CHAPTER 1

Teaching and Learning With Technologies for Safe, Quality Care

CHAPTER GOAL

Gain an overview of teaching with technologies, including an introduction to the text and tools that are used throughout the book to promote teaching and learning with technology.

BEGINNING REFLECTION

1. What experiences have you had teaching and learning with technology?
2. What experiences have you had using technologies for safe, quality patient care?
3. What are your goals for expanding the use of technology in promoting student learning?

Overheard: *Although I am told that teaching with technologies is intuitive, I am not sure I agree….*

Traditional teaching methods have not always kept up with rapidly changing technology. Rapid expansion in online learning, national calls for all students to gain informatics competencies, and the major impact of high-fidelity patient simulators all support the need for faculty competence and confidence in teaching with technologies. Because all levels of faculty seek to enhance traditional teaching with technologies, how do nursing faculty keep up with the rapid changes? This book provides an overview of teaching and learning concepts or pedagogies that are relevant across a variety of technologies. This book can help new and seasoned educators gain strategies for keeping up with technologies. It can also help faculty make thoughtful selections of how and where technology should be integrated into learning environments to meet specific educational goals. Readers can gain new ideas for integrating technology-based learning strategies in their own teaching projects.

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Technology and the changing clinical arena are an interesting mix. Addressing technology is important in this time of rapid change in healthcare and renewed emphasis on safety and quality in clinical care. As national reports document problems with communication and safety in the health professions, technology can provide unique opportunities for making improvements in these critical areas. What considerations are necessary in technology integration into healthcare programs? How does technology affect teaching and learning? Basic approaches that are covered in this text include the following:

- Helping our students (and ourselves) recognize personal learning styles and skills for self-directed learning
- Gaining a conceptual tool kit that can promote success in teaching and learning concepts (such as evidence-based practice) with a technology base
- Gaining familiarity with a variety of available teaching resources such as the Quality and Safety Education for Nurses (QSEN) Institute (www.qsen.org)
- Gaining a template for teaching technologies that is based on best-practice evidence

This book is about combining the best of the traditional teaching and learning principles with new, rapidly changing technologies. We have explored the advantages and limits of teaching with and about technologies. We are not expecting our readers to become experts in all technologies. Rather, the idea of the book is to understand good basic teaching and learning principles, educational leadership, and quality and safety practices and to apply them to rapidly changing technologies. This book is intended not to develop skill proficiency with a particular software or technology, but rather to introduce pedagogical concepts and practices relevant to future teaching with technology.

Methods supplied throughout this text are consistent with adult learning theory. In rapidly changing arenas such as educational technology and clinical knowledge, there are benefits to time-tested theory in guiding rapid decision making to meet student and patient needs. This is particularly important for students in clinical professions.

WHY ARE PEDAGOGIES IMPORTANT AND WHAT DO THEY MEAN?

A world of technology has opened up for our use in teaching and learning. In particular, our overall focus on pedagogies has been enhanced by the major shift that online learning presented. As learning moved online, educators were pushed to think of what they were trying to accomplish with teaching rather than just moving a classroom session to the web. As new technologies emerged for both classroom and clinical units, more opportunities to consider pedagogy and technology combinations exist. Although the term andragogy was defined as referring specifically to adult learners (Knowles, 1984), the more common umbrella term pedagogy is used throughout this text. A pedagogical

approach reminds us to keep student learning at the forefront. Although varied definitions for pedagogy exist, the term relates to the activities of educating or instructing that facilitate learning by another. The concept of facilitator is the key throughout our discussions.

In addition, best-practice pedagogies relate to learning by doing. Although definitions of best practice can vary, examples of teaching principles and resources based on evidence include the following:

- Chickering and Gamson (1987). This classic reference describes seven best practices for teaching.
- Carnegie Mellon University (2015). In these resources, research-based principles are expanded to include both teaching and learning principles.
- National Academy of Sciences (2015). This resource provides a basic reference on how people learn.

Technology enhances teaching opportunities and, in some cases, may even make teaching easier. Technology, for example, allows ready access to new materials. Gaining knowledge of simulation practices is at our fingertips using the Simulation Innovation Resource Center (SIRC). The question then becomes how to help students know where to look to gain these best tools not only now, but also in future practice.

Approaches to teaching with technologies are quite varied. The meaning of even a seemingly straightforward term such as online course can vary greatly. Our intent is to build opportunities and enhance readers' repertoire of tools for conveying content and using technology when it presents the best solution for helping our students learn. As faculty, we want to not only convey content to our students, but also help them understand what to do with the content so that they can make the connections between concepts and put concepts into context. Determining the best practices to do this is a worthy goal.

WHAT DO WE MEAN BY TECHNOLOGIES?

Technology is a very broad term, and its use in education has been described in different ways. Skiba, Connors, and Jeffries (2008) have considered the term to consist of three frames, including educational technology, information management, and clinical practice technology. Although there is overlap in the three frames, they provide direction for our discussions. We have addressed our teaching from the educational technology frame and consider how best to teach concepts within the practice frames, with an overarching information literacy theme.

Although we are privileged to live in a technology-rich time with all the accompanying opportunities, this fast and furious pace may lead us to question how we can make teaching with technologies manageable. Technology changes too fast to constantly focus and learn updates, so we must focus on the broad concepts or pedagogies that facilitate our use of technologies to promote student learning.

Educational Technologies

Technology provides educational options. We are talking not only about teaching online, but also about the many ways that classroom and clinical activities can be enhanced by technology. For example, we can give students the option of reading texts in print versions or using online teaching resources such as Center for Excellence in the Care of Vulnerable Populations (Brewington, n.d.). Also, assignments traditionally shared in the classroom, such as creating posters or brochures for health fairs, can be developed electronically in teams, viewed electronically, and then debriefed in class or by online discussion. Students can view these documents before class and come ready to debrief in class or in an online discussion. Using this electronic medium not only works for students, but also helps prepare them for using these resources as tools in their clinical practice. We have discussed our resources, courses, and assignments differently. We have used theories and best practices to guide us when research does not keep up with our rapidly changing needs.

Even in our core or basic classes, there are many opportunities for using technology to enhance teaching and learning. In a pathophysiology class, for example, faculty might use technologies to capture self-assessments, present automated quizzes with instant feedback for student learning, apply case studies to make the learning more relevant, engage students with questions embedded in PowerPoint presentations, and assign a relevant clinical project such as teaching handouts or posters to be completed with technology. Follow-up discussions on online discussion boards might be assigned. Ultimately, good teaching principles should align with technology applications for quality student learning. (See Exhibit 1.1.)

Information Management and Clinical Practice Technology

We are taking on expanded roles as we move into teaching technologies in the clinical setting. Technology has populated our clinical worlds in terms of managing information and working with our patients. The Institute for Healthcare Improvement (2017) discusses the triple aim, including

EXHIBIT 1.1

HOW MANY WAYS ARE THERE TO TEACH RESPIRATORY ASSESSMENT?

Should all classes on respiratory assessment be taught the same way? Is technology needed to teach assessment? Could technology enhance learning? How many ways can you identify to do each of the following? How do you know what the best approach is?

- How many ways are there to teach respiratory assessment?
- How many ways are there to document a respiratory assessment?
- How many ways are there to encourage critical thinking with a respiratory assessment?
- How might technology (and which technology?) assist with any of these tasks?

improving patient experiences of care, improving health of populations, and reducing the cost of healthcare. Patients are seeking healthcare that is evidence based, meaningful, and personally delivered in settings where technology is used. Technology, such as using electronic medical records to store, manage, retrieve, and analyze data, is key to improving the health of populations. Healthcare professionals gain unique information about populations via electronic data sets. In addition, technology provides opportunity to promote clinical safety, support population health, gain efficiency in teaching and learning, and it makes it easier for health professionals to track information, to get reminders on care issues, and to develop plans for positive patient outcomes. Technology is a tool for facilitating connections, caring, and collaboration.

Four broad technology goals for practice conveyed by the U.S. Department of Health & Human Services (Brailer, 2004) are specific to informing clinical care, interconnecting clinicians, personalizing care, and improving population health. Practice technology not only includes teaching students to care for patients on respirators in the ICU, but also involves changes from paper to electronic patient charting or documentation. In addition, the Institute of Medicine (IOM, 1999) safety report reminds us to use technology for a variety of reasons, including enhanced team communication to promote patient safety and outcomes. Patient safety in common practices such as medication administration and fall prevention is now often promoted with technologies that help assess, monitor, and direct care planning using interprofessional educational practices. Faculty gain opportunity to help students use technology in supporting patient care. Gaining familiarity with diverse technologies for teaching and learning to promote safe student practices and positive patient outcomes is a focus of this text.

The overarching information-literacy theme has particular relevance to our students of the future, serving as a basic platform for all of their professional work. Information literacy serves as guide to faculty for teaching evidence-based practice. As faculty, we first consider where to find best evidence to share with our students and then we teach them how to find their own best evidence for their future practice.

OUR DIVERSE LEARNERS AND THEIR CLINICAL PRACTICE

We have worked with diverse students in the classroom and in clinical units, including students who are diverse both in their cultural backgrounds and in their learning styles and interests. Our students bring a range of academic proficiencies, as well as unique talents and desires, to becoming clinical professionals. As faculty, we are challenged to help all of our students gain learning tools for success. An outcomes orientation in nursing education also includes a focus on the student remediation that technology makes much easier for us to provide.

We are preparing to teach students who will be practicing across diverse settings, from acute care to homes to long-term care. Students provide care ranging from health promotion to palliative care. The amount of information they will need can seem overwhelming unless we use broad concepts to help them learn the must-know content.

THINKING CONCEPTUALLY

Our discussions in this text often relate to the broad concepts that can keep us moving forward with diverse patient populations, rapidly changing clinical settings, and technologies. We are preparing to teach students who will be practicing across diverse settings from acute care to extended care settings and caring for patients from infants to frail elders. Thinking conceptually helps us keep track of broad content areas. Concepts remind us quickly of what we already know about a topic area and lay a foundation for further learning and organizing.

The concepts and themes addressed in this text include teaching about being professional and ethical, using evidence, thinking critically, and being competent in clinical skills. The rapidly changing field of genetics and genomes is one example. Students need to understand the basic concepts of genetics and technology for testing and treatment purposes. Beyond their basic clinical skills, counseling and supporting are called into play. Much of their work in this area relate to having good ethical models for decision making and patient-support strategies, along with an awareness of psychosocial issues and professional practice models.

BUILDING OUR TOOL KIT WITH MODELS AND RESOURCES TO GUIDE TEACHING AND LEARNING

Technology, if used in the best ways, presents opportunities to facilitate many aspects of teaching and learning. Theories and best evidence are our guiding practices in our pedagogies. Adult education reminds us to build on what students already know, engage students in learning the content, apply active relevant assignments, and help motivate students with assignments that incorporate their current and future interests. We learn (and help our students learn) by accessing new information, actively using that information, and reflecting on our learning (Fink, 2013). In addition, specific technology models have helped us synthesize and build on our own skills as faculty as we continue to ask questions and incorporate technologies into our teaching.

Exhibits 1.2 and 1.3 provide two guides for advancing our work with technologies: (a) our Readiness Guide and (b) our Integrated Learning Triangle for Teaching With Technologies. The Readiness Guide provides a checklist approach based on a broad mentoring model (Zachary, 2000) to determine our readiness, opportunities, and motivations for learning about teaching with a particular technology, as well as the opportunities and resources available to us (see Exhibit 1.2). Learning a technology such as Camtasia might be guided

EXHIBIT 1.2

NEW TECHNOLOGY READINESS INVENTORY

The following inventory can help answer the why, how, and when of learning a new technology. Organized around the concepts of readiness, opportunity, and support, the inventory provides direction in identifying an individualized plan. Please reflect on the following items specific to a new technology with which you would like to teach.

1. For the *specific* technology, what is your:
   a. Readiness/motivation—What is your readiness to learn/gain comfort with the technology? Would you rate this as low, moderate, or high?
   b. Opportunity—What is available to you in terms of technology resources and environment? Are there opportunities to access the technology you hope to use?
   c. Support—Who is available (locally or at a distance) to mentor or coach you in teaching with a specific technology?
2. Based on your assessment, what learning goals will you set?
   a. Goal statement (includes your intention and time frame).
3. Based on your goals, what specific plan will you design to enhance your technology learning/comfort needs?
   a. Plan (includes two to three specific action steps).
4. What potential challenges exist or might limit your efforts? What strategies would be most likely to promote success?

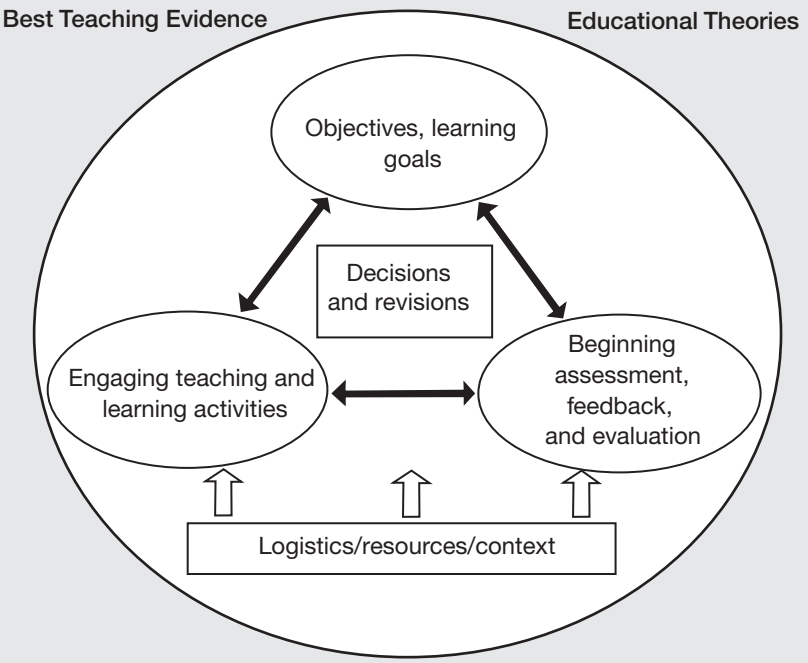
by this checklist of considerations (see Exhibit 1.4). The checklist helps faculty document opportunities and challenges, as well as assess faculty readiness for specific teaching technologies.

As we gain comfort with a particular technology, we may be preparing to design an assignment or a course using it. The Integrated Learning Triangle for Teaching with Technologies, based on best-practice evidence, provides further direction in planning to use technology in teaching. Influenced by the work of Fink (2013), the Integrated Learning Triangle is further clarified around the concepts of BEBOLDER (best evidence, educational theories, beginning assessments, objectives, logistics, decisions, evaluation/feedback, and revisions). This triangle is introduced in Exhibit 1.3 and is referenced in later chapters. The Integrated Learning Triangle helps faculty document opportunities and challenges for student learning, as well as assesses faculty considerations in planning a course, lesson plan, or assignment using technology.

Technology keeps evolving, presenting us with both challenges and opportunities for being flexible and creative. In new areas, where there is limited research, we have to rely on solid theory, educational principles, and best practices. Gaining a tool kit built around broad teaching principles and concepts helps faculty stay flexible and adapt to change. Case examples throughout this text help consider opportunities for using the template with varied content. Promoting the effective and efficient use of a broad array of technologies, the BEBOLDER template sets the stage for lifelong faculty learning and planning that promote student learning with technologies.

EXHIBIT 1.3

INTEGRATED LEARNING TRIANGLE FOR TEACHING WITH TECHNOLOGIES



The following guides flow from the Integrated Learning Triangle for Teaching With Technologies and can help answer the why, how, and when of using technology for a specific course, lesson, or assignment. Questions are organized around the mnemonic BEBOLDER to guide reflection. Consider the following items as you think about your plans for using technology:

- ***B*est teaching evidence and practices.** What evidence is available to guide implementing a particular technology? What are recommended approaches?
- ***E*ducational principles and theories.** What broad principles or theories, such as adult education theory, best fit student learning needs and teaching opportunities?
- ***B*eginning assessments.** What student learning needs are specific to the student level and content to be taught?
- ***O*bjectives.** What is to be achieved in a specific course, lesson, or assignment? How can technology help?
- ***L*ogistics/context.** What is the setting for teaching and learning? What physical resources are available? How many students are to be engaged? What are the strengths of available resource people to assist them?
- ***D*ecision/fit.** What is the best technology fit for given learning needs and resources? What are the best teaching/learning activities to engage students?
- ***E*valuation and feedback.** What is the evaluation plan? What feedback mechanisms are integrated into the course? How will you know if technology is helping students learn?
- ***R*eview and revision.** How will you build quality improvement into your plan? What worked and what did not? What needs to be improved?

(continued)

FURTHER QUESTIONS TO GUIDE REFLECTIONS

How does a particular technology best meet learning needs? For a particular course or assignment, will the technology:

- Help capture the concepts you are teaching?
- Assist students in meeting the objectives of the course?
- Help focus students' learning? Motivate students to become involved in learning?
- Help students make transitions to practice or focus on important concepts?

Also, for a given point in time:

- Is a particular technology worth the time and effort? (Would a less expensive technology work as well? What are the trade-offs?)
- What is the evidence for using the technology? (If there is limited evidence, is it consistent with good theory and educational principles?)
- Is the workload reasonable and well placed for both faculty and students?

EXHIBIT 1.4

LEARNING A TECHNOLOGY: FIRSTHAND ACCOUNT FROM AN ANONYMOUS AUTHOR

As a faculty member seeking to enhance my audio presence with online students, I was seeking opportunities for obtaining a technology and the know-how to use it. Using the Readiness-Opportunity-Support Checklist (see Exhibit 1.2), I gained some ideas for following up on this need. At our university, I found both resources and opportunity for an initial training session to prepare me to learn the new (to me) Camtasia; I was motivated and ready to learn.

After making a special trip to our college, I arrived early and ready to go. (I am now aware there are also online videos of this technology to support my work.) As the session began, I started stressing out because I did not realize the variety of things I could do with the Camtasia technology and thought I had come to the wrong session. Then I calmed down and focused on the parts I wanted. The session helped me confirm that my goal of providing brief audio clips to an online class made sense. I then scheduled a follow-up session with the Camtasia presenter, who had offered further mentoring services. At this follow-up session, I got a sense that my planned project was feasible from a technical standpoint. Then I needed to think about how it was feasible from a pedagogical standpoint. Here is where I started using the Integrated Learning Triangle for Teaching with Technologies to guide me (see Exhibit 1.3).

As I learned Camtasia, I was not starting from scratch. I used teaching skills I have learned throughout my career and have organized around adult education principles. I have created class outlines, and I know how to interact with a group of students to engage them in learning. Key points for me to consider beyond the physical "how-to" of Camtasia now related much more to pulling educational concepts together. Pushing the big red start button on the technology is the least of my worries. Instead, I am focusing on organizing manageable content bites that will encourage students in their own readings and activities. I am thinking about tricky concepts that I could describe in additional content bites. I am considering how to make the information relevant to the students with my examples and theirs.

SUMMARY

This is a book about understanding teaching technologies in partnership with pedagogy. We are being asked to teach in new ways that differ from the ways in which we were taught. New approaches are also needed for educating ourselves in using technology. Technology will continue to be a moving target, so we need to focus on pedagogy and student learning goals, building the technology around goals to support learning. As technology changes, we can tweak our technology skills and continue to use our educational principles and best practices. As educators reflecting on our practice, we consider questions for ongoing thought and learning resources with each chapter. Our goal is to share guides for keeping up with teaching technologies without being overwhelmed. Ideas and activities for self-directed learning are incorporated throughout the text.

ENDING REFLECTIONS FOR YOUR LEARNING NOTEBOOK

1. What is the most important content that you learned in this chapter?
2. What are your plans for using the information provided in this chapter in your future teaching endeavors?
3. What are your further learning goals?

GUIDELINES FOR TEACHING AND LEARNING WITH TECHNOLOGIES

Quick Teaching Tips

1. Orient students to their learning responsibilities and self-directed learning opportunities at the beginning of class.
2. Gain familiarity with web-based resources designed to support faculty in teaching with technologies such as QSEN Institute resources (available online at http://qsen.org/faculty-resources/courses/learning-modules).

Questions for Further Reflection

1. Using Exhibit 1.2 as a resource, think about what specific new technology you would like to learn about given your readiness/motivation, opportunity, and support services to enhance your technology learning/comfort needs.
2. Think back on how you were taught respiratory assessment. How would you recommend teaching the content with technology for diverse students?

Learning Activity: Self-Reflection on Technologies

As you begin your work in teaching with technologies, consider the following self-assessment, indicating Agree or Disagree for each of the following statements. As you review further chapters (or discuss the survey with colleagues), see if your opinions change or stay the same.

1. ____Helping students become self-directed learners takes on increasing importance in teaching with technologies.
2. ____Active learning has limited relevance for online courses/classes.
3. ____Technology has made information literacy and searching the literature easier concepts for students to understand.
4. ____Technology is advanced using interprofessional collaboration.
5. ____Electronic medical records can serve as tools to promote student critical thinking.
6. ____Student–faculty boundary setting has gotten easier with online social spaces such as Facebook and Snapchat.
7. ____Students in observer roles, as well as students with actual case roles, can learn with simulation.
8. ____Clickers in the classroom promote opportunities for gaining test-taking skills.
9. ____Fall-safety projects have little to do with teaching data management.
10. ____Rubrics, in addition to evaluation, serve as effective student learning tools.
11. ____Technology provides numerous ways to organize and facilitate student clinical work.
12. ____Students need opportunities to learn critique of web-based audiovisuals.

Learning Activity: Create an Assignment

BEBOLDER—CONCEPT MAP

The purpose of this assignment is to practice using the Integrated Learning Triangle for Teaching With Technologies with a teaching topic of interest.

After studying the Integrated Learning Triangle for Teaching With Technologies (Exhibit 1.3) model, develop a concept map depicting a topic (e.g., assessing lung sounds) that you would like to teach for a course, lesson, or assignment. Consider your responses to the questions framed by BEBOLDER. Once you have responded to the questions related to your teaching topic, depict them on a concept map. What strengths and weaknesses do you see with your plan?

Online Resources for Further Learning

- Technology Informatics Guiding Education Reform (TIGER) Initiative (Health Information Technology). This site describes the TIGER

competencies and suggested targets for knowledge, skill, and attitude development during prelicensure education. www.tigersummit.com
- QSEN Institute. A Robert Wood Johnson Foundation Initiative, this project provides interesting tools and resources to promote student learning, located at www.qsen.org
- NLN Center for Excellence in the Care of Vulnerable Populations. This site currently discusses the unique needs of adults, veterans, and Alzheimer's patients with the caregivers in the initiative Advancing Care Excellence (ACE). www.nln.org/centers-for-nursing-education/nln-center-for-excellence-in-the-care-of-vulnerable-populations
- SIRC. This site offers courses on designing and debriefing in simulations, interprofessional education (IPE), and advanced evaluation. sirc.nln.org

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