357 by 2024. This number of students is staggering and begs the need for online offerings that engage students with interactive content such as simulation games.

This phenomenon is not unique to United States post-secondary academic institutions. A review of current academic publications revealed that many countries are experiencing the same need for expanding course offerings via the online venue. For example, in Spain, total college enrollment has risen with unemployment cited as the primary cause as people return to school for new skills. Online enrollment is dramatically higher (18.52%) at UNED, Spain's most developed source of distance education (Reina-Paz, Rodriguez-Oromendia, & Sevilla-Sevilla, 2012). India faces continual escalation in course requests and utilizes distance education to meet the degree demand (Overland, 2000). In Pakistan, the same continued demand for higher education exists (Ellahi & Zaka, 2015). Jung, Wong, Li, Baigaltugs, and Belawati (2011) write about the need for quality assurance in distance education due to the rapid expansion of online colleges. Between 1998 and 2003, China licensed sixty-eight new distance education colleges to help meet rising demand. They go on to specify ten other Asian countries also addressing quality assurance of online offerings due to the expanded offerings.

2.2. Need for quality online courses

Numerous studies comparing student learning outcomes in traditional versus online classes have found either no differences or distance learning slightly better than traditional models (Borthick & Jones, 2000; Callister & Love, 2016; Friday, Friday-Stroud, Green, & Hill, 2006; Gagne & Shepherd, 2001; Lapsley, Kulik, Moody, & Arbaugh, 2008; Lyke & Frank, 2012; Piccoli, Ahmad, & Ives, 2001). Teaching methods in both face-to-face and online venues have in the past relied on theory based information. Critics have expressed frustration with this teaching concept especially in business classes and advocated the use of a pragmatic approach including the use of simulation based training (Lane, 1995; Salas, Wildman, & Piccolo, 2009; van der Merwe, 2013).

Students on today's campuses grew up with technology and learned much differently than most of their instructors (Prensky, 2000). Business simulations have increased in potency as technology has improved. The use of these simulations in business schools has validated improvement in both student performance and learning (Blunt, 2007; Levant, Coulmont, & Sandu, 2016). By exposing business students to simulation games using today's ERP software, they learn more than winning. Several studies published between 2011 and 2013 addressed the measurement of learning and attitudes toward ERP learning using simulation games (Cronan & Douglas, 2012, 2013; Cronan et al., 2011). The outcomes suggest that student

Table 1
Growth of online courses.

Year	Full time online	At least one online course	Total
2000	8.00%	2.00%	10.00%
2003	16.00%	5.00%	21.00%
2007	20.00%	4.00%	24.00%
2012	12.50%	13.30%	25.80%
2013	12.78%	13.59%	26.37%

Source: Department of Education, accessed Dec. 9 (2015).