



A new take on testing

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1. A new take on testing: historical perspective

A 20-year-old report from the United States Department of Education (Bennett, 1998) predicted the effect computers, access to the internet, and cognitive science would have on educational testing. At the time, testing was primarily administered in a traditional format: individually with paper and pencil for assessment of learning in a controlled, secure environment. Bennett's (1998) report envisioned three evolutions: first, a change in testing format would use emerging technology infrastructures and more closely adhere to principles of cognitive science in question construction and format. This evolution would better allow standardized evaluation of student performance. Second, computer-based adaptive testing would individualize the testing experience and better reflect the learning and critical thinking ability of each student. The use of audio and video artifacts embedded in tests would present a more accurate representation of real-life problems. In retrospect, these predictions have been startlingly accurate. Multiple-choice questions, which nurse educators have predominantly used in test construction, have given way to alternative-format questions that include charts, exhibits, audio, video, short-answers, hot-spots, and ordered response (Oermann and Gaberson, 2017). Computer-adaptive testing programs have become available through testing and textbook companies. A third prediction concluded this proposed evolution of testing: to make testing a dynamic extension of learning, using approaches that would embrace real-world problem solving and collaboration, seamlessly incorporating assessment of learning into the curriculum.

This article examines the limited literature on current testing practices in schools of nursing, comparing these with interdisciplinary knowledge and trends. Looming changes in how students will be tested for licensure make this an important time in nursing education and presents new challenges in teaching students to think and make clinical decisions. The landscape of nursing education is changing and nurse educators need to be proactive in order to advance educational pedagogy and better prepare students for future practice.

2. Current testing practices in nursing

Schools of nursing rely heavily on traditional individual testing

models and high-stakes testing for assessment purposes. A 2011 survey of schools of nursing by the National League for Nursing found that at least one third of nursing programs used high-stakes standardized test scores to make student progression and graduation decisions. There is reason to believe that this number has increased as schools of nursing attempt to keep student first-time National Council Licensure Exam – Registered Nurse (NCLEX-RN) pass rates high (National League for Nursing, 2012). A teacher-centered approach of lecture followed by individual testing to measure learning is common, ignoring what is known about student-centered learning (Kantar, 2014). This emphasis on traditional use of testing for assessment of learning has prevented nursing faculty from using testing in ways that could extend learning (Kantar, 2014; Killingsworth et al., 2015).

Testing is also used to gauge the effectiveness of educational programs and as indicators of nursing program graduates' readiness to sit for the NCLEX-RN. Pre-licensure program graduates must pass the NCLEX-RN to practice as a nurse, and NCLEX-RN first-time pass rates are a primary measure used to assess program quality by state boards of nursing and national nursing education accrediting bodies. As a result, nursing educators have emphasized the importance of frequent evaluation of student learning based on individual, NCLEX-style testing. The literature on testing in nursing has focused on NCLEX-style test item construction, test item analysis, test revision, test administration, test security, and academic integrity (Bristol et al., 2018; Killingsworth et al., 2015; Palmer et al., 2016; Stillwell and Krautscheid, 2016). Existing guidelines emphasize testing solely as a measure of learning, to be conducted in a secure environment for assessment of individual students' knowledge. However, there is a paucity of research on testing in nursing education on which to base best practices (Bristol et al., 2018).

3. Testing re-envisioned

Years of data demonstrate that an increased focus on testing for summative assessment has not led to improved learning (Spurlock, 2013). Some professional programs are moving to correct this trend and make education more student-centered, restoring education's focus on learning (Harrison and Wass, 2016). Positive results regarding use of testing for learning have been reported from research in psychology,

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biological science, and healthcare education (Gilley and Clarkston, 2014; Jang et al., 2017; LoGiudice et al., 2015; Rivaz et al., 2015).

In addition, the next generation NCLEX-RN will likely challenge schools of nursing to transform the way they teach students. Educating students to learn nursing content and pass an exam will be replaced with educating students to use clinical judgement and make patient-centered decisions. The purpose of the revised NCLEX-RN is to introduce more realism into testing to better mimic actual practice situations, rather than a traditional test setting (Caputi, 2019). Students will need exposure to case-based, high-quality questions that require them to make clinically-based decisions, considering multiple patient factors and ever-changing patient conditions. Collaborative practice is receiving more emphasis within educational programs, and students are challenged to recognize when they need to collect more information and seek out team input when considering patient decisions. With these changes in mind, testing can be re-envisioned as more than a measurement on which to base evaluation decisions. Creative, low-stakes approaches to testing can increase learning and student success as students recall information and apply it in new ways.

Testing improves learning through the phenomenon of testing effect, a process where information becomes a part of a student's knowledge structure more effectively through retrieval rather than traditional studying. Traditional studying is a low-level approach to learning that involves reading and re-reading material, note taking, and memorization of new information. This is often referred to in the literature as knowledge encoding (Kantar, 2014; Racsmány et al., 2018; Yang and Shanks, 2018). Testing has traditionally been used to assess knowledge and skills that are gained through studying, or encoding (Baghdady et al., 2014; LoGiudice et al., 2015).

Knowledge retrieval makes learned information more accessible for future retrieval when compared to knowledge encoding, and has both short- and long-term effects (Foss and Pirozzolo, 2017; LoGiudice et al., 2015; Pugh and Regehr, 2016; Racsmány et al., 2018). Students who learn through testing demonstrate improved knowledge transfer across test formats, contexts, and domains. Improved learning is seen not only in information recall but also in situational application of knowledge, demonstrating students gain more than factual information through knowledge retrieval; they also gain an understanding of how that information can apply to real-life scenarios (Baghdady et al., 2014; Raupach et al., 2016; Yang and Shanks, 2018).

4. The future of testing in nursing education

In spite of evidence of testing effect found in other disciplines, nursing education has not widely explored creative uses of testing for learning. However, nurse educators have been cautioned to balance the use of high-stakes, traditional individual testing with low-stakes, low-anxiety approaches (National League for Nursing, 2012; Røykenes et al., 2014; Spurlock, 2013). Adopting creative testing as a replacement for selected occurrences of traditional testing would meet this recommendation.

Creative approaches to testing have demonstrated success in higher education, with students exhibiting improved learning and critical thinking. Examples of these approaches include: embedding questions into lecture or learning modules, competitive testing games using on-line programs, collaborative testing, interactive quizzes, and scaffolded tests that require the student to continue to answer questions until mastery is achieved. Testing can be interwoven into learning both in and outside of the classroom (Batsell et al., 2017; Griswold et al., 2017; Hanna et al., 2016; Iwamoto et al., 2017; Shiell and Slepokov, 2015; Vogler and Robinson, 2016). Creative approaches to testing can be either a method of informal formative evaluation or formalized summative evaluation. These uses reflect Bennett's (1998) third prediction, making testing an integrated and dynamic part of learning.

Individual benchmark testing will not go away as nurse educators determine whether students are on track while progressing through a

nursing program. However, because of the increasing need to provide students with opportunities to analyze and apply clinical reasoning, as well as the known benefits of the testing effect, nurse educators will need to find ways to incorporate creative uses of testing that combine learning and evaluation into their courses.

5. Conclusion

Testing in nursing education has received little attention in the literature, despite heavy use of both course-specific and standardized benchmark testing to evaluate student learning and prepare students for the NCLEX-RN. Testing has long been tied to tradition, receiving little attention from nurse education researchers to ensure that evidence supports current practices. More research is needed on the use of creative approaches to testing for learning with nursing students, and its impact on development of clinical reasoning, student success, and entry to practice. The U. S. Department of Education long ago provided a roadmap to the future of testing, which has so far turned out to be accurate (Bennett, 1998). Current trends in nursing, including a demand for graduates who can clinically problem-solve, warrants additional critical appraisal of how testing is used in schools of nursing.

Declarations of Competing Interest

None.

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