

# **Beyond the Lecture: Interactive Strategies in the Health Profession Education Curriculum**

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## **ABSTRACT**

*Health care is constantly evolving. Health care professionals and the educators responsible for training those professionals need efficient ways to a) assure new information is getting across to the students and/or professionals, b) relay all new and previous information in a timely manner, and c) correctly utilize the information gathered and observed and apply it to the needs of the patients. Lecture is the original teaching method, but does not cover the dynamic world of health care. Simulations with actors and high-fidelity mannequins are two methods of relaying vital information. Research is limited on these forms of education, but the results are thus far promising.*

## **Introduction**

According to the U.S. Bureau of Labor Statistics (2010), of the top 20 occupations with the fastest growth, half are in healthcare. The rapid growth in healthcare is due in part by the aging population and the overall longer life expectancies. As this rapid increase in the demand for healthcare services occurs, the baby-boomers who receive credit for the increased demand will retire, including those currently working in healthcare, increasing the demands on the remaining healthcare workers. Technological advances increase the longevity of patients, but also the medical complexity associated with this longevity. Not only do health care professionals need to identify and manage the long term care or highly acute care of the patient, but an assessment and management of the life-saving technology the patients are utilizing and the navigation of the information management systems must also occur simultaneously (Institute of Medicine IOM, 2010).

The time restraints educational programs have placed on them by credit hours severely limits the width and/or depth of graduates' competency when the new complexities are taken into account. Some fields already require additional classroom time. Specialties such as neonatal and pediatrics, for instance, require extra time to complete training due to the lack of time spent while in school on these populations. This does not take into account the advanced complexity that technology also added. The extra training delays the time from graduation until students become fully functioning staff members in these areas. For a respiratory therapist, the length of orientation to the neonatal/pediatric setting varies from 4 weeks to 6 months depending on the definition of orientation and the amount of previous experience (Walsh, Gentile, & Grenier, 2011, p. 1127). For a medical doctor, three additional years of training is required to be able to sit for the pediatric board exams.

With all of the schooling and training, making the most of the time allotted can help minimize the delay between graduation and fully functioning health care professional. A literature review was performed to answer the question: what teaching methods are effective for maximizing learning opportunities for the ever-evolving field of healthcare?

## **Purpose of Article**

The purpose of this article is to review the literature available regarding interactive strategies in the health profession education curriculum as an attempt to quicken the pace from new graduate to responsible and responsive healthcare professional.

## **Background**

Lectures are useful for presenting up-to-date information that may not yet be in textbooks (McKeachie & Svinicki, 2006). The time between the research publication of information and the textbook publication can be years apart. In this age of constant research and reexamining of previously held assumptions, health care educators need to keep themselves and their students current. Lectures can provide the avenue to inform the learner of the newest information available at the time of the lecture. Summarizing information from multiple sources about a key topic is also a strength of lectures (McKeachie & Svinicki, 2006). Not only can a few items be focused on, but the sources can vary from text to journals to real-life experiences.

However, lectures are not always the most effective way to train a health care professional. There are many qualities needed for healthcare professionals to be adequately prepared for the clinical environment. In order to be a proficient healthcare professional, improvement in the “links among knowledge, practice and clinical reasoning skills” must occur (IOM, 2010, p. 9). Healthcare education needs to move toward an emphasis of “competent performance through active learning” (p. 9).

Cholowski & Chan (2004) found one of the most important factors in “high quality diagnostic reasoning” was the “role of the structuring and the accessibility of prior knowledge” and not just the knowledge itself (p 93). The information needs to be delivered in a way that students can organize and retrieve it as needed (Cholowski & Chan, 2004).

## **Research Findings**

Stegeman & Zydney (2010) performed a literature review of various studies involving multimedia instruction (MMI). They concluded MMI as beneficial as an adjunct to traditional teaching styles. The use of the interactive strategies may help maintain current graduation timeframes while allowing for the expanded information healthcare professionals are responsible for today that they were not a decade prior. The question of how to best utilize the technologies and other interactive strategies takes on many variations.

The Robert Wood Johnson Foundation (2011) discusses the need to encourage nurses, physicians and other health care professionals to improve communication and work in a team concept. Studies have found interprofessional team rounds decrease days on the ventilator as well as mortality of those in the intensive care unit (ICU). The American Association of Colleges of Nursing (2008) recently revised curriculums beyond the associate’s degree to include a section specifically for interprofessional communication and collaboration. Pharmacy and dental schools have also added this important aspect into their curriculums. The Institute of Medicine’s Forum on Nursing Education (2010) regarded interdisciplinary team skills and collaboration as

“essential for coping with the complexity of care for an older population and to ensure that patients receive continuous care across settings and providers” (p. 10). An additional member of the forum noted that the use of “simulations could be particularly valuable in conveying this type of knowledge” (p. 10).

Simulation as an intervention has many different opportunities for inclusion. Kitson-Reynolds (2009) described a method of interactive learning utilized in a midwifery school. The method was described in the literature as “interactive practice” (p. 238). The practice portion of the learning initiative involved utilizing volunteers to mimic real-life scenarios. The volunteers were experienced clinicians and pregnant women. The volunteers acted as clinicians and pregnant women, respectively. The roles they took on were semi-scripted. The midwifery students entered into the examinations as they would in a real situation. The volunteer actors responded to the students as naturally as possible.

The sessions were videotaped to allow students to review how others perceive them. The students viewing the videotape often were “able to identify areas where improvement was required as well as the positive aspects of their actions” (Kitson-Reynolds, 2009, p. 241). The goal for the interactions varied depending on the year of the student involved. First year students focused on improving communication and professionalism. Third year students focused on improving their decision-making. As a side note, students often reported a higher level of appreciation for the goals of the activity after graduation than immediately following the activity (Kitson-Reynolds, 2009).

Zavertnik, Huff, & Munro (2010) also utilized actors in a simulation with nursing students. The concentration on this study was communication skills with family members. Nursing students, after introducing themselves, attempted to gather information about the patient, as well as set goals and expectations with the patient’s family members. The group that had received formal training regarding communicating with family members showed statistically significant positive difference when gathering information. The other domains of goals and expectations showed no statistically significant difference.

Every professional begins as a student. People learn information and take offered chances to refine and enhance their skills. Unfortunately, practicing in health care has until recently meant learning to do a procedure on an animal or another human being. This learning on another living thing prompted the development of a human-like patient simulator.

The original patient simulator developed in the late 1960s had a heartbeat which synchronized with the pulses in the carotid and temporal arteries, a measurable blood pressure and spontaneous breathing (Good, 2003). In addition, a computer program could control movements of the eyes and mouth. Endotracheal intubation practice and evaluating responsiveness to intravenously administered anesthesia were the main uses for the simulator.

Patient simulators of today can simulate everything from the electrocardiographs viewed while practicing a pulmonary artery catheter insertion to the effects of wedge pressure measurements on the cardiopulmonary systems (Good, 2003). Medications injected into some models allow practitioners to view the effects of administering medications too quickly or the

effects of the wrong medication entirely. Simulators connected to ventilators give feedback regarding gas exchange and lung function. Nearly every aspect of humans is simulated in some form or another with the exception of skin color changes associated with hypoxia.

In the beginning, only the University of Southern California had a simulator. Today one-third of United States medical schools and hundreds of colleges, universities, and medical centers utilize human patient simulators (Good, 2001).

There are many opportunities for research in regards to the high-fidelity simulation mannequins. For instance, Kaddoura (2010) stated a lack of research on the effects of clinical simulation on the critical thinking, learning, and confidence of new graduate nurses. Kaddoura surveyed new graduate nurses who had entered the ICU setting as employees of a teaching hospital equipped with a well-developed clinical simulation center within the last year. The new graduate nurse participants reported that the simulation experience “assisted them in attaining a deeper understanding of the critical care nursing concepts” as well as helping to develop their critical thinking skills (Kaddoura, 2010, p. 513). The graduate nurses viewed the clinical simulations as valuable to their overall professional development. Fero et al. (2010) found the results of performance with high-fidelity simulation correlated to “scores on metrics of critical thinking” (p.2182). Unfortunately, they had no data on how this translates to actual patient care. More research linking simulation learning to the post-graduation professional world would be beneficial.

The Institute of Medicine recognizes the changes occurring in health care delivery. Just as the population is aging and diversifying, the “way health care is provided is also shifting; care frequently requires a team of providers working together across settings” (IOM, 2010, p. 9). Health programs are recognizing the change and looking for ways to implement teamwork in curriculums. Clinical simulation is a readily available avenue for teamwork practice.

Kaddoura (2010) stated mannequin simulations “prepare learners for safe practice through the prevention of medications errors and the development of confidence, critical thinking skills, clinical decisions-making, effective teamwork, and communication skills” (p. 514). The simulation in Kaddoura’s study showed the appropriate information was communicated with the other team members when a mannequin was utilized. Looking at a mannequin who is exhibiting some human characteristics, even if it is just looking like a person, makes the practice scenarios feel more real.

Reising, Carr, Shea, & King (2011) paired nursing students with medical students to examine interprofessional communication in the education context. The interaction was valued by both sides. The medical and nursing students both felt running through a code scenario beneficial. The communication between the groups increased the trust between the members had working outside of a true code situation. The mannequin’s responses increased the realism of the scenario.

## **Discussion: Rethinking the education of health care professionals**

Established medical schools battle tradition as they attempt to update technology and teaching methods. Schools building from the ground up have the opportunity to establish a new atmosphere of learning that takes advantage of the trials of those schools that came before them. University of Central Florida's (UCF) College of Medicine is an example of what may be a new era of medical schools.

UCF's Clinical Skills and Simulation Center is an example of dedication to technology. The university boasts "12 examinations rooms, a consultation area, monitoring and control room" in their 7,500 square foot center (UCF College of Medicine, 2011a). Medical mannequins and training simulators allow students to work on their techniques involving venipuncture, bowel sounds, and more.

Training rooms are also available for "standardized patients" (UCF College of Medicine, 2011a). These patients are actually actors who come in from the community with a background script memorized in order for the medical students to practice obtaining a medical history, conducting physical exams, counseling patients, and developing treatment plans with the patient.

UCF College of Medicine (2011b) describes its Microscopy laboratory as "the lab of the future." Instead of using only traditional slides, for instance, virtual digitized slides are used. The entire class can explore the slides in question and view the normal and abnormal slide side-by-side. Traditional slides are still part of the curriculum, and have the advantage of a team concept. A "ten-headed microscope with digital image capturing and multiple video monitors" allow the entire class to participate in discussions and discoveries.

## **Future Implications**

UCF College of Medicine actively participates in the research of medical education. The Clinical Skills and Simulation Center "provides space exclusively for research and development in virtual simulation technology" (UCF College of Medicine, 2011a). The school is determined to provide the most effective methods for student learning and constantly monitors student progress. While data is currently unpublished regarding the methods of this new school, it is being collected for examination. Faculty utilizes the data for their professional development as they analyze the value of the teaching methods chosen. UCF College of Medicine also collaborates with other academic institutions on their medical research data.

The data regarding simulations, "standardized patients" and other interactive interventions is still forthcoming. Research regarding their use and significance on student attrition, credentialing exam pass rates, and duration employed in the field are all areas of need. Schools such as the UCF College of Medicine and their academic cohorts will hopefully publish the data collected and allow other educators the opportunity to learn from their experiences.

There are some lessons that future investigators should remember when undertaking an interactive training program. Debriefing sessions held immediately after the clinical simulation was a "crucial component" of the experience allowing the new nurses to "incorporate their clinical experience into their knowledge base to bridge the theory-practice gap" (Kaddoura, 2010, p. 515). Of particular helpfulness, the nurse reported being able to view themselves on the

screen during and after the debriefing helped solidify opportunities for improvement in the future.

In addition, when setting up a system where multiple feedbacks will occur, thorough planning is vital. Devitt, Kurrek, Cohen, & Cleave-Hogg (2001) demonstrated that a concise classification system increases user reliability rating of videotaped performance of simulated learning environments. By decreasing the feelings of the judge on the choices made and scoring based purely on actions of participant, the simulation scores were consistent by the various judges. For instance, Devitt et al. (2001) consistently scored anesthesiologists utilizing a clinical simulator. Either the physician chose to place a chest tube for a pneumothorax or they simply increased the inhaled oxygen percentage. Those who placed a chest tube correctly identified that a pneumothorax indeed occurred and performed the appropriate action. The scoring problem often arises on participants who did not place a chest tube. The knowledge of whether the physician correctly identified the change in breath sounds and decreased oxygen saturation as a pneumothorax is unclear. The scorer was able to separate their assumptions about what the physician knew or did not, and what the physician chose to do about the problem thus decreasing bias.

## **Limitations**

More research regarding the long-term benefits of high-fidelity simulation mannequins is needed before many managers squeeze money out of a continually shrinking budget. A poll of neonatal and pediatric respiratory therapy managers and educators resulted in over 75% agreeing the high-fidelity simulation is an effective training tool for the critical care environment that offers opportunities that would not necessarily be available otherwise (Walsh, Gentile, & Grenier, 2011, p. 1125). However, of those same people polled, only 26% reported the use of a simulator at their institution with the majority of respondents expressing neutrality regarding the costs outweighing the benefits.

Another limitation is the curriculum available to complement the simulations. The lack of published curriculum information includes scenarios with actors, with mannequins, or for interprofessional team building. The lack of material means educators are making a time-consuming educational method, even more labor intensive.

## **Conclusion**

Simulations appear to be the future standard of educational tools. Simulations with actors allow the addressing of behavioral training needs prior to direct patient contact. Information gathering, communication, and even decision making can be practiced using this method.

Electronic patient simulators can assist medical students, nurses, and other health professionals to “acquire, refine, and rehearse advanced clinical skills, both individually and in teams” (Good, 2003, p. 20). Unfortunately, some institutions still find patient simulators cost prohibitive. Both types of simulation allow for teamwork, feedback, and overall practice to occur in an environment where real patients are not at risk, but results of choices made can still be analyzed. The studies also showed the benefit of collaboration during the scenarios between

professionals. The professionals in the same field as well as interdisciplinary collaboration during simulation each had positive impact. Interactive strategies do not currently speed up the time to graduation itself. However, the time to graduation may best be maintained by the use of interactive strategies as healthcare knowledge demands continues to expand.

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