

## Chapter 15

# Transdisciplinary Collaborative Development of Healthcare Virtual Simulations

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### ABSTRACT

*There is a need for collaborative, participatory exploration into emerging simulation technologies supportive of distributed, interdisciplinary practice to promote cultures of collaborative praxis. Higher educational institutions are adapting curriculum to support interprofessional education among healthcare students such as in medicine, nursing, and social work to build the ability to practice with greater safety for patient care. An analysis of critical supporting factors and challenges for distributed teams seeking to develop virtual simulations is presented with guidelines for distributed development and delivery using emerging simulation platforms applicable to healthcare teams and beyond.*

### BACKGROUND

Higher education curricula must be up-to-date, relevant, and feasible, especially where technology is involved. Complexity in curricular development increases as interdisciplinary faculty become involved in efforts to combine and integrate curriculum for students of different disciplines. Technology evolution is even more complex but has resulted in benefits for distributed, interdisciplinary education. Higher educational institutions are adapting curriculum to support interprofessional education among healthcare students such as in medicine, nursing, and social work to build the ability to practice with greater safety for patient care. In-person simulation is a strategy used in training and current advances in virtual simulation use immersive technologies to create virtual characters and teams for education and

DOI: 10.4018/978-1-5225-9679-0.ch015

professional development in remote and geographically-separated campuses. Successful integration of virtual simulation holds the promise of applying lessons learned toward building a culture of readiness to adapt to future challenges.

Méndez (2015) referred to a joint problem-solving using “Prevention through Design,” a cross-disciplinary initiative to “understand the impact on the environment and nearby communities of people to guide reiteration of their designs” (p. 131). West et al. (2016) reviewed IPE curriculum and practices conducted at higher education institutions across the United States. They reported that the format of IPE included didactic instruction, simulation, and team-based learning. The latter were popular methods since they are “...conducive to role exploration, application of various communication techniques and “hands-on” team development” (p. 44). Meeting the instructional needs of each discipline requires faculty development even for shared didactic instruction. “Faculty development efforts ranged from limited or non-existent, to very sophisticated; however, the schools uniformly expressed the need for faculty development resources” (West et al., 2016, p. 42).

This chapter provides a glimpse of what is possible to construct as models of environments where designers can gain insights from accelerated experience when they have learned to interact and even build in the virtual world environment where simulated scenarios can be performed. This chapter explores the benefits and challenges of integrating virtual technology into healthcare curricula as well as the enabling processes and lessons learned in the collaborative development and deployment of virtual simulations using a transdisciplinary action research approach (Stokols, 2006, p. 66).

## **Integrating Technology Into Healthcare Curricula**

A variety of 2D and 3D collaboration technologies are available for distributed teams. Figure 1 illustrates typical tools such as Skype, Google Documents, and learning management systems. These tools do not rely upon 3D capabilities. Lacerenza, Zajac, Savage and Salas (2015), reported that global virtual teams must communicate through technology-mediated tools cited as a disadvantage or challenge to team process. “However, with continual technological advancements and increased usage, these tools may actually represent an advantage” (p. 100) for example in creating a record of revisions that can be referred to later. The best collaboration approach involves identifying and combining the use of technologies that permit display and joint authoring capabilities.

Mature, campus departments engaged in learning technologies that support innovative faculty development may have all three platform capabilities in their repertoire. Managing digital media assets can also

*Figure 1. 2D collaboration technologies*



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