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The relationship between business simulations in capstone management courses and standardized test scores

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ABSTRACT

Students now prefer and expect opportunities to be actively engaged in their own education. As more methods become available to engage students in experiential learning, examining the impacts of these methodologies becomes even more important. The authors sought to expand the literature by examining how various instructional methodologies may be associated with student learning in a business capstone course. This study examines the relationship between simulation and case instructional methodologies with a rarely-used outcome in the related literature, a standardized assessment of all disciplines related to the business field. Data were collected on demographics, academic performance, and instructional methodology for 1049 undergraduate students from 83 sections of the capstone strategy course from Fall 2006 to Summer 2013. The results show that the instructional methodology utilized in the course was related to scores on the standardized assessment, with the case methodology being associated with higher scores. Computer simulations were not associated with scores significantly different from sections with no experiential exercise. The implications of these findings are discussed, along with potential methods for educators using these methodologies and avenues for future research.

1. Introduction

> "We believe simulations are the only credible method to recreate somewhat authentically the environmental context of a manager" (Kachra & Schnietz, 2008: 499).

When teaching and learning styles are aligned, student learning is improved (Gioia & Brass, 1986). As technology advances and society changes, students' learning styles change and our teaching methods must change accordingly. A very popular suggestion in the literature for providing effective learning experiences to the virtual generation of learners is the use of simulations and games (Proserpio & Gioia, 2007; Salas, Wildman, & Piccolo, 2009). Simulations and games, which are used interchangeably in this research, have been used in diverse contexts and across various business-related disciplines to educate students on many topics (Faria & Wellington, 2004), with computer-based simulations available for 50 years (Faria & Dickinson, 1994; Summers, 2004). Educators and trainers have used three general categories of simulations and games:

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computer-based simulations, board games, and behavioral simulations (Summers, 2004). Such educational tools have been utilized in contexts such as marketing (Cook & Swift, 2006), entrepreneurship (Wolfe, 2004), corporate social responsibility (Moratis, Hoff, & Reul, 2006), and accounting (Springer & Borthick, 2007). In these contexts, a wide range of approaches and outcomes have also been considered including team-building (Scarfino & Roever, 2009) and cross-functional decision-making (Chakravorty & Franza, 2005), for both undergraduates and MBAs (Kachra & Schnietz, 2008).

Simulations and games for education and training have spawned a rapidly changing industry (Summers, 2004) and attracted the attention of more and more researchers. Entire journals such as *Simulation & Gaming* are dedicated to the topic, although not exclusively to business applications (Faria, 2001), and research on the subject often appears in journals such as the *Academy of Management Learning & Education*. Simulations and games have even been the focus of formal associations such as the Society for the Advancement of Games and Simulations in Education and Training (SAGSET) and the Association for Business Simulation and Experiential Learning (ABSEL) (Moizer & Lean, 2010).

In the literature on simulations and games (Anderson, 2005; Gosen & Washbush, 2004; Xu & Yang, 2010), performance in the game is the most common dependent variable through measures such as team ranking (Adobor & Daneshfar, 2006). Although extant studies have enriched our understanding of simulations and games, insight into student outcomes from these tools is still limited (Anderson, 2005). Researchers have called for future research that examines additional performance outcomes, such as overall performance in a course (Cook & Swift, 2006; Zantow, Knowlton, & Sharp, 2005).

Simulations are popular teaching tools in the capstone course of many business programs, often the strategic management course (Faria, 2001; Kachra & Schnietz, 2008; Zantow et al., 2005), making it critical to understand their impacts and outcomes. For example, Faria and Wellington (2004) found that 30.6% of surveyed business faculty were using simulations and suggested this would continue, as almost 91% of users were highly unlikely to cease using a simulation in their courses. Their survey also found strategy faculty to be the most likely to use simulations within their courses (50% of strategy respondents utilized simulations). Examining simulations within strategy courses also takes on special meaning because simulations help teach analysis and strategic thinking within the capstone course (Tompson & Dass, 2000).

Technology is changing rapidly, making this a good time to examine current simulation tools and pertinent relationships, such as between simulations and self-efficacy (Proserpio & Gioia, 2007; Tompson & Dass, 2000). It has been found that simulations are the best option to provide experiential experiences in strategy courses (Kachra & Schnietz, 2008) and that students can learn and retain lessons for a long time even if they do not perform well in simulations (Adobor & Daneshfar, 2006; Kachra & Schnietz, 2008). The authors are aware of no study that incorporated a measure of performance that went beyond that in the simulation itself or the course in which the simulation was utilized. In their review of the literature to that point, Gosen and Washbush (2004) called for more research to follow this approach and suggested objective measures of assessment. Wolfe (1997) also suggested objective measurement, along with control group designs (or at least evidence of equivalence among groups). Drawing on theories of experiential learning and self-efficacy, this research seeks to add to our understanding of the relationship between various methods of applied learning (i.e., simulations and cases) and student outcomes on standardized, objective assessments which focus on application and integration across a variety of disciplines. The contribution of this research is to provide educators additional insights on how the methodologies utilized in the classroom may impact student scores on such assessments.

In the following section, extant literature on various instructional methodologies is reviewed, with a focus on one of the more recent developments, simulations. Following the literature review, hypotheses are developed regarding the relationship between applied learning methodologies (simulations and cases) and outcomes on standardized assessments through the lens of self-efficacy theory. After development of the hypotheses, the sample and methodology for the study are discussed. We conclude with a discussion of the findings, limitations, and implications for future research.

1.1. Literature review

For the purpose of this research, we focus on research targeting undergraduates in management and related disciplines. The review begins by examining some of the learning processes and theories associated with simulations and games. The outcomes and results of using simulations and games are then presented. The review concludes with suggestions for the use of simulations and games in courses, as well as an overview of the adoption of simulations by educators.

1.1.1. Learning processes in simulations

Learning has been defined as 'the process whereby knowledge is created through the transformation of experience. Knowledge results from the combination of grasping and transforming experience' (Kolb, 1984: 41). There are several approaches to the study of learning and underlying processes in simulations and games in the literature. One approach is experiential learning, which is discussed in greater depth in the development of the hypotheses. According to Faria (2001), three categories of learning may result from participating in a simulation. Behavioral learning involves students using concepts they have previously learned to take the correct action in a situation; coming to an understanding of the basic concepts in an area is indicative of cognitive learning; and affective learning is the perception of the students as to what they learned from the simulation.

Kachra and Schnietz (2008) found that simulations in an MBA strategy course allowed three types of integration: theoretical integration involves understanding how the different concepts across courses overlap; applied integration focuses on how these concepts impact the overall performance of the organization; and practical integration occurs when students can