SECTION II

Theoretical perspectives and frameworks for healthcare simulation

CHAPTER 2

Theories informing healthcare simulation practice

Margaret Bearman, Debra Nestel & Nancy McNaughton

KEY MESSAGES

- Learning theories are guides rather than prescriptions.
- Learning theories align with different ways of understanding the nature of knowledge.
- Behaviourism emphasizes the achievement of an external standard through demonstrated behaviours; elements of 'deliberate practice' reflect behaviourist principles.
- Constructivism is a broad umbrella term for theories concerned with individual and social constructions of knowledge, many with great relevance to simulation-based education.
- Critical theory approaches focus outward on society and its effect on simulation practices.

Overview

Theories can be considered coherent frameworks of ideas, which inform learning and other simulation practices. This chapter provides a brief overview of different types of theories, illustrated by selected theorists and examples of application to practice. The first section provides a short overview of behaviourism and some of the key debates, as well as expanding on an additional theory, *deliberate practice*, which draws from behaviourist principles. The next section starts by describing constructivist approaches associated with theories such as *reflective practice*, before going on to explore a social learning theory, *situated learning*. The final section articulates the broad premise of critical theories, before focusing on one theorist, *Michel Foucault*, and providing an exploration of simulated patient (SP) practice through a critical theory lens. The development of patient-focused simulation is presented as an example of how theory can be applied to develop simulation practice.

Introduction

Ideas about how people learn underpin simulation-based education (SBE) in the health professions. When these ideas are formalized into coherent frameworks, they are referred to as *learning theories*. Learning theories permit educators to identify teaching approaches that can optimize the opportunity afforded by the simulation encounter, and thereby assist learners to acquire new knowledge or skills. They can be purely conceptual or derived from the rigorous collection of qualitative and quantitative data. Learning theories are not absolute; they guide rather than prescribe. Educators draw on them for different reasons. For example, theories can support the initial educational design such as making decisions about what simulation method to choose and why; they can assist with resolving specific dilemmas such as how to manage underperforming learners; or they can challenge accepted practices such as a longstanding approach to debriefing.

This overview of theories that inform healthcare simulation practice can assist in guiding simulation design, development, implementation and facilitation. It is by no means comprehensive, but gives an indication of both the value and the diversity of theories informing SBE. We provide our perspectives as SBE practitioners, researchers and scholars, noting that this is an area in which there is no definite expert consensus.

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Learning theories are often very abstract. Educators may find theory most helpful by considering its value within local professional and environmental contexts. For example, the legacy of Western political domination may seem irrelevant to SBE, but thinking about this in theoretical terms can prompt educators to review whether their simulators and SP represent the skin colour and physical appearance of the local community.

We suggest that learning theories can be aligned with ways of understanding knowledge (epistemology) and reality (ontology). This chapter presents three overlapping categories of learning theories, which align with particular notions of knowledge and reality. *Behaviourist* learning theories align most easily with worldviews that are concerned with objective truths and measurement. These theories are less concerned with the internal mechanisms of learners, and more with their behaviours, which can be observed. *Constructivist* theories are focused on the learner's role in learning, while *social learning* theories extend this to consider the role of the learning environment. Both of these approaches are concordant with a worldview that is concerned with individual and social constructions of knowledge. Finally, *critical theories* consider the broader questions of society and social behaviours. These are not learning theories per se, but provide valuable lessons on understanding how the broader sociocultural context may influence learning. It is worth noting that there is little consensus on the categorization of learning theories and that educators draw from multiple theories for diverse reasons. We will present some of this complexity in our discussion while maintaining the focus on the practical value of learning theories to SBE.

Behaviourism

Behaviourism, unlike the other categories in this chapter, can be considered a coherent theory as well as a pedagogy. Behaviourism's dominance of the educational literature has waxed and waned over the last 80 years. Its current place in the learning theory landscape is controversial. Some people consider it to be primarily a notion of learning as response to a stimulus, and certainly Ivan Pavlov, a notable historical influence, studied stimulus and response in animals [1]. Rote learning, such as memorizing the sum '$7 \times 8 = 56$', is a simple example of this. In this instance, '7×8' is the stimulus and '56' is the learnt response. Behaviourism was once seen as being superseded by a cognitive view of learning [2], but over time discourses about behaviourism have continued to develop. Those who draw on it today distinguish a range of more nuanced features, although they still hold to the basic premise of stimulus and response [1].

We broadly define contemporary behaviourism as those approaches to learning that focus on achieving an external standard that must be achieved through demonstrated behaviours. This aligns with Woollard's view [1] that 'behaviourism, in terms of learning, considers that it is through modifying behaviour and ensuring learners' preparedness for learning that the best outcomes will be achieved. Behaviourism embraces a pedagogy built upon precision, rigour, analysis, measurement and outcomes' (p. 22). These notions provide the foundation for many of our historical educational practices. For example, the writing of learning objectives focuses on demonstrable change in behaviours, as proposed by Ralph Tyler in 1949 [3]. Equally, accreditation of learning with its concerns about valid and reliable assessment also aligns with behaviourist principles.

There are some areas where we think behaviourism is most valuable in SBE. In particular, health professional practice is full of simple and complex practices, which should occur automatically without the practitioner thinking deeply about how to complete the tasks as they do them. These activities can be psychomotor skills such as suturing, cognitive tasks such as pattern recognition, or even communication skills, such as always introducing oneself to the patient or healthcare consumer by name. These activities are also often well taught in simulation, due to the emphasis on repetitive practice to ensure automaticity.

McGaghie et al. [4], in their 2011 critical review, noted a number of 'best practices' in SBE that draw from behaviourist principles. One of these is *deliberate practice*, which is presented as an example of a theory with particular relevance to SBE. *Deliberate practice* was conceptualized by Anders Ericsson, a cognitive psychologist, who sought to understand how elite performers achieved excellence [5]. From this empirical basis, he concluded that a necessary part of excellence was the notion of focused, repetitive practice. He described essential elements: a highly motivated individual can develop expertise through repetitive practice that also

involves receiving feedback on performance, goal setting that continuously seeks to extend performance, individual coaching and practice occurring under different conditions. Like many approaches, this is not purely behaviourist in its approach, but there are key elements – 'well-defined learning objectives' and 'rigorous precise measurements' of demonstrated behaviours [4] – that align with behaviourism. See Box 2.1 for an example of how deliberate practice can be integrated into simulation educational design.

Box 2.1 Theory in Action: Patient-Focused Simulation

Deliberate practice, reflective practice and situated learning were developed in real rather than simulated settings and are appropriated with caution to the world of healthcare simulation. Drawing on these three theories, Roger Kneebone, a surgeon educator, and Debra Nestel, a communications educator, developed the concept of patient-focused simulation for learning procedural skills [11]. Patient-focused simulation involves a learner performing a procedural skill while working with a simulated (standardized) patient (SP) aligned with a task trainer (bench-top simulator). Kneebone and Nestel had noticed that teaching basic procedural skills on a task trainer was effective inasmuch as correct sequencing of psychomotor skills could be observed, but the experience was out of context. When the learner was required to perform the procedure on a patient in a clinical setting, the bench-top simulator experience alone was insufficient because it was not situated. That is, there was little resemblance to the setting in which the learner would be required to practise. Notably, there was no patient, no human interaction. Nestel and Kneebone argued that safe training approaches need to include ways in which learners can integrate complex sets of skills (psychomotor and professional) as they will be required in clinical settings. At a minimum, patient-focused simulation comprised a SP trained to respond as if undergoing the procedure in a simulated clinical setting. The learner in patient-focused simulation was offered the opportunity to perform the whole procedure in simulation and to receive feedback on their performance – from the SP and experienced clinicians and further individual reflection, to make sense of the experience from the learner's perspective. Elements of deliberate practice included motivating individuals, encouraging goal setting, multiple repetitions in different contexts and feedback. From situated learning, patient-focused simulation located the procedural skill in a clinical context with a SP; and from reflective practice, reflection-on-action was adopted, most commonly as facilitated dialogue between the learner, SP and observers after the simulation.

Constructivism and associated social learning theories

Constructivist theories of learning argue that individuals construct knowledge and meaning based on their experiences and ideas. Fosnot [6] claims that educators adopting constructivist theories enable learners to use 'concrete, contextually meaningful experience through which they can search for patterns, raise their own questions, and construct their own models, concepts, and strategies' (p. ix). Adopting this stance, educators may be seen to be orienting their role to that of facilitator rather than teacher. Using Sfard's metaphors [7], constructivists sit more comfortably within the metaphor of learning as participation than within that of learning as acquisition. Education is seen as what the learner can learn rather than what the teacher can teach.

Constructivism is an umbrella term for many theories that acknowledge the role of the learner in constructing their own meaning from experiences. *Cognitive* constructivism respects traditions of cognitivist theories, of acknowledging individuals' characteristics such as their stage of development, motivation, engagement and preferences for learning. *Social* constructivism emphasizes how understanding and meaning emerge from social encounters. Imagine a simulation educator who has been asked to design an activity for medical students to safely *put in a drip* (that is, establish a peripheral intravenous infusion, IVI). Adopting a constructivist stance, the educator is likely to use some of the following techniques:

- Finding out what other similar procedures students have been learning and how.
- Asking students about their relevant knowledge, prior experiences and practices relevant to IVI.
- Demonstrating, talking through and inviting questions from students on IVI performed on a task trainer.
- Encouraging students to set goals related to performing the IVI.
- Providing opportunities for students to perform the IVI on a task trainer.
- Providing opportunities for students to observe others performing the IVI on a task trainer and then share their observations.
- Providing opportunities for students to receive feedback on their performance on the task trainer from experts and peers.

- Promoting students' reflections on their performance of IVI on the task trainer.
- Asking students to identify what they found easy and why, and what they found difficult and why.
- Discussing how the level of skill experienced by the student on the task trainer may align with performing IVI in a clinical setting.
- Discussing the links between IVI and other clinical procedures that students need to be able to perform.
- Promoting students' reflections on the feedback offered.
- Encouraging students to set goals that enable them to use their learning.

Each of these techniques acknowledges that individuals make sense of designed learning activities in their own way, based on their own ideas, prior experiences and practices. Conversation or dialogue is heavily weighted. The simulation educator's role is to help surface these ideas and experiences, offer new experiences through the designed learning activity, and support students in locating the (new) experiences in their existing knowledge and practice.

Also widely cited in health professions educational literature is the work of Donald Schön [8]. His concepts of *reflection-in-action* (immediate 'thinking on your feet') and *reflection-on-action* (later analysis of actions in light of outcome, prior experience and new knowledge) characterize ways in which practitioners react to unexpected experiences in their work. Schön argued that practitioners seek to place new and unexpected experiences within a personal framework by identifying similar past experiences and then giving consideration to possible outcomes by selecting new actions. In SBE, *reflection-on-action* can usually be facilitated by clinicians, teachers or peers. However, *reflection-in-action* requires an immediate response, especially in time-urgent clinical scenarios. Techniques that simulation educators use such as *pause and discuss* (stopping the scenario at certain points) enable access to learners' thoughts and feelings and discussion of their proposed actions. Where *pause and discuss* is used in simulation, there is no consequence for patients. Using the IVI simulation example, the educator could implement both *in* and *on* action reflective discussions.

The last constructivist learning theory to be presented is *situated learning*, which locates learning in a social context [9]. This shifts the focus of learning from the individual to the community. Using observational methods from social anthropology and education, key theorists Jean Lave and Etienne Wenger studied ways in which practitioners learnt their practices in apprenticeships [10]. They coined the term *legitimate peripheral participation* to describe how newcomers to a practice were provided with meaningful tasks that contribute to the work of the community. In the simplest form of this, learners were drawn more centrally to the community as they participated, gaining a sense of identity. Lave and Wenger recognized that learning in work settings through participation provided powerful opportunities to learn critical elements of practice and created the term *living curriculum* to describe this apprenticeship-style learning.

Critical theories in education

Popkewitz and Fendler [12] suggest that '[c]ritical theory in education is concerned with the workings of power in and through pedagogical discourses and … addresses the relations among schooling, education, culture, society, economy and governance' (p. xiii). There are many critical theories, such as Marxian, post-colonial and feminist approaches, and as a group they hold in common a questioning stance to the status quo. *Critical* does not refer to negative critique, but rather to questioning taken-for-granted notions about the way things are in the hope of shedding new light on accepted practices. The tangle of educational jargon related to epistemologies and ontologies aside, at the core of a critical perspective is an understanding that truth is not a given, but is responsive to different contextual and historical conditions that may benefit some people at the cost of others. Critical scholars share a restlessness to break free from assumptions about what is said to be 'true' and a desire to try to see the world with fresh eyes [13]. The ideas and practices that critical theories explore can vary significantly depending on context, cultural setting and historical period. As such, critical theories are located within a social theory category.

Although critical theories in SBE have been embraced by a few brave scholars, such as Alan Bleakley [14], Janelle Taylor [15], Brian Hodges [16] and Nancy McNaughton [17], they are far less prominent than behaviourist or constructivist theories in the simulation field. Perhaps this is because critical theories tend to

focus outwards on society and its effect on our simulation practices, rather than on individuals and their knowledge, skills or experience.

One critical theory scholar, Michel Foucault (1926–84), wrote about the birth of clinical medicine and medical education, public health, psychiatry, schools and examinations, the body, physical and laboratory examination, sexuality and ethics. Indeed, some of his notions – *discourse, bio-power, technologies of the self* and the *clinical gaze*, just to name a few – have major importance for medical education today [13]. Discourse is an idea that has relevance for exploring SBE. According to Foucault [18], discourses refer to language and ways of speaking as well as 'practices that systematically organize what it is possible to say and do' (p. 49). Many different discourses support SBE. They exist coextensively – at the same time and in the same place – and they compete for dominance over knowledge claims. In other words, some ideas are seen to be truer than others. The competition between ideas has material implications in that human resources, space and funding get allocated according to how compelling the rationale is for investment.

From a critical theory perspective, SBE is an important form of knowledge production within health professional education. It is a methodology through which we learn and produce new knowledge and ideas about competence and what this looks like in training and practice. Critical theory helps understand how prevalent ideas about simulation as a methodology become embedded in learning processes, which in turn shape our understanding about what is acceptable within the simulation field.

Consider the case of SPs as an example. By the inclusion of SPs, a power differential between patients, learners and different types of educators is created. SPs are lay people but not 'real' patients, and in many educational activities they represent the clinical educator's ideas about specific patient cases. As proxies for the 'real thing', SPs are often 'used' as tools by clinician educators [19], effectively reproducing prevailing professional ideas about appropriate physician/patient interactions. We can see this reflected in language that historically has described SPs as being 'used' for different activities. 'Used' is a small word and easily missed; however, this discourse locates SPs within a medical hierarchy as clinical outsiders and part of an educational apparatus.

In addition, SP scenarios are most often written by clinician educators and loosely based on real stories that are then modified for educational purposes [11]. There is often no contact between the person whose story and experience are being enacted and the SP enacting it. SPs are recruited and trained according to an educational need (teaching or assessment) and suitability to the patient scenario. 'The person whose story is being enacted' is a phantom. Rather, SPs, their roles and portrayals are vehicles for the transmission and reproduction of professional values, attitudes, clinical knowledge and skills. In this analysis, SPs are 'subjects of' and 'subjected to' prevailing ideas about medical competence and professionalism; and from a critical theory perspective, they are constituted as particular tools (assessment instruments, physical models) within a larger medical education enterprise. The notion of SPs as tools or a technology supports practices related to standardization and OSCEs (objective structured clinical examinations) and is maintained by many within the field of human simulation, extending back to its inception by neurologist Howard Barrows [20].

Over many years and in conjunction with changes in societal expectations about physicians' professional responsibilities to communicate with patients differently, and patients' increasing demand for accountability and a greater say in their own care, a professionalizing SP group has developed expertise in different domains of clinical knowledge as well as pedagogical and assessment practices. From this location, they have negotiated strategically a valued place from which to contribute to clinical knowledge production. The various subjectivities and power relations authorized by the ideas that support the 'use' of individuals in live simulation teaching are complex. Implicated in this complexity are unspoken ideas that shape the work in which SP educators engage [17].

This example illustrates how a critical theory approach to SBE is not interested in describing simulation modalities or techniques per se, or whether they are good or bad. Rather, critical theory scholars in SBE are engaging in analyses that on the one hand attempt to shed light on taken-for-granted notions about a myriad of different factors affecting healthcare training and practice, such as changing conceptions of professionalism, the role of patients in healthcare and the inclusion of performance as an important competence. At the same time, critical explorations are also interested in how different

simulation practices are affected by taken-for-granted notions and ideas about SBE that live inside our varied training cultures and how these may be producing and reproducing expectations within the simulation field.

Engaging simulation for teaching and/or assessment is a cultural and political undertaking. As mentioned at the beginning of the chapter, the local cultural and political environment needs to be taken into account when designing simulation activities in order to prevent the reproduction of stigmatizing stereotypes. For example, when simulation experiences are codesigned with consumers, this can provide a depth of understanding around being a patient [21]. Critical theory assists us to view the health professions as a social undertaking as well as a clinical one; and to see that simulation experiences have the potential to influence professional values and attitudes in practice.

Conclusions

This brief exploration indicates the breadth of theories that inform SBE in healthcare. Behaviourist, constructivist, social learning and critical approaches stem from a range of different traditions and this is apparent in the applications described in this chapter. Behaviourism and associated theories are suited to the consideration of designing SBE that enhances skills requiring automaticity. Constructivist approaches focus on learners, providing opportunities through SBE to direct their own learning. Critical theory prompts educators to challenge their assumptions and conventions. Specific theories such as deliberate practice, reflective practice and situated learning are used to illustrate broad ideas, but we urge educators to investigate theories relevant to their own practice in further detail.

Key term definitions

Behaviourism: an educational theory and pedagogical approach, stemming from framing learning as a response to external stimuli.

Constructivism: a broad approach to education, inclusive of many learning theories, stemming from framing learning as belonging to the learner, rather than to the teacher.

Critical theory: a theory that considers the contextual and historical perspectives of society and seeks to challenge assumptions about power and practice.

Epistemology: philosophy concerned with the nature of knowledge.

Learning theory: a coherent framework of ideas that describe how people learn.

Ontology: philosophy concerned with the nature of reality.

Simulated patient: a well person role-playing a patient, for the purposes of learning and/or assessment.

Social learning theory: one of a group of associated theories that frame learning as a social rather than an individual endeavour.

Worldview: a stance that represents particular epistemological and ontological positions.

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