

How **GAMING** Is Used as an *Innovative Strategy* FOR **Nursing Education**

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A **MONG THE MANY CHALLENGES** *nurse educators face today is the need to keep the teaching/learning process captivating and interesting.* **CONSIDERING** the large amount of information that nurse graduates must have in order to function as competent professionals in a demanding and ever-changing health care system, this challenge is not easily accomplished. **LECTURES**, routinely used to teach nursing education and clinical competencies and to verify knowledge, are frequently described as tedious and boring (1).

- **ONE EXAMPLE** of an innovative teaching strategy that can strengthen learning outcomes is gaming. Used as an adjunct to more traditional forms of teaching, games keep students from becoming bored, generate enthusiasm, and stimulate thought processes (1). **THIS ARTICLE** discusses the literature related to the use of gaming as an innovative teaching strategy in nursing and presents implications for nursing education.

ABSTRACT Gaming is an innovative teaching strategy that research has shown to be effective for improving nursing student learning outcomes. Specifically, gaming enhances retention of knowledge, promotes problem-based learning, and motivates nursing students to become more engaged in their learning. The literature also indicates that the use of gaming during nursing education promotes active learning, encourages critical thinking, makes learning more exciting, and can replicate real-life scenarios. However, empirical support for these advantages is lacking. This manuscript discusses the literature related to gaming, describes its use as a teaching strategy, and addresses implications for nursing education.

Literature Review A search of the literature was conducted using several databases, including CINAHL, ERIC, and Medline. Keywords used in the literature search were: gaming, teaching strategy, nursing education, and innovative teaching strategies. The search resulted in 31 references; 23 journal articles, four of which were empirically based, and eight books.

Although games have been played for centuries (2), their use as a teaching strategy is relatively new (3). According to Rowles and Brigham (4), games are defined as activities presided over by precise rules involving varying degrees of chance in which players compete through the use of knowledge or skill in attempts to reach specified goals. The nursing literature indicates that nurse educators first became interested in gaming as a teaching strategy in the early 1980s. At that time, experiential approaches to learning were on the ascent within the nursing profession (5).

Despite interest in innovative teaching strategies, nurse educators typically rely on traditional methods of teaching, such as lectures and class discussion (2,6). The underutilization of nontraditional approaches to teaching and learning may be related to a lack of understanding. In addition, gaming can be thought of as a fad where little, if any, worthwhile learning occurs (5). Still another reason may be that most nurse educators tend to have a philosophy of nursing education reflective of the philosophy held by Florence Nightingale. Educated in a classical manner, Nightingale strongly advocated that approach for nurse training and education (7).

The nursing literature highlights many reasons for using gaming as a teaching strategy, including the promotion of active learning (8), encouragement for critical thinking (1), the value of fun and excitement in learning (9), and replication of real-life situations (4). Active learning is particularly important because such learning stimulates interest (10), increases motivation, and relates topics to real-life scenarios (8), all of which have the potential to make learning more fun (11). Active learning is the way adults learn best (2). As self-directed and self-motivated learners, adults prefer learning environments that promote active involvement and value gaming as a teaching strategy that demands their participation in solving problems.

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Gaming can bring about critical thinking in students, encouraging them to work to reach decisions and, in some cases, requiring them to question the contributions of others in efforts to reach the right decision (12). Gaming can challenge students to tap into their cognitive reservoir for knowledge about how they would handle various situations (1).

Games can make learning more enjoyable. When the teaching/learning process is perceived as fun, stress and anxiety may be reduced. In addition, gaming alters the roles of students and teachers, resulting in an environment that is more relaxing and conducive to learning (13,14). According to Bartfay and Bartfay, “The fun aspect associated with gaming appears to be conducive to learning by generating joy and excitement” (9, p. 440). When used to review or practice material, gaming may help decrease the fear that arises naturally when students have failed to practice particular skills sufficiently (2).

Games have the potential to stimulate interest in learning. Using a game to teach content that may be considered dry or boring can bring about an atmosphere that is fresh and enjoyable (10). The student’s interest is captured by the pleasure of actively participating in the game and the suspense that comes from not knowing the outcome (15). Using gaming can be particularly helpful in classes scheduled for the end of the day when students and faculty are tired.

The final, and perhaps most important, reason for using gaming in nursing education is that games can be used to replicate real-life situations or processes, usually referred to as simulation (4). When student learning involves the use of simulation, practice takes place in an environment that facilitates clinical decision making without the fear of harmful real-life consequences.

Research into Gaming Although gaming has been associated with many positive curricular and student outcomes, there have been few empirically based reports to validate outcomes. The few studies that have been reported indicate that gaming, when used as a teaching strategy in nursing education, is effective in enhancing the ability to retain knowledge, promotes problem-based learning, and motivates students to learn.

A study by Cowen and Tesh (11) sought to determine whether gaming, combined with lecture, was more effective than lecture alone in improving student knowledge regarding pediatric cardiovascular dysfunction. The sample consisted of junior undergraduate nursing students from one baccalaureate school of nursing. Students in a pediatric nursing course were assigned to either a comparison group or a treatment group, depending on which semester they were enrolled. The game, developed by one of the researchers, consisted of 50 questions that examined the students' knowledge regarding congenital heart defects, diagnostic tests, congestive heart failure, blood flow, and acquired heart diseases in children.

The comparison group was taught the content with traditional methods — lectures, overhead transparencies, and class discussions. Students in the treatment group were taught using the same methods, but were also expected to play a pediatric cardiac game. For this group, class discussion time was reduced so that students could play the game during the last 30 minutes of class. A pretest/posttest developed by the researchers served as the evaluation tool. While pretest scores did not differ significantly between the two groups, there were differences in posttest scores. The comparison group answered 85 percent of the posttest questions correctly, while the treatment group answered 94 percent correctly. The results of this study support the use of games as an adjunct to traditional teaching methods.

Ingram, Ray, Landeen, and Keane (16) studied whether gaming enhanced students' ability to generate hypotheses and learn issues in a problem-solving situation. The sample consisted of generic four-year and postdiploma RN students enrolled in a problem-based learning course focused on chronic illness. Students were divided into two groups, each with generic baccalaureate and RN students. One group was taught the material in the conventional way. The other group played a game entitled "Let's Hypothesize," which was developed by the researchers to cover a number of categories: physical, psychological, social, developmental, spiritual/cultural, and political/economic. Outcomes were evaluated with a posttest administered during the next semester. Results indicated that students who used the gaming format outperformed their peers

on accuracy and breadth of answers; the gaming students had an accurate response rate of 85 percent compared to 74 percent for the control group. The researchers indicated that the differences were sufficiently large to be statistically significant ($p = .001$) and educationally important.

Cessario (17) developed a board game to motivate students to learn content related to the conceptual models of nursing.

The sample consisted of undergraduate and graduate students from one school of nursing who were enrolled in a nursing conceptual model course. Students were randomly assigned to either the control or the experimental group. The control group attended regular class sessions; the experimental group also attended class but played the board game on two separate occasions. A pretest/posttest design was used to assess level of knowledge. The posttest, consisting of multiple-choice questions that reflected course content, was given to both groups three weeks after the pretest. Students in the experimental group were better able

to retain knowledge related to the conceptual models than their peers in the control group. Cessario also developed a questionnaire to determine whether the board game reinforced and/or motivated student learning. Analysis of the data revealed that all students in the experimental group found the game to be motivating and enjoyable and stated that it reinforced their learning.

Bays and Hermann (18) compared test scores of students taught by gaming with those taught by lecture. The convenience sample consisted of 69 baccalaureate nursing students enrolled in a junior-level medical-surgical course at a major urban university. Both the control group and the experimental group were taught content on the endocrine system by the same instructor. The control group attended a traditional lecture and discussion. The experimental group played a nonsimulation game called "Draw-Learn-Win," where students applied the nursing process to patients with endocrine disorders. One week prior to playing the game, the experimental group received a content outline that highlighted important information from the required readings. The instructor also provided a brief overview to the experimental group prior to their playing the game that emphasized pathophysiologic

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processes. Scores on both a unit exam and the course final exam were examined for both groups. No significant differences in test scores on either the unit or the final exam were found. However, the researchers commented that student interest in the content was enhanced when gaming was used, and that gaming was a desirable teaching strategy.

The Need for Research and Testing Nurse educators can draw on many teaching strategies when developing curricular and course content. However, the use of gaming seems to have polarized nurse faculty. Essentially, those who favor the use of games in the teaching/learning process feel they bring about enthusiasm and pleasure, enhance motivation, and ultimately benefit the process (18). Critics, on the other hand, speak to being unsure of the amount or quality of learning that takes place, especially when games are played in teams or groups (18). Before nurse educators will more enthusiastically adopt this nontraditional method of instruction, additional research is needed to validate learning outcomes.

The research method most often supported for evaluating cognitive learning involves the use of pretests and posttests (19). The pretest determines student baseline knowledge and the posttest indicates whether students have achieved the objectives (20). An important distinction made by Oermann and Gaberson (21) is that gaming is only suitable for formative, not summative evaluation. With formative evaluation, immediate feedback is provided to the learner, which is consistent with the philosophy behind the use of gaming. Summative evaluation, on the other hand, is meant to assess whether the learner has mastered the objectives at the end of the learning experience (20).

Another recommendation for educators who wish to use gaming is to field test the game first to identify inconsistencies or problems with the rules and procedures. A field test may identify game questions that are ambiguous and need to be rewritten (17).

Finally, it is recommended that a debriefing session follow the gaming experience. Debriefing brings the teaching/learning

process full circle. “The discussion centers around analysis of the data presented during game play and conclusions drawn, so the learners can relate the game to their work” (19, p. 47).

Implications for Nursing Education All teaching strategies have some disadvantages, and gaming is no exception. Students differ with regard to preferred learning styles, and some do not enjoy competition. Developing games can be costly in terms of money and time. And the learning environment can be difficult to control (9,13,14).

When students differ in their preferred learning styles, there is the potential for student outcomes to be compromised (22). The literature indicates that adult learners benefit from an assortment of delivery modes, and gaming may meet the needs of adult learners who prefer to assume responsibility for their learning. However, some students prefer taking a more passive role and may not view gaming as worthwhile (22). There is no one single teaching strategy that will be the preferred learning strategy for a classroom of students. Introducing a variety of teaching strategies can challenge students and help them find

ways to solve problems, an especially important skill in the clinical setting.

Gaming helps create a competitive environment that can seem threatening to students and impede their learning (17). On the other hand, competition can make a game more interesting and stimulating and increase the motivation of players. Bartfay and Bartfay (9) stress that competition creates unnecessary anxiety and causes negative feelings, but Bloom and Trice (23) suggest that these problems can be avoided if incentives for playing are incorporated into the game and students know they will not be ridiculed for providing an incorrect response. Learning takes place when the instructor explores the rationales for incorrect as well as correct answers.

A challenge with gaming is to maintain control over the learning environment. It is necessary set guidelines so that the game does not get out of control (4) and lead to noisy and dis-

Sidebar.

Resources for Gaming in Nursing Education

UNIVERSITY OF MICHIGAN SCHOOL OF NURSING

Faculty Instructional Technology Resources – Games

www.nursing.umich.edu/facultyresources/bestpractices/games.html

STUDENT NURSE PLAYBOOK

www.studentnurseplaybook.com/

KNOWLEDGY™: DO YOU KNOW ONCOLOGY?

<http://esource.ons.org/productdetails.aspx?sku=04PRGN09>

NURSELEARN

www.nurselearn.com/free_game_&_tips.htm

THE THINKING NURSE

www.dupagepress.com/COD/index.php?id=1787

MARILYN SMITH-STONER

http://nursestoner.com/online_games.html

organized play (24). When participants fail to abide by the established guidelines, the game playing will break down (9), and the environment will not be conducive to learning. An ideal environment for game playing is one where open discussion and willingness to take chances are encouraged while the educator guides the group, without rigidity, toward achieving the learning outcomes (4).

Finally, a major barrier to the use of gaming is that it can involve a time-intensive and costly process. The number of games available for purchase is small (23), and nurse educators usually must design their own games and develop methods to evaluate whether the learning outcomes have been attained. (See Sidebar at left for some gaming sources.) According to Bloom and Trice, "Writing questions for a good game or developing a good word puzzle is just as demanding as writing items for a good test" (23, p. 138).

Gaming also takes time away from other classroom activities. Thus, while the potential benefits of gaming warrant their

use in the nursing classroom, it is important to ensure that the time spent playing games is used wisely (23).

Games can increase student motivation, help students retain knowledge and develop the capacity to solve problems, and have a positive impact on learning outcomes. Ultimately, it is the educator's responsibility to choose teaching strategies that best suit the needs of the curriculum and are likely to facilitate the achievement of course objectives. NLN

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