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Why Use Simulations?

The Case for Experiential Learning Through Behavioral Simulations

A Research Position Paper

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Introduction

The latest research supports empirically what humans have always believed intellectually and emotionally; that we learn best through experience. At exper!ence it inc., we work hard to mix the marrying of leading edge learning pedagogy and design, immersive, story-driven worlds, technology and deep data to enable deep and lasting learning by experience. The following paper explains some of the empirical research behind our passion for experiential simulation-based learning.

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experience it inc. has been designing simulations for over 25 years. We have gathered compelling evidence from our clients, based on the experiences of hundreds of thousands of learners, which reveals that our behaviour-based simulations enhance their learning experience. The purpose of this research paper is to go beyond the recognized bias in our own data collection to examine the current research on the effectiveness of simulations in achieving learning outcomes. Research by M. Reid, et al (2012), revealed that "the value of simulation has been extensively discussed in the literature with the majority of the literature (Chapman & Sorge, 1999; Farrell, 2005; Wolf & Luethge, 2003) supportive of the enhancement in learning that can occur. This seems to support the claim of Zantow et al. (2005) that the real value of simulation continues to be underestimated." M. Reid et al. (2012) also reported that the research literature on simulations shows that some of the many benefits include the opportunity to merge professional and active learning, along with appreciation of real life business decision-making actions and processes.

"Experience it inc. simulations are designed to account for the complexity of an organization's context of processes and systems"

It can narrow the gap between a complex reality and the classroom (Doyle & Brown, 2000; Mizukami, 2002). When students make good, well-planned decisions, they can clearly see the results and rewards reflected in the simulation (Wolf & Luethge, 2003). Simulation has also been found to be effective in the integration of the functional areas of business (Stephen et al., 2002) as well as the integration of theory and practice (Wolf & Luethge). Dynamic cases provide a structured

environment for learning complex problems and empower students to act in a rational way and solve real world problems (Brookfield, 1995; Senge & Fulmer, 1993; Shubik, 1975). Gilgeous and D'Cruz (1996) offered the following advantages of using simulations:

- simulations support lecture and theory validation through real life application.
- simulations add dynamics to cases where students can learn about the quality of their decisions.
- simulations provide much more personal interaction and team building.
- even the poorest simulation performers may be the most significant learners.

M. Reid et al. (2012) cite the research of Williams (2008) that noted how simulations can facilitate the development of professional and technical skills that include the ability to collaborate and analyze just-in-time information. "Simulation applications can be targeted to specific learning objectives or be very generic with ambiguous ill-defined problems requiring multiple solution identification and implementation iterations." experience it inc.'s simulations are designed to account for the complexity of an organization's context of processes and systems, which are open to alternative and innovative approaches to problem solving, as outlined in the research literature.

M. Reid, et al. (2012) and Hyunjung, K., et al (2013) note the significance of a systems approach to learning new mental models that support the development of double-loop learning (Argyris and Senge 1996) as a compelling contribution of simulations to the learner's experience. Hyunjung, K., et al (2013) contends that a simulation-based learning experiences can improve the manager's ability to apply double-loop learning to their decision making practices. "This article posits that systems theory and its associated simulation

methods are well suited to support "double-loop learning" (Argyris and Schön 1996) for public managers, especially when the problems confronted are characterized by "dynamic complexity," as explained in the following section." The author contends that simulations create the opportunity to break out of the mental models, old paradigms, and boundaries of single-loop learning and decision-making, and move towards double-loop learning, which is generative and proactive.

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How does simulation modeling support double-loop learning in management teams? Sterman (1994) argues that experimenting with the virtual world enhances double-loop learning by reducing various learning impediments such as bounded rationality, system complexity, and information delays. Building on Sterman's seminal work, this article presents a framework to explain how the process of causal theory building and dynamic hypothesis testing in system dynamics aids double-loop learning in two seemingly contrasting epistemological paradigms. Building on studies on collective mental models (Cannon-Bowers, Salas, and Converse 1993; Kim 2009; Mohammed, Ferzandi, and Hamilton 2010), the framework assumes that collaborative decision making requires emergence, alignment, and modification of collective mental models.

Based on the seminal work of Argyris and Senge (1990) that examined mental models, and the Tolman's seminal research on cognitive maps (1948), along with the ground-breaking systems

sight investigation of Barry Oshry, it can be concluded that simulation-based learning has the potential to create immersive, experiential practice that can lead to double-loop learning with profound effects on decision making.

Because managerial decisions are generated from mental models, mental models are viewed as the main leverage point for enhancing managerial decision-making....When double-loop learning occurs, observations of the policy system have a more profound effect, leading to a modification of mental models or the "theory-in-use" (Argyris and Schön 1996).

The research evidence supports the case that behavioural simulations, whether face-to-face or in a virtual world, lead to profound learning experiences that include greater systems sight and personal insight and understanding. "Rather than simply communicating concepts in a lecture style format, simulations allow participants to immerse themselves in a learning-by-doing experience that closely replicates reality."(Carmen, 2013). The author further notes the many advantages of simulations that include: practicing performance; implementing and experimenting with processes improvements; participating in market structures; experiencing competitive and collaborative situations.

Simulations help overcome the chief obstacle to the effectiveness of traditional classroom-based training: that the context in which the training occurs is completely separate from the day-to-day work context, and therefore the lessons from the training are lost en route to the workplace. (Carmen, M. 2013)

References

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