Establishing a Safe Container for Learning in Simulation

The Role of the Presimulation Briefing

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Summary Statement: In the absence of theoretical or empirical agreement on how to establish and maintain engagement in instructor-led health care simulation debriefings, we organize a set of promising practices we have identified in closely related fields and our own work. We argue that certain practices create a psychologically safe context for learning, a so-called safe container. Establishing a safe container, in turn, allows learners to engage actively in simulation plus debriefings despite possible disruptions to that engagement such as unrealistic aspects of the simulation, potential threats to their professional identity, or frank discussion of mistakes. Establishing a psychologically safe context includes the practices of (1) clarifying expectations, (2) establishing a ''fiction contract'' with participants, (3) attending to logistic details, and (4) declaring and enacting a commitment to respecting learners and concern for their psychological safety. As instructors collaborate with learners to perform these practices, consistency between what instructors say and do may also impact learners' engagement. (*Sim Healthcare* 9:339–349, 2014)

Key Words: Debriefing, Prebrief, Psychological safety, Realism, Education

Simulation and postsimulation debriefing have long been appreciated as linked steps in generating insights and clarifying lessons in experiential learning situations.[1–4] In the experiential learning cycle, simulation can serve as an experience or experimentation period, and postsimulation debriefing is an opportunity for reflection, allowing learners to make a sense of the experience and determine how to apply lessons learned to future clinical performance.[2,5] Yet, there are a variety of threats to learner engagement in simulation and debriefings, which can weaken the effectiveness of the experiential learning cycle. Learning can be impeded when (1) learners do not "buy in" to the simulation endeavor,[6] (2) they find the fidelity of the simulation problematic, (3) they feel exposed by the simulation and debriefing in a way that threatens their professional identity,[7] (4) they feel defensive discussing performance that falls short of a standard.[8,9]

So what can instructors do to help create a safe container, an environment where learners face professionally meaningful challenges and are held to high standards in a way that engages them but does not intimidate or humiliate them?

We suggest that establishing an environment where learners can enter a deep level of connection to their motivations, each other, and the instructors begins before the simulation starts. The notion of a thoughtful prebriefing, introduction, orientation, or other similarly entitled epoch occurring before a simulation has long been part of practice.[10,11] However, the elements, rationale for each, and predicted effectiveness have not been blended into a set of promising practices, and we wish to do that here.

One crucial aspect of engagement in health care simulation and debriefings is risk taking in the service of learning. This focus on risk taking in the service of learning is guided by a diverse set of research findings that stress a willingness of the learner to go to their social and intellectual edges with a positive attitude.[12] Manifestations of this engagement are what Edmondson[13–15] calls *learning-oriented behaviors*: these include reflection on action, feedback seeking, speaking up about what one thinks, asking for help, testing ideas that might or might not be right, and reflecting on results. Engagement also includes what March[16] calls *experimentation* and Elliot and Dweck[17] call *learning orientation*, which both refer to the willingness to try and err at the edge of expertise or capacity, where knowledge and skills may or may not be sufficient to avoid mistakes. The edge of expertise is similar to the "zone of proximal development" where instructor assistance is needed to help the learner move to the next level.[18] These studies suggest that participants willing to experiment and who hold a learning orientation can (1) tolerate practicing at the edge of their ability, within an unfamiliar and possibly confusing environment; (2) appreciate comprehensive feedback in the context of demanding professional standards; (3) willingly reflect on problems and skills that are new or challenging to them; (4) correct and repeat actions; (5) contemplate and learn from mistakes; and (6) tolerate not knowing the exact answers to complex questions.

Importantly, psychological safety may not completely mitigate feelings of interpersonal risk. Rather, it tends to

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create a setting where learners feel safe enough to embrace being uncomfortable. It creates a setting where learners can practice new or familiar skills without the burden of feeling that they will be shamed, humiliated, or belittled.

RATIONALE FOR A STRONG PRESIMULATION BRIEFING—THE ROLE OF PSYCHOLOGICAL SAFETY

The presimulation briefing (synonymous with the terms *introduction*, *orientation*, and *prebriefing*) for a simulation session or entire simulation course sets the tone for all that follows. Building on work in the field of organizational behavior that finds that the climate set by group leaders has a significant impact on group member engagement, we believe a well-crafted introduction in which instructors collaborate with learners to set goals and expectations can enhance participation and learning, minimize later complaints and disengagement, and reduce potential participant defensiveness and resentment during the simulation and debriefing.

Although learning is often seen primarily as a cognitive task, it has deep psychological and emotional foundations as well. The psychological foundations of learning from experience involve containing or reducing feelings of insecurity and threat while nurturing feelings of well-being and possibility.[19–22] With origins in psychoanalytic disciplines, the metaphor of a safe container in which learners feel secure enough to be uncomfortable or trust that they will have help managing difficult feelings and anxiety has come to be recognized as an important feature of nurturing experiential learning.[23,24] Furthermore, reducing threats to professional and social identity is increasingly recognized as the *sine qua non* of learning in groups.[13]

Our literature review suggests that psychological safety is a crucial concept in determining whether a safe container has been created. If one feels psychologically safe, then one feels that the current environment is conducive to interpersonal risk taking; learners feel that they will be viewed positively even if they make mistakes. Psychological safety has been demonstrated to be a precursor to *learning-oriented behaviors* such as asking questions, sharing one's thinking, and asking for help.[13,15] Psychological safety helps avert defensive behaviors triggered by feelings of personal threat such as obstructing and withdrawing; it can reduce elaborate false explanations known as "fancy footwork"[25] and ego defenses such as mocking or denigrating the simulation activity.[26] Psychologically safe simulation exercises are friendly to risk taking in the service of learning; people feel that it is acceptable, even desirable, to work at the edge of their expertise or capacity where mistakes are likely. The importance of this psychologically safe container is amplified by the fact that core professional skills closely associated with the construction of professional identity[24,27,28] are in view with live observation and subsequent video. Paradoxically, creating a psychologically safe container does not mean completely avoiding the negative emotions associated with mistakes, which, in limited doses, can help motivate learning.[29]

Being observed by others usually increases physiologic activation. This activation can enhance performance via a number of mechanisms[30] including *social facilitation* a process by which people perform better under scrutiny. The physiologic activation associated with being observed can also degrade performance when such scrutiny triggers *evaluation apprehension* or is viewed as a threat.[31–33]

Although psychological safety has been extensively studied as a predictor of learning in groups, few studies have looked at the variables that create psychological safety. *Leader inclusiveness*, behaviors such as inviting input and listening to and acknowledging subordinates' ideas (or at least not shutting them down), has been posited as a precursor to psychological safety.[14,15] There are, we hypothesize, practices such as these that are within an instructor's control and might contribute to psychological safety.

METHODS FOR IDENTIFYING PROMISING PRACTICES

We have identified and structured practices useful in presimulation briefing through 3 inputs: (1) a synthesis of existing theory and research in fields closely related to simulation and debriefing; (2) from the exercise of developing an assessment of health care simulation briefing and debriefing[34]; and (3) the authors' collective experience in conducting more than 6000 debriefings, hundreds of presimulation course briefings, as well as roughly 2000 instances of coaching other simulation instructors on the flow from prebriefing to simulation to debriefing.

Input From a Literature Review

Working on the premise that research findings and theory from domains closely related to simulation plus debriefing logically transfer, we identified and synthesized findings, constructs, and theory from aviation simulation, clinical learning and teaching, formative assessment, adult learning, experiential learning, organizational learning, deliberate practice, and the cognitive, emotional, and behavioral bases for mobilizing change in adults.[1,5,10,13,25,35–38]

Consistent with a nascent set of recommendations on how to conduct literature reviews to synthesize complex evidence, we used a systematic, but nonprotocolized literature review.[39,40] We read and hand searched through references in articles related to debriefing, reflective practice, and learning in groups; we then asked 2 experts each in debriefing, psychological counseling, organizational learning, clinical and general education, and adult behavior change to provide 1 to 5 references that they thought relevant for creating a context for learning and change. From these sources, we were able to identify key words and search terms that we provided to medical and social science librarians at our university. The librarians helped us adapt these to different clinical and social science databases and find additional articles and books. We read these articles and, through citation tracking, pursued additional references that, in our judgment, seemed relevant. This process led to 78 articles we initially reviewed for this article (Appendix 1).

Structure From Developing a Behaviorally Anchored Rating Scale on Briefing and Debriefing

We also used the organizing structure provided by developing a behaviorally anchored rating scale on briefing and debriefing.[34] Element 1 of the 6-element Debriefing Assessment for Simulation in Healthcare (DASH)[41] assesses

what instructors do or fail to do in a presimulation briefing to establish an engaging environment for learning (Table 1 and Appendix 2). In the following sections, we use the dimensions (subparts) of DASH Element 1 as the organizing rubric for the proposed practices.

Input From Our Own Experience

We have created, erred (sometimes significantly), and modified our presimulation briefings during a period of 20 years in the course of delivering hundreds of clinical crisis resource management courses for a variety of specialties, interprofessional teams, and levels of training from nursing and medical students through advanced practice professionals, primarily in the United States. In addition, we have observed the variance in the prebriefs of hundreds of simulation instructors-in-training from North America, Oceania, Europe, South America, Central America, and Asia. The prebriefing behaviors captured in Appendix 2—identified through research for the DASH behaviorally anchored rating scale—are emblematic of some of our own as well as other people's errors and good practices; they reflect 2 ends of the variance in practice that we have observed in our instructor courses.

PROMISING PRACTICES FOR PRESIMULATION BRIEFING

Creating psychological safety is an abstract goal that instructors can move toward in collaboration with their learners through a set of discrete, concrete activities. The specific practices we have identified within a presimulation briefing are setting clear boundaries, expectations, and goals; establishing a fiction contract; attending to logistic details; and conveying respect for the learner and interest in their perspective.

Clarifying Objectives, Environment, Roles, Confidentiality, and Expectations

Educational and psychological research agree that when learners have a sense of control and clarity about what is expected of them and what to expect from those in authority—provided it is benign—they are more likely engage.[10,42,43] Clarity about what is expected in a simulation and debriefing also increases learners' ability to meet those expectations.[10] Because the simulation etiquette, norms, and roles may be unfamiliar to learners, it is incumbent on simulation instructors to clarify them.

Although instructors may have a clear vision about the goals of the simulation and debriefing encounter, they may make the common and natural mistake of assuming that the learners see it the same way.[44] Explicitly clarifying learning objectives, actively exploring learners' objectives, explaining or demonstrating the properties of the simulators, explaining the process and timing of the debriefing or other postsimulation analysis activities, and creating shared agreements with learners regarding the role of instructors and learners are helpful in bridging this gap.[10,43,45,46]

Furthermore, to the extent that clearly stated goals are inspiring for the learners, they can trigger the positive affect shown to stimulate increased openness to new ideas.[47,48] Creating the conditions for this positive affect and openness is a boon when simulations plus debriefings are designed to stimulate reflection and the integration of new knowledge, ideas, or perspectives.

Formative Versus Summative Assessment?

Absolute clarity about how and if performance during the session will be evaluated is vital to establishing a safe container for learning during debriefing. Learners may worry that mistakes will openly or surreptitiously be held against them. Formative assessment, often known as evaluation *for* learning, is the process of identifying the learner's current assets or deficits with respect to specific learning objectives and helping learners remediate the deficits and leverage the assets.[49–51] Summative assessment, also known as assessment *of* learning, is usually a higher-stakes evaluation of whether the learner has achieved expected milestones and may determine whether they advance in their program of learning.[38] How and if performance in the simulation bears on the learner's advancement in a training program, licensure process, or maintenance of certification are likely to influence the climate of the debriefing because many learners feel that summative or formal evaluation is a threat rather than an aid.[49,52] Thus, trust can be built by being clear, consistent, and transparent about the sort of evaluation that will be taking place.

Confidentiality/Privacy?

The boundaries regarding who might observe or be informed about learner's performance in the simulation and debriefing can impact simulation behavior and debriefing conversation. Whether the exercise takes place in situ or in the simulation laboratory, instructors can further define the parameters of the learning environment and build trust by informing learners whether visitors, researchers, colleagues, patients, preceptors, or students will or will not be privy to their performance. The principle is that maximizing transparency about what and with whom information about simulation performance will or will not be shared builds trust (not that confidentiality alone is the only way to build trust[53]).

Establishing a "Fiction Contract" With Participants

Engaging in a simulated learning environment poses a unique challenge, that is, acting *as if things are real*.[6] To immerse themselves into a scenario, learners must often be willing to play an active role, pretending to take care of real patient in a simulated setting where their professional skills are on display. The skilled instructor, like a novelist or playwright, attempts to create a fictional environment engaging enough to draw people in.[6,54] Rather than assuming participants will or must accept the simulated environment, Dieckmann et al[6] have suggested that instructors must create

TABLE 1. DASH Element 1 and Dimensions

DASH Element	Element Dimensions
1. Establishes an engaging learning environment.	Clarifies course objectives, environment, confidentiality, roles, and expectations.
	Establishes a "fiction contract" with participants.
	Attends to logistic details.
	Conveys a commitment to respecting learners and understanding their perspective.

an explicit and collaborative agreement with participants, in which both instructors and learners have commitments. The fiction contract is a form of psychological contract that describes what instructors and learners owe each other and should expect of each other to have a successful encounter.[55]

To create a fiction contract, the instructor typically offers to do what can reasonably be done to make the situation as real as possible but acknowledges the limitations (eg, mannequin patient's skin color does not change or does not feel or look real; invasive procedures cannot be performed on standardized patients). The instructor seeks a voluntary commitment from the learner to do what he or she can to act as if everything is real[6] and conveys that the quality of the learning experience depends, in part, on the learner's willingness to participate as fully as possible.

Building on the work of Dieckmann et al,[6] we propose a model of how the fiction contract, along with the other practices we describe, impacts learner engagement. In this model, the fiction contract moderates and influences learners' willingness to engage despite perceived lapses in realism (Fig. 1). Dieckmann et al argued that health care simulations have 3 kinds of fidelity, where fidelity describes how accurately reality is represented and we have adapted their terminology.[57] Physical fidelity is the degree to which the simulation elements are sensed as approximating visual, tactile, auditory, and olfactory reality. Conceptual fidelity is the degree to which the simulation proceeds in a causally plausible manner. When the patient's physiologic, pharmacologic, or emotional responses make sense for a given intervention, this is conceptual fidelity. Emotional/experiential fidelity is the degree to which the simulation generates the feelings learners would expect in a similar real situation. How the simulation unfolds to develop realistic time pressure, stress, happiness, or relief would be a property of emotional/experiential fidelity.

For a given participant in a simulation exercise, the 3 kinds of fidelity combine to produce a perception of realism for that individual. One person may perceive a certain degree of realism, whereas another may experience a very different degree of realism, both with the same simulation fidelity. Thus, realism is a property of the learner's perception rather than a property of the simulation.

Based on their subjective perception of realism, we propose that an individual's willingness and ability to engage in the learning experience varies. Moreover, the willingness to engage is affected by the ambient psychological safety of the whole education encounter of which the fiction contract is an important part.

By making explicit faculty's interdependence with learners on buying in to the simulation, the fiction contract also plays a vital role in mitigating the occasional shame or humiliation learners may feel if they do not perform well in front of others. By revealing their own vulnerability in setting the fiction contract, the instructor invites collaboration: for example, "I have done everything I can to make this as real as possible, but in the end, it is not reality; I have to depend on you. I ask you to do your best to act as if this is real so that the time we have together is used to our best advantage." Without this, learners who feel they have not done well in the simulation tend to blame the simulation for lapses in perceived realism as a way to combat the identity threats[7,58] they feel when they do not perform as well as they would like. They may feel that these "unfair" (unrealistic to them) qualities of the simulation prevented their performing better.

Conversely, we have found in our own simulations that if learners feel that the instructors are playing fair with respect to fidelity and realism, they are more likely to focus on the learning objectives at hand and to willingly reflect on their own practice.

Attending to Logistic Details

To help participants focus on the demands of the simulation exercise, they need to know what to expect logistically. Simulation instructors can easily focus on the content or technical aspects of the simulation environment and ignore or minimize the logistical details of the exercise. An important part of creating engagement is "student-centered design" where clinician learners know how the structure of the session interfaces with their other professional or educational commitments.[59] Attending to logistics can prevent the dissatisfaction that results when care and comfort issues, also known as "hygiene factors," are handled poorly.[60] As trivial as these issues may seem, covering appropriate details such as the starting and stopping time of the session, breaks, how to handle pages, texting, e-mail, social media, telephone calls, transportation, refreshments, whether they will have enough time to get to their next class or shift, and so on prevents distraction and worry and helps learners focus on issues within the curriculum.[61] Demonstrating sensitivity to the logistic constraints of participants' other duties—by, for example, asking about them—sends a subtle message that

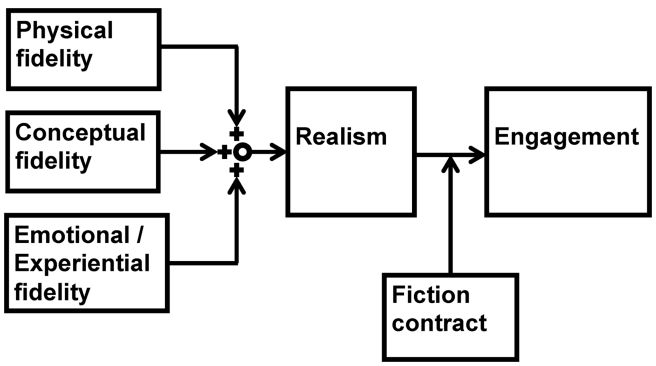

FIGURE 1. A model of fidelity, realism, and educational engagement in simulation.[56]

the instructor is aware of and cares about the learner's competing commitments.

Conveying a Commitment to Respecting Learners and Understanding Their Perspective

When instructors convey that they value the learner's perspective, it can have a powerful impact on learning.[62] Three related theories from experimental economics, organizational behavior, and cognitive anthropology are relevant to how instructors convey respect and interest in learners' thinking. First, learners are not simply doers of correct or incorrect actions; they construct meaning about the world around them. Learners, like the rest of us, sample the stream of experience around them and make sense of it, constructing categories to label their reality.[63] This "sense making"[64] shapes how they perceive reality and, in turn, how they act. When instructors communicate—by inquiring into their perspective, for example—that they see learners as "meaning makers," not simply doers of correct or incorrect actions, it reveals a deeper interest in the learner.[62] When instructors show they value their students' internal sense-making processes, learners will be more likely to give weight to the role of their own thoughts and emotional processes to improve future performance.[62,63]

Second, working on the premise that people are actively constructing a view of reality, experimental economics finds that people are generally "intendedly rational"; they are trying to accomplish a valued goal given their current perceptions and analysis of the situation.[65–69] Learners, even when they make mistakes, usually fit this assumption. When instructors indicate that they realize the learner was working toward a goal as best he or she could in the moment given their current sense-making processes, level of knowledge, level of stress, and so on, they convey respect and interest in the learner's perspective. For example, instructors could convey that mistakes are puzzles that will reveal valuable information about learners' meaning-making process rather than a crime to be covered up or punished.[4,62]

Third, psychotherapeutic theory, although it has different goals from debriefing, also concerns itself with transforming thinking, skills, and attitudes. The role of *positive regard*[70] for other people—assuming they are capable of competent action and self-transformation—infuses the debriefing with a positive psychological tone. Recent research on the transformative features of evoking positive emotion indicates that its presence in debriefing can help spur learning.[71,72]

CONCLUSIONS

Through a review and synthesis of relevant concepts from literatures with bearing on presimulation briefings, we have proposed and discussed a set of promising practices that make up a sound presimulation course briefing and provide examples of these practices in Appendix 2. We cannot be sure that any one of the practices we have proposed or all of them together will always enhance engagement, but they are supported conceptually by previous research and theory, our primary research on how to assess precourse briefings and debriefing, and our experience in health care simulation. We have found them to be useful in structuring our own presimulation briefings.

The promising practices we have proposed can be adjusted to match the demands of different simulation contexts and stable or changing participant composition. The presimulation briefing would be adjusted depending on whether it is for a once-a-year teamwork training for medical flight or retrieval medicine group, a twice-a-week simulation laboratory within a prelicensure nursing course, or a monthly residency training program on interprofessional collaboration. Different aspects of these practices could be covered at different degrees of depth; a briefing might run from 3 to 5 minutes for a one-hour session, to 45 to 60 minutes for a day-long training. For example, first-time exposure to simulation might involve a much longer discussion of principles of formative assessment, more details of what is expected from both the learner and the instructor with respect to the fiction contract, and a more deliberate description of the progression of the exercise than would be required for repeat learners. The presence of learners from different specialties and disciplines who might be unfamiliar to each other in an interprofessional simulation session might merit a longer discussion of confidentiality to be sure that everyone is confident that those principles will be upheld. A simulation course with learners who have experienced simulation with the instructor in the same setting many times before might warrant just a quick reminder of the elements of psychological safety, fiction contract, confidentiality, and behavior.

We believe that a strong presimulation briefing begins the process of creating a safe container for learning that allows learners to tolerate and welcome direct and critical feedback, create opportunities to "redo" a skill, work outside their comfort zone, accept and deal with surprises, change their current clinical practice, recast their current ways of thinking, and validate themselves as professionals.

Creating and sustaining an engaging environment for learning relies on understanding and implementing the concept of a psychologically safe container.[73,74] If well constructed, this container, like the nonreactive crucible used in chemistry experiments,[75] allows instructors and learners to tolerate the "heat" of participating in simulations and debriefings to transform practice through experiential learning in a simulated environment.[8,9] Based on the theory, research, and experience we synthesized for this article, we believe that 4 promising practices help learners participate actively in simulations, openly and rigorously analyze their performance in debriefing, and set the stage for improving clinical performance.

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ELEMENT 1

Establishes an engaging learning environment

How well the debriefer or instructor introduces the simulation learning experience can set the tone for all that follows. Before any simulation begins, the instructor helps participants be clear about what is expected of them, and helps them understand the benefits and limits of the simulated clinical setting. The instructor informs trainees whether and how the case, event, or procedure will later be debriefed (i.e., discussed and analyzed) and whether the simulation will be recorded. The effective instructor makes plain that the focus is on learning, not on "catching" people in a mistake, and seeks to create an environment where participants feel safe, even inspired to share their goals, thought, or feelings about the upcoming simulation and debriefing.

Element 1 Dimensions

Clarifies course objectives, environment, roles, and expectations.

Simulation-based courses flow better and participants engage more when they understand 1) The goals and objectives: What do the instructors intend learners to get out of the session? What do learners hope to get out of the session? 2) Learner and instructor roles; 3) The simulation environment– what can they expect from the simulators and actors/embedded simulated people? Who will be observing? 4) Expectations: What level of performance is expected or encouraged? To what extent is their performance confidential? How will recordings of their

performance be handled? Will there be research conducted during the session?; To what extent is summative and/or formative assessment involved in this course?

Positive, effective behaviors for this dimension include:

- Introducing oneself and inviting others to introduce themselves.
- Sharing and inviting others to share information about their personal qualifications and experience, background, and interest in and goals for the course.
- Presenting the session overview and learning objectives.
- Addressing confidentiality explicitly. Examples: "Your preceptors will (or will not) be getting a report of your performance here;" "What you say and do here stays here—can we all agree to this?"
- Explaining assessment: E.g. "There is no formal evaluation in this course. We will provide you feedback on what we observe only to assist you in developing your skills." Or "Your ability to follow the central venous line (CVL) insertion protocol will be assessed using the hospital checklist and this will determine whether you will be allowed to insert a CVL on the unit."
- Introducing and/or describing the simulators, ancillary equipment, location of supplies, role of actors/embedded simulated people, etc.
- Discussing the origins of the cases, procedures, or events to be simulated and why certain cases or tasks have been included in the session (e.g., they are part of a transition to practice curriculum; they are actual cases that had bad outcomes; they are high consequence, low frequency events amenable to practice, etc.).
- Explicitly stating expectations for participants' roles in the simulation course and subsequent debriefing. Example: "Act as yourself in the simulations. Take care of the patients using the skills you have. Don't pretend to be a different specialty or level of training."
- Requesting that participants engage in debriefing discussions and attempt to be self-reflective. "One of the hard things about this course is reflecting on the thought processes behind what you do in the sim. I can help you with reflective process. We can see what you do, but not what you are thinking. Understanding the relationship between your thinking and performance is one of the most interesting things about this course. I hope you will engage with me in that process."
- Stating etiquette rules for the simulation and debriefing: e.g. to be respectful, curious about others' thoughts and actions.
- Explicitly encouraging people to speak up and allowing for respectful disagreement. "I may say something you disagree with or have a different perspective on. I welcome hearing different perspectives; so please speak up."
- Explicitly describing the instructor's role: examples: to facilitate discussion; commenting on performance based on expertise or observing similar events or simulations; acting as a resource on own area of expertise (e.g., New practice guidelines, procedural steps, PALS, ACLS; CRM; teamwork; clinical, breaking bad news, human factors); and ensuring that the training objectives are met.
- Negative, ineffective behaviors include:
- Starting the session without introducing oneself or others or explaining why introductions are not needed.
- Not mentioning objectives, roles, or expectations of the session or describing them in a too-vague or misleading way
- Not explicitly addressing matters of confidentiality such as who will be informed of participants' performance while in the simulation.
- Not explaining whether the goal of feedback is to improve performance (formative assessment); or that evaluation has consequences for the learners' advancement (summative assessment). E.g. Student: "Does this matter for our grades?" Instructor: "We'll see."
- Being vague or misleading in describing the simulation or debriefing.
- Ignoring or leaving no time or opportunity for student statements or questions about goals and expectation of the session.
- Making statements or using body language that appears to belittle the learners' goals, questions or concerns about the session.
- Using language that implies that poor performance in the simulation will be held against the learner.

Establishes a "fiction contract" with participants.

The fiction contract is a joint agreement that debriefers and students create. In it, the instructor acknowledges that the simulation cannot be *exactly* like real life but agrees to make the simulation as real as possible within resource and technology constraints. The instructor invites learners to do their best to act as if everything were real but acknowledges that s/he is dependent on the learners' participation. Conveying this interdependence is a way to build agreement on how the learning process will go and is part of an effective learning contract. It is a better approach than unilaterally decreeing that the learners shall "suspend disbelief."

Positive, effective behaviors for this dimension include:

- Explaining that the instructor and participants have to collaborate to create an engaging simulation and learning environment
- Stating that the instructor‘s obligation is to do everything to make the simulation as real as possible within resource and technology constraints.
- Asking the participants to do their part to act, as best they can, as if the simulation were real, acknowledging that a participant will likely act differently in the simulation environment than in the real clinical environment.
- Stating a fair and balanced assessment of simulator strengths and weaknesses.

An example that includes some of the above behaviors is: . E.g. "We have done our best to make the simulations as real as possible, but when all is said and done it is a simulation and not exactly the same as real patient context. So I'm asking you to meet me half way and do your best to act as if it is real. I know you will likely not exactly the same as you

would if it were a real patient, but we will still have lots of interesting things to discuss."

- Modeling the practice of engaging with the simulated environment as if were real by talking to or taking care of a simulated patient during an orientation.
- Negative or ineffective behaviors include:
- Trivializing the challenges students face in "buying in" to the realism of the simulation.
- Stating or assuming that trainees should and will act the same way they would in the real clinical setting.
- Insinuating or stating that it's the student's fault if the simulation doesn't seem real to them. "We judge you level of commitment by your ability to suspend disbelief."

Attends to logistical details.

Although it may seem secondary, informing participants about logistical details and providing a physically comfortable environment helps them focus on learning.

Positive, effective behaviors for this dimension include:

- Making sure that the learning space or conference room is clean. When available, chairs, tables, white board, video, simulation devices, or other educational materials are orderly, clean, and ready when the participants arrive.
- Briefing participants on where the simulation will take place and how long it may last.
- Letting participants know about the availability of food and drink, transportation or logistical considerations, locations of bathrooms, etc.
- Informing participants about when and where the simulated case, procedure, or event is likely to be debriefed.
- Inquiring or stating provisions to make accommodations for allergies (e.g. latex) or physical disabilities. Offering the opportunity to speak privately with instructors about these issues.

Negative or ineffective behaviors include:

- Not orienting participants to course logistics and the physical environment.
- Ignoring or making light of trainees' concerns about timing, location, or physical needs.
- Failing to address individuals' potential challenges related to their particular physical circumstances (e.g., do they use a wheelchair or other device, do they have a latex allergy etc.)

Conveys a commitment to respecting learners and understanding their perspective.

Participants often worry that simulations are designed to expose their weaknesses or to humiliate them. To counter these notions, instructors should offer clear alternative interpretations. One alternative is to highlight the difference in stress and cognitive load inside versus outside the simulation; it is easy to see what needs to done when one is outside the simulation; much harder inside. A second alternative is for the instructor to convey that they assume the trainee has good intentions and are trying to do their best but will likely make mistakes along the way – which is perfectly all right because this is a good place to talk about improving our practice.

Positive or effective behaviors in this dimension include:

- Stating that he or she understands that trainees are trying to accomplish something positive, even when they make mistakes. Could include a comment like, "Mistakes are puzzles to be solved, not crimes to be punished."
- Expressing a commitment to hold generous inferences about learners such as "We believe participants in our courses are intelligent, capable, and are trying to do their best to learn and improve."
- Stating that learners' goals and interests are important in the learning process: "Your goals and interests are important. What are some of the things you would like to get out of the session today?"
- Expressing interest in thought and emotional processes: "An important feature of simulation is that it allows us all to reflect on the thought processes that drive our practice. Though I can see what you do, I can't know what you are thinking or feeling. I'll do my best to share my thinking and I am also very interested in yours."
- Normalizing and clarifying the difference in perspective inside versus outside of the simulation: "Research on cognitive load and stress tells us that it is often much more challenging to be in the simulation; on the outside things may seem obvious and the pathway clear, but in the sim it can be very challenging."

Negative, ineffective behaviors include:

- Teasing, belittling, or ignoring participants' expressions of anxiety.
- Threatening to expose inadequate knowledge, values, or skill
- Stating or implying that poor performance by trainees in the simulation is indicative of poor actual skills or will be held against them.
- Making demeaning comments about a student's competence.
- Using a mean tone of voice and message to undermine a student's aspiration to be a capable health care provider. "You really aren't cut out for this profession, are you?"

CHAPTER 1

Applying Educational Theory in Practice

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OVERVIEW

- Medical education has accumulated a useful body of theory that can inform practice
- Three educational theories can be applied in practice: social constructivism, experiential learning and communities of practice (CoPs)
- The range of cognitive skills that can be developed with expert guidance or peer collaboration exceeds what can be attained alone
- Experiential learning is a spiral model with four elements: (i) the learner has a concrete experience; (ii) the learner observes and reflects on this experience; (iii) the learner forms abstract concepts about the experience and (iv) the learner tests the concepts in new situations
- Effective knowledge translation (KT) is dependent on meaningful exchanges among CoP members for information to be used in practice or decision-making

Introduction

When confronted with a challenge in our clinical teaching, wouldn't it be a relief if we could turn to a set of guiding principles based on evidence or long-term successful experience? Fortunately, the field of education has accumulated a useful body of theory that can inform practice. The old adage that 'there is nothing more practical than a good theory' still rings true today. In the first edition of the *ABC of Learning and Teaching in Medicine*, I discussed the application of adult learning theory (andragogy), self-directed learning, self-efficacy, constructivism and reflective practice to the work of medical educators (Kaufman 2003). In this chapter, I extend that discussion by addressing three additional educational theories and show how these could be applied in the context of three case studies; these theories are social constructivism, experiential learning and communities of practice (CoPs). In social constructivism, we are talking about how learners learn from and with peers and in interactions with their tutors. In experiential learning, we are talking about how learners process and learn from concrete events and experiences. Lastly, in CoPs, we are talking about how learners are socialised into a profession and how they learn through participation in their professional community. Let's examine these three theories in more detail (Overview box).

Social constructivism

The primary idea of constructivism (i.e. cognitive constructivism) is that learners construct their own knowledge based on what they already know, and make judgements about when and how to modify their knowledge. There are some important implications of adopting a constructivist perspective. First, the teacher is not viewed primarily as a transmitter of knowledge but as a guide who facilitates learning. Second, since learning is profoundly influenced by learners' prior knowledge, teachers should provide learning experiences that expose inconsistencies between students' current understandings and their new experiences. Third, teachers should engage students in their learning in an active way, using relevant problems and group interaction. This is not just about keeping learners busy but the interaction must activate students' prior knowledge and lead to the reconstruction of knowledge. Fourth, if new knowledge is to be actively built, sufficient time must be provided for in-depth examination of new experiences.

Vygotsky (1978) elaborated this theory describing 'social constructivism', which posits that learners' understanding and meaning grow out of social encounters. The major theme of Vygotsky's theoretical framework is that social interaction with teachers and other learners plays a fundamental role in the development of understanding. An important aspect of Vygotsky's theory is the idea that cognitive development occurs in a zone of proximal development (ZPD). Vygotsky's (1978) often-quoted definition of ZPD is

> *. . . the distance between the actual developmental level as determined by independent problem solving and the level of potential development as determined through problem solving under adult guidance, or in collaboration with more capable peers*
>
> – (1978, p. 86)

Full development of the ZPD depends upon full social interaction (Figure 1.1). Vygotsky asserts that the range of cognitive skills that

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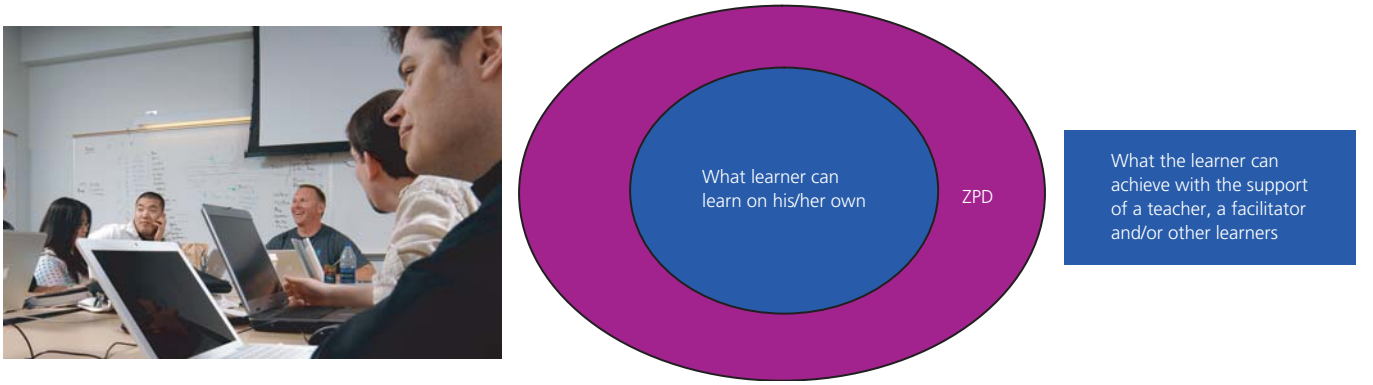

Figure 1.1 Students in a small-group discussion.

can be developed with expert guidance or peer collaboration exceeds what can be attained alone.

The concept of 'scaffolding' is closely related to the ZPD and was developed by other sociocultural theorists applying Vygotsky's ZPD to educational contexts (Wood *et al.* 1976). Scaffolding is a process through which a teacher or more competent peer gives help to the student in her or his ZPD as necessary and then gradually reduces the help as the student becomes more competent. Effective teaching is therefore about identifying the student's current state (prior knowledge) and offering opportunities and challenges that are slightly ahead of the learner's development, i.e. on challenging tasks they could not solve alone. The more able participants (or the experts) model appropriate problem-solving behaviours, present new approaches to the problem and encourage the novice (or the learner) to take on some parts of the task. As novices develop the abilities required, they should receive less assistance and solve more of the problem independently. Simultaneously, of course, they will encounter yet more challenging tasks on which they will continue to receive help (Box 1.1).

Box 1.1 **Social constructivism**

- Learners actively construct their own knowledge, influenced strongly by what they already know.
- Social interaction plays a fundamental role in the development of understanding and meaning.
- The range of cognitive skills developed with expert guidance or peer collaboration exceeds what can be attained alone.
- Effective teaching is slightly ahead of the learner's development, with novices working with more capable others on challenging tasks they could not solve alone.

Experiential learning

Experiential learning theory (Kolb 1984) is a model of learning that posits that learning is a four-step process. It describes how learners learn from experience through four steps: (i) the learner has a concrete experience; (ii) the learner observes and reflects on this experience; (iii) the learner forms abstract concepts about the

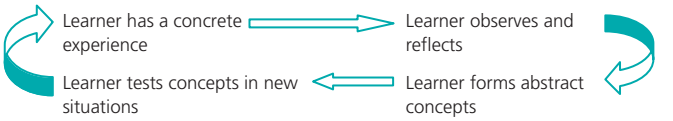

Figure 1.2 Experiential learning cycle.

experience; and (iv) the learner tests the concepts in new situations (Figure 1.2). Kolb asserts that experiential learning can begin at any one of the four steps and that the learner cycles continuously through these four steps. In practice, the learning process often begins with a person carrying out a particular action and then seeing its effect. Following this, the second step in the cycle is to understand these effects in the particular instance to be able to anticipate what would be the result in a similar situation. Following the pattern, the third step would involve understanding the general principle under which the particular instance falls, for example, by looking up the literature or talking to a colleague.

When the general principle is understood, the last step, according to Kolb, is its application through action in a new circumstance. Two aspects can be seen as especially noteworthy: (i) the use of concrete experience to test ideas and (ii) the use of feedback to change practices and theories (Kolb 1984: p. 21–22) (Figure 1.3). Learners along the medical educational continuum use various experiential learning methods such as (i) apprenticeship; (ii) internship or practicum; (iii) mentoring; (iv) clinical

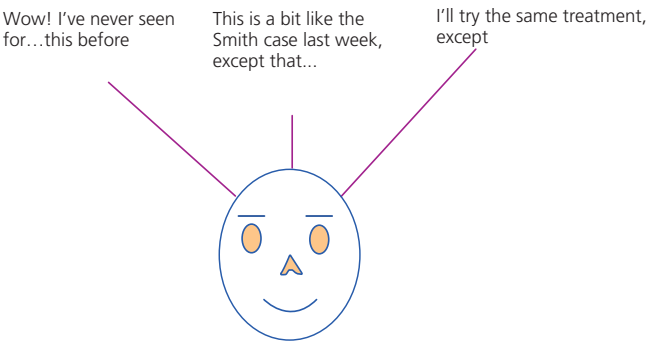

Figure 1.3 Student testing ideas.

supervision; (v) on-the-job training; (vi) clinics and (vii) case study research (Box 1.2).

Box 1.2 **Experiential learning**

- Learning is a four-step cyclical (or spiral) process: feeling, thinking, watching and doing.
- Experiential learning can begin at any of the four steps.
- Each step allows a learner to reflect and form new principles and theories to guide future situations.
- Concrete experience is used to test ideas and these are modified through feedback.

Communities of practice

The term *community of practice* (CoP) was proposed by Lave and Wenger (1991) to capture the importance of integrating individuals within a professional community, and of the community in correcting and/or reinforcing individual practices. For example, a student joining a clinical team for a period of 6 weeks starts as an observer but gradually gets drawn into becoming a participant in team activities and interaction – this is a powerful driver of professional socialisation and the acquisition of professional norms and practices. There are many examples of CoPs including online communities and discussion boards. Barab *et al*. (2002, p. 495) later described a CoP as 'a persistent, sustaining social network of individuals who share and develop an overlapping knowledge base, set of beliefs, values, history and experiences focused on a common practice and/or mutual enterprise.' Within this context, learning can be conceived as a path in which learners move from *legitimate peripheral participant* (e.g. observer, questioner) to core participant of the CoP.

CoPs have gained prominence primarily as vehicles for KT, which refers to the acceleration of the process of making the most current information available for use. Effective KT is dependent on meaningful exchanges among network members for using the most timely and relevant evidence-based, or experience-based, information for practice or decision-making. CoPs are natural places for partnerships and exchanges to start and grow; in them, relevant learning occurs when participants raise questions or perceive a need for new knowledge. Moreover, internet technologies enable these discussions to occur in a timely manner among participants regardless of physical location and time zone, with discussions archived for review at a later date or by those who miss a discussion (Box 1.3).

There are a number of key factors that influence the development, functioning and maintenance of CoPs. The initial CoP membership is important. For example, a medical team with undergraduate and postgraduate students and a clinical mentor would be a typical and legitimate CoP. The commitment to the CoP goals, its relevance and members' enthusiasm about the potential of the CoP to have an impact on practice are also key success factors. On the practical side, a strong infrastructure and resources are essential attributes; these include good information technology, useful library resources, databases and human support. In order to provide these key factors, one or more strong, committed and flexible leaders are needed to help guide the natural evolution of the CoP (Figure 1.4).

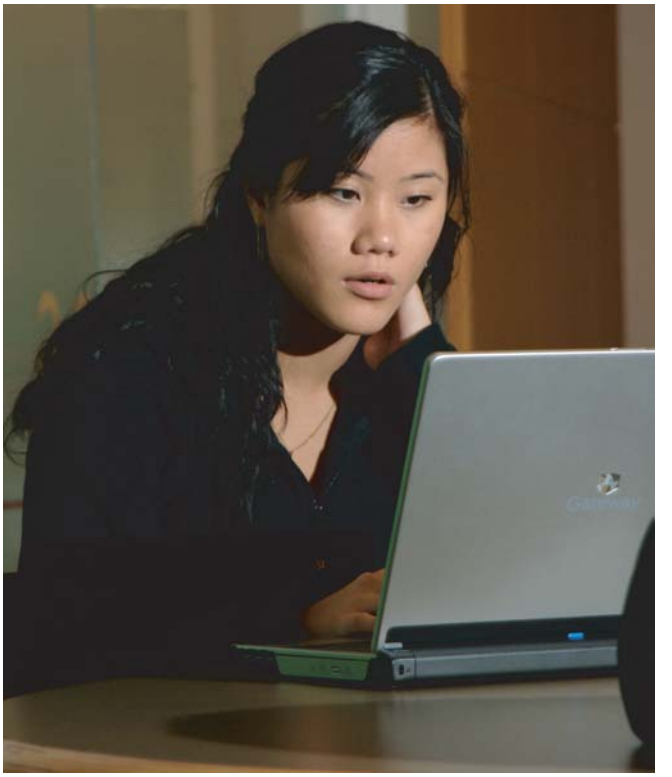

Figure 1.4 Student participating in an online CoP.

Box 1.3 **Communities of practice**

- A CoP is a persistent, sustaining social network of individuals who share and develop an overlapping knowledge base, and focus on a common practice and/or mutual enterprise.
- Within this context, learning can be conceived as a path in which learners move from 'legitimate peripheral participant' to core participant of the CoP.
- CoPs have gained their prominence primarily as vehicles for *knowledge translation*, which depends on meaningful exchanges among network members.
- Internet technologies enable discussions to occur in a timely manner among participants regardless of physical location and time zone, with the discussions archived.

Implications for medical educators

In this chapter, three educational theories have been presented, each of which can guide our teaching practices. Some theories will be more helpful than others in particular contexts. However, a number of principles also emerge from these theories, and these can provide helpful guidance for medical educators (Box 1.4).

Box 1.4 **Eight principles to guide educational practice**

1. Learning is an active, rather than a passive mental process, with learners making judgements about when and how to modify their knowledge.
2. Learners should be given opportunities to develop their own understanding through self-directed learning, combined with dialogue with their teachers and peers.
3. Learners should be given some challenging tasks they could not solve independently, and then work on these with more capable others (teachers or peers); as they develop the abilities required, they should receive less assistance and work more independently.
4. Learning should be closely related to the understanding and solution of real-world problems.
5. Learners should complete the full experiential learning cycle in order to gain a complete understanding of a concept; the steps in the cycle are concrete experience, observation and reflection, forming abstract concepts and testing the concepts in new situations.
6. Learners should be given opportunities and support for practice, accompanied by self-assessment and constructive feedback from their teachers and peers.
7. Learners should be given opportunities to reflect on their practice, through analysing and critiquing their own performance and, consequently, developing new perspectives and options.
8. Learners should be included in a CoP focused on a clinical specialty, involving their peers, more senior learners, clerks, registrars, clinicians and others. The CoP will support meaningful exchanges among network members about the most timely and relevant evidence-based, or experience-based, information for practice or decision-making.

Box 1.5 **Three cases**

Case 1 – Teaching basic science

You have been asked to give a lecture to the first-year medical class of 120 students on the topic of the autonomic nervous system. This has traditionally been a difficult subject for the class, particularly as it has not been covered by faculty in the problem-based Anatomy course. You wonder how you can make this topic understandable to the class in a single lecture.

Case 2 – Internal medicine training

You are the trainer for a first-year registrar in an Internal Medicine training programme. Your practice is so busy that you have very limited time to spend with her.

You wonder how you can contribute to providing a valuable learning experience for your trainee.

Case 3 – Clerkship academic half-day

You are a member of a course committee in the department of family medicine, which is charged with the task of integrating a weekly academic half-day into the third-year, 12-week, family medicine rotation. However, the students are geographically distributed in clinics and physicians' offices across the region. You wonder how your committee can overcome this obstacle.

Back to the 'real-world' situations

How do the three educational theories described here, and the principles that emerge from them, guide us in the three cases presented? (Box 1.5)

Case 1. You would prepare an interactive lecture on the autonomic nervous system (principle 1), and include a clinical example of its application (principle 4). By interactive, I mean a lecture in which you would plan to stop at key points and interact with the students. A note-taking guide would be distributed in advance (for students to print from a website) containing key points, space for written notes and two key short answer questions to answer or partially completed diagrams for students to complete before the lecture, requiring higher level thinking and strategically situated in your lecture sequence (principles 1 through 5). You would stop twice while delivering the lecture and ask students to discuss their response to each question with their neighbours (principles 1 through 6). A show of hands would determine the class responses to the question (checking for understanding) and the correct answer then would be given (principles 5 and 6). Finally, you would assign a more challenging learning issue for out-of-class research (principles 1 through 6) and the solution given in a later lecture or posted on the website (principles 5 and 6).

Case 2. You could first invite the registrar to observe you with patients, and do a quick debrief while walking from patient to patient, and then at the end of the day (principles 1, 2, 4, 5). To complement this, you would assign a number of appropriate case-based simulations, either online or on CD) for her to work through (principles 1 through 7). There is a strong correlation between experiential learning and simulations. In fact, Kolb described simulations and games as presenting learners with a broad experiential learning environment that offers learners support for active experimentation (Kolb 1984). With your help, the registrar would then develop his or her own learning goals, based on the certification requirements and perceived areas of weakness (principles 1 and 7). These goals would provide the framework for assessing the registrar's performance with patients (principles 6 and 7). You would observe and provide feedback (principles 4 through 7), and the registrar would begin to see patients alone (principles 1 through 7). The registrar would keep a journal (written or electronic) in which he would record the results of each step of the experiential learning cycle: concrete experience, observation and reflection, concepts and/or principles learnt and results of testing in new situations (principles 5 through 7). The registrar would also record in his journal the personal learning issues arising from his patients, would conduct self-directed learning on these (principles 1, 2, 7) and would document his or her findings in the journal (principles 5 through 7). The trainer would provide feedback on the journal (principle 7). If practical, the cohort of registrars would communicate via the internet to discuss their insights and experiences (principle 8).

Case 3. You could meet with your IT department to discuss your needs, and agree either to purchase or develop a CoP software platform. You would enlist your willing departmental colleagues and support staff, and your registrars, to help you design the CoP structure (e.g. table of contents), enrol in the CoP and upload some

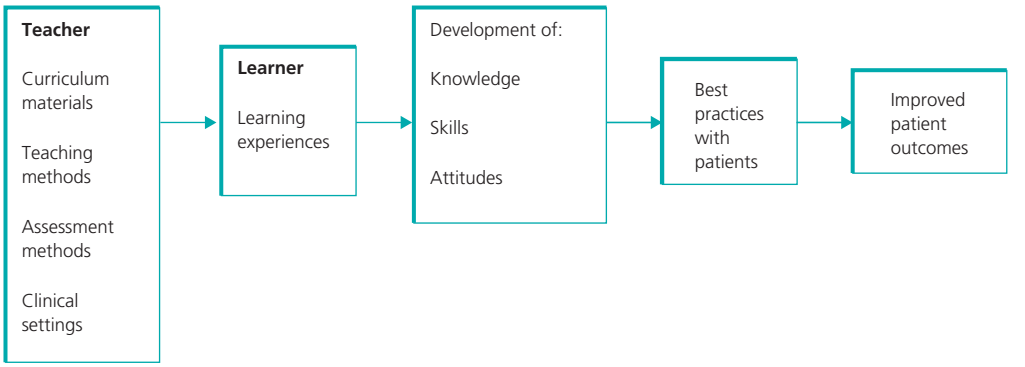

Figure 1.5 The medical education cycle.

content, for example, guidelines, cases, policies, administrative items, website links and so on (principles 1, 2, 8). You would collaborate with the director of the family medicine rotation, and the students would be enrolled in the CoP and assigned the task of uploading some content of their choice as a requirement of the rotation (principles 1, 2, 3, 8). Finally, you would set a schedule for asynchronous case discussions to occur throughout the rotation, with each student having a turn to organise and facilitate the online discussion (principles 1 through 8). These discussions would be archived so that you could provide feedback and a grade at the end of the rotation using a rubric for online discussions (principle 6; see http://www.winona.edu/AIR/rubrics.htm).

Conclusions

This chapter has discussed how to bridge the gap between educational theory and practice. In some situations, a theory can serve as a guide for decisions on educational practice. In other cases, the theory can be used to validate a practice(s) that a medical educator has shown to be effective. In either case, by using teaching and learning methods based on educational theories and derived principles, medical educators can become more effective teachers. This will enhance the development of knowledge, skills and positive attitudes in their learners, and also improve the next generation of teachers. Ultimately, this should result in better trained doctors who provide an even higher level of patient care and improve the outcomes of their patients (Figure 1.5).

Further reading

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Scenario & Debriefing Tips & Techniques

Answers to some practice-oriented FAQs raised by IMS students

Robert Simon, Ed.D, CHFP

1. I'd like to know more about introducing a simulation course. What things need to be considered?

Four areas to consider

- Provide for personal comfort & build trust
- Orient to environment
- Agree on the fiction contract
- Agree on participation, confidentiality, respectfulness

2. Provide for personal comfort & build trust

- Introduce self – background and expertise
  - Reveal your expertise
  - Reveal your stories and experience
  - Convey that you like what you're doing and think it's important
- Introduce participants – background, experience, level
- Help participants understand the context
  - Mistakes are puzzles to be solved; not crimes to be punished
  - Vicarious, observational, and direct experiential learning
  - *The Basic Assumption:* We believe that everyone participating in activities at CMS is intelligent, capable, cares about doing their best and wants to improve.
- Provide course learning objectives

3. Orient to environment

- Introduce simulation (4 page handout)
- Explain simulation specific techniques
  - Unusual events, time warps, pause & discuss, deliberate practice
- Discuss research protocols & obtain permission
- Announce whether there will be visitors
- Discuss care and comfort issues
  - Schedule, restroom facilities, food, transportation, etc.

4. Agree on the Fiction Contract*

- Be fair about simulation's strengths and weaknesses
  - Don't over or undersell
  - Admit weaknesses and focus on the strengths in terms of what needs to be accomplished
  - Don't try to convince participants the simulation is more real than they're willing to make it
- Discuss the roots of cases
  - QI, M&M, litigation, faculty experience
- Ask for buy-in to the fiction contract
  - We're going to work hard to make the simulation seem as realistic as we can
  - For your part, see if you can focus on solving the problems presented
  - Is that OK?
- State that participants will probably conduct themselves differently in simulation than they do in the real clinical environment.

5. Set ground rules on participation, confidentiality, respectfulness

- Ask for confidentiality (Las Vegas principle)
  - Actions and remarks of participants
  - Case details
- Appeal to participants to reflect on their actions and thinking during debriefing
  - Ask them to think deeply about their practice, assumptions and knowledge
  - Insist that participants be polite, respectful and curious about others' actions and remarks.

6. I want to use video. Can you give me some advice about its use?

- Be familiar with the equipment
- Use video as springboard for discussion
- How much to use?
  - Liberal use of fast forward & bookmarks
  - Focus on 2 - 4 segments
- Research shows that video is a powerful learning tool.

Print Name: _____ Date: _____

CONFIDENTIALITY OF INFORMATION

During your participation in courses at the Center for Medical Simulation, you will likely be an observer of the performance of other individuals managing medical events and debriefing of those events. It is also possible that you will be a participant in these activities. You are asked to maintain and hold confidential all information regarding performance of individuals and details of the simulated cases.

By signing below, I acknowledge to having read and understood this statement and agree to maintain the strictest confidentiality about any observations I make regarding the performance of individuals and the simulated cases.

_____

Participant Signature (***Required to observe or participate in the course***)

PERMISSION TO REVIEW VIDEO RECORDINGS FOR EDUCATIONAL PURPOSES

During the course at CMS, you will likely participate in realistic simulated cases of medical events that are routinely video recorded for review during debriefings as part of the educational experience. The goal is for the facilitators to provide focused feedback to the team. The faculty may review these recordings at a later date for quality improvement of the training.

By signing below, I acknowledge to having read and understood that I will be video recorded in the course, and agree to allow CMS faculty to review these video recordings for educational purposes.

_____

Participant Initials ***(Required to participate in the course)***

PERMISSION TO REVIEW VIDEO RECORDINGS FOR RESEARCH PURPOSES

CMS faculty conduct research projects involving these cases focusing on trends in participant behaviors and team performance. These recordings may be reviewed by others involved in the IRB approved study with all identifiers removed to safeguard anonymity.

By initialing below, I acknowledge to having read and understood this statement and agree to allow CMS faculty and approved investigators to review these video recordings for research purposes.

_____

Participant Initials

RELEASE FOR STILL PHOTOS AND VIDEO RECORDINGS

I authorize the Center for Medical Simulation personnel to publicly use images and video recordings depicting me during the course at CMS. I will not be identified by name in any images; they will be shown only for educational and informational purposes.

_____

Participant Initials