Theory for Simulation

Theory and Simulation-Based Education: Definitions, Worldviews and Applications

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Abstract: In this article, we introduce readers to the role of theories in simulation-based education. We discuss "theory" against a background of complex ways of thinking about the world. We present our notion of theory as a framework of ideas, which illuminates simulation-based educational practice. Theories are derived from, and resonate with, educators' worldviews. We offer a foreword to five articles in *Clinical Simulation in Nursing* that explore specific theories applied to simulation-based education. These frameworks challenge educators' thinking and practices. We have divided the article into three parts. In Part 1, we define theories and consider concepts of worldviews and two metaphors—of theories as lenses and as liquids. In Part 2, we describe why theory is important for simulation-based education and consider the breadth of theories, referring to commonly and less commonly cited theories. In Part 3, we orientate readers to the five articles from postpositivist, interpretivist, and critical theory worldviews, specifically from theories of *Cognitive Load*, *Reflective Cycle*, *Informal Learning*, Stanislavski's *System*, and *Cultural Historical Activity Theory*. We conclude on an exciting note that, through the articles in this series and elsewhere, theories are increasingly being conceptualized, adapted, and applied to simulation-based health professional education.

Cite this article:

Introduction

"Theories are nets cast to catch what we call 'the world': to rationalize, to explain and to master it. We endeavor to make the mesh ever finer and finer." (Popper, 1959)

In this article, we introduce readers to the role of theories in simulation-based education. Conceptual issues are foregrounded that are relevant to five articles in *Clinical Simulation in Nursing* that explore specific theories applied to simulation-based education. Although the articles in this series are designed for educators, they may also benefit researchers by providing a framework in which to locate their research.

The authors of this article are educationalists, simulation practitioners, and researchers with decades of experience in health care simulation across various modalities. Knowledge and appreciation of theories has enhanced our

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educational and research practices. In Part 1, we invite readers to consider the higher order and conceptual issues outlined in this article before considering the application of theories to specific elements of simulation-based education in those that follow. We start be defining theory, introduce the notion of worldviews and metaphors for theories. In Part 2, we explain why theory is important to simulation educators and identify theories for further consideration. Finally, in Part 3, we orientate readers to the five articles in the series.

Key Points
- Theories can be seen as frameworks of ideas, which illuminate simulation-based educational practices. Theories are complex and contestable.
- Metaphors can facilitate understanding of theories and include the notion of a lens or a liquid.
- Worldviews represent ways of thinking about reality and knowledge.

Part 1: Defining Theory

"Theory" is a complex and nuanced term. In our experience, it signifies different concepts to different people, and sometimes individuals have strongly negative or positive emotional reactions to the word itself. The Oxford Dictionary online defines theory as: "1. A supposition or a system of ideas intended to explain something, especially one based on general principles independent of the thing to be explained… 1.1 A set of principles on which the practice of an activity is based… 1.2 An idea used to account for a situation or justify a course of action …" Theory is conceptualized, applied, and discussed in diverse ways.

Theories can be described as grand, middle range (Worsley, 1987), and practice based (McEwen, 2007) or micro theories. Although the nature of these categories can be debated (Collins, 1988; Im, 2005), they provide helpful ways to consider different types of theories. Nursing practice has a strong tradition of grand theories such as Roy's Adaptation Model (Callista, 1980), Orem's Self-care Model (Orem, 1991), and others. These theories are "unified" explaining higher order approaches to nursing practice with embedded values. There are many nursing theories of the middle range that focus on phenomena essential to nursing practice (e.g., pain management). Then, there are practice-based nursing theories that provide evidence of specific nursing approaches or techniques in defined circumstances.

In this article, theory is offered as a framework of ideas, which illuminates simulation-based educational practice. In our interpretation, we suggest that theories seek to provide understandings of *how people learn* and *how teaching is enacted*. We also draw on the layering of theories previously outlined as grand, middle, micro, and practice based because it can facilitate understanding of the different layering of the ways educators approach and enact their practice.

The Relationship Between Theories and Worldviews

Our notion of theory is contestable and draws from our experience as constructivist educators and qualitative researchers. We suggest that any notion of theory stems from disciplinary and individual perspectives on the nature of reality (ontology) and the nature of knowledge (epistemology). These perspectives in turn align with the notion of a paradigm, which can be regarded as "some implicit body of intertwined theoretical and methodological belief that permits selection, evaluation, and criticism" (Kuhn, 1962). A helpful alternative term for "paradigm" is "worldview" (Lincoln, 1990). Although worldviews are most often discussed with respect to informing health professional education researchers (Weaver & Olson, 2006; Rees & Monrouxe, 2010), they are equally relevant to health professional educators.

Guba presented four worldviews, using terms which may appear daunting to the uninitiated: positivist, postpositivist, interpretivist, and critical social theorist (Guba, 1990; Bunniss & Kelly, 2010; Weaver & Olson, 2006). These worldviews represent ways of thinking about reality and knowledge and are most easily understood with a concrete illustration. Consider, for example, alternative worldviews of a standard manikin as used in many simulation centers. For a positivist educator, who is oriented toward an objective reality, this manikin might be most easily understood as a representation of a "real" patient. The positivist educator may be very focussed on issues of "physical fidelity." For example, they may be very concerned that the physiological parameters of the manikin accurately reflect those of a patient in a specified clinical state. For a postpositivist educator, who is oriented toward an objective reality but is prepared to accept the importance of the experiential and qualitative, the focus is slightly different. The manikin is still a representation of a real patient, but the educator may closely consider issues of "psychological fidelity." For an interpretivist educator, who is oriented toward reality being subjective and constructed by individuals, the manikin may be most easily seen as a learning tool. In this worldview, fidelity per se may not be the focus, but rather how the learner perceives and interacts with the manikin. This educator may privilege the learning activity above how the manikin represents reality. For a critical theorist educator, who is oriented toward the social construction of reality, the colour, body shape, and gender of the manikin may be most significant. For this educator, a white muscular male manikin, as are common, may perpetuate a notion that white muscular men are the most "normal" members of society.

Often educators find that they can in fact hold all these worldviews but may privilege particular issues over others