Technology and Innovative Teaching Strategies in Healthcare Education

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HOW TO RECEIVE CREDIT

- Read the enclosed course.
- Complete the questions at the end of the course.
- Return your completed Evaluation to NetCE by mail or fax, or complete online at www.NetCE.com. (If you are a Florida nurse, please return the included Answer Sheet/Evaluation.) Your postmark or facsimile date will be used as your completion date.
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Faculty

Jessica Kamerer, EdD, MSN, RNC-NICU, has worked training healthcare providers using simulation methods since 2006. She has experience utilizing simulation in academic and staff development environments. She works with college faculty, residency programs, and hospital educators to develop simulation-based educational programs. Programs range from medical student education in programs such as the family practice residency, nursing and respiratory care programs, to staff development, policy testing, and competency trainings. Her undergraduate degree from Indiana University of Pennsylvania is a Bachelor of Science in Nursing and her Master's degree from Walden University is a Master of Science in Nursing, specializing in education. Her Master's degree capstone project focus was research utilizing simulation to increase the effectiveness of graduate nurse orientation in critical care units. Her Doctorate of Education degree with a concentration in organizational leadership is from Nova Southeastern University. As an expert, Mrs. Kamerer provides trainings on learner-centered teaching pedagogies including simulation, as well as consults on development of simulation curriculums,

research, and grant writing. Her medical background includes emergency medicine, mental health, and neonatal intensive care. She has a specialist RNC certification as a neonatal intensive care nurse. Mrs. Kamerer has been published and presented locally, nationally, and internationally on a variety of topics related to simulation, innovative teaching strategies, and neonatal medicine. She is currently a nursing faculty member and Director of Online Nursing Programs at Robert Morris University.

Faculty Disclosure

Contributing faculty, Jessica Kamerer, EdD, MSN, RNC-NICU, has disclosed no relevant financial relationship with any product manufacturer or service provider mentioned.

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The division planner and director have disclosed no relevant financial relationship with any product manufacturer or service provider mentioned.

Audience

This course is designed for healthcare educators in the academic and staff development sectors, including nursing, medical, and allied health programs.

Accreditations & Approvals

In support of improving patient care, NetCE is jointly accredited by the Accreditation Council for Continuing Medical Education (ACCME), the Accreditation Council for Pharmacy Education (ACPE), and the American Nurses Credentialing Center (ANCC), to provide continuing education for the healthcare team.

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Disclosure Statement

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Course Objective

The purpose of this course is to guide educators in implementing some of the newer, most popular technologies available and innovative strategies in healthcare education.

Learning Objectives

Upon completion of this course, you should be able to:

1. Describe the application of technology to healthcare education, with examples of uses.

2. Evaluate the application of innovative strategies to healthcare education.

3. Outline how to match an innovative teaching strategy or technology to curriculum content.

4. Discuss the incorporation of innovative strategies and/or technology into content, including the role of needs assessment and evaluation.

5. Identify resources available to educators to use and implement technology and innovative strategies in teaching.

INTRODUCTION

Healthcare careers are complex, and it can be demanding to prepare individuals to be successful in these occupations. Educators in academia and professional development arenas related to health care are challenged with having to deliver complex curricula and concepts in understandable terms [1]. Many of these educators come from a clinical background. Traditionally, many institutions take experts in practice and experience and recruit them to be teachers in academic or professional development areas. These types of professionals may not have prior training on educational theory, practice in being educators, or knowledge of the resources available to enhance their skills. Teachers with degrees or training as educators may be less familiar with new technologies or innovative methods they could be using to augment their instruction and engage learners. With the increased use of technology and informatics in every area of health care, as well as the technology-savvy generation entering secondary education and clinical practice, the demands for incorporation of these tools into teaching are increasing.

The success of students in academic programs to prepare for careers and licensure in health care is contingent on comprehension of very complex material. Healthcare professionals seeking professional development encounter compression of equally or more complex material that can have a direct impact on their ability to provide safe and evidence-based care to their patients. With medical treatments, technology, and healthcare delivery changing at a nearly constant pace, many educators find it difficult to relay the most up-to-date information. Educators are also challenged with parsing the content into understandable parts for students to be able to successfully comprehend and apply to their clinical practice. At the heart of it all is the need to prepare healthcare providers with the critical thinking and clinical reasoning skills necessary to ensure they are safe, competent practitioners post-graduation. Using technology and innovative teaching strategies can help to overcome these challenges. There have been many recommendations for the implementation of technology, innovation, and new instructional methods to address these needs by increasing active learning by participants. When learners are learning actively instead of passively, they are able to better develop critical thinking skills and apply knowledge in more efficient ways to professional practice [2]. The American Psychological Association's Medical Student Education Task Force on Informatics and Technology recommends programs should increase their use of technology for learning skills and generally decrease the knowledge-based content of curricula [3]. There has been a shift in instructional strategies to include more self-directed learning, technology, problem-based learning, and accelerated learning courses to support this recommendation [4].

This course is designed to help educators understand some of the most popular technologies and innovative teaching strategies in healthcare education today. Basic implementation techniques to make healthcare education more actively engaging, innovative, and comprehensible are also outlined. The use of technology and innovation to support learning is widely accepted as being needed in healthcare education, although the methods for implementation and the extent to which they are incorporated vary greatly [5]. Learning, designing, and implementing innovative instructional methods can be time consuming and resource intensive for educators in any area of medical technology. Some of the most effective and popular strategies will be discussed in this course. By focusing on the overall methods and educational theory, educators will be able to find application globally to a variety of material, courses, and/or audiences.

POPULAR TECHNOLOGY IN EDUCATION

Young learners are growing up in a technology-driven environment. They are accustomed to accessing technology in their daily life for personal and professional use. Since 2000, there has also been a significant increase in technology use in kindergarten through 12th grade educational environments [6]. Learning with computer-based technology has been emerging and evolving over the past three decades, and the variety of tools and resources available for educators is daunting and ever growing [7]. For example, enrollment in online undergraduate programs increased 32.3% between 2012 and 2019, compared to a 6.8% decrease in overall undergraduate enrollment in that same time period [8]. However, producing an effective learning environment with technology is a challenge for educators [9]. This section will cover some of the tools available, their uses, and examples of how they can be used in nursing education.

E-LEARNING

A clear, all-inclusive definition of e-learning has yet to be established, though research and international collaboration has focused on creating one [10]. Generally, e-learning refers to the use of computers and electronic media and resources in education. It is broadly inclusive of all forms of educational technology, including the Internet, web-based instructional modules, distance education, and reusable learning objects. Distance e-learning is used to describe the integration of available technologic methods for distance education. These methods continue to evolve based on the currently available web resources, information, and communication technologies. The growth and promotion of distance and e-learning education has been attributed to the need to reduce costs, introduce learners to information and communication technologies, and meet the increased demand for this type of learning from consumers [11]. Some also refer to any learning that uses a computer as the main delivery device of education as computer-based learning [12].

Implementing e-learning technology can help meet the needs of learners and create a dynamic and engaging learning environment. The benefit of e-learning is that it is often essentially "on demand" for users, being available anytime, anywhere, and to anyone, especially if the lessons are asynchronous (i.e., can be used without an instructor or immediate communication with others) [13]. One instructor can manage or reach more learners with this type of delivery than traditional classroom instruction, and the resources can often be used repeatedly, making it a cost-effective delivery option [12]. With the rapid growth of this mode of learning, there are a number of premade e-learning tools available for free or purchased use. Using premade materials, educators can supplement pre-existing courses with e-learning tools. The question then becomes how to choose the material appropriately and when to use it in lessons.

The e-learning environment is more solitary, and there are challenges to consider when choosing this route for instruction. For example, motivation and achievement of learning may be difficult to maintain because there is no instructor regulation or group collaboration [13]. Also, creation of e-learning resources can be cost, labor, and resource intensive; benefit versus cost should be considered. Potential costs may be direct (e.g., software and hardware needs) or indirect (e.g., time spent by faculty and staff to create and maintain lessons) [14]. If a broad audience can use the tool, it can be used repeatedly, making the cost/benefit ratio more attractive. In addition, if the resource enhances and positively impacts learning, the costs may be warranted.

Courses may be fully e-learning based or e-learning tools may be incorporated into existing traditional courses. For example, the American Heart Association (AHA) offers the option for learners to do a portion of their courses online. The AHA's Basic Life Support for Healthcare Providers course has an online option accessible 24 hours a day, giving a flexible alternative to the traditional classroom-based training for busy healthcare professionals [15]. The learner can complete the didactic portion of the course online, and then come to a classroom for the skills demonstration and validation to receive their certification. This transitions an all-day face-to-face course to a combination of brief face-to-face instruction and e-learning, allowing the content to be mastered by the participant at his or her own pace.

WEB 2.0 TOOLS

Web 2.0 is a term used to describe a group of Internet-based tools that all share a user-focused approach and have an affinity toward user content creation, syndication, and open collaboration between users [16]. Some of the most common Web 2.0 tools include blogs, wikis, rich site summary (RSS) feeds, and social media sites such as Twitter, Instagram, and Facebook. These tools allow users to access information but also to contribute, create, and share. Instead of passively reading or receiving information, learners can collaborate and learn with and from each other, making learning engaging for participants [17]. The use of these tools offers a chance for educators to allow participants to seek out information and learn from each other, helping to construct and grow their knowledge base in an active learning fashion.

The benefit of using Web 2.0 tools is that it changes the passive participation of e-learning into an interactive experience [21]. Learners and instructors can collaborate without the limitations of the immediate classroom and group. These tools can also be used for learners to connect with others, depending on how the educator builds the activity. Often, learners are already using Internet applications in their daily lives for personal use, which can eliminate the need for instruction on how to operate or access these resources. Web 2.0 tools allow instructors to evaluate and assess learning and material comprehension and allow learners to report back or discuss course material and individual progress.

However, inter-peer collaboration can be a challenge with these tools. Educators should be sure to monitor posts and discussions to clarify misinformation, moderate conversation as needed, and remind learners that they are present and available by posting feedback on a regular basis [22]. If the tools are new to the learner, he or she may require instruction on how to use them appropriately, and if learners are accustomed to using the tools in daily life, they may need guidelines or standards of participation to guide their use for the purpose of scholarship [23].

The effects of Web 2.0 tools for learning generally seem to be positive, although the available research and quantitative data are weak [24]. Implementation of these tools should be carefully designed with attention to the specific purpose for their use [25]. If not well planned, incorporation can become a barrier for users and teachers to moderate and participate. Educators should become familiar with Web 2.0 tools and understand their functionality, consider limiting the number of new tools used in one course, and be mindful not to overwhelm participants with having to learn and use too many tools at once [17]. Consider ways to use Web 2.0 to modify or replace existing assignments or material learners have found difficult or tedious in traditional methods.

Because there are many Web 2.0 tools, they can be integrated in many ways. For instance, Flickr—a photo-sharing application that lets users upload photos and share comments or stories—could be used as a forum for discussion or an educator may send learners on a virtual scavenger hunt. For instance, learners may be instructed to find and post a photo example of a pressure ulcer with a caption describing treatment options or medical chart documentation.

A wiki is a web application that allows various users to contribute, edit, or remove material in collaboration with others. This type of application could be used for learners at various locations to participate in a case study. The educator could post the link to the wiki with the case study and moderate to make sure participants are on task. Additional case information or questions may be added to evolve the case.

When real cases are involved, it is important to keep confidentiality and the rules of the Health Insurance Portability and Accountability Act (HIPAA) in mind. Even if a patient's name and specific identifying information are excluded, the details provided could increase the risk to violating confidentiality. This risk is further increased with the advent of data mining software, which can analyze and search e-mails for certain content or key words. Therefore, steps should be taken to alter the details in such a way that the patient is not recognizable.

SIMULATION

Simulation has become increasingly popular in medical and nursing schools and education programs across the country [26]. A 2016 study indicated that, among nursing programs across the United States, 91% were using simulation in their curriculum [27]. This approach is more interactive than traditional lecture methods and allows for immersive learning [28]. The National Council of State Boards of Nursing (NCSBN) defines simulation as "activities that mimic the reality of a clinical environment and are designed to demonstrate procedures, decision making, and critical thinking through techniques such as role playing and use of devices such as interactive videos or mannequins" [29]. Simulation in healthcare education is often associated with mannequin-based simulation or human patient simulation, with the use of mannequins to replicate real patient cases. The ability of the simulator to realistically replicate real patients depends on their fidelity. High-fidelity simulators are more capable of replicating patients than lower-fidelity simulators. A 2014 NCSBN study showed that replacing up to 50% of clinical hours with simulation in prelicensure nursing education achieved comparable student outcomes (e.g., clinical competency, pass rates) to traditional clinical experiences in nursing education (i.e., simulation used in less than 10% of clinical hours) [20].

Using simulation in healthcare education has a variety of applications, including teaching new skills, testing and validating competency, improving team dynamics, and testing of protocol or procedures. It is a valuable tool because it offers a unique, controlled, learner-focused environment that can mimic real-life situations and experiences without risking patient harm [30]. These devices can provide realistic situations and opportunities for hands-on experience of procedures and the practice of professional skills [12]. As such, simulation-based learning can build confidence and improve clinical judgment [31]. Students in the simulation setting are also permitted to practice in their full scope of practice, performing skills they are not permitted to do in their student functions in traditional clinical settings. Creating realistic, student-driven simulation cases can increase critical-thinking skills and promote knowledge retention when correlated with previously learned content [26]. Cases may be adapted to challenge learners and expose them to diverse clinical situations.

Simulation is a teaching method as well as a technology [30]. It is an evolving best practice in healthcare education, with recommendations and new technology constantly emerging for implementation. A challenge with this is mastering the teaching strategies associated with the facilitation and debriefing of simulation lessons while also learning the technology and operation of the equipment. The high costs associated with starting simulation programs and procuring equipment can be a challenge to programs and educators wishing to gain access to this modality [12].

With the growing popularity and implementation of simulation in healthcare education, resources are increasing. There are a number of prewritten simulation scenarios available from reputable resources such as the National League for Nursing, the AHA, and the American Academy of Pediatrics. Some textbook publishers are also creating companion simulation scenarios. Most often, these are available only for purchase, but some networking groups also share cases. All cases not written by the educator should be reviewed closely for adherence to current best practices, pertinence of learning objectives, and content validity.

The decision to implement simulation should be based on program objectives and support of learning goals and outcomes. Educators may use course evaluations when assessing the need for simulation in educational courses or identify areas of the curriculum that are weak or that learners are having difficulty comprehending and choose simulation activities to supplement instruction.

One example of simulation integration is the use of cardiac arrest scenarios in hospital units to practice interdisciplinary code responses. Cases may be basic life support for non-intensive care or cardiac units for staff to practice recognizing the patient is in cardiac arrest, initiating a code team response, and correctly performing cardiopulmonary resuscitation. Alternatively, in undergraduate nursing programs, the faculty could review the standardized test scores, course evaluations, and learner feedback to identify trouble content areas. For instance, they may find that the learners repeatedly have trouble with oxygenation concepts and oxygen delivery systems. This could then be worked into a simulation session with patient cases around chronic obstructive pulmonary disease, asthma, or pulmonary embolism.

AUDIENCE RESPONSE SYSTEMS

Audience response systems (ARS) are a technology that promotes interactive learning by allowing participants to anonymously answer questions in response to a live presentation. This allows the presenter to instantly gather and collect learner feedback to live questions via the remote devices and display a graph of the collected data in real time [32]. Students tend to have a strong desire for interaction and engagement in their learning process, and ARS can allow an educator to make traditional presentations more interactive and increase learner engagement [33].

ARS systems can be purchased as bundles or as mobile applications. If a mobile application is used, the instructor is usually required to log on to a hosting website and learners must download the application to their mobile devices.

The anonymous factor of ARS use allows learners to feel free to respond honestly to the best of their ability without fear of being embarrassed by a wrong answer [34]. Most commonly, educators pose multiple-choice questions, which learners answer using the remote device. The educator can then see the number of responses collected and close the ability to answer when all learners have responded. The information is then analyzed and reported to the educator and/or presented to the group.

These systems work well with large groups in lecture courses or conference format because multiple devices can be used simultaneously, allowing every learner the option of interacting with the material and presenter. As financial support for healthcare education in all areas seems to be decreasing, educators may see larger class sizes, which can make it more difficult for educators to actively engage participants in the learning process. This may be one solution to such a problem [35].

If students perceive the use of ARS to be useful, they are more likely to use them effectively [35]. Educators may help increase positive perception by explaining how to use the devices and why they will be used at the beginning of the educational session.

There are a variety of ways to implement ARS into courses. The most common is the question-immediate answer format. ARS may also be used to facilitate discussion. In this instance, the educator divides the class into small groups, poses a question, and asks the group to select an answer after a brief discussion. These questions may be more challenging or complex (e.g., based on a case study). Well-constructed questions that target critical thinking and specific learning objectives stimulate active learning when using ARS, so educators should build them into courses wisely [36].

ARS may also be used to conduct surveys, assessments, and course evaluations. Questions may be entered into the ARS system, and participants may complete the survey while they are still present and captive in a course. The graphic output of the results may be made available only to the educator after completion. This can be valuable tool to collect information in real time and electronically.

INNOVATIVE TEACHING STRATEGIES

Innovation is simply defined as anything that is new or different from established methods [12]. Regulating bodies in higher education and healthcare agencies recognize the need to integrate technology into the curriculum and have called for innovative teaching strategies as well [30]. Changes in today's learners in conjunction with the difficult and vast material taught in healthcare education require the increased effectiveness of educators [1]. Lecture and discussion are cost-effective means of delivering education and can be useful, but intermittent breaks in content for instructional activities or other types of content presentation can increase retention and comprehension [37]. The overall purpose of innovative strategies is to make learning more memorable and applicable to practice by enhancing knowledge acquisition [12]. There are a variety of innovative strategies educators may use, including problem-based learning, blended learning, gamification, storytelling/journaling, and social network-based learning.

PROBLEM-BASED LEARNING

Problem-based learning is a student-centered instructional approach whereby students are exposed to real-life problems or situations as opposed to subject-related courses. Students are then asked to generate learning issues related to what they need to know to solve or understand the problem. They seek out this information either independently or as a group and then reconvene to use their findings to solve the original problem through application [38]. It is a guided learning activity based in inquiry and built upon the foundation of cooperative learning [39]. The major goal of using this approach is to foster critical thinking that relates to professional practice situations. Other goals include helping students to develop flexible knowledge that can apply to various situations, fostering effective problem-solving skills, and increasing intrinsic motivation [40].

Problem-based learning has been used extensively in medical programs [38]. Yet, there is little available high-quality evidence supporting the promotion of critical-thinking outcomes related to this approach [41]. Still, there is an increased demand to prepare problem-solving professionals to be able to work in modern complex healthcare environments, and this educational approach seems to address this need [42]. It can be a challenge to implement problem-based learning in large classes or conferences due to the complexity of managing constructive learning in larger groups; additional faculty may be needed to help facilitate. With this approach to teaching, faculty adopt more of a facilitator role than that of a traditional educator or lecturer role, which some educators are not comfortable with [38].

There are issues to consider when implementing a problem-based approach. Orientation is very important, as many students are not familiar with this type of learning experience [43]. In addition, resources available for learners should be assessed. Learners require sufficient educator and resource support in order to successfully address and devise solutions for the problems. The scenarios should be carefully created by the educator from real-life situations, published cases, or educator experience [43].

BLENDED LEARNING

Professionals and learners in the healthcare industry require specific clinical and technical skills to practice [44]. Blended learning combines traditional face-to-face instructional methods with online or e-learning techniques with the goals of supporting and enhancing student, educator, and resource interactions and making learning meaningful [45]. Many universities and colleges have turned to blended learning as a means to meet the needs of learners and their current or potential employers [46]. With this approach, educators post course lectures, resources, lecture slides, or other materials in online formats for participants to access as required or needed. It allows the learner more flexibility in using content, as participation in a traditional class setting is not necessary to receive class materials. This appeals to the principles of adult learning, giving learners more flexibility in their educational process [47].

It is important to ensure that blended learning is focused on course objectives and goals, not the technology itself [44]. Lessons should be geared toward the goal of achieving optimal learning by combining instructional modalities [48]. Choosing the appropriate technology or content is challenging, and combining them in a way that does not overwhelm learners or distract from course material is a difficult balance.

A blended format can be as simple as posting videos or other course resources online that learners are to access and use outside of traditional class time. Or, it can be more innovative or complicated. For instance, educators may use the flipped classroom model, whereby all instruction is presented outside of class in the form of videos, readings, and other formats. Then, class time is used for application of the pre-class work. For instance, a blended course on pharmacology might require learners to review the pharmacokinetics, uses, side effects, and patient teaching related to beta blockers outside of class. Then, class time would be spent on various cardiac patient case studies.

GAMIFICATION

Gamification refers to the application of a wide variety of activities typically found in games into educational sessions. This can include anything from board and card games or quiz competitions to online virtual or digital games. Simulation and simulation games may also be used. Educational gamification is most often governed by a set of rules and is completion based, with elimination criteria removing players from the game until there is a winner [49].

Healthcare education benefits from tools that foster systems thinking and facilitate complex learning [50]. More complex forms of gaming, such as digital role-playing or simulation-based games, can provide immediate or just-in-time feedback, helping participants realize consequences of their actions in a safe learning environment [39; 50]. Educational games can address all levels of learning, including reinforcing content, helping participants with application of content, and employing analysis and decision-making skills [49].

Creating complex games for use in the classroom can be time consuming. If digital or simulation games are being created, the cost may also be high. Resources for creation of classroom learning games are available from textbook publishers and/or outsourced agencies. Some tools are free source, meaning educators can access, modify, and use them for no fee. When implementing games, educators should remember that poor planning, lack of attention, and lack of follow-up will result in failure. Also consider that "losing" a game may have a negative effect on learners' self-esteem [49]. Game development should be closely tied to curriculum content and appropriate for the audience and environment. The game should have a designated objective for its use.

STORYTELLING OR JOURNALING

Adult learners have a past and bring life experiences to the classroom with them; these histories can promote or inhibit learning [51]. Telling stories is part of human nature, a way of passing information through generations, helping members of society connect with one another, and archiving history [52]. In essence, it is one of the oldest methods of teaching. For these reasons, some individuals are more attuned to this type of learning; others may shy away from it [53].

Journaling is simply the process of writing down one's personal thoughts, feelings, beliefs, and/or values related to an experience or situation. It can be used as a tool for healthcare providers to reflect on and review how personal experiences and beliefs influence their professional practice [12]. Storytelling can be used as a way to relate taught material to professional situations and practices, particularly for learners with limited exposure to clinical practice. Educators may also use storytelling to illustrate how course content relates to various clinical situations, thereby enhancing understanding.

Every learner's past, positive and negative, is carried into the learning process, and linking lessons to a person's life experiences accesses the affective domain and can assist in making cognitive learning more memorable [51]. This connection is more likely if course materials are related to positive personal stories. If material is tied to stories that are painful or emotionally charged for participants, then the educator should consider this and help put the material and story into a frame that promotes learning and understanding. For instance, sharing a story of how a family member died due to a medical error is sad and can be upsetting. Sharing how the death could have been prevented through different medical decisions can give the story purpose by helping participants think critically about the story as a case in which alternatives could mean a positive outcome.

There are various ways storytelling can be implemented by teachers. Even case studies can be story based if the educator uses clinical stories to guide learners through reflective exercises in order to build critical-thinking and decision-making skills [12]. Educators may also instruct learners to tell a story to a peer or write a story that relates to the material presented. There is a growing amount of literature that indicates that while learners can learn from their own experiences in experiential learning, they can also learn from their peers' experiences [54].

Learners may also journal about clinical experiences to explore their personal knowledge, feelings, and ideas related to a clinical situation.

SOCIAL NETWORKING SITES

As noted, social networking sites are online applications that allow users to share, interact, and collaborate. The adoption of social networking in education has changed the way learning and teaching take place [55]. These sites are very often used for personal reasons among friends and acquaintances, but they are also popular in education, as they provide an opportunity for learners to interact in a familiar online environment while connecting with learners in other geographic or learning environments. The evolution of the Internet as a large-scale information resource has created these opportunities for collaboration regardless of spacial or temporal limitations [55].

Social networking can be a means to create virtual communities that do not limit participation to those who are able to attend a class. The increasing application of social networking sites as online communities of practice in education is not exclusive to personal, social, and cultural identities and relationships [56]. Most social network memberships are free, making these sites useful resources for any course in which participants have Internet access. Another benefit to social networking is that some learners are more comfortable expressing their opinions and questions in a virtual environment as opposed to in the traditional classroom. These sites can serve as a way for learners and educators to share resources and information with one another while also learning through active participation and contribution [12].

Challenges implementing social networking methods are often related to professional boundaries. As noted, most learners are accustomed to social networking sites, but guidelines for professional learning participation should be provided if they are to be used as instructional mediums. The guidelines should include communication expectations and standards and how to represent oneself professionally online. Professional agencies, such as the American Nurses Association, remind healthcare professionals that their participation in social networking and online self-portrayal are reflective of the overall profession [12; 18].

Privacy can also be a concern. If the learner or educator uses a personal account for participation in professional development or education, their personal content (e.g., follows or friends, pictures, previous postings and comments) may be available for students and other class participants to view [18]. It is wise to investigate privacy settings and the various options to limit the sharing of personal content when incorporating this method. As noted, information or photos acquired through the professional-patient relationship should not be shared online [18].

Social networking sites can move beyond communities of practice and information sharing. They can be used as way to reflect on topics, debrief events or difficult situations, and work through complex problems by promoting group thinking and collaboration. These applications can also bring students together for emotional and professional support. For instance, first-year nursing students at various colleges could be invited to the same social networking sites to discuss and share opinions or questions uniquely related to their common situation. Remember, any information published on social media should reflect professional standards and best practices, be well vetted for accuracy, and be closely monitored for abusive or misinformative comments or content. The desired outcomes as well as the consequences of a social media post should be considered before publishing [19].

IMPLEMENTATION CONSIDERATIONS

There are many challenges in healthcare education. Both in higher education and professional development, the material being taught is often deep and complex. In many cases, curricula may rapidly change in response to advances in medicine, technology, and the industry itself. In addition, learner demographics have evolved, with more technology-savvy individuals entering the professions and more older individuals entering healthcare careers later in life. Younger generations tend to have shorter attention spans and require more immediate feedback in education. Teaching approaches can be enhanced to meet these challenges and address specific generational learning styles [1].

The use of innovation and technology can range from simple to complex depending on the needs of the class and the comfort of the educator [57]. When choosing strategies or tools, consider what will enhance the impact of the lessons and your level of comfort as the main user. Technology can distract from learning if participants are confused by its role and purpose. Educators will be less likely to help guide learners if they are not comfortable with the methods or resources.

When using technology, it is wise not to assume that participants are proficient with the selected applications. Many use technology in some way in daily life, but this is not always the case [58]. Although learners may be accustomed to using these devices or applications casually, time should be taken to set rules, give directions, and explain the purpose of their use in formal education. This will reduce the amount of time spent explaining and answering questions during a course.

With modern technology and creative or innovative thinking, an educator can access numerous resources and applications. The Internet and telecommunication advances have multiplied the number of potential sources of information exponentially, essentially eliminating geographical barriers [57]. Consider expanding a lesson beyond its application in the immediate classroom or hospital to include the entire state, country, or even world. Technology may also serve as a means to obtain information or to connect and network with leaders or experts. Using social media sites to connect learners to each other or to share ideas and concerns can be invaluable.

When trying new instructional methods or technology, remember to be flexible. It would be fantastic if new approaches always worked and were well received. In reality, innovation is a calculated risk. Educators can prepare by practicing the new techniques and becoming familiar with using and troubleshooting technology to minimize anxiety and stress. It is also important to build and communicate clear objectives, directions, and expectations to learners to help them commit to the new learning methods [57]. Be ready to adjust for unforeseen complications and have a backup plan if needed. Deliberate on the amount of time available to revise or create the class or course. Plan a timeline accordingly, and allow extra time to trial and address any complications or problems for the new strategies or technology that are going to be used. Projects that are successful have an adequate timeline [59].

Course assessments should include an opportunity for participants to provide feedback on the innovative strategies or technology, which can then be used to revise and adjust courses. Consider if strengths can be enhanced or shared with other educators to improve courses further. Identify weaknesses that can be addressed with revisions or by adjusting the instructional method or technology used to improve learning outcomes. It is important to embed assessment in courses and to revise periodically and as needed to keep as current as possible with the changes and needs in health care.

The educator is the single most critical factor in determining the success of any strategy incorporated in a course, so educators should strive to become proficient in their use [9]. Being overly anxious or uncomfortable with technology or innovation will distract from the learning process and the purpose of their intended implementation.

CHOOSING A STRATEGY OR TECHNOLOGY

When creating or revising a course, it can be difficult to determine where to start, and deciding which new strategies or technology to incorporate can be complex [60]. Learners and instructors have seen trends come and go in technology and innovation use in education [9]. Making strategic decisions regarding the incorporation of innovative techniques requires educators to take on the role of designer and analyzer, which they may or may not be familiar and comfortable with. However, this is necessary in order to create a balanced course delivery. Finding this balance is important to ensuring an efficient mix of conveying class material and providing a means for students to connect with it [61].

Determining Needs and Objectives

The first step in the selection process is considering the specific content of the learning activity and the learning needs of the participants [57]. How do these two items relate and/or support each other? If the current content is not clearly defined, an innovative strategy or technology can be used to help clarify and/or to make information more accessible or applicable to learners. Take time to define the audience, environment, and motivating factors that will engage learners so they are addressed by the choice in innovative strategy or technology [14].

Learning styles are generally classified as visual, auditory, verbal, and kinesthetic (or a combination of these styles). Visual learners benefit from seeing what they are learning and prefer courses rich in visual aids. Auditory learners focus more on what they hear rather than what they see; they are the class participants who do not care where they sit as long as they can hear what is happening. Verbal learners respond best to repeating lessons in their own words, in speech or writing. Kinesthetic learners are also referred to as tactile learners and prefer to have direct, hands-on experience [12]. As noted, technology and innovative strategies can be very helpful in appealing to a variety of learning styles (often simultaneously), which will help with the effective transfer of knowledge from educator to students.

A review of past course performance and/or evaluations will provide insight into what has worked or not worked in the past. Look for trends in evaluations that point to content or concepts learners are having difficulty comprehending, processing, or applying to practice. A literature review may uncover options and suggestions to address these gaps [57].

When setting measurable learning objectives, truly investigate what learners need to accomplish and how competence can be measured. Specifically, evaluate the appropriateness of the objectives in relation to the domain of learning. For example, an objective of the psychomotor domain will require demonstration of a skill [12]. Innovation or technology should be selected that will support the learning objectives and allow learners to demonstrate successful completion. The personal preferences of the educator should not guide these decisions. Instead, priority should be given to the approach that best supports the learning objectives and outcomes [12].

The number and various types of innovative strategies and technologies in a single course should be limited. Too many could strain or fatigue participants [1]. By tying the choice of strategy to learning objectives and audience needs, this can be avoided. Always remember the purpose of incorporating innovative strategies is to augment learning, not distract from it [1].

Considering Resources

After identifying the best technique(s) to implement, consideration should be given to available resources. Are there additional costs associated with the new technique (e.g., buying new software or hardware)? Remember to consider other costs, such as the time and/or salary of technical support or the educator for managing equipment [12]. Make sure it is feasible to obtain the needed resources within the defined budget.

Plan ahead and consider if the support of other professionals (e.g., the curriculum committee) is needed. Do you need to obtain approval for a course change prior to implementation? Will additional faculty members or technical support specialists be needed for mentoring or implementation support [57]? Consider collaboration with other professionals who may be interested in helping or learning as well. It can also be wise to reach out to professional colleagues or fellow members of professional organizations to partner with individuals who have successfully implemented the same or similar strategies [12]. This will allow one to learn things that worked well, factors that were adjusted or changed, and necessary resources.

Incorporating Into Content

With new strategies or technology comes the need for adaptation and evolution. Part of creating an innovative learning experience is identifying keys to successful completion. Do learners need written directions or an orientation to the new technology? Helping learners prepare for success ensures that incorporation of the strategies into the course will be smooth. Taking time to explain why specific methods were chosen can help the learner to understand the expectations for their use, further facilitating learner buy-in to the change in educational modality.

Selected educational strategies should accomplish their purpose for incorporation effectively and efficiently [1]. To ensure this occurs, the final phase of incorporation should be evaluation. Educators should take time to reflect on their personal experiences in order to identify potential areas for adjustment to make the next course or activity more successful. Learner feedback should also be gathered to determine if the strategy enhanced learning, facilitated engagement with the material, or resulted in improvements in application of the information. Learners may also be asked to share their experiences and provide suggestions for improvements. In addition, quantitative course data may be helpful. For example, exam questions related to course content presented using innovative strategies may be assessed to determine if knowledge was retained and appropriately applied.

RESOURCES FOR EDUCATORS

For educators, a lack of resources can be a significant barrier in the adoption of new technologies or instructional practices, limiting the potential for a positive impact on learning [62]. With modern advances and access to new technology increasing for educators and learners alike, alternative ways to deliver instruction are now available [63]. To be successful, having access to resources is a must. Professional development centers can be a great foundation for support on educator issues, research, and teaching [64].

EDUCATOR SUPPORT

Although it is possible to incorporate innovative design and implementation strategies without assistance, finding support services to aid in the process increases the chances of success. There are a variety of ways an educator can find sources of support related to their personal projects or interest, including professional development courses, technology training classes, mentoring relationships, support or interest groups, and professional learning communities.

Professional Development

Conferences and shorter workshops for professional development on technology and innovation in health care are becoming increasingly popular. These types of events can be found via the Internet or professional organizations. Libraries in health systems and higher education institutions may also be a good source of information. The initial course development process should include taking time to identify the personal need for development. For instance, does the instructor need education on the operation of a specific technology? This can also help in the selection process. For operational instructional needs, the vendor or manufacturer of the equipment or technology may also offer applicable workshops or classes.

Mentoring

Mentoring can be a prized resource when trying to advance any skill set, including instructional methods as an educator. Workshops and classes can be helpful but may not offer the full support necessary, especially if time will pass before the information is put into use. A mentor can be a vital resource and can help address concerns and questions or help find solutions to challenges [65]. Competence seems to be best achieved with sustainable and accessible professional development and support for educators [62].

Technology can also be a means to obtain mentoring and to connect with experts in remote locations [66]. Programs such as FaceTime, Skype, or webconferencing software allow mentor-mentee meetings and discussions to be held remotely without limitations of geography.

Professional Learning Communities

A professional learning community provides an extended opportunity to foster collaborative learning among colleagues within a particular work environment or field [67]. Also referred to as communities of practice, these groups are self-motivating and supportive peers changing and growing their practice [68]. The groups improve knowledge and skills together around a common mission or objective, as defined by the group. Professional learning communities support inquiry and ideally learn from the successes and failures of all members of the group. Though these communities are used in higher education more than other areas of healthcare education, they can be created among any group of professionals with a similar interest who would benefit from learning from and with others.

RESOURCES FOR TECHNOLOGY

All educators will need help at some point, but they may not have the time, experience, or connections to access the support they need to be successful [64]. Gaining access to materials or people that could be helpful can be a challenge. If available, technical support staff can provide assistance with troubleshooting and questions. However, many educators do not belong to institutions with dedicated information technology staff or access to such staff may be limited. Alternative resources may include the startup guides, troubleshooting guides, and frequently asked questions related to usage of specific technology.

Manufacturers or vendors may also have instant messaging services to contact remotely located support professionals. Discussion boards and chat rooms from professional organizations and networking sites can also provide knowledge and insight.

Attention should be paid to the impact of incorporating technology into teaching practices and workload, including the educator's time and learning curve [60]. If the estimates of time are high and/or significant, then it would be wise to consider speaking to a supervisor about accessing additional support to expand teaching practices.

RESOURCES FOR INNOVATIVE TEACHING STRATEGIES

Innovative teaching methods challenge long-held assumptions and standards regarding clinical-based education in nursing and other health sciences [69]. While the use of technology is growing in acceptance and popularity, educators implementing innovative teaching strategies may have more challenges to address. The natural instinct for curiosity and drive to learn seems to be dissipating, especially for students in higher education [61]. Today's learners prefer class information to be given passively through notes and lectures. New strategies require a substantial shift in students' roles and responsibilities [70]. This can translate to negative acceptance or pushback when educators try to employ engaging, innovative, active, and/or new teaching methods. Support for these approaches may be found in empirical research, other faculty members who have or are implementing such strategies, and supervisors (if learner complaints are made). Explaining why certain methods are used and the expectations for learners can improve participation and commitment. When an educator uses a teaching method that may make learners uncomfortable or anxious, time should be taken to explain why [71].

Professional organizations and learning groups, as previously mentioned, can also be a source of support. These organizations often connect educators to share materials, techniques, and advice on handling challenges and dealing with uncooperative learners or administration. There are a number of professional organizations related to healthcare education, nursing, honor societies, and professional development, and they may be accessed through peers, the library, Internet searches, or professional social networking sites such as LinkedIn.

CONCLUSION

Nursing and healthcare education has been evolving from an apprenticeship model to newer models of education that include technology and innovation to support the acquisition of knowledge to new professionals [7]. There is a growing body of resources educators can tap into to make their instructional practices more active, engaging, and dynamic for participants. As in daily life, technology is becoming an integral part of the teaching and learning process [72]. Because the healthcare environment is rapidly changing, education has responded in kind. This course has covered some effective innovative teaching methods, including e-learning, web 2.0 tools, simulation, social networking sites, ARS, problem-based learning, blended learning, gaming, and storytelling or journaling. It remains to be seen what new pieces of equipment, software, or teaching methods will emerge in the future. Educators should connect with user and professional groups, literature, and research to seek out new and emerging technologies and practices.

Even more important is the process of choosing and implementing innovative teaching strategies. The approach may evolve or change completely, but the theory and method behind choosing and implementing will not. Remember to investigate current practices and make choices based on the impact and effect on learning outcomes and objectives, consider resources and costs, and look for avenues of support for execution. Following these guidelines will help ensure that time and assets are invested wisely. Strive to utilize options that will facilitate application of the material to professional practice.

Educators of current and future healthcare practitioners are challenged with preparing professionals who function and excel in a fast-paced and rapidly changing environment. By bringing elements of collaboration, technology, critical thinking, and clinical judgment into instructional techniques, workers are better prepared to be safe and competent. Incorporating technology and innovative teaching strategies supports these learning goals by allowing participants to use the tools and technology common in today's healthcare system.

Implicit Bias in Health Care

The role of implicit biases on healthcare outcomes has become a concern, as there is some evidence that implicit biases contribute to health disparities, professionals' attitudes toward and interactions with patients, quality of care, diagnoses, and treatment decisions. This may produce differences in help-seeking, diagnoses, and ultimately treatments and interventions. Implicit biases may also unwittingly produce professional behaviors, attitudes, and interactions that reduce patients' trust and comfort with their provider, leading to earlier termination of visits and/or reduced adherence and follow-up. Disadvantaged groups are marginalized in the healthcare system and vulnerable on multiple levels; health professionals' implicit biases can further exacerbate these existing disadvantages.

Interventions or strategies designed to reduce implicit bias may be categorized as change-based or control-based. Change-based interventions focus on reducing or changing cognitive associations underlying implicit biases. These interventions might include challenging stereotypes. Conversely, control-based interventions involve reducing the effects of the implicit bias on the individual's behaviors. These strategies include increasing awareness of biased thoughts and responses. The two types of interventions are not mutually exclusive and may be used synergistically.

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