Using Games to Provide Interactive Perioperative Education

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ABSTRACT

Perioperative nurses must use critical thinking and sound clinical judgment to meet their patients’ needs safely and effectively. This requires the integration and continual updating of large amounts of detailed clinical information. Innovative education strategies are designed to make teaching and learning more interesting and interactive, especially for the presentation of complex subject material. One interactive educational strategy is the use of games. Educational games can foster collaboration and critical thinking among peers and associates. An example of this was the Perioperative QuizBowl: Evidence-Based Practice presented at the annual AORN Congress from 2003 to 2010, which was used to teach and reinforce evidence-based practice in a fun, competitive way. Although AORN no longer presents this offering, the QuizBowl format demonstrates how educational games can support clinical practice. AORN J 94 (October 2011) 370-376. © AORN, Inc, 2011. doi: 10.1016/j.aorn.2011.01.018

Key words: educational games, teaching strategies, games as teaching strategies.

Adult learning involves academic, continuing education, and job-related learning situations, and educators are continually challenged to find ways to keep the material fresh and interesting so that students are able to develop a deeper understanding of a subject. In adults, learning is an active process. Active learning helps to engage both students and teachers, and stimulates deeper-level, critical thinking. Nurses, by profession, are both educators and learners. The nurse educator role is demonstrated through patient education and in academia; clinical instruction; staff development; and orienting, precepting, and mentoring students and peers. As adult learners, nurses are constantly updating their knowledge, techniques, and skill sets to meet patients’ needs.

Active learning techniques are experiential. In other words, learning improves when it involves a personal experience that includes audio, visual, tactile (ie, psychomotor), and social styles of learning. In active learning, the focus of the process shifts from being solely that of the teacher’s or presenter’s point of view and educational process to include the learner’s or attendee’s point of view and process. Educators use active learning approaches to keep data fresh and interesting, promote information retention, and stimulate critical thinking. This is especially important when the subject is complex or tedious. Educators consider
some established and familiar techniques, such as group discussions or laboratory practice, to be innovative teaching strategies because they provide alternatives to lecture presentations.4,5,9-13 The use of games to teach, learn, and reinforce a subject or course material is one example of an innovative teaching strategy that promotes active learning and critical thinking.1-5,9-20

Critical thinking assumes that, if a person can accurately critique his or her environment, then that person will act effectively. Critical thinking is based on the skills an individual uses to process information about situations, people, and phenomena in a logical, analytical manner. Studies on critical thinking have yet to develop a consensus definition of the concept,5,7,10,13,20 but, regardless of how it is defined, critical thinking is an active process that requires an engaged participant. Critical thinking does not create clinical judgment; it supports it. One goal in nursing is to foster the development of sound clinical judgment in nurses. Nurses must be critical thinkers to be able to foster critical thinking in others. As educators and as clinicians, nurses constantly use creativity, flexibility, and contextual perspective—elements of critical thinking and active learning used in educational games.1-5,8-15,17-19,25-29

Educational games challenge students and teachers to look at learning in a nontraditional but engaging way.1-15,17 Identifying how games can be used in nursing education is particularly relevant in the perioperative setting because keeping abreast of evidence-based practice in this fast-paced, stressful environment is a vital component of perioperative care.6,17,20 Literature provides support for the perioperative nursing standards developed and updated by AORN,21-23 but published research and perioperative standards of practice are technical and complex, which can make reading and synthesizing this information tedious. Using a game format to meet perioperative education demands in a more interesting, nonthreatening way is one option for perioperative educators.6,17,20

EDUCATIONAL GAMES
Games of strategy and chance can be traced to ancient civilizations.24 The subject of educational games first appeared in nursing literature in the 1980s.25 Educational games are distinctly different in purpose from games used for entertainment.3,4,13-15,18,19,25-29 The concept of games as a teaching strategy in health care has been called “educational gaming”3,7-10,18,20 or “serious gaming.”17 These terms can be confusing because virtual gaming also is frequently called serious gaming.17 However, virtual gaming usually refers to computer simulation formats or virtual learning environments.15,20,30 Virtual gaming and simulation games are educational strategies in their own right and are only mentioned here for clarification. In business and management disciplines, the term “business games” also is used to identify educational games. Academic educators often use business games in academic settings, and these are an important training tool in many companies.25

Educational games work best as a supplement to primary course curricula to reinforce learning objectives, as long as the games are learning oriented and not disruptive. Educational games seek to stimulate and support critical thinking and an interest in learning and encourage creativity, collaboration, networking, and problem-solving skills among peers in a fun, less stressful atmosphere.1-5,8-15,17-19,25-29 Games help nurse educators provide information in new ways and promote learner-based knowledge. In educational gaming, the subject material is related to a specific topic, learning objective, or course curricula.1-5,8-15,17-19,25-29 Educational games can simulate clinical practice and bridge theory and application or connect previous knowledge with new knowledge. The core concepts for educational games include

- a defined set of play rules,
a goal,
the challenge or competitive spirit of the game, and
the subject material to be addressed.

Field testing questions before a game occurs (eg, taking the game format to a test audience to discover problems and applicability) is important to validate the game.\textsuperscript{4,9-15,18} The prize or reward for winning an educational game can be tangible (eg, money, gift cards, paid time off) or intangible (eg, personal satisfaction). Game rules can be applied to a variety of formats and can be tailored to group size, educational needs, and learning styles.\textsuperscript{1-5,8-15,17-19,25-31}

There are numerous examples of educational games that can be used in health care specialties (Table 1), including game show formats,\textsuperscript{1,21} puzzles,\textsuperscript{19} card games,\textsuperscript{3,15} board games,\textsuperscript{2,9,15} electronic games,\textsuperscript{26} slide presentations,\textsuperscript{8,30} and multimedia formats.\textsuperscript{3,17,27} Games also can be used as part of a needs assessment for a research program development.\textsuperscript{19} Researchers conducting medical and behavioral science studies have used crossword puzzles,\textsuperscript{18} board games,\textsuperscript{28} and game show formats.\textsuperscript{29} Premkumar and Bonycastle\textsuperscript{8} reported on a multidisciplinary health care workshop for faculty development that included developing games as a teaching strategy.

There is sound evidence for the use of a variety of approaches in teaching and learning, including educational games.\textsuperscript{10,13,14} A Cochrane review of educational games for health professionals concurred with growing evidence that supports the use of educational games in teaching the health sciences.\textsuperscript{12} To contribute to evidence-based research, games can provide qualitative and quantitative data through the use of research tools, such as pretest and post-test scores or Likert-type scales.\textsuperscript{1-3,10,11,15,18,26,27,29} Nursing researchers have found statistical significance in pretest–post-test data analysis of student participants’ knowledge.\textsuperscript{1-3,9,10,13,26}

**THE PERIOPERATIVE QUIZBOWL**

An example of the use of a game format to present perioperative information is the Perioperative QuizBowl: Evidence-Based Practice, which, until recently, was hosted at AORN’s annual Congress. The QuizBowl originated in 2003 with the objective that teams of contestants would compete to answer questions based on perioperative evidence-based practice information in a fun, competitive atmosphere.\textsuperscript{21,22} The questions were developed by perioperative experts who also served as judges for the competition. Team contestants were chosen from applicants who had advanced through preliminary question rounds via the AORN web site.\textsuperscript{21,22} The team that correctly answered the most questions won free registration to the following year’s AORN Congress for each team member, valued at more than $500. Consolation prizes were given to the remaining participants.\textsuperscript{21,22} The Perioperative QuizBowl lasted until 2010, and its longevity was an indicator of its success.

Although AORN no longer offers the Perioperative QuizBowl, its history provides useful insight into educational gaming\textsuperscript{21,22} and demonstrates the concepts underlying educational gaming. Using a game show format, there are established rules of play. The two main objectives of an educational game are to

- actively stimulate interest, understanding, and knowledge of perioperative evidence-based practice and
- reward the participants for having and potentially applying that body of knowledge.\textsuperscript{17,18,21,22}
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Game show questions should be field tested before the game to ensure relevance, clarity, and difficulty. Field testing validates the material used and prompts interest and dialogue in perioperative evidence-based practice among the field test participants. Although the QuizBowl was one of many educational sessions provided at Congress, it was the only one with a game format. Although individual reactions to game learning formats differ, in general, participants find them less stressful because they are fun and presented in a nonthreatening atmosphere. QuizBowl attendance and participation were voluntary and provided an additional learning strategy for the attendees.

**IMPLICATIONS FOR EFFECTIVE USE OF EDUCATIONAL GAMES**

The challenge in creating and using educational games is that they must be cost-effective, fun, and educationally sound without being viewed as frivolous. Educational games have been perceived by some as entertainment instead of education. Proper use and application of educational game strategies, therefore, are important. The purpose must be stated clearly in a fun, not funny, way. Clear communication of the educational goals and rules, and an opportunity for learner feedback or debriefing are paramount for an educational game to be effective. If the subject matter is not reinforced or learned by the audience, then the message may have been lost in the medium. Games also can become gratuitous or ineffective if used too much. The competitive spirit of games also can be a deterrent for some students; losing must be kept within the perspective of improving subject knowledge, and the game should not frustrate, stereotype, embarrass, or ridicule participants.

**Limiting Factors**

There are factors that limit educational games for the nurse educator as well as the learner. Teaching strategies need to be tailored to the intended learner and be plausible for the instructor to implement. No education strategy is effective for all learners all of the time. Clear objectives and guidelines help keep students engaged but not overexcited or distracted. Care must be taken to maintain control of the game environment. Start-up time and cost for game formats can be significant. The time required to develop educational games varies by content, purpose, originality, and by the existence or lack of complementary programs, templates, or web sites. Commercially available educational games or templates are limited and vary widely in price.

**Solutions**

Despite the challenges, current literature provides insight into solutions for creating efficient, effective, and engaging educational games. Most games can be modified and tailored to meet the educational needs of the perioperative nurse educator or student. Educators can use Internet search engines to find credible web sites cited in the literature. Many elementary school-level educational games, such as word search puzzles or crossword puzzles, can be tailored to higher-level learning or to reinforce key points of a course or program. Some Internet sites allow users to create puzzles for free, and Microsoft Corp also has many game templates that can be downloaded by Microsoft® users.

**Evaluating Effectiveness**

Evaluating the effectiveness of an educational game starts with choosing an appropriate game for the topic and the audience, and continues...
through field testing and through formal evaluation (e.g., session evaluation forms) and informal feedback from the target audience. After an educator has developed a game format, he or she can modify the program as necessary for future use, thus reducing subsequent cost. Collaboration among peers, personnel in other departments, or faculty members also can result in program sharing and reduce costs. By using creativity, flexibility, and contextual perspective, nurse educators can successfully develop educational games to suit their learners.

CONCLUSION
Professional learning is not a static event; it is a constant process that needs to integrate a variety of education strategies to meet the learners’ needs. There are a number of ways to keep teaching and learning strategies efficient, effective, and engaging. The QuizBowl is one example of educational gaming as an innovative teaching strategy in nursing. Perioperative nurse educators can use games to supplement curricula, orientation, and staff development programs; foster team collaboration; and support critical thinking in nursing practice. Teaching and learning experiences gained through educational game strategies can provide insight into future developments in learning and clinical practice. AORN

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