Chapter 10
Shaping an Evaluation Framework for Simulations:
A Marriage Proposal

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ABSTRACT

This chapter presents a hypothesized evaluation framework for measuring the effectiveness of simulations for learning, while indirectly providing an instructional design framework. The proposed framework was formulated using course design concepts, a newly emerged purpose-based simulation taxonomy, and a frame using Kolb's Experiential Learning Theory. To examine the untested taxonomy, which posited an alignment between purpose-based simulation categories to that of Bloom, an analysis reviewing literature within the last decade identified 80 articles. Correlation analysis indicated the area of application when compared to that of a modeling-based simulation type presented the strongest relationship. A summary section includes various domain examples to demonstrate an initial examination for fit to the newly proposed framework.

INTRODUCTION

As this chapter is one of several within our book "Teaching, Learning, and Leading with Computer Simulations" that explores some aspect of using simulations for learning, the intent of this particular chapter is to provide a new evaluation framework for measuring effectiveness of simulations for learning, while indirectly providing an instructional design framework in which to build courses containing simulations. To support this goal, a discussion will unfold that begins by discussing the importance of simulations to the educational field. Since gaps in teaching and design of learning activity support were identified within the literature, both challenges and opportunities will be presented that showcase the need for such an evaluation framework. An extended discussion will include the more predominate happenings in the field of working with educational simulations. The chapter will explore the more popularized forms of examination techniques and theories currently being used in the field that explore simulation effectiveness for learning. The focus of the chapter, however, will shift midway to review issues found that led to the conception of said framework. They include: (a) missing implementation guidelines, (b) missing instructional design support, and (c) the lack of cross-domain investigations in which data could be generalized. To address these concerns, it is posited that a uniquely hypothesized framework be considered. This particular evaluation framework was formulated using course design concepts, a newly emerged simulation taxonomy, and a frame based lens using Kolb's Experiential Learning Theory (ELT). Taken from previous systematic literature reviews and literature reviewed within the last decade, 80 articles were located in support of this research goal to better investigate one of the three framework components, which is a newly proposed purpose-based taxonomy for the classification of simulation types per learning activity. To this end, a "marriage of the ages" is suggested for the purpose of embedding this taxonomy into a Kolb-based course investigation to posit how these elements can work in tandem in order to begin to address these gaps of support for the field. While some may say this is a lofty goal to address such a great issue using only a suggested framework, discussed in a small chapter of a book, it is hoped that this chapter will spark a greater discussion, and exhibit an acceptable resource for educators alike. Therefore, let's begin and consider how to better provide much need support to tackle these profound issues.

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