1.5: TECHNOLOGY ENHANCED CLINICAL EDUCATION

“Technology gives us power, but it does not and cannot tell us how to use that power. Thanks to technology, we can instantly communicate across the world, but it still doesn’t help us know what to say.”
—Jonathan Sacks

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**Simulation isn’t just a game!**

Each year the Canadian Association of Schools of Nursing honours an outstanding leader in nursing research with the Pat Griffin Scholar Award. This year’s winner is **Dr. Bernard Garrett**, a scholar with a passion and commitment to advancing the quality of nursing education. His area of research is focused on the use of educational technologies, in particular virtual and augmented reality in the support of clinical nursing skills.

Nurse educators have been using simulation for years to give nursing students the opportunity to practice life-saving procedures in an environment that does not endanger patients. Simulation can also be used to master basic skills, role play challenging situations, or practice critical interventions, but simulation does not replace real experience with patients.

Augmented reality, which is used both in simulation labs and clinical practice, overlays the real world with digital data that is accessible and expands the way we take learning out of the classroom into the real world. In this new ‘real world’, elements are augmented by computer-generated sensory input (sound, video, geographical data) that allows students immediate access to information that supports them in their practice. So in the near future, if you see your nursing
student reach for her smart phone, it’s likely she will be using it to gather information from symbols on medical equipment instructing users on safe and appropriate use.

Canada and nursing education are still in the early stages of developing augmented reality but with researchers like Dr. Garrett (RN PhD UBC) we will get to where we need to be: a real world patient environment where nurses and nursing students are supported by accessible, interactive educational technologies. (University of British Columbia, 2014) http://www.nursing.ubc.ca/News/NewsItem.aspx?id=372

Advances in technology over the past few decades have had an impact on all aspects of life in North America. The practice of health care and the education of all health care professionals are no exception. Technology for communication through email made it possible to share information relating to patient care or health professions education much more quickly than snail mail or pneumatic tube systems. Although email was tortuous in the beginning, it became more functional with availability of browsers such as Internet Explorer, Firefox and Chrome.

Once we had browsers and file sharing, electronic communication of lab results and pharmacy prescriptions became standard within hospitals. Still, many years passed before a hospital system could communicate with systems outside the facility. Many hours and dollars were spent trying to get one system to speak to another. Now with the internet present ubiquitously, information and records can be paper-free and stored in cyberspace. The most recent advance, the smart phone, allows practitioners, students and educators to hold access in their hand at all times, with the correct passwords, to all the information they need for their work or studies.

This communication technology now extends to the community, into clinics and into private homes. Beyond merely sharing information, we can now share physiological data. Patients can send their blood pressure, their heart rate, their cardiac rhythm, etc. via the Internet to a health care provider through what are now called Wearables. Beyond needing to learn how to use these information technologies in patient care, health care students need to learn how to use a myriad of computer-regulated equipment such as IV infusion pumps, digital scales and cardiac monitors. The practice of health care and the basic education of practitioners must encompass understanding and skill with technology.

In this chapter we suggest that entry level practice requires use of technology. We give an overview of a sample of common technologies and comment on how teachers need support to use technology. Describing specific strategies for clinical instruction relating to all technologies is not possible here. Our intent is to uncover the possibilities for technology use in the clinical setting and to direct clinical instructors towards appropriate resources.

Entry Level Practice Requires Use of Technology

Health care professionals must be able to understand and use technology in their workplace. They must use information technology to assess and manage patient or client information and they must understand the associated ethical and legal considerations. In most health professions, entry level competencies spell out the expectations for beginning practitioners. For example, community health pharmacists have specific competency requirements for using the Electronic Health Record and the Computerized Pharmacy Management System, (Accreditation Council for Canadian Physiotherapy, 2009: NACDS and NCPA Task Force, 2012).

In nursing, individuals are required to be literate and competent in informatics and other communications technology. Prior to entering their program, nursing students are expected to be able to use “personal computers, tablets and mobile
devices as well as other peripheral devices including USB drives and printers, … email, multimedia such as videos and podcasts, word processing applications, and be able to navigate operating systems such as Microsoft Windows®, social media and use technology that supports self-directed learning” (Borycki & Foster, 2014, p.15).

As an illustration of the importance of informatics, a committee of experts at the Canadian Association of Schools of Nursing (CASN) has prepared a document on nursing informatics needed for entry to practice “to promote a national dialogue among nurse educators, informatics experts, and nursing students on integrating nursing informatics into entry-to-practice competencies; to increase the capacity of Canadian nurse educators to teach nursing informatics; and to engage nursing’s key stakeholders in developing nursing informatics outcome-based objectives for undergraduate nursing curricula.” (CASN/CHI, 2012, p. iv).

Clearly, clinical education is an appropriate arena for learning to use assessment tools that are moving more and more into the digital realm and for practicing using information systems. Although curricula related to ethical and legal issues may be covered in classroom settings, physical use of the technologies in clinical setting can bring issues to life new ways.

Creative Strategies

How Do We Access Data?

Although you may be very familiar with accessing the data you need in the clinical practice area where you teach, think about what the process looks like through the eyes of a student new to the profession. Make a list of the digital communication and information gathering tools in use at the practicum site. Compare the tools on this list to those incorporated into your program’s lab activities for students. If students have not been introduced to some tools, seek out ways to provide additional practice time during pre- or post-practicum conferences or in a clinical lab.

Your students will be working in many different practice facilities and most will use different programs for their patient data. Know in advance the procedures in each facility. How do students access the data? Do they need passwords? Do they access data at a specific time?

Try to obtain examples of the presentation of lab work, medication recording and charting and incorporate this into all levels of simulation with students.

Some programs have established web portals to host examples from multiple facilities, helping students gain alternative experiences. This may not be practical for you but you can make a mock set-up with screen shots from various clinical placements for your case studies.
Simulation

Simulation is one of most common and widely used technologies in practicum components of post-secondary education programs. In aviation, flight deck simulators that focus on developing cognitive and psychomotor skills have long been known to enhance pilot competence and reduce human error (Helmreich, Merrit & Wilhelm, 1999; Taylor, Dixon-Hardy & Wright 2014). In business administration, simulated experiences are used to strengthen skills needed in crisis-based activities (Aertsen, Jaspaert & Van Gorp, 2013) and to support students’ abilities to manage their information technology portfolios (Larson, 2013). In bioengineering, simulations help students address challenges in understanding complex bioprocesses and systems (Roman, Popescu & Seliteanu, 2013).

In health care, simulation offers a safe environment for students to practice their skills and begin to adopt professional values (Shepherd, McCunnis, Brown & Hair, 2010). Since simulation can emulate the practice environment, the option of replacing required clinical hours with simulation activities has been debated for a number of years and remains contentious. Debate continues on whether simulated activities can or should replace contact with patients and if so, to what extent.

Regulatory bodies usually determine the number of hours professional programs must allocate to clinical practice. Hayden, Smiley, Alexander, Kardong-Edgren & Jeffries’ (2014) seminal work with 10 pre-licensure programs across the United States replaced up to 50% of traditional clinical hours with simulated activities. They then assessed student competency at program end through clinical preceptor and instructor reports and pass rates on the required National Council Licensure Examination (NCLEX). The students were also evaluated by managers after their first six months of practice. There were no statistical differences in the preceptor, instructor or manager ratings of students who completed traditional clinical hours and those who participated in simulation activities. The authors concluded that “substituting high-quality simulation experiences for up to half of traditional clinical hours produces comparable end-of program outcomes and new graduates that are ready for practice” (p. S3).

Dictionary definitions are usually a good place to begin description. The Dictionary.com definition

**Simulation**[sim-yuh-ley-shuh n] noun
1. imitation or enactment, as of something anticipated or in testing.
2. the act or process of pretending; feigning.
3. an assumption or imitation of a particular appearance or form; counterfeit; sham.
4. Psychiatry. a conscious attempt to feign some mental or physical disorder to escape punishment or to gain a desired objective.
5. the representation of the behavior or characteristics of one system through the use of another system, especially a computer program designed for the purpose. "

Using this broad definition, every activity in a clinical lab and pre- and post-practice activity is a form of simulation. Systems that imitate or pretend to act as patients include actors, manikins and different types of machines posing as patients.

In health care education, the word simulation became more prominent in recent years with the development of low-, medium- and high-fidelity manikins, artificial human patients, or artificial parts of patients that respond electronically to intervention by the learner. These fit the fifth definition of simulation. Clinical labs around the world now house such manikins, with computerized scenarios and lab technicians to run case study practice sessions that are as close to reality as possible without a human patient.

As its definition indicates, simulation also includes low-fidelity activities such as case study discussions, role-playing interactions with patients, and practicing skills such as changing dressings or giving injections. Many of these activities can be implemented without actors or costly manikins to simulate patients and their conditions. Although the introduction of high fidelity has increased skills practice in emergency and specialty situations (Sharp, Newberry, Fleishauer & Doucette, 2014), simulation involves more than simply having learners use machines to practice required skills. Journals such as Clinical Simulation in Nursing, organizations such as the International Nursing Association for Clinical Simulation and Learning and interest groups such as the CASN Simulation Interest Group offer valuable guidance for using a full range of simulation activities in clinical teaching.

**Simulation has the potential to improve education outcomes.** In health, a meta-analysis of studies relating to health professions education concludes that "[i]n comparison with no intervention, technology-enhanced simulation training in health professions education is consistently associated with large effects for outcomes of knowledge, skills, and behaviors and moderate effects for patient-related outcomes." (Cook et al., 2011, p. 978). Studies in medicine, paramedic training and nursing support this conclusion. In medical education, simulators help novice surgeons develop their skills, retain knowledge, and reduce procedure times and error levels for laparoscopic surgery (Al-Kadi & Donnon, 2013). In paramedic education, creating simulated accident scenes helps firefighting and paramedic students prepare for situations they will encounter in practice (Smith & Anderson, 2014).

In nursing, simulation experiences may enhance knowledge gains (Gates, Parr & Hughen, 2012; Shinnick, Woo & Evangelista, 2012; Weaver, 2011), decrease medication errors (Shearer, 2013), be equivalent to traditional clinical experiences promoting student acquisition of fundamental knowledge (Hayden et al. 2014; Schlairet & Pollock 2010), and increase self-confidence (Leavett-Jones, Lapkin, Hoffman, Arthur & Roche, 2011) and efficacy (Dunn, Osborne & Link, 2014). However, questions remain as to how these outcomes transfer to the clinical setting (Norman, 2012), if they promote an unrealistic level of self-confidence (Liaw, Scherpber, Rethans & Klainin-Yobas, 2012) and if they heighten stress (Weaver 2011).
The Stages of Simulation. No matter what type of simulation activity you implement, like any learning experience, simulations require detailed planning. Some learning institutions house high-fidelity simulation labs that are complex environments and often have dedicated simulation experts available. In other instances, clinical teachers will lead students through a series of activities geared towards developing specific skills. We suggest seven stages that can be adapted and modified to guide most simulation activities: 1) choose or write a scenario; 2) obtain and set up equipment; 3) determine the student pattern or roles; 4) offer pre-briefing activities; 5) implement the simulation; 6) facilitate a debriefing discussion; and 7) evaluate the activity.

1. Choose or write a scenario

All planned learning experiences should address specific learning objectives. This is no less important in a simulation. What does the instructor want the student to accomplish in the planned setting? Every simulation should have a goal, a context and a story, whether it is a case study on paper, an actor as patient/client, a situation in Second Life, or a full high-level simulation. The learning objective should thread through the simulation, allowing students to understand the goal and yet not excluding incidental learning (chapter 3). Some educators do not want the students to know the specific goal in advance. This should be stated explicitly (Alinier, 2011; Brackney & Priode, 2015).

Once you determine your goal, you can take several routes to design your simulation. Vignettes, story boards, flow charts and scripts are part of pre-planning and design. They will indicate when and where the students will receive content and context information. They can be home-made by instructors, purchased from provider companies such as Pearson, or found free on the Internet. Reid & Raleigh (2013) provide a selection of simulation scenarios. As students advance in their program, they can be invited to suggest or write scenarios.

2. Obtain and set up equipment

Whatever the degree of fidelity, simulation activities require equipment. It could be oranges and syringes to simulate giving intramuscular injections or a complex piece of machinery such as these [simulators from Carolina Health Care System](https://med.libretexts.org/Bookshelves/Nursing/Book%3A_Creative_Clinical_Teaching_in_the_Health_Professions_(Melrose_&_Watson)/Chapter_11/Simulations).
Determine the equipment you need, practice working with it yourself, and plan the specific amount of time each student is likely to need compared to the time allotted for your group. Whenever possible, apply moulage, or the process of applying make-up or other props to help make the simulation as realistic as possible (Merica, 2011). Simply adding personal items such as clothing and wigs to manikins can help make them seem more lifelike.

Bear in mind that simulation experiences do not need high fidelity. Setting up practice time with equipment that students will be using in their hospital, clinic or community placement is also an important simulation. For example, how can you create opportunities for students to work with electronic data collection and recording or with operating IV pumps?

### 3. Determine the student roles

Clinical practicum placements are now at a premium. Not every student can experience every situation or skill under the guidance of their instructor. This is also true in high fidelity simulation labs. To maximize the learning, consider dividing students into different roles. For example, one student might actively provide care, a second student might act as consultant to the care provider, and a third student could keep records. Rotate students through each role in a timely manner and ensure that all students do participate in providing care.

### 4. Offer pre-briefing activities

Pre-briefing is recognized as important in developing learners’ clinical judgement and thinking. Established goals of pre-
briefing activities are to support students' capacity to “notice aspects of the clinical situation, anticipate patient needs, and focus on the application of existing knowledge” (Page-Cutara, 2014, p.140). Students need to know why the simulation is salient and relevant to their future practice. Clearly outline the learning objectives, the expectations for each role, and times allotted to each activity. Provide any available advance reading or pre-testing activities. Review any medications in the simulation (Brackney & Priode, 2015). Specify how the simulated activity varies or is different from real life experience (Willet, 2013). Whenever possible, invite students to walk around the equipment and become accustomed to the space before the simulation activity begins.

5. Implement the simulation

Jeffries’ (2005) seminal model for implementing simulation activities emphasizes having teachers offer frequent cues or directions to learners and provide ongoing feedback throughout the simulation. Expect that learners may feel anxious and self-conscious as they perform new psychomotor tasks in front of peers. As in the clinical situation they are designed to illustrate, simulation activities may not all progress as planned. Use these opportunities to model professionalism and critical thinking.

6. Facilitate a debriefing discussion

Debriefing is considered a critical component of any simulation activity (Boellaard, Brandt, Johnson & Zorn, 2014; Cockerham, 2015; Fanning & Gaba, 2007; Jaye, Thomas & Reedy, 2015; Jeffries 2005; Shinnick, Woo, Horwich & Steadman, 2011; Wang, Kharasch & Kuruna, 2011). Ensure that time and space are available for all those who have participated in a simulation activity to share their feelings and perceptions about what occurred. In some instances, planning more time for debriefing than for the actual simulation activity is needed.

Begin the discussion, either with students individually or in groups, by inviting students to reflect on their experience and describe what happened, without interruption and in their own words. Follow this by asking what they might do differently next time. Emphasize how the process of balancing negative and positive reflections can strengthen clinical reasoning skills. Conclude the discussions by eliciting comments from students about how they can transfer what they learned to future situations.

With larger groups, create dyads for students to share their reflections with a partner. Monitor the timing of the partnering discussions so each partner has an equal opportunity to speak. Private reflections in the form of journal entries can also be used as a debriefing strategy.

7. Evaluate

Evaluating student performance during any simulation activity should mirror clearly established learning objectives. See chapter 6 for an in-depth discussion of student evaluation. Psychological safety or feeling comfortable about truthfully expressing their reflections on their performance is especially important for learners during and after simulation activities (Morse, 2015; Runnacles, Thomas, Sevdalis, Kneebone & Arora, 2014). Frame evaluation discussions with a reminder that the purpose of simulation activities is to provide opportunities for practicing skills in a safe environment where patients will not be harmed.

Evaluation must also include measurement of the value and usefulness of the simulation activity. Be sure to provide
students with the opportunity to share any recommendations they have for improving the simulation. A short, anonymous online evaluation form with specific multiple choice questions about the experience can also serve as a debriefing activity.

Creative Strategies

What’s the Hardest Part?

Despite the complexities in any simulation activity, when we deconstruct the process we will likely find one or two key elements that stand out as particularly difficult and anxiety-provoking. These difficult or hardest parts may be common to most learners or they may be quite individual. For example, nursing students may state that putting the needle in was the hardest part of their first intramuscular injection. Others may comment that mapping the injection site was the hardest part. Exploring what students believe is the hardest part will give important insight and understanding on how students approach a learning activity such as simulation. Ask the question “What’s the hardest part of …?” When we view difficulties through the eyes of our students, we can help them build directly relevant strategies to overcome specific difficulties.

From the Field

It’s OK to Be Wrong

Affirm that knowing what we don’t know and knowing when we’re wrong is positive. If something doesn’t go well, create a climate where it’s OK to be wrong. When students implement procedures and things don’t go well, be sure they know that they will be supported rather than penalized for sharing what they did poorly. The important thing for students to think about is “How can I make it better?” Communicate that the only way students can improve and do better next time is to discuss what they think went wrong. Genuinely let students know that you will offer some feedback, some guidance, and that that you want to hear about the times when things went wrong. Then go back in the trenches together and try again.

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In sum, despite the variation in fidelity among simulation activities, their purpose is to provide opportunities for learners to feel safe practicing and developing their skills. Next, we discuss a sampling of additional technologies that clinical educators can use: virtual clinical labs, mobile technology and social media.

Virtual Clinical Labs

Virtual clinical labs, which also run from low to high fidelity, need to be included in any description of simulation. Licenses to use these programs are generally purchased by health care education programs and individual teachers cannot implement the programs without these licenses. Some online communities for health care practice are really story boards with pictures and discussion questions, such as The Neighbourhood. In Second life, you can find virtual...
Technology can augment clinical experiences for students by allowing an entire group of students to feel that they are at the bedside in real time. Roving Robots such as Vgo can be operated from outside the patient room. They can record health professional, student or instructor interactions with a patient as through a one-way mirror, but the technology can go along with the care giver from room to room. Vgo is not the same as video recording or using Skype because the robot is maneuverable from a distance and the educator can focus on what is needed at the moment. Situations can also be recorded for further review. Patient permission is clearly required for this type of activity but that does not need to be a roadblock. The Vgo is in use in hospital health education and can also be used for community practice education.

Creative Strategies

Visit a Virtual Clinical Lab

Find out whether the program in which you teach has access to any virtual clinical labs. If access is available, visit the lab and identify two or three cases or scenarios that have relevance to your clinical area. Create links between the virtual cases and real life cases in the clinical practice area.

Mobile Technology

Mobile technology that incorporates information, decision platforms and communication ability for expert advice is becoming ubiquitous in most health care practice. Unfortunately, cell phones are stigmatized in some areas of health profession education and practice. Concerns relate to disease transmission, privacy and inappropriate use, all of which apply to any technology and to health professionals themselves. Appropriate care and use of any technology is part of overall professional education and the responsibility of all practitioners.

Health care professionals are beginning to adopt hand held devices, particularly Smartphones, to replace textbooks and traditional references such as pocket formularies. Commercial software with mix and match selections of products is becoming popular. In one Canadian study assessing the self-efficacy of nursing faculty and students’ use of mobile technology, results indicate that both faculty and students are highly confident in their use of mobile technology and are prepared to engage in mobile learning (Kenny, Van Neste-Kenny, Burton, Park & Qayyum, 2012). Professionals value having the information they need right at the point of care as they making critical decisions about patient care (Lamarche & Park, 2012). This textbook, downloaded on a Smartphone, is a clear example of everyday use of mobile technology. Possibilities for clinical teachers to connect with their students through Smartphone apps are limitless. Links to relevant resources or motivational messages could be just a text away.

Creative Strategies

To Text or Not to Text

Instructors may use texting as a method to communicate with students. One concern with texting is that messages may not be considered urgent. Students may believe that texts can just be ignored until an appropriate time. Another concern is with privacy. Both instructors and students must consent to sharing their phone numbers for this purpose. At the beginning of a clinical practicum, establish the ground rules for using (or not using) texting throughout the rotation.
Social Media

Social media refers to interactive Internet platforms in which users create, share and exchange information in online communities. Facebook®, Twitter®, Instagram® and LinkedIn® are well-known social media programs. Students use social media widely in their free time, particularly those who are younger (Tuominen, Stolt & Salminen, 2014). Social media platforms hold promise as important contemporary teaching tools in clinical education. Students have gained important insights from creating a professional presence on social media, blogging on clinical topics, contributing to Wikipedia, using wikis for collaborative group work, and sharing their presentations on SlideShare®, Slide Rocket®, Glogster® or Prezi® (Schmitt, Sims-Giddens & Booth, 2012). Some educators may have limited experience with social media platforms but use of these platforms in higher education has been steadily increasing (Seaman & Tinti-Kane, 2013).

Note that although students may use social media platforms extensively, they may not understand professional nuances of privacy and ethics on those platforms (Grajales, Sheps, Ho, Novak-Lauscher & Eysenbach, 2014; Schmitt, Sims-Giddens & Booth, 2012; Thompson et al., 2011). Problems identified among health care learners include separating personal and professional identities (DeCamp, Koenig & Chisolm, 2013), posting photographs of interactions with identifiable patients (Thompson et al., 2011), and using informal or colloquial language (Killam, Carter & Graham, 2013). The Canadian Nurses Association provides guidance on the use of social media in their seminal publication *When private becomes public: The ethical challenges and opportunities of social media* (https://www.cna-aiic.ca/~media/cna/page-content/pdf-en/ethics_in_practice_feb_2012_e.pdf?la=en).

Creative Strategies

**Now That’s Professional**

Invite students to review online profiles of faculty members or professional staff members working in the clinical area in which they hope to practice after graduating. Have students identify one or two specific aspects of the profile they would like to emulate on their own present or future professional website.

Discuss what drew students to these aspects of the profile and why they stood out as professional. How did the author of the profile use (or not use) language and pictures intentionally and appropriately? What precautions were put in place to ensure privacy?

Teachers Need Support to Use Technology

Using technology can be challenging. Clinical teachers need support as they sort through all the options and possibilities available. Several tensions come with using new technologies in teaching. How do clinical educators, with years of practice and experience, find creative ways to capitalize on the new digital and networked technologies and simulated activities, particularly if they were not exposed to them in their own education? How do we come to terms with the idea that teachers may no longer be relevant, that students can do it all by themselves with the right technology because the classroom can be ‘anywhere any time any how’?

Other tensions come from shifts in educational philosophies (chapter 2). Many institutions of higher education now espouse shifting away from a traditional liberal philosophy emphasizing transmissive or lecture/demonstration methods.
Instead, many health care education programs are embracing a more constructivist approach in which teachers build on what students already know (Melrose, Park & Perry, 2013).

Connectivist approaches are also becoming popular, in which students recognize what they need to know, use the abundance of digital networks and resources to gather information, and then organize it in useful ways (Melrose, Park & Perry, 2013). Students and practitioners have long been expected to participate in collaborative projects and develop communities of practice (Lave & Wenger, 1991; Wenger, 1998; Wenger, McDermott, & Synder, 2002). Access to these communities is no longer restricted in time and place. Students can connect digitally with like-minded others from around the world at any time and in a variety of new ways. However, questions about credibility of sources used by students may not have straightforward answers.

In chapter 3 we discussed intergenerational learners, noting how individuals in their 20s and 30s (Millenials) and those born after 1995 (Generation Zers) have grown up with technology. Those in their 40s (Generation Xers) and in their middle years (Baby Boomers) may (or may not) be less comfortable with technology. For those less familiar and comfortable with digital innovations, the technology can be confusing and even annoying. If the pedagogical purpose of a program, app or simulation is not clear, educators must raise questions about its use. Neither students nor teachers have time to spare on technologies just for the novelty of using them.

On a practical level, the administrative support for teachers to implement new technologies may be limited. Funding and release time for them to attend workshops and learn how to use equipment themselves may not be available (Goldsworthy, 2012; Jeffries, 2008). Most technologies, particularly those offering high-fidelity simulation experiences, are expensive and may be shared among different learning programs. Schedules may only provide minimum time for learner access to equipment (Garrett, MacPhee & Jackson, 2011). Space for critically important post-simulation discussion and debriefing may not be provided.

Jeffries (2008) used the acronym S.T.E.P. to propose a sequence of steps that can help create the support instructors need to confidently implement simulation activities.

- **S**, for standardized material, suggests initiating and maintaining a repository of easily accessible materials about simulation for all educators.

- **T**, for training the trainers, encourages health care faculties to promote education for instructors, for example designating a champion or individual with expertise to promote the simulation activities.

- **E**, for understanding the importance of top-down encouragement. Teams can be developed to work on a plan for introducing simulation education for instructors. An orientation plan and guidelines need to be developed and shared.

- **P**, for the planning itself, suggests ongoing collaborative activities such as forming an interest group for clinical teachers and any interested instructors.

Creative Strategies
Step Up for Simulation

Consider whether one, two or even all the strategies Jeffries (2008) suggests in her S.T.E.P. model might be useful to you.

S (repository of standardized material). Start a repository by collecting and then posting journal articles related to simulation on an inter-faculty website.

T (train the trainer). Consider the idea of championing simulation. Would you be interested in taking on this role? Could you co-create a champion role with another teacher interested in simulation?

E (top-down encouragement). How can you contribute to any orientation or guidelines about implementing simulation activities that already are, or should be, in place? Can you extend existing processes to be more team oriented?

P (Planning). If a simulation interest group is not in place in your training program, could you initiate one? Can you make links between program interest groups and national interest groups such as the CASN Simulation Interest Group?

Conclusion

In this chapter we discussed how technology can enhance clinical education. To achieve entry level competencies, students in the health professions must use technology. We provided an overview of common technologies, elaborating on simulation. We emphasized that the purpose of simulated activities is to provide safe environments where students can practice the skills they need to learn. Whether simulation is a low-fidelity activity such as discussing a written case study or a high-fidelity activity such as operating a complex machine simulating a human function, students need supportive feedback throughout the activity. Establishing a climate where it’s OK to be wrong is an essential element in any simulation activity. Time and space must be carved out at the end of a simulation to debrief and reflect critically on how the activity developed.

Virtual labs, mobile technologies and social media are additional technologies to enhance clinical teaching. As with the use of any new innovation, teachers themselves may need support in learning how to use the technology.

References


Accreditation Council for Canadian Physiotherapy Academic Programs, Canadian Alliance of Physiotherapy Regulators,


